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ABSTRACT

The French Zones D'Education Prioritaire: Much Ado About Nothing?*

We provide an assessment of the French ZEP (Zones d'Education Prioritaire), a programme started in 1982 that channels additional resources to schools in disadvantaged areas and encourages the development of new teaching projects. Focusing on middle-schools, we first evaluate the impact of the ZEP status on resources, their utilization (teacher bonuses versus teaching hours) and key establishments characteristics such as class sizes, school enrolments, teachers' qualifications and experience, and student composition and mobility. We then estimate the impact of the ZEP programme on four measures of individual student achievement: obtaining at least one diploma by the end of schooling, reaching 8th grade, reaching 10th grade and success at the Baccalauréat. We take into account the endogeneity of the ZEP status by using both differences in differences and instrumental variables based on political variables. The results are the same in all cases: there is no impact on student success of the ZEP programme.

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Introduction

A central tenet of the French education system has long been its commitment to the principle of “equal treatment” of all students – in the sense of equal public expenditures on educational inputs irrespective of social background, location, or achievement.

In the early 1980’s, however, in the face of mounting “urban” problems, widening disparities in educational outcomes between schools serving different populations, a persistently high rate of academic failure among poor students (20% of each cohort was leaving school without any degree, one of the highest rates among OECD countries) and increasing unemployment concentrated among low-skill workers, this doctrine became increasingly unsustainable.

In 1982 a new program, the “Zones d’Education Prioritaire” (Priority Education Zones, henceforth ZEP) was launched, under which selected schools received extra resources such as funds, teacher hours, etc. These zones were initially intended to be temporary, but the program instead became permanent and was substantially extended in successive “waves” throughout the 1980’s and 1990’s. Initially, the main goal of the ZEPs was to foster new educational projects and partnerships with local actors that would help improve academic achievement. Gradually, decreasing class size also became an important objective. However, the amount and nature of the extra resources given to the ZEPs were never specified, and neither was the actual procedure by which priority status was determined. Perhaps most tellingly, until 1999 (sixteen years into the program), the Ministry of Education’s budget contained no specific line item for “priority education”.

There has also been no systematic evaluation of the ZEPs’ impact on schooling outcomes, which is quite surprising given the financial importance of the program and its centrality in France’s education policy. Moreover, as the first program to target schools and local areas rather than provide individual financial aid to poor students (usually very modest stipends), the ZEPs remain highly controversial. Some argue that any form of “positive discrimination” is contrary to national ideals, others that it serves both fairness and efficiency and should get much more resources, others yet that it has just been a waste of money. Meanwhile, other countries have adopted similar programs that direct extra resources to disadvantaged schools. For instance, in the United Kingdom, the “Excellence in Cities” (EiC) program aims at alleviating underachievement in inner city schools (Machin, McNally, and Meghir (2004)).

In this paper, we provide an assessment of the ZEP program in terms of the resources effectively deployed, the mobility response of both students and teachers and the overall impact on academic achievement. Due to data limitations we study the period that covers the first phase of the policy (1982-92) and focus on its implementation in junior high schools.

Compared to other exercises in program evaluation or studies of the “educational production function”, ours presents both particular challenges and opportunities.² In studies based on randomized or “natural” experiments, the incidence and often the nature of the “treatment” are precisely controlled. Even with “real-world”, large-scale programs implemented without a proper scientific-evaluation design, the nature of the intervention is generally well known and one seeks primarily to evaluate its effects. With the ZEP program, by contrast, the “treatment” is itself an unknown: the priority status is allocated according to a rather opaque, erratic administrative procedure and it translates into unspecified extra resources that may vary from zone to zone, from year to year, or be used differently by different schools. Together with the lack of budgetary data, this leads us to devote the first part of the paper to a kind of “detective work” aimed at determining what it meant in practice for a school to become a ZEP, in terms of class size, annual teaching hour, qualifications and seniority of the teachers, and size and composition of the student body.³ Then, in the second part of the paper, we examine how the granting of ZEP status to a junior high school affected its students’ educational outcomes, both in those grades and beyond. The fact that the priority status may –in particular through a “labeling” effect– induce a mobility response on the part of teachers or students’ families (moving to another district, sending their children to private school, etc.) is another source of complexity in evaluating the ZEPs. At the same time, studying the elasticity of such responses and assessing educational outcomes from a program in which they potentially operate is both interesting and important, because any intervention that exceeds the scale of small controlled experiments is likely to trigger such behaviors.

Our analysis combines very rich student survey data and administrative files on all French schools and teachers. The first source consists of two panels of students that provide detailed information on their family background, early educational history, and major academic outcomes throughout the junior-high and high-school years. The second source is an original panel of schools that we constructed using exhaustive establishment files from the Ministry of Education. We unfortunately had to restrict attention to junior-high and high schools because of the available data, even though the ZEP program also concerned primary schools.

We address the endogeneity in the allocation of ZEP status using two methods, namely differences-in-differences (or establishment fixed effects) and instrumental variables. These techniques are applied both on a linear and a nonlinear model and with four different measures of academic achievement. Our instrumentation strategy relies on the fact that national political forces

² For recent studies (and debates) on the link between school inputs and student achievement, see for instance Angrist and Lavy (1999, 2002), Card and Krueger (1992), Case and Deaton (1999), Hoxby (1996, 2000), Dewey, Husted and Kenny (2000), Krueger (1999), Hanushek, Kain and Rivkin (2005). Krueger (2004) is an excellent survey of the literature.

³ We also examine the evolution of establishments until 1999, but for a more limited number of characteristics, because of changes in the way the data was gathered.

interfered in the process by which priority zones were designated, and in particular in the timing of the choice of ZEPs. We show that the vote shares obtained in different French regions by the major parties in the national (legislative) elections of 1981 and 1988 provide a plausibly exogenous source of variation that we can use to identify the ZEP effect.

