Leave them kids alone! The positive effect of abolishing grade repetition on pupils' dropout rates: Evidence from a policy change *

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Abstract

Repeating a grade during the first years of education may reduce children's and parent's motivation, increase family and school costs and pupil's dropout likelihood. While most of the research conclude no gains from grade retention, the debate is still open given the lack of causal evidence. This paper evaluates the impacts of an exogenous policy change in Mexico which eliminates retention in-grade for all first to third grade students. This reform helped schools to reduce repetition rates from varying higher levels to almost zero in one academic year. We use a seven-years panel of schools to exploit such variation in a short-span of time. Estimations coming from two-way fixed effects models show an average reduction in dropout rates after reform implementation, specifically in richer schools and for children with pre-school education. Further findings suggest that eliminating the "threat" of grade repetition did not affect pupil's performance in standardized tests. The results are robust to different specifications, a secondary methodology and falsification tests.

Key Words: educational achievement, education policy, grade repetition, dropout rates

JEL Classification: I12, I21, I28, H52

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1 Introduction

Automatic promotion of students who fail to meet specified promotion criteria is often opposed on the grounds that it lowers school expectations and students achievement. In some school systems, grade repetition is seen as a valid corrective measure for underachievers, working as a deterrent to poor school performance by inflicting a high penalty on under-performers or as an incentive for students to increase their efforts (Manacorda, 2012). Supporters of this policy also argue that retention in-grade gives children more time to meet the minimum academic standards of a given level. Indeed, some evidence in developed countries has attributed positive effects of grade retention on academic achievement (Jacob and Lefgren, 2004; Dong, 2010).

Contrary, other school systems consider retention in grade as unnecessary, as it raises costs for schools and families, affects children's motivation and self-esteem, stigmatizes students and increases the likelihood of dropout. Some authors argue that those who are retained may be at a higher risk of dropping out because youths who are older than their classmates feel different than their peers and are discouraged (Holmes et al., 1989; Roderick, 1994). Furthermore, it is considered that repeating a grade delays entrance of students into the labor market which may pose substantial monetary cost on individuals over the life-cycle. Consequently, some schools are experimenting different alternatives to grade repetition in favor of other types of "social promotion" for children who are not keeping up, considering parent's participation and remedial academic assistance.[1] [2]

A handful of studies in social sciences have documented that pupils who repeat a grade do not improve their school outcomes and are significantly more likely to dropout, compared to continuously promoted students (Roderick, 1994; Gomes-Neto and Hanushek, 1994; Jimerson, Anderson, and Whipple, 2002; Manacorda, 2012). Nonetheless, there is a less well-studied causal relationship between retention in-grade and its possible outcomes, including dropout, regardless of children's socioeconomic status and in contexts of high educational privation as observed in low- and mid-income countries.

This paper evaluates the effects of abolishing grade retention in the first three grades of primary school on pupil's dropout rates in the context of a developing country with universal primary education.

[1] For a revision of common alternatives to retention in-grade, see Protheroe (2007).

[2] This also relates to cross-national variations associated with contrasting systems of schooling where historical reasons also take play. For example, Brophy (2006) documents that Scandinavia and the English-speaking countries (and developing countries influenced by them) emphasize universal education to higher levels, encourage social promotion and grade repetition rates are low. Whereas, France, Portugal, and Spain (and developing countries influenced by them) emphasize universal education at lower levels but limit admittance to secondary and post-secondary levels, so repetition rates are higher in lower school levels.

In August 2012, Mexico passed from a punitive system in which all children graded below a threshold were not promoted to the next academic level, to one focused on the mandatory "social promotion" of students. The reform allowed children in the first three years of primary education to pass to the next grade regardless of their level of achievement. This change caused an exogenous reduction independent of schools' context of grade repetition rates in primary schools with varying trends before policy reform. This sharp effect in a short-span of time, allows to study the effects of such policy in a novel quasi-experimental manner using two-way fixed-effects models on a seven-year panel of schools and administrative data from 2007 to 2014.

Most likely, neither automatic promotion nor grade repetition completely address the problems of low achievers. There are different reasons to repeat a grade that are determined parallel to schools' systems and some are even voluntary. For example, a family may see repetition as a necessary measure for their offspring to fully acquire the knowledge of one specific grade. Retention in grade is "rational" if for example, children are continuously absent from school to work or help their family in housekeeping tasks and this is clearly plausible in poorer countries or contexts (Gomes-Neto and Hanushek, 1994). Similarly, other factors outside schools may as well determine student's involuntary grade retention and most of them also relate to their socioeconomic status. High direct costs and opportunity costs of attending school are more likely to strike children from impoverished backgrounds. Undoubtedly, parent's education and cultural capital have an effect on both, children's repetition and dropout likelihood. Finally, malnutrition, which is also related to poverty, may also affect pupils' achievement (Pollitt, Cueto, and Jacoby, 1998).

Disentangling socioeconomic and school factors from grade repetition and dropout rates is difficult in a non-experimental set-up. Poorer families, low-quality teachers and schools, absenteeism and infrastructure, often cited as major problems of school systems in developing countries, may explain both high repetition rates and students' incentives to abandon school. Therefore, it remains important to understand the practical consequences of policies seeking to abolish retention in-grade in favor of a cost-efficient "social promotion", as they may be undone if for example, children's socioeconomic context and family decisions are the main source of high repetition rates. In this case, other policies directed to eliminate the socioeconomic and cultural causes of grade repetition may be more effective.[3] Similarly, there are concerns that the social promotion may disincentive children's performance at school, as for example,

[3]For example, Patrinos, López-Calva, Bando et al. (2005) show evidence that in Mexican indigenous households, conditional cash transfers coming from the PROGRESA program have increased attendance and reduced grade repetition and school dropout rates.

evidence on Brazil has shown a negative and significant causal effect of automatic promotion on math test scores Koppensteiner (2014).