Our results on the *nature* of the ZEP “treatment”, at least in term of quantifiable inputs, show that it translated into a continuous but extremely slow decrease in class sizes (-0.2 students per year on average) and increase in annual teaching hours per student (+1.2% per year), that the qualifications and experience of ZEP teachers remained at best stable, or even declined slightly, in spite of the bonuses offered. The socioeconomic composition of the student body following a school’s classification as ZEP shows a gradual deterioration, with a reduction in enrollments that was particularly concentrated among students from less disadvantaged families. Turning finally to the *effects* on student achievement of the overall ZEP treatment (including the financial resources, the more qualitative aspects of the zones’ educational projects and the effort and mobility responses of students and teachers), the results from our three different methodologies lead to the same conclusion: during our sample period, the impact of the ZEPs on all measures of academic achievement is nil.

The paper is organized as follows. In Section 2, we describe the general educational context and the main features of the ZEP program. Changes in schools’ characteristics when they become ZEP are then examined in Section 3, and the impact of priority zone status on student achievement is analyzed in Section 4. Each of these two sections comprises subsections on the data used, the statistical models and the estimation results. Section 5 offers a brief summary of our main findings and their policy implications.

1. A Brief Description of the Education Priority Zones (“Zones d’Education Prioritaire”)

First established in 1982, the ZEPs, or education priority zones, include both primary and junior-high establishments, plus a small number of high-schools. In particular, the ZEPs initially covered approximately 8% of junior-high students in the country. The program was originally meant to be temporary, with the zones established for a limited statutory term of 4 years. Over time, the program was not only maintained but substantially expanded, with many new zones created in 1989, 1990, 1994 and 1999.⁴ It is now the main policy in France directed at helping students from disadvantaged backgrounds.

The operating principle of the ZEP program was to provide additional resources to schools in the most disadvantaged zones and allow them to develop specific initiatives and educational methods

⁴ See also Moisan and Simon (1997), the Notes published by the Ministry of Education n° 98-15 (“Les Zones d’Education Prioritaires en 1997-98”) and n° 98-16 (“Travailler en ZEP”), the articles devoted to the ZEP in *Le*

tailored to their students' needs. In 1982 the regional heads of the education administration were thus asked to select zones according to the following criteria for the student population: parents' social and professional backgrounds, parents' rate of unemployment, fraction of students who are not native French speakers and fraction of students having repeated a grade (a very large fraction of French students repeated at least once in those years). In later years many new zones were created, according to a procedure that left considerable discretion to the regional heads of the education in making decisions that were loosely based on indicators such as the shares among parents of blue-collar workers, unemployed workers, and high-school dropouts, the fraction of families with at least one non-European member, and 3rd grade test scores in a national student evaluation).

In 1997 nearly 700,000 students in primary schools and 400,000 in junior high schools benefited from "priority" treatment, representing respectively 11% of those in primary schools and 15% those in junior high school.⁵ Only very few high schools are ZEPs. The vast majority of ZEP students live in major urban centers; conversely, only 10% of them reside in towns of less than 10,000 inhabitants, versus 30% for non-ZEP students. A good indicator of poverty is the fraction of students *not* enrolled in the school's cafeteria's plan, because this generally denotes that their family cannot afford to pay for these (subsidized) lunches. This fraction is indeed higher in the priority zones (69%) than outside (40%), and reaches 80% in those ZEPs located in major urban centers. Similarly, the proportion of non-French students is typically higher, exceeding 35% in more than 10% of the ZEP schools. Finally, in 1995, 37% of students entering the 3rd grade (age 8) in ZEP schools did not possess "basic reading competencies", which is double the proportion found in non-ZEPs (18%).

The ZEP status is associated with extra resources for the selected schools, mostly in the form of additional hours of instruction and bonuses for teachers and other personnel. The first year for which *any kind* of budgetary information is available is the school year 1998-1999. Extra resources directed to the ZEPs that year amounted to 400 million Euros,⁶ of which 110 million took the form of bonuses paid to all employees of the schools –essentially teachers– and the rest was used to increase total teaching hours and reduce class sizes.⁷ Every ZEP employee also benefited from a relative advantage in administrative promotion criteria. As far as non-wage financial resources are concerned, there was no priority for ZEP schools (Jeljoul, Lopes, and Degabriel (2001)). In particular, regional and local subsidies were not higher in ZEP schools.

The 400 million Euros represented 1.2% of total expenditures on teaching activities in primary and junior high schools, and were directed to 12% of the total student population in those grades. This

Monde de l'Education (2000) and the issue of *Education et Formations* devoted to the priority education, n° 61 (2001).

⁵ The statistics presented in this paragraph are taken from the Ministry of Education's Note n° 98-15, «Les Zones d'Education Prioritaires en 1997-1998 ».

⁶ By comparison, the resources devoted to the EIC program in UK were equal to £300 million in 2003.

⁷ Thus, a ZEP bonus of 1,046 Euros was paid to 96,000 teachers, accounting for 100 out of the 110 million.

means that a school's classification as ZEP translated in 1998-99 into an extra 10% more resources per student. Looking more appropriately at instruction costs (leaving aside fixed operating costs, etc), which represent 77% of total costs on average, the increase was 13%, of which $13 \cdot (110/400) = 3.6\%$ went to bonuses and the remaining 9.4% to increased hours of teaching per student.⁸ No such data is available for the earlier period that corresponds to most of our student sample. We can, however, use some of our estimation results to come up with a reasonable ballpark estimate. Based on the establishment data, we estimate that annual teaching hours per student increased by about 1.2% per year following the granting of ZEP status in the 1989 and 1990 waves (relative to non-ZEP schools). We also know that the teacher bonus in 1990-91 was approximately equal to 2% of the average teacher wage. Thus we can estimate that the ZEP label brought an extra 4.4% in the teaching budget that year, with the allocation between bonuses (2%) and hours per student (2.4%).