Results coming from this paper show a positive effect of exogenously reducing grade repetition rates on dropout rates despite the short time period of analysis. Two-way fixed effects models exhibit an average impact close to 0.2 percentage points (pp.) lower dropout rates after policy change. However such reductions are concentrated in richer schools and in schools with a higher proportion of children with preschool education. This suggests that despite policy reforms on social promotion may alleviate dropout rates, the socioeconomic conditions that fosters them are still dominant in disadvantaged contexts. Additionally, two-way fixed effects regressions on the impacts of policy change on student's achievement show that eliminating the "threat" of grade retention does not have negative effect on the average results of standardized Spanish and mathematics test scores in neither richer nor poorer schools. These results are a contribution on the broader debate in favor of the "social promotion" of children in less developed countries.

The rest of this paper is structured as follows: Section 2 discusses in detail policy change in promotion criteria in Mexico. Section 3 presents the panel of schools used for the analysis and descriptive statistics. Section 4 describes the empirical strategy. Section 5 discuses average effects and presents further robustness checks. Section 5 shows the heterogeneous effects of the reform by school varying characteristics. Section 7 includes some concluding remarks.

2 Automatic promotion in Mexican Schools

On August 2012 the Ministry of Education changed the rules for the student's evaluation and promotion in basic education for the academic cycle 2012-2013.[4] After this reform, rules remained the same for fourth to sixth grades in primary schools and for seventh to ninth grades in secondary schools, where children with an average mark lower than six, in a scale of one to ten, continued to have an 'insufficient' level of knowledge to be promoted to the next grade or educational level. Nonetheless, the reform transformed the way children from first to third grade of primary education were evaluated and promoted. As from the academic cycle 20012-2013, all first to third graders in both, public and private schools, would be automatically promoted to the next grade, and thus, pupils who got a mark lower than six would only repeat grade "if their parent's required it". [5]

Figure 1 draws grade repetition trends in first to third grades for the 32 Mexican States. The lines show a sharp reduction in grade repetition from varying higher rates to lower rates, converging below 1%, and remaining stable throughout the next academic cycle,[6] Except for the case of two states with traditional lower educational outcomes, Oaxaca and Michoacán for which repetition rates remained notably higher than the average. Note that the nature of the intervention caused a higher/ lower impact in States (and schools) with different repetition levels in the pre-policy period, allowing to compare some schools with higher repetition to others with lower rates before and after the exogenous change in policy. This is the key argument for our identification strategy as it will be discussed in Subsection 4.

3 Data and Descriptive Statistics

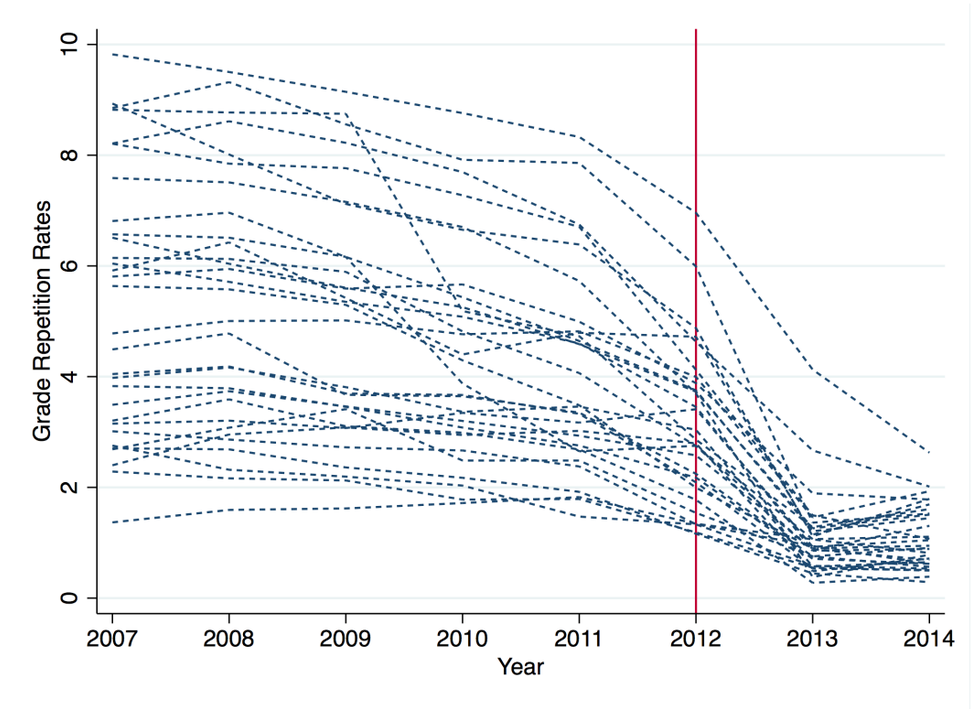
This paper uses the Statistics 911 corresponding to the academic years 2006-2007 to 2013-2014. This is a novel database coming from school's self-reported questionnaires that gather information at the beginning and at the end of each academic year, offering information on school's infrastructure such as number of classrooms in use. It also offers characteristics of teachers and principals including the

[4] All details of the reform can be consulted in the 'Pact 648' (Acuerdo 648 in Spanish) in the Nation's Official Diary (Diario Oficial de la Nación) published on August 14th, 2012.