The idea of the ZEP program was not only (even not principally) to reduce class size, but to impulse new educational projects and partnerships with local authorities. Unfortunately, there are virtually no data sources on these projects, and the few studies that have tried to measure the benefits of the ZEP status have been unable to identify clear gains. Those most comparable to our approach are Meuret (1994) and Caille (2001). Meuret examines the same period as we do (the beginning of 1990's) for a sample of 100 junior high schools (31 ZEP establishments in 1990, 69 non-ZEPs). His results show that the improvement in mathematics and reading test scores over the two years of 6th and 7th grades is in fact slightly smaller in ZEP than in non-ZEP schools, controlling for other factors, Meuret notes, on the other hand, that students' attitude toward school attendance seems to improve in the ZEP establishments. Caille (2001) examines a more recent period using both panels of high school students entering 6th grade (at age 11) in 1989 and in 1995.⁹ In general, his results also show no effects of the ZEP program. Some analyses, in particular Moisan and Simon (1997) and Meuret (1994), compare the different priority zones among themselves. Several conditions seem to be associated to an apparent success of the program: a lower size of the zone, being located within a region of generally higher educational performance, a greater fraction of students who started preschool at the age of two, a stable teaching and managerial staff, and active participation of the local government and local authorities of the Ministry of Education. Unfortunately, all the above analyses pay little attention to classic endogeneity and selection bias problems that are of primary concern in the literature on program evaluation, such as the endogeneity of the ZEPs themselves and of most of the aforementioned conditions "for" their success or failure.

⁸ As a check on this calculation, direct computations based on the data we obtained show that the bonus in that year was approximately 4% of the average teacher salary.

⁹ We will analyze the same data source for the students that enter 6th grade in 1980 and in 1989, the period when the program was launched. Because we examine achievement up to the end of high school, we do not use this 1995 panel: in the available data, most students have not yet completed their high school education.

3. The Impact of ZEP Status on School Characteristics

3.1. The Data

The FSE administrative files (Fichiers Standards Enrichis) of the Ministry of Education constitute our main source of school-level data. Every year, all school principals fill out a detailed questionnaire on the characteristics of each grade in their establishment. This includes information on class size, nationalities of students, number of students having repeated each grade, number of students having lunch at the school's cafeteria, and language courses chosen. Each statistic is measured by grade. These data are exhaustive for the period 1987 to 1992 and cover both public and private schools; we shall focus here on public-sector junior high schools (6th grade to 9th grade).¹⁰

The FSE dataset can be extended to the period 1994 to 1999 by another data source, the IPES (Indicateurs pour le Pilotage des Etablissements Scolaires). Unfortunately, not all the variables reported there are compatible in their definitions with those available for the earlier period. We will therefore mainly present the results based on the FSE dataset and report more briefly on those obtained for the longer period, which are essentially identical.

We also link these two establishment datasets with files from the Education Ministry's information system of the management of teachers. This source provides us with statistics on teachers' characteristics by establishment, such as the number of young or experienced teachers, the diplomas held, etc. Finally, another set of files from the Ministry of Education identify which establishments are located in a priority zone.

3.2. Estimation Framework

Using the FSE data for every year from 1987 to 1992, we analyze the changes in school characteristics that occur when the ZEP status is granted. We distinguish the impact of this event on both levels and trends, by estimating the following model

$$\begin{aligned}
 Y_{j,t} = & \delta_t + \delta_j + 1_{j \in zep89} \left[\gamma_{88}^{zep89} 1_{t \geq 88} + \gamma_{change}^{zep89} 1_{t \geq 89} + \gamma_{trend}^{zep89} T_{89} \right] \\
 & + 1_{j \in zep90} \left[\gamma_{88}^{zep90} 1_{t \geq 88} + \gamma_{89}^{zep90} 1_{t \geq 89} + \gamma_{change}^{zep90} 1_{t \geq 89} + \gamma_{trend}^{zep90} T_{90} \right] + \mathcal{E}_{j,t}, \quad (1)
 \end{aligned}$$

where $Y_{j,t}$ corresponds to characteristics for school j in year t , δ_t is an indicator for year t (year fixed effect), δ_j an indicator for the establishment (school fixed effect), $1_{j \in zep89}$ is equal to 1 if the school j

¹⁰ Throughout the paper we will use "year" instead of the "school year"; for instance, year 1987 corresponds to the school year 1987-1988.

becomes ZEP in 1989, $1_{t \geq \tau}$ is equal to 1 if the year t is greater or equal to τ , T_{89} is a linear trend starting in 1989, and ε is an i.i.d. residual. The variables in the second line of (1) are defined similarly.

Since year dummy variables control for evolutions common to all establishments and school dummy variables control for any difference in levels between them that already existed in 1987, the coefficients γ_{change}^{zep89} and γ_{change}^{zep90} capture the change in the level of $Y_{j,t}$ specifically associated to a change in status. Similarly, γ_{trend}^{zep89} and γ_{trend}^{zep90} capture the linear trends specific to ZEP establishments after they became ZEP. Because a ZEP-specific trend could preexist, the coefficients γ_{88}^{zep89} , γ_{88}^{zep90} and γ_{89}^{zep90} capture any changes in $Y_{j,t}$ that started in 1988 (respectively, in 1988 or 1989) between the establishments that became ZEP in 1989 (respectively, in 1990) and the others.

In Tables 1 to 4 we only report γ_{88}^{zep89} , γ_{88}^{zep90} , γ_{89}^{zep90} , γ_{change}^{zep89} , γ_{change}^{zep90} , γ_{trend}^{zep89} and γ_{trend}^{zep90} , together with their estimated standard deviations. The estimation is carried out over 4,743 junior high schools per year. Among those, 138 establishments became ZEP in 1989 (we shall refer to them as ZEP-89) and 365 others acquired the status in 1990 (ZEP-90). Finally, we also present, as descriptive statistics, the means of all the variables in 1987 in both ZEPs and non-ZEPs.

3.3. Results

3.3.1. Number of Students and Class Size

Table 1 first shows that ZEP establishments tend to be about 7%-9% larger than others. Second, it reveals that the average number of students decreased by 7 per year in those schools that became ZEP in 1989, but also that this trend apparently started before 1989 for the entering cohorts (the coefficient in 1988 for ZEP-89 schools is significant in the “number of students in 6th and 7th grades” regressions, but not in the overall “number of students” regression). The most likely explanation is that of an avoidance strategy on the part of some families, even before the status change, a view that will find further support in our analysis of changes in student composition (section 3.3.3).¹¹ Our results on students mobility (section 3.3.4) will also confirm that the reduction in the number of students was primarily due to reduced entry into those establishments, rather than to increased exit.

The coefficients for the ZEP-90 are generally not significant, but this is not surprising given that the FSE data ends in 1992, making it difficult to identify structural breaks. And indeed when we analyze the full 1987-1999 period using both FSE and IPES data, the previous results are largely

¹¹ In principle, this evolution could also have reflected systematic efforts by the Ministry of Education to reduce enrollments in those schools deemed “too large”, but no such policy was ever in place, or even discussed.

confirmed. The number of students in ZEP-89 schools continued its gradual decrease, relative to the general trend, until 1999. Schools that became ZEP in 1982 lost about 4 students per year between 1987 and 1999, and those became ZEP in 1990 lost about 6 students per year between 1995 and 1999. Again, the decrease in the number of students is essentially concentrated on 6th and 7th graders.¹²

The second and important result in Table 1 is that the reductions in *class size* associated to ZEP status were quite small: on average, a decrease of 0.2 students per class per year. On the other hand, class size in 1987 was already smaller in schools that became ZEP in 1990 (24.0 versus 24.4 for non-ZEP). These schools were thus probably already identified and benefiting from extra resources even before acquiring priority status. The analysis over the longer period 1987 to 1999 shows a continuation of this modest and slow decrease. Over the course of 10 years, the average class size decreased by 2 students for the ZEP-89 and by about 1.5 students the ZEP-1982 and ZEP-90, while the average class size in non-ZEPs remained stable.

Our results are thus consistent with the Ministry's estimate that ZEP junior high schools in the late 90's had 2 students less per class than non-ZEP¹³, but at the same time they reveal a much less well-known fact: the underlying process was extremely slow and actually began before the granting of priority status. In any case, even the ten-year reduction in class size in the priority zones was at best modest, especially in light of the intended goal of improving educational conditions of students living in socially disadvantaged areas.

3.3.2. *Size and Composition of the Teaching Staff*

Table 2 shows that the number of teachers in ZEP schools did not increase more than in other establishments, except for a small positive trend in the ZEP-90.¹⁴ Since in the ZEP-89 the number of students went down slightly more than elsewhere, the number of teachers per student rose slightly after 1989. The annual rate of increase was again small, which is consistent with the results on class size.

It is worth noting that the extra teaching hours attributed to ZEP schools would not necessarily have translated into reductions in class size. These additional man-hours (or woman-hours) can also be used to divide classes into subgroups for some disciplines, or to add remedial classes given in small groups. One way of capturing such uses is to compute the annual number of hours per student. This ratio increased when a school acquired priority status, by 1.1 hour per year in the ZEP-89 and by 1.5 hours in the ZEP-90. Thus, once again, the increase was very slow and modest – in percentage terms,

¹² The results for the period 1987-1999 are available from the authors upon request.

¹³ See, e.g., for 1997, Ministry of Education, note n° 98-15.

¹⁴ Over the longer period 1987 to 1996, the number of teachers actually decreased by one per year for the ZEP-1982 and ZEP-1989, and remained stable for the ZEP-90. As explained earlier, these results are not reported here but are available from the authors.

0.9% and 1.2% per year respectively. Since the reduction in class size was 0.8% per year, it thus accounted for most of the increase in annual hours per student, with only a much smaller fraction used in other ways.

While class size and hours show only very modest changes, the significant resources allocated to raising *teacher pay* in ZEPs could have led to an improvement in the qualifications of the professorial staff. In fact, our estimates reveal exactly the opposite. One standard measure of quality is experience: Table 2 shows that the fraction of young professors (less than 30 years old) in ZEP schools goes up slightly shortly after the status change (the increase appears in 1990 for the ZEP-89). An optimistic interpretation of this evolution would be that young teachers are more dynamic or better able to relate to the children, even though they have less professional experience. Unfortunately, our results on professional qualifications show that the fraction of teachers without tenure and holding lesser diplomas (“*maîtres-auxiliaires*”, who do not have the regular teaching certificate) also increased slightly in schools that became ZEP in 1990.¹⁵

The results established so far lead to two main conclusions. First, the extra resources allocated to ZEP schools in terms of additional teacher slots and extra hours were quite limited. Second, the more substantial bonuses and promotion incentives granted to ZEP teachers (independently of the performance of their students) did not help in stabilizing the teaching staff or improving its skill composition. In the “market” for teachers (internal to the Education civil service), the ZEP wage premium was not nearly sufficient to compensate for the adverse “hedonic” and signaling characteristics associated with teaching in such schools.

3.3.3. *Social Composition of Schools*

We now compare the social composition of ZEP establishments to that of non-ZEP ones, both before and after the former’s change in status. The evolution of the social mix is of interest both *per se* and because of its possible impact on student performance through peer effects.¹⁶

Table 3 presents the results for the fraction of students coming from private schools (recall that we are focusing on the public sector), and the fraction having lunch at the school cafeteria. As mentioned earlier, in France children who are enrolled in the school cafeteria plan typically come from more advantaged backgrounds than those who do not; in particular, this is more often associated with the mother working outside the home.

The first column in Table 3 shows that inflows from private schools were not affected by the status change for the ZEP-90, but did show a statistically significant decrease for the ZEP-89. Still,

¹⁵ Other measures of skills, such as the proportion of those with the highest teaching diploma (“*agrégation*”), remained virtually unchanged (results not reported here).