[5] It is worth mentioning that before policy change, all children were graded using evaluations designed by each teacher. Thus it cannot be ruled out that teacher's criteria had an influence on children's retention in-grade. However, despite the lack of a national test, there exists a national curricula. Hence teacher's design of evaluations and criteria should not be the dominant cause of the variation in school's average grade repetition rates before policy change. For the purpose of this research, all the results presented in subsequent sections include controls for teacher's education as a proxy of their characteristics in the classroom.

[6] Note that despite the policy change abolished retention in-grade, the remaining 1% of repetition rates may be explained by parents asking for their children to repeat a grade, for different personal reasons, including 'children's maturation.

Figure 1: Average repetition rates in 1st to 3rd grades: trends by States before and after policy change



proportion of those in each school with any given level of education, from primary to postgraduate levels. The data at hand also includes information on the number of students by grade, age and sex, number of pupils who passed and failed and those who are repeating a grade. This allows us to estimate the total proportion of children repeating grade in any given year and those dropping out from school during the academic year (intra) and between school cycles (inter) and consequently the total dropout rate, considered as the sum of intra- and inter-course dropout rates.

Additionally, the Statistics 911 are merged with each schools' proportion of students receiving a PROSPERA Scholarship[7] in order to explore differences between poorer and richer schools. Furthermore, we also integrate the average third grade results in standardized tests of language and mathematics from 2008 to 2013 to test if abolishing the 'threat' of grade repetition had an impact in student's achievement. ENLACE includes the number of students tested and the proportion of unreliable tests in each school.

The main descriptive statistics are present in Table 1 for public and private general schools. The number of units for which there exists full information about grade repetition and dropout rates for the eight years period in a balanced panel is of 463,424 schools or about 59,000 schools in each academic year. Note that, regarding ENLACE test scores, the number of observations available is lower, this is because we only have information from 2008-2009 to 2012-2013. Average grade retention rates for the

[7]PROSPERA, before PROGRESA or OPORTUNIDADES, is a conditional cash transfer program directed to the poorest families in Mexico. For more information please refer to (Dávila Lárraga, 2016)

cited period corresponding to 1st to 3rd grades is of 3.82% while total dropout rates are of 1.51% on average. Dropout rates are higher when we consider all primary education (1.93%) while retention is lower (2.62%). This implies that grade repetition is higher in lower grades, when children are younger, but dropout is higher in 4th to 6th grades when students are typically between age 9 and 12.

Table 1: Main Descriptive Statistics

Variable	N	Mean	SD	Min	Max
Grade Repetition 1st-3rd	463,424	3·82	5·22	0	100
Dropout 1st-3rd	463,424	1·51	10·88	−100	100
Repetition 1st-6th	463,423	2·62	3·59	0	100
Dropout 1st-6th	463,345	1·93	9·01	−100	100
A. Teacher's Education					
Vocational	462,798	37·05	33·00	0	100
Bachelors	462,800	56·79	33·44	0	100
Postgraduate	462,798	5·20	12·58	0	100
B. Schools's Characteristics					
Number of Students	463,424	213·69	174·27	2	1416
Number of Teachers	463,424	7·64	5·07	1	30
"Carrera Magisterial"	463,424	3·15	3·75	0	33
Low-SES School	463,424	0·35	0·48	0	1
Public School	463,424	0·89	0·31	0	1
Morning Shift	463,424	0·82	0·38	0	1
C. ENLACE results					
Math Avg. 3rd Grade	372,618	535·38	75·82	103	914
Spanish Avg. 3rd Grade	372,674	538·44	82·25	64	897

Source: Author's elaboration using Statistics 911 for the school years 2006-2007 to 2013-2014 and ENLACE databases from 2008-2009 to 2012-2013. "Carrera Magisterial" is a national program that offers monetary incentives to "the best" teachers according to a set of standardized evaluations. The variable presented refers to the percentage of teachers receiving such incentives in each school.

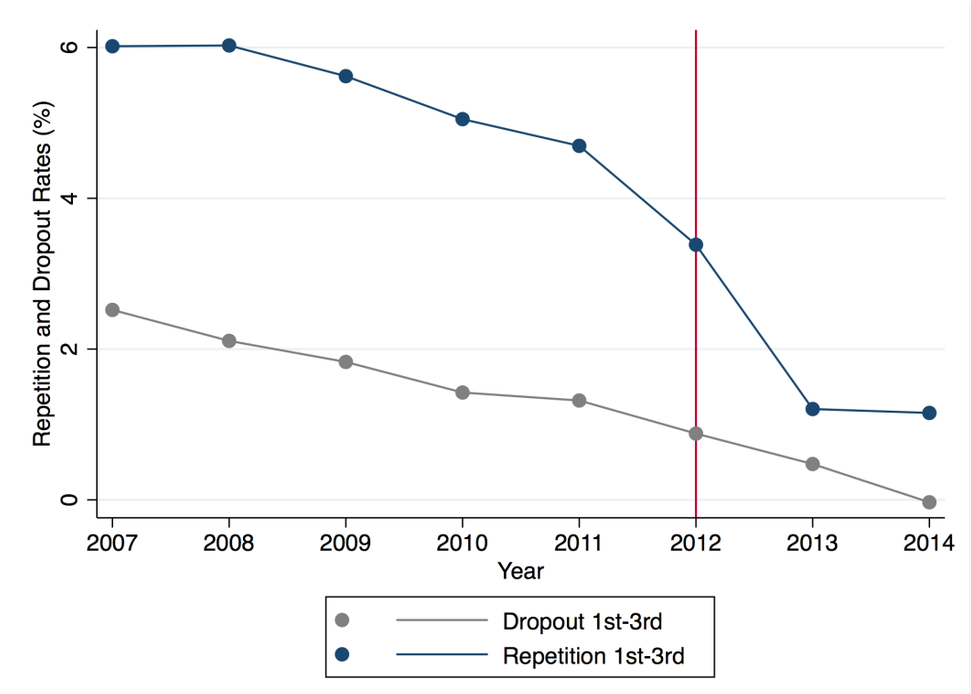
Table 2 presents average grade repetition rates for 1st to 3rd and 1st to 6th grades across years. Note the decreasing trend for all variables along with a clear sharp reduction in both grade repetition and dropout rates from the school cycle 2012-2013. For example in the case of 1st to 3rd grades, we observe a decline in average retention rates, from 3.26% to 1.14% from 2011-2012 to 2013-2014, respectively. This same reduction is registered in dropout rates, as they go from an already low 1.03% to a lower 0.06%, respectively. Such trends can be graphically depicted in Figure 2. Note the clear downwards pre-trend in both, repetition and dropout rates that could sense a possible anticipation to the policy; however, repetition laws in Mexico are only approved at the national level and states or schools are not allowed to individually change their evaluation criteria. The clear downwards trend in retention rates may represent a normal pattern due to the general improvement in education across different States in Mexico. In any case, state/county and school pre-trends in repetition are addressed in the methodology and falsification tests presented in the coming sections.