¹⁶ For recent empirical studies of such externalities, see for instance Sacerdote (2001) and Hoxby (2001).

this proportion is quite small, as we observe in general little movement from private to public schools. The second column confirms our claim that the fraction of students having lunch at the school cafeteria is a very good (reverse) indicator of poverty. In 1987, only 25% of students in the ZEP-89 establishments (and 36% in the ZEP-90) ate lunch at the cafeteria, compared to 56% for non-ZEP schools. We also note that this share decreased further, by 0.5% per year, following the change to ZEP status. This means that the gap in social composition widened, with the student population in ZEP establishments becoming poorer. Of course, this differential trend needs not be due to the allocation of priority-zone status itself, but could also reflect a concomitant deterioration of the socio-economic environment in those areas, relative to others. Examining the whole 1987-1999 period confirms these results, with a slow but steady deterioration in the social mix between 1987 and 1996, and a leveling off since then.¹⁷

3.3.4. Student Mobility

Did the (moderate) deterioration in the social composition of establishments observed after they acquire priority status (especially the ZEP-89) reflect an escape strategy by parents from relatively privileged backgrounds, an avoidance strategy at the entrance into junior high school (6th grade), or both? To address this question we use the student panels (described in detail in the next section) to analyze an individual's probability of leaving his or her school for another one in the same educational administrative region ("académie"). We thus estimate the linear probability model

$$\begin{aligned}
 1_{leave}(i,t) = & \alpha X_{i,t} + \delta_{j(i,t)} + \gamma_{82} \cdot 1_{j(i,t) \in zep82} \cdot 1_{t \geq 82} \\
 & + \gamma_{89} \cdot 1_{j(i,t) \in zep89} \cdot 1_{t \geq 89} + \gamma_{90} \cdot 1_{j(i,t) \in zep90} \cdot 1_{t \geq 90} + \varepsilon_{i,t},
 \end{aligned} \tag{2}$$

where $X_{i,t}$ is a vector of individual characteristics for student i at date t and $1_{leave}(i,t)$ is equal to 1 if between dates t and $t+1$ that student leaves the establishment $j(i,t)$ in which she or he was enrolled at date t (the indicator equals zero otherwise). The establishment fixed effect δ_j , ZEP indicator $1_{j \in zep82}$ and time indicator $1_{t \geq 82}$ (and their analogues for the other ZEP waves) are defined just as in equation (1). The coefficients γ_{82} , γ_{89} and γ_{90} thus measure the extra probability of leaving the establishment because of its priority status. To examine whether parents with different economic backgrounds respond differentially to the status of their child's school, we also interacted the ZEP indicators in (2) with parents' occupations categories.

¹⁷ Again, these results on the longer period are available from the authors upon request.

Table 4 presents the results.¹⁸ The change of status of a school, from non-ZEP to ZEP, has no impact on student outflows. This holds both in general and for children of different social origins. We can therefore conclude that the negative changes in social composition observed earlier are not primarily due to “exit” but rather stem from an “avoidance effect”. That is, more privileged families avoid sending their children to ZEP schools, choosing instead either non-ZEP or private establishments. Because of the fairly tight regulations that define public schools’ “catchment areas” in French cities and because also of the significant transaction costs involved in residential mobility, it is not surprising that adjustments are mostly made at the entry margin rather than through exit.

4. The Impact of ZEP Status on Individual Schooling Achievement

Our results so far show that the financial support given to ZEP schools was far from negligible, but also that these funds were sprinkled across many establishments, without any apparent targeting towards the potentially most efficient inputs or towards those students most likely to benefit from these extra inputs. Thus the decrease in class size was small and progressive, the number of teachers hardly increased and their qualification remained at best unchanged.

The ZEP “treatment”, however, is a potentially much more complex object than a simple change in financial resources or teaching hours. First, the official goal of the ZEP program was also to provide the means for schools to create *new educational projects* and connect more closely with local institutions such as municipalities. These projects were supposed to have a positive impact on the academic achievement of ZEP students. Second, the sizeable bonuses and career improvements offered to teachers in ZEP schools could have contributed to improving their motivation,¹⁹ or allowed the Education Ministry to select teachers for these schools from a higher-quality pool of applicants (in ways not reflected by seniority and tenure indicators). Third, on the negative side, an adverse signaling effect (stigmatization) could have discouraged effort by both professors and students, leading to deterioration in school performance. Finally, if peer effects operated within the classroom or the school, the impoverishment of the student population associated to the acquisition of the ZEP status could have lowered the educational achievement of some or all the students.

To assess the value of the ZEP program, one therefore needs to quantify the *overall* impact of granting priority status to a school on students’ academic achievement. This is the paper’s second main objective, to which we now turn.

¹⁸ We limit the analysis to the years of junior high school (6th to 9th grades), in order to be consistent with our previous estimations.

¹⁹ Since these bonuses were not conditioned on student achievement or any other performance measure they could not have had any standard incentive effect. They could still, however, have enhanced teachers’ “intrinsic motivation” by eliciting feelings of reciprocity or professional pride.

4.1. Data Sets

The main sources of individual data used in our analysis are two panels of students collected by the Ministry of Education.

- *The 1980 panel.* This panel includes 20,961 students who entered 6th grade (age 11) in 1980, and constitutes a representative sample of 1/40 of all students entering junior high school in France that year. The sampling scheme has two levels. First, establishments were stratified according to city size, establishment size and sector (public or private school). One in five junior high schools was thus selected. Second, one out of eight students in those schools was selected and then followed across establishments until the completion of his or her secondary schooling. The attrition rate was 9%, reflecting departures abroad, deaths, and (in 80% of cases) “unexplained” school departures.
- *The 1989 panel.* This sample includes 24,455 students who entered 6th grade in 1989. The sampling scheme here has only one level: the heads of all junior high schools were asked to include in the panel all students entering 6th grade in 1989 who were born on a specific day in each month (1/30th). These students were observed until the end of their schooling, including higher education. The attrition rate was similar to that observed in the 1980 panel.

These two panels provide extensive information about the students. First, we have family background data: date of birth, sex, nationality, country of birth, number of siblings, birth rank, parents’ socio-professional categories, parent(s) legally responsible for the child, number of years spent in nursery school and in primary school. Second, we have schooling information for each year in school from 6th grade on: grade, class size, foreign languages studied, lunch at the school’s cafeteria or not, financial aid received. For each observation (student-year), we also know the identification number of the schooling establishment.

Starting from the raw data, we grouped parents’ occupations into the following categories: farmers, workers in agriculture, craftsmen, executives, teachers and professors, technicians and foremen, retail employees, office employees, skilled blue-collar workers, unskilled blue-collar workers, service employees, unemployed and inactive. We also aggregated nationalities into the following groups: French, European, African, and Asian. Finally, history in primary school was summarized by the student’s number of grade repetitions.

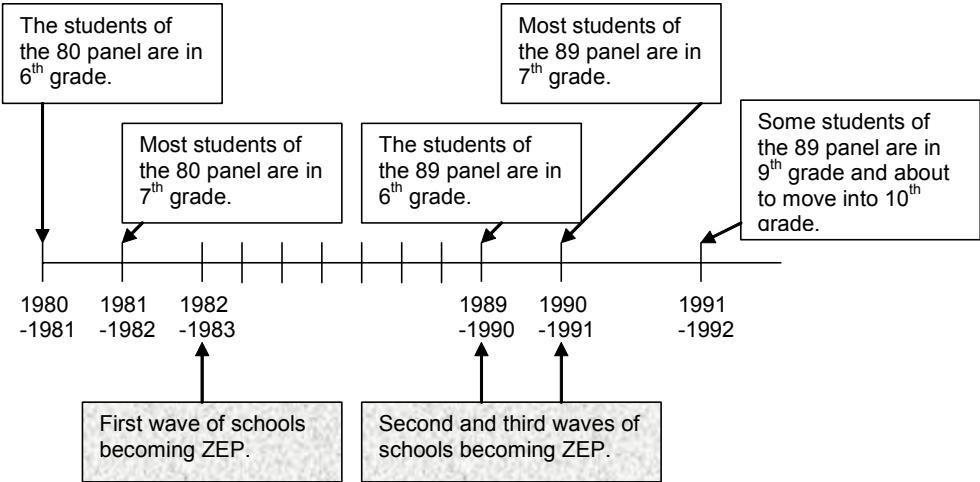
The only available characteristic on classes is class size. The information on schools consists of the establishment’s identification number, the educational administrative region and whether it is a private or public establishment. Thanks to the identification numbers, we are able to match the student panels with the time-varying ZEP or non-ZEP status. Given our sample period, we had students in each of the three “waves” of ZEPs –1982, 1989 and 1990 (see the descriptive statistics in Appendix

A, tables A.1 and A.2). We also computed school-level variables by averaging students' characteristics by establishment in each panel.

We now turn to measures of academic achievement. The panels unfortunately do not contain information on the grades received in national exams or national evaluations. We do know, however, whether the student passed or failed any exam that she or he took. We also know, for each year, whether he or she moves up to next grade, repeats the grade, or exits to the vocational track. More precisely, the four measures of academic achievement that we use are:

- Completion of school years with at least one degree (versus finishing schooling without any diploma)
- Moving up to 8th grade (versus switching to a vocational track at the end of 7th grade)
- Moving up to 10th grade (versus switching to a vocational track after the 7th or the 9th grade)
- Success at the “Baccalauréat”, the French national exam at the end of high school, i.e. 12th grade (versus going to a vocational track that does not lead to the Baccalauréat, or failing the Baccalauréat).

These choices are motivated by the following observations. First, reducing the number of students who leave the school system without any degree was the main target of the Ministry of Education in general, and of the ZEP program in particular.²⁰ More generally, this measure captures the bottom part of the achievement distribution. Second, in France many students are virtually forced to switch to a vocational track (seen as much less desirable and even stigmatizing) at the end of 7th or 9th grades. For instance, only 46% of those entering 6th grade in 1980 continued their education in the regular track all the way to 12th grade. Reaching the 8th and 10th grades are therefore important milestones in the schooling process. Finally, success at the Baccalauréat is key because it conditions entry into the university system and the “grandes écoles” (selective colleges).



²⁰ Among students entering 6th grade in 1980, 23% had no degree at the end of their schooling years.

Figure 1: Chronology

Figure 1 describes how the time structure of our panels meshes with the chronology of the ZEP program. In 1981, just before the launching of the policy, most students of the 1980 panel were in 7th grade (except those who repeated 6th grade). By contrast, for the students in the 1989 panel, entry into 6th grade took place as 1989 wave of ZEPs was ongoing. And one year later, when most of them were in 7th grade, the 1990 wave was launched. Because conditions prevailing in the 6th and 7th grades strongly affect students' future schooling outcomes, and because mobility between establishments is low, the ZEP indicator we shall use is equal to 1 if the student's establishment in his or her 7th grade is located in a ZEP, and equal to 0 if not.²¹ Note that this indicator is time-varying, since some students in the 1980 panel do their 7th grade in schools that will become ZEPs only in 1982, 1989 or 1990, while some in the 1989 panel do their 7th grade in the very same schools after they have acquired priority status.

Other potentially interesting measures of exposure to the ZEP policy would be the number of years spent in a ZEP school, or being a ZEP student in some grade(s) beyond the 7th. In particular, when examining the Baccalauréat outcomes, the impact of being in a ZEP in 6th or 7th grades, i.e. 6 or 7 years earlier, may seem too remote to matter much. However, two reasons justify restricting attention to these early grades. First, there are only a few high schools ("lycées", grades 9-12) participating in the ZEP program. Second, and most important for our purposes, even when examining Baccalauréat outcomes or reaching the 10th grade we need a variable that is measured for *all* students. Yet we saw that a large fraction leave the general track after the 7th grade, so using any ZEP variable available only in higher grades would create a potentially huge selection bias.