Table 2: Average repetition and dropout rates from 2007 to 2014

	Grade Repetition		Dropout	
School Year	*1st-3rd Grades*	*1st-6th Grades*	*1st-3rd Grades*	*1st-6th Grades*
2006-2007	5.79	3.95	3.14	3.25
2007-2008	5.83	4.01	2.59	2.71
2008-2009	5.41	3.75	2.53	2.56
2009-2010	4.88	3.32	1.82	1.94
2010-2011	4.46	3.01	1.76	1.72
2011-2012	3.26	2.22	1.03	1.29
2012-2013	1.18	0.92	0.87	0.94
2013-2014	1.14	0.91	0.06	0.61

Source: Author's elaboration using Statistics 911 for the school years 2006-2007 to 2013-2014

Figure 2: Average grade repetition and dropout rate in 1st to 3rd grades



4 Empirical Specification

Our estimation strategy follows the work of Duflo (2000) and more recently Chakraborty and Bakshi (2016) and uses the variation in grade repetition rates across schools in time to identify the effect on dropout rates of abolishing grade retention for students not passing mandated assessments. The intuition is that schools with higher grade repetition rates would be affected 'more intensively' by the exogenous change in policy, compared to schools with already low-levels of grade repetition. The key assumption is that the proportion of the reduction in grade repetition rates is independent of observed and unobserved school characteristics and it is only because of the policy implementation. As a matter of fact, Figure 3 shows that, regardless of poverty level and rural/urban status, all schools after policy change converge towards the same repetition rate of approximately 1%. Additionally, different time trends at the state and school levels are considered in the corresponding estimations to account for differences between states' and schools' trends explained by unobserved changes happening at the state/school level. Thus, if lower retention is associated with lower dropout rates, the change in grade repetition rates from 2012 to 2013 will be negatively related to the proportion of children abandoning school after the reform. This is captured by the following equation:

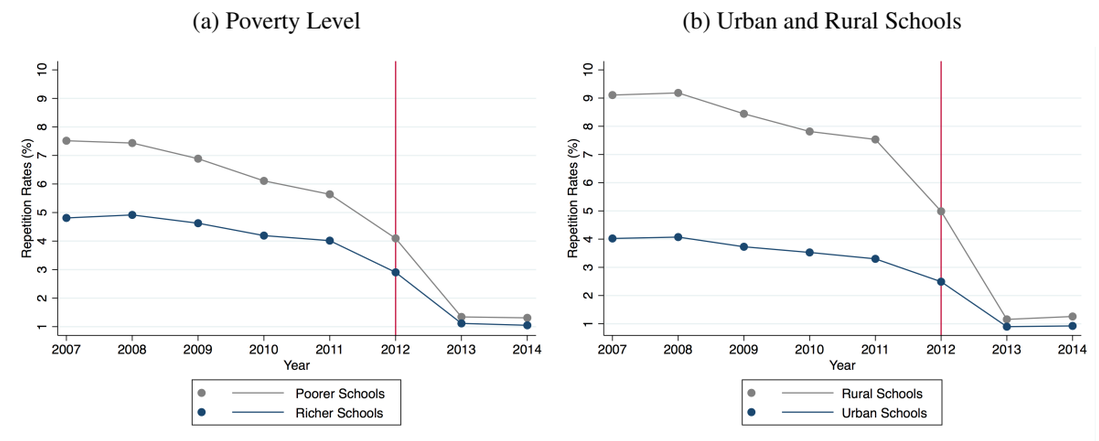
$$Dropout_{sti} = \alpha + \alpha_2 Repetition_s * Post + D_t + D_s + \alpha_3 X_{st} + D_{i,s} * Year + \varepsilon_{sti} \quad (1)$$

Where $Dropout_s$ is the total dropout rate in school s in time t in state i. 'Post' is a dummy taking the value of one in the post-change period and zero otherwise. $Repetition_s$ measures repetition rates at the school s before and after policy change. Hence, $Repetition_s * Post$ captures the effect of the exogenous change in repetition rates for school s. X_{st} includes school level potential predictors of dropout rates for the whole pre- and post-policy period, such as number of students, teachers per every 100 pupils and teachers' and principals' average education. D_t is a time dummy variable that accounts for changes in the pre- and post-policy period that might have affected school's outcomes. D_s are time invariant school dummies capturing specific school characteristics which might affect the outcome of interest. Finally, $D_{i,s}$*Year represents state i, or school s year trends that capture state time-varying changes in institutional frameworks/or school-level policies that correlate to dropouts and grade repetition. Standard errors are two-way clustered at the school-by-year and state level to account for potential serial and group correlations.