The last set of data that we use is political variables, which will provide instruments to address the potential selection bias in the determination of the priority zones. The shares of the vote received by each political party in every parliamentary election are collected at the regional level ("département") by the CEVIPOF ("Centre d'Etudes de la Vie Politique Française"). To reflect the main features of the French political system we aggregated them into "Extreme Right", "RPR and UDF" (the two main right-wing parties), "Other Right", "Greens", "Communist Party", "Socialist Party", and "Other Left". We grouped RPR and UDF together, since these two parties formed a coalition (single list) during some of the parliamentary elections in the 80s. Voting in French parliamentary elections involves two rounds, and as in Bertrand and Kramarz (2002) we used only the first round. Finally, we focused on the years that precede 1982, 1989 and 1990 (when new ZEPs were implemented), that is, on the elections that took place in 1981 and in 1988. Our variables thus consist of the fraction of votes received by the various political groups in every "département", in each of these two elections.

4.2. Estimation Strategy

It would clearly be inappropriate to simply regress individual student performance on personal characteristics plus a ZEP indicator, and thus compare mean outcomes between ZEP and non-ZEP students. Indeed, the ZEP variable certainly is endogenous, even given all our individual controls. For instance, priority status could have been preferentially granted to those establishments where schooling outcomes were the worse or deteriorating the most rapidly, or conversely to those among the “difficult” zones deemed the most likely to succeed. To deal with this problem, we use both differences-in-differences (implemented through establishment fixed effects) and instrumental variables.

The first method exploits the fact that, thanks to our two panels, we can compare students who went through the same grade in the same school, but with some attending before it became a ZEP and others nine years later, after it had acquired priority status. The idea is then to subtract from the deviation between ZEP and non-ZEP schools estimated on the 1989 panel the corresponding deviation estimated on the 1980 panel, but with the ZEP indicator replaced there by a “future ZEP” dummy, equal to 1 if a school was part of the ZEP “wave” of 1989 or 1990. This “difference in difference” controls for any unobserved factors affecting student performance in the priority zones (relative to non-ZEP ones) that already existed prior to the status change, and therefore yields an unbiased estimate of the reform’s impact (assuming stability of the unobserved heterogeneity and distribution of errors.) In the linear model, this method is implemented both very simply and more generally by running a single regression that includes establishment-specific fixed effects, which control for unobserved stable heterogeneity across *all* schools.

Our second method for dealing with potential selection biases uses instrumental variables, described in subsection 4.4. Finally, we also estimate a multivariate non-linear system (including both “differences-in-differences” and instrumental variables) with for the three possible outcomes at the end of a student’s first 7th grade: promotion to 8th grade, repeating 7th grade, or switching to the vocational track (subsection 4.5).

In all these cases, our estimates differentiate between the three “waves” of ZEPs, thus capturing a potential “duration effect”: for instance, some establishments that were ZEPs in 1990 acquired that status in 1982, whereas others received it only in 1989.

4.3. Linear Model Estimates

²¹ Our results are robust to using instead an indicator equal to 1 if the student was in a ZEP in either the 6th or 7th grade, due to the low inter-establishment mobility between these two classes.

In this section we estimate the effect of the “ZEP treatment” using the “differences-in-differences” technique in linear probability model with fixed effects. Thus, a student’s academic achievement is modeled as follows:

$$\begin{aligned}
1_{achievement}(i) = & \alpha X_i + \delta_{i \in 80 \text{ panel}} + \delta_{j(i)} + \gamma_{82} \cdot 1_{j(i) \in zep82} \cdot 1_{t(i) \geq 82} \\
& + \gamma_{89} \cdot 1_{j(i) \in zep89} \cdot 1_{t(i) \geq 89} + \gamma_{90} \cdot 1_{j(i) \in zep90} \cdot 1_{t(i) \geq 90} + \varepsilon_i
\end{aligned} \tag{3}$$

where $1_{achievement}(i)$ is an indicator for achievement (moving up to 8th grade, to 10th grade, getting at least one degree, success at the Baccalauréat) of student i ; $j(i)$ and $t(i)$ denote respectively the establishment and year where and when the student was in (his of her last) 7th grade; $\delta_{j(i)}$ is an indicator for the establishment where the student was in his of her 7th grade and $\delta_{i \in 80 \text{ panel}}$ an indicator equal to 1 if the student belonged to the 1980 panel. The vector X_i contains the student’s individual and family characteristics as well as establishment variables, measured as the average of the individual variables over those students in the panel studying in the same school $j(i)$. This aggregation is done separately for each panel, so these establishment variables are time-varying. Finally, the indicators $1_{j \in zep82}$, $1_{t \geq 82}$, etc, are defined in the same way as before.

Equation (3) makes clear how the coefficients γ_{82} , γ_{89} and γ_{90} , which capture the effects of a change to ZEP status, are identified by using our two panels simultaneously. For instance, for a given establishment that became ZEP in 1982 the indicator function $1_{j(i) \in zep82} \cdot 1_{t(i) \geq 82}$ goes from 0 for the students in the 1980 panel who attended that school to 1 for those in the 1989 panel who followed them there nine years later.

Appendix B presents the complete set of results. The estimations corresponding to reaching 8th grade are carried out over 17,279 students enrolled in 2,099 establishments in the 1980 panel and 11,435 students enrolled in 3,031 establishments in the 1989 panel.²² The identification of the ZEP coefficients relies on the 1,944 establishments present in both panels, with 93 of these becoming ZEP in 1982, 40 in 1989 and 62 in 1990. The reference establishment is that of the first 7th grade of each student. When estimating the other three equations –for obtaining a degree, moving up to 10th grade and success at the Baccalauréat– the sample consists of 16,816 students enrolled in 2,051 establishments for the 1980 panel and 11,016 students enrolled in 3,009 establishments for the 1989 panel. The identification of the ZEP coefficients now relies on 1,891 establishments common to both

²² We excluded the observations from Corsica from our sample, in order to make the regressions more comparable to those run later with instrumental-variables, in which the political variable was not available for that region (due to the fact that a single “département” was later split into two). Leaving in Corsica has no effect on the results, however.

panels, with 93 establishments becoming ZEP in 1982, 40 in 1989 and 61 in 1990. In these cases, the reference establishment is that of the last 7th grade of each student.²³