This two-way fixed-effects models compare schools dropout rates between units with high and low repetition rates before and after policy change and thus, α_2 is our coefficient of interest. It measures the impact of abolishing retention in-grade (or exogenously reducing grade repetition rates) on drop out rates in percentage points. If the policy change had an impact we would expect α_2 to be negative. More specifically, this term will tell us for schools where repetition rates are 1 pp. higher in the pre-policy period, how much would dropout rates change after abolishing grade repetition.

The causal interpretation of α_2 in the above framework rests on the assumption that after controlling for time fixed-effects, state/county or school year trends and time invariant characteristics of schools, ε_{sti} is independent of the interaction term. In other words, there are no time-varying unobserved school-specific and state/county factors that are correlated with the change in grade repetition after policy intervention. As mentioned, we believe this is rather plausible as the sharp reduction in retention in-grade comes from a modification in the federal law to asses pupils that is independent of school characteristics and state/county policies.

Figure 3: Average grade repetition 1st to 3rd grade: trends before and after policy change by poverty level and urban/rural status.



Notes: Each panel separately shows pre and post reform trends in grade repetition for grades 1st to 3rd using data from the 'Statistics 911'.

5 Does abolishing retention in-grade reduce pupil's dropout rates?

Table 3 shows the estimations coming from the specification in Equation (1). Column 1 shows the effect of the policy change on total dropout rates including school and time fixed effects. Columns 2 and 3 show the effects by adding state and school-specific time trends, respectively. For the three different specifications the coefficient attached to the change in policy shows a highly significant reduction in total dropout rates, from 0.17 to 0.24 pp. on average (S.E. of 0.04) for schools with repetition rates 1% higher in the pre-policy period. This means, that a school going from a repetition rate of 4 to 1 pp., after policy change, would show an approximate reduction of 0.5 to 0.7 pp. in dropout rates. Similarly, if one considers that the average repetition rate before policy was already at a low 1.2%, the average reduction of 0.17 percentage points, computed in the preferred specification in Column 3, translates into an average reduction of approximately 15% of the average pre-policy dropout rate.

Note that other variables included in the model also show sensible results regarding their effects on dropouts. For example, bigger schools have more dropouts but increasing the ratio of teachers in one per 100 students significantly reduces dropout rates. Not surprisingly, teacher's education at higher levels, also relates negatively to dropout rates.

5.1 Falsification Tests

Figure 4 plots the results of different regressions including interactions between grade repetition and a set of dummies taking the value of 1 in the years 2008-2012, as if policy had changed before 2012. Across all models, we use 2007 repetition rates as a base. Estimations, as those coming from Equation 1 include time and school fixed-effects (left hand figure) and the preferred specification including time and school fixed-effects and a school specific time-trend (right hand figure). Regressions also include a set of school and teacher's characteristics as controls.[8] The results offer the relationship between grade repetition changes and dropout rates independent of school characteristics across time and school trends in retention rates for the pre-policy period, as well as the effects after policy change in the school cycle 2012-2013. If the estimate of α_2 is confounded with unobserved factors that vary directly with repetition rates, α_2 would be different from zero for any year before policy change.

Note that the coefficients in the pre-policy period are non- significantly different from zero at the

[8] Detailed results for these specifications and another one including state-year fixed-effects are included in the Annex Table A2

Table 3: Two-way fixed-effects models of dropout rates on grade repetition

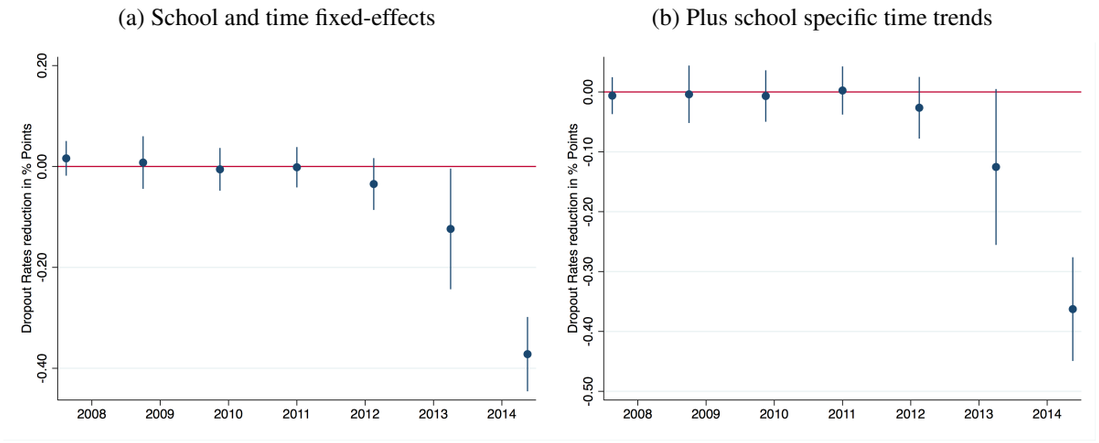
	Dropout (1)	Dropout (2)	Dropout (3)
Repetition * After	−0·242***	−0·234***	−0·165***
	(0·041)	(0·042)	(0·043)
Students	0·182***	0·195***	0·464***
	(0·009)	(0·009)	(0·019)
Students Sq.	−0·000***	−0·000***	−0·000***
	(0·000)	(0·000)	(0·000)
Teacher Ratio	−1·506***	−1·599***	−2·052***
	(0·134)	(0·128)	(0·223)
Vocational Training	−0·004	−0·004	−0·012**
	(0·004)	(0·004)	(0·006)
Bachelor's Degree	−0·010**	−0·008*	−0·015**
	(0·004)	(0·004)	(0·005)
Postgraduate Studies	−0·014***	−0·013**	−0·018**
	(0·005)	(0·005)	(0·007)
"Carrera Magisterial"	−0·064***	−0·063***	0·055***
	(0·017)	(0·015)	(0·019)
R-squared	0·244	0·268	0·433
Number of schools	412047	412047	412047
School Fixed- Effects	Yes	Yes	Yes
Time Fixed-Effects	Yes	Yes	Yes
State-Specific Trend	No	Yes	No
School-Specific Trend	No	No	Yes

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Standard errors, clustered on the school-by-year and sate level, are in parenthesis. Teacher's education is measured as the proportion of teachers with any given educational level in each school. "Carrera Magisterial" is a national program that offers monetary incentives to "the best" teachers according to a set of standardized evaluations; the variable included in the model refers to the proportion of teachers receiving such incentives in each school. Teacher Ratio is measured as the number of teachers per 100 students at the school level.

95% of confidence for all periods previous to policy reform, ruling out a possible anticipation to policy change and implying that the average coefficient α_2 represents the effect of the change in promotion rules in Mexican primary schools, as unobserved factors independent of time, school-fixed characteristics or changing characteristics causing varying school grade repetition trends, are plausibly not correlated with our estimator of interest. This offers support to the conclusion that abolishing retention in-grade caused a reduction in dropout rates in Mexico, and that the effect remains (and is statistically higher) two years after policy change.

Figure 4: Falsification test of a reduction in grade repetition on dropout rates in the pre- and post-policy period.



Point estimates and the 95% confidence intervals are obtained from a regression including interactions between grade repetition and year dummies taking the value of zero in the pre-policy period and one in the subsequent years, 2008-2012 as if policy had changed before 2012. We use 2007 repetition rates as a base. Estimations include time and school fixed-effects (left) and a combination of time and school fixed-effects and a school specific time-trend (right). Regressions also include a set of school and teacher's characteristics as controls.

5.2 Alternative Specification

This section presents the estimates of a different specification to account for the effects of the reform in promotion rules. The estimation is similar in spirit to a triple-difference strategy as defined by the equation:

$$Dropout_{st} = \alpha_1 + \alpha_2 Repetition_{st} * Post * Non-CDMX + \\ repetition * D_t + nonMX * D_t + D_t + D_s + \alpha_3 X_{st} + D_{i,s} * Year\varepsilon_{st} \tag{2}$$

In this equation, α_2 gives the casual estimate of the effect of policy change in all states different from Mexico City (non-CDMX) on dropout rates. $Repetitions_s$, Post, D_t, D_s and X_{st} are defined as before. Non-CDMX is an indicator that takes value one for any state different from Mexico City. Mexico City schools are used for this setup because repetition rates there did not chance dramatically after policy

intervention, because they were already at a very low level, nonetheless, as the rest of Mexico they also depict a similar trend years before policy intervention as shown in Annex Figure A1. The interaction $Repetition_s * D_t$ between average repetition rates before policy change and time dummies, denote time trends that account for any time varying differences in retention rates between Mexico City's schools and the rest of Mexico apart from the change in promotion rules. Moreover there can be differences in the education conditions and policies between non-MX states and Mexico City, this is controlled by the varying state effects $non - MX * D_t$. Finally, $D_{i,s}$*Year represents county i or school s year trends that may correlate to policy change. Standard errors are also clustered at the school-by-year and state level.

This strategy allows states with varying high and low repetition rates to have different time specific trends but it rests on the assumption that difference in grade repetition trends between high and low repetition schools is similar across non-MX states and across Mexico City. This is likely to hold once state specific factors are controlled for.

The estimations coming from Equation 2 are presented in Table 4. They show a slightly higher average reduction of about 0.26 to 0.27 pp. on dropout rates in the preferred estimation in column 3. However results are quite similar to those obtained in Table 3.

Table 4: Alternative models of dropout rates on grade repetition

	Dropout (1)	Dropout (2)	Dropout (3)
Repetition * Non-CDMX	−0·256***	−0·264***	−0·273***
	(0·021)	(0·002)	(0·003)
R-squared	0·169	0·191	0·304
Number of schools	413232	413232	413232
School Fixed- Effects	Yes	Yes	Yes
Time Fixed-Effects	Yes	Yes	Yes
County-Specific Trend	No	Yes	No
School-Specific Trend	No	No	Yes

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Standard errors, clustered on the school-by-year and sate level, are in parenthesis. Other controls included are teacher's education measured as the proportion of these with any given educational level in each school and "Carrera Magisterial" referring to the proportion of the 'best' teachers receiving incentives in each school. Teachers Ratio measured as the number of teachers per 100 students at the school level and number of students are also included.

6 Heterogenous effects of abolishing grade retention

6.1 Do policy effects differ for children dropping out during the academic year or between courses?

In order to explore some underlying factors behind the effects of abolishing retention in grade, Table 5 includes the average results separated by intra (during the academic year) and inter-droput rates (between academic years). The estimations suggest that policy change effects come from students promoted to the next grade, who are now returning to the next academic cycle, as dropout rates between courses (inter) are driving the reduction in the total dropout rates. This effect plausibly relates to students not feeling 'discouraged' after they are not failed. On the other hand, intra-course dropout rates do not seem to be affected.[9] Plausibly, children abandoning school during the academic year are doing it for reasons less related to retention laws or school characteristics. In this regard, other variables shown in Table 5 related to the 'academic environment' of schools such as the proportion of teachers with Bachelor's or postgraduate studies, do not seem to be related to intra-course dropout rates, suggesting that this type of dropout relates less to school/teacher policies and characteristics and more to other context and children/family unobserved characteristics.

6.2 Do policy effects differ by school's socioeconomic contexts and family investments?

One important issue is whether the effects of abolishing retention in-grade hold for different socioeconomic contexts and family investments. For example, if the reform has no impacts in poorer schools or in schools with a higher proportion of children with no pre-school education (used as a proxy for family investments), naturally, similar policies would have a lower potential to help the most vulnerable. In this regard, Table 6 presents the results of the preferred estimation defined in Equation 1, using time and school fixed-effects and a school specific time-trend, adding an interaction that identifies poorer schools as those above the state average of children receiving a PROGRESA scholarship and another variable that identifies schools with a higher proportion of children with preschool education, compared to the state average. The results suggest that the effects of the reform are concentrated in richer schools and in

[9] In recent years, intra and inter-course dropout rates are similar on average as it can be noticed in the Annex Table A1. For which, half of the proportion of children dropping out of school were not affected by the policy.

Table 5: Effects of abolishing grade retention on intra- and inter-course dropout rates.

	Total Dropout	Intra-Course	Inter-course
	(1)	(2)	(3)
Repetition * After	−0·165***	0·040*	−0·216***
	(0·043)	(0·022)	(0·042)
Students	0·464***	0·169***	0·293***
	(0·019)	(0·013)	(0·013)
Students Sq.	−0·000***	−0·000***	−0·000***
	(0·000)	(0·000)	(0·000)
Teacher Ratio	−2·052***	−0·815***	−1·233***
	(0·223)	(0·162)	(0·185)
Vocational Training	−0·012**	−0·003	−0·008*
	(0·006)	(0·002)	(0·004)
Bachelor's Degree	−0·015**	−0·004*	−0·009**
	(0·005)	(0·002)	(0·005)
Postgraduate Studies	−0·018**	−0·004	−0·013**
	(0·007)	(0·003)	(0·005)
"Carrera Magisterial"	0·055***	0·040***	0·013
	(0·019)	(0·009)	(0·016)
R-squared	0·433	0·404	0·387
Number of schools	412047	411920	411825
School Fixed- Effects	Yes	Yes	Yes
Time Fixed-Effects	Yes	Yes	Yes
School-Specific Trend	Yes	Yes	Yes

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Robust standard errors, clustered on the school-by-year and state level, are in parenthesis. Teacher's education is measured as the proportion of these with any given educational level in each school. "Carrera Magisterial" is a national program that offers monetary incentives to "the best" teachers according to a set of standardized evaluations; the variable included in the model refers to the proportion of teachers receiving such incentives in each school. Teachers/Stud Ratio is measured as the number of teachers per 100 students at the school level.

schools with a higher proportion of children that attended preschool education.

Table 6: Effects of abolishing grade retention on intra- and inter-course dropout rates by poverty level and family investments.

	Total Dropout (1)	Intra-Course (2)	Inter-course (3)
A. Richer Schools			
Repetition * After	−0·194***	0·040	−0·235***
	(0·066)	(0·024)	(0·053)
B. Poorer Schools			
Repetition * After	0·052	−0·000	0·034
	(0·059)	(0·019)	(0·039)
C. Above Preschool State Average			
Repetition * After	−0·173***	0·031	−0·233***
	(0·051)	(0·025)	(0·055)
D. Below Preschool State Average			
Repetition * After	0·012	0·024	0·026
	(0·057)	(0·024)	(0·046)
R-squared	0·433	0·404	0·387
Number of schools	412047	411920	411825
School Fixed- Effects	Yes	Yes	Yes
Time Fixed-Effects	Yes	Yes	Yes
School-Specific Trend	Yes	Yes	Yes

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Standard errors, clustered on the school-by-year and sate level, are in parenthesis. Other controls included are teacher's education measured as the proportion of these with any given educational level in each school and "Carrera Magisterial" referring to the proportion of the 'best' teachers receiving incentives in each school. Teachers Ratio measured as the number of teachers per 100 students at the school level and number of students are also included.

6.3 Does abolishing retention in grade affect pupil's performance?

One of the most common arguments in favor of retention in grade, is that it acts as a deterrent to poor school performance by inflicting a penalty on under-performers. Therefore, an unintended outcome of the automatic promotion of students, may be a negative effect on children's performance. In order to explore this, we use the ENLACE results and the set-up presented in Equation 1 to evaluate the effects of abolishing retention in-grade on math and language test scores. Unfortunately, the analysis is constrained by the fact that such test was applied for the last time during the school year 2012-2013 and that it is only taken by pupils in 3rd to 6th grade. Still, we can study the effects of the policy change on the test scores of 3rd graders, as the change in promotion guidelines happened in September 2012, whereas the last round of the ENLACE test was applied at the end of the school year, in June 2013. It is important to highlight that the effect we are exploring here is not that of the automatic promotion, as we would need to observe test results of children who would not be promoted in the absence of the policy. Consequently, what we study is the exogenous elimination of the "threat" of grade retention for the year 2012-2013.

Table 7 shows the effects of policy change on mathematics in Panel A and on language in Panel B. The columns show different heterogeneous results for poorer and richer schools. The estimations in Column 2 suggest a statistically significant but economically insignificant positive effect of abolishing grade retention on language of 0.8% of a Standard Deviation. This effect translates into a marginal gain of just 0.8 points in a test with an average of 500 points. In the overall, the estimations suggest that eliminating the "threat" of grade repetition does not reduced the effort of third graders. An alternative interpretation is that policy change could have increased school resources and efforts devoted to children who progress but should have failed in the absence on the reform. This is a question that remains open given the data at hand.

Table 7: Effects of abolishing grade retention mathematics and language test scores.

	Mathematics (1)	Language (2)
Repetition * After	0·003	0·008 ∗ ∗
	(0·002)	(0·004)
Repetition * After * Poorer	0·000	−0·003
	(0·004)	(0·004)
R-squared	0·615	0·626
Number of schools	331264	331214
School Fixed- Effects	Yes	Yes
Time Fixed-Effects	Yes	Yes
School-Specific Trend	Yes	Yes

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Standard errors, clustered on the school-by-year and sate level, are in parenthesis. Test scores are standardized by year with an average of zero and a standard deviation of one. Other controls included are teacher's education measured as the proportion of these with any given educational level in each school and "Carrera Magisterial" referring to the proportion of the 'best' teachers receiving incentives in each school. Teachers Ratio measured as the number of teachers per 100 students at the school level and number of students are also included.

7 Conclusions

This paper evaluated the impact effects of an exogenous policy change on dropout rates. The reform took place in 2012 and modified Mexico's grade retention laws for 1st to 3rd grade students . The data at hand offered the possibility to study a panel of schools between 2007 to 2014 and explore different heterogeneous effects by poverty level and a proxy of family investments at the school level. Additionally, it was possible to summarily test if abolishing the grade repetition 'threat' affects children's performance.

The main results obtained show a significant effect of abolishing grade retention on dropout rates of approximately –0.17% points. These findings do not seem to respond to pre-trends in retention rates as placebo tests probe that our identification strategy manages to isolate the effect of the exogenous change in retention laws. Similarly, an alternative specification using Mexico City's trends as controls allowed to confirm similar effects.

The average reduction in dropout rates is not minimal if we consider that the average before policy change was already at a low 1%. Such effects are observed one and two years after policy change. Indeed this is a very short span of time and we acknowledge that they are rather preliminary and will be more relevant when more data on dropout and pupil's performance is available. It will be interesting to analyze if the short-term effects remain once children grow older and go to secondary school where dropout rates in Mexico can be as high as 8%. Nonetheless, these results are a good a first approach to the possible effects of a low-cost policy.

Finally, the results show that policy change does not modify intra-course dropout rates and that the

main effects are concentrated in richer schools. This suggests that dropout rates in poorer environments are apparently not affected by the reform, possibly, because pupils' attainment in such conditions is heavily influenced by their socioeconomic and cultural disadvantages, regardless of the promotion rules. Finally, we do not observe effects of abolishing grade repetition on standardized results of math and language.

In sum, this paper offers evidence that a low-cost policy modifying retention laws independent of other inputs at the school level, can on average enhance children's overall achievement without seemingly affecting pupil's general performance. This is of great relevance in the Mexican context where authorities face an important challenge to improve education outcomes.

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Appendices

Table A1: Average Total Intra- and Inter-course Dropout Rates

	Dropout rates on 1st to 3rd grades		
School Year	*Total*	*Intra-course*	*Inter-course*
2006-2007	3.14	2.06	1.00
2007-2008	2.59	1.81	0.77
2008-2009	2.53	1.90	0.57
2009-2010	1.82	1.36	0.39
2010-2011	1.76	1.30	0.36
2011-2012	1.03	0.56	0.51
2012-2013	0.87	0.33	0.47
2013-2014	0.06	-0.38	0.39

Table A2: Two-way fixed-effects: Placebo tests with policy on in the pre- policy period 2008 -2012

	Dropout (1)	Dropout (2)	Dropout (3)
Repetition * Policy on 2008	0·024	0·019	0·002
	(0·018)	(0·017)	(0·015)
Repetition * Policy on 2009	−0·023	−0·026	−0·035∗
	(0·022)	(0·020)	(0·19)
Repetition * Policy on 2010	−0·028	−0·028	−0·030
	(0·022)	(0·022)	(0·022)
Repetition * Policy on 2011	−0·020	−0·020	−0·017
	(0·019)	(0·019)	(0·019)
Repetition * Policy on 2012	−0·035	−0·036	−0·024
	(0·025)	(0·025)	(0·025)
Repetition * Policy on 2013	−0·144∗∗	−0·159∗∗	−0·148∗∗
	(0·064)	(0·069)	(0·070)
Repetition * Policy on 2014	−0·356∗∗∗	−0·367∗∗∗	−0·347∗∗∗
	(0·028)	(0·032)	(0·036)
School Fixed- Effects	Yes	Yes	Yes
Time Fixed-Effects	Yes	Yes	Yes
State * Year Fixed-Effects	No	Yes	No
School * Year Fixed-Effects	No	No	Yes
Other controls	Yes	Yes	Yes
R-squared	0·243	0·258	0·266
Number of schools	435822	435822	435822

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Robust standard errors, clustered on school-by year and state, in parenthesis. Regressions include interactions between grade repetition and year dummies taking the value of 0 in the pre-policy period and 1 in the subsequent years, 2008-2012 as if policy had changed before 2012. We use 2007 repetition rates as a base. Estimations include time, school fixed-effects and a combination of county-year fixed-effects. Regressions also include a set of school and teacher's characteristics as controls.

Figure A1: Repetition trends in Mexico City and the rest of Mexico in the pre- and post-policy period.