Before turning to the ZEP effects, we see that most individual characteristics have the expected impact on students' academic achievement (see Tables B.1 to B.4 in Appendix B). Thus, parents' occupations are very important, girls do better than boys, late entry into primary school (after 6) has a negative impact, as do having more siblings, living with a single or with neither parent, and being the recipient of financial aid. Learning German as a first foreign language is associated with better chances of reaching 8th grade than learning English, which in turn leads to better outcomes than choosing some other language, such as Spanish.²⁴

It is important to note that all the results are very similar across our four measures of success. Because of the centralized nature of the French education system, the criteria for all academic degrees and in particular the Baccalauréat are essentially uniform across establishments. By contrast, the two other performance measures we use (reaching the 8th and 10th grades of the regular track) could, in principle, reflect establishment-specific policies. The fact that they lead to similar results as national diplomas provides *ex post* reassurance about their validity. Finally, one notes that the dummy for the 1980 panel in the promotion equations is always negative, reflecting the nation-wide policy of lowering repetition rates and raising exam success rates that was set up at the end of the eighties.

Since class size is an outcome of the ZEP program, it is not included in the regressions. Nor is the number of grades repeated by the student in primary school, since children in a ZEP junior high school often come from a neighboring ZEP primary school, and the ZEP program may (and, hopefully, should) have had an impact on repetitions in those primary schools. Including these variables does not affect any of our results (on the latter variable, in particular, see subsection 4.5).

Most of the establishment-level variables have insignificant coefficients. Those estimates that are significant have the expected signs, except for the fraction of children in the school whose parents are professors or executives, which appears to have a negative effect on academic achievement. Possible explanations could be increased competition for promotions to the next grade, or the use of higher standards by teachers in response to the better academic preparedness and higher parental expectations of children from such backgrounds. The lack of significance of many establishment-level variables is probably due to the fact that they are not measured very precisely, because they were obtained by aggregation of the individual variables in the panels.²⁵ Moreover, the coefficients are identified from time variation in these regressors across the establishments present in both panels. If these school

²³ The idea here was to minimize the time interval between the 7th grade ZEP / non-ZEP treatment and the 10th grade or Baccalauréat outcome. Using the first 7th grade instead makes no difference to the results, however.

²⁴ In the French education system, choosing German as a first foreign language plays the role of a pure Spencerian signaling device (as it is much harder to learn than English or Spanish): it is one of the main ways in which "better" students, or those with informed parents, sort themselves into more selective classes.

characteristics remain generally stable, only a few establishments help identify the coefficients. In any case, the estimated ZEP coefficients remain unchanged when we exclude all establishment variables.

Turning finally to the variables of central interest, we see from Table 5 that the ZEP coefficients are never significantly different from 0, irrespective of the measure of achievement used. These non-significant ZEP effects show that the granting of “priority” status to their school did not help students, once pre-existing differences between establishments are controlled for. This is our second main finding.

4.4. Instrumental Variables Estimation

To address the endogeneity of the ZEP status, we also estimate the model using instrumental variables, based on the shares of the vote received by the various parties (or coalitions) in the first round of the 1981 and 1988 parliamentary elections. Several elements reveal that the granting of ZEP status was indeed influenced by political considerations, on top of educational ones. First, establishments in a designated geographical zone could opt out and, in the first years of the program, the Communist Party gave instructions to its mayors to refuse the ZEP status in their cities, as it saw it as stigmatizing. Second, and surprisingly, priority zones were initially concentrated in only a handful of regions, especially in Seine Maritime and Aquitaine, which are far from being particularly poor. By contrast, there were no priority zones in Marseilles until the “wave” of 1990, even though it is France’s third-largest city and includes some of its most disadvantaged areas. And even then, there were odd priorities: as many as 29% of the junior high schools located in the Nièvre “département” were granted ZEP status, as were 19% of those in the Ariège “département” – two rural regions with obviously much less need for this type of program. Analysts duly noted that the Nièvre was president Mitterrand’s electoral stronghold, and Ariège that of prime minister Jospin.

Our instrumentation strategy relies on two hypotheses. First, political factors must affect the determination of where ZEP schools are located – as we just confirmed. Second, the political variable must be uncorrelated with the (differential) performance of students in ZEP schools, conditional on all the other exogenous regressors. To understand why this is a plausible assumption, it is important to note that: i) the political variable is measured at the level of a “département”, which is a much larger entity than that of school districts (subject to the ZEP / non-ZEP classification), where educational outcomes and political conditions could be quite correlated; ii) the control variables include school fixed effects, which will absorb in particular any fixed differences in the population composition of a “département” that could affect both its political outcome and the (relative) performance of its most disadvantaged schools.

The first-stage regression corresponds to the linear probability model

²⁵ Unfortunately, it was not possible to use the FSE files since they are available only since 1987.

$$1_{i \in zep89} = X_i' \beta + \gamma P_{j,t(i)j} + \delta_{i \in 80 \text{ panel}} + \delta_j + \varepsilon_i \quad (4)$$

where $P_{j,t(i)j}$ denotes the shares of the different parties in the parliamentary elections that took place in 1981 (resp. in 1988) if the student belonged to the 1980 panel (resp. the 1989 panel), the share of the Socialist Party being the omitted variable. The inclusion of the establishment fixed effects is again allowed by the fact (with the estimation performed on both panels of students) both the ZEP variables and the political instruments are time-varying.

The first-stage results are presented in Table 6. They first show that the schools that became ZEP in 1989 were characterized by rising fractions of students of African and Asian origin, of students not having lunch at the cafeteria and of students having repeated one or more grades in primary school. On the political side, the priority zones were located in “departments” in which the Extreme Left and the Other Right did better in 1988 than in 1981, relative to the Socialist Party, and the opposite for the Extreme Right and especially for the Communist Party and Other Left. By contrast, the schools that became ZEP in 1990 tended to be located in regions where either extreme wing (right or left), as well as the Green Party, were stronger in 1988 than in 1981 (relative to the Socialists) and where the Other Right, Other Left and the Communist Party were relatively weaker. The F-statistics given in Table 6 are high enough to confirm our intuition that these political instruments are of sufficient quality.

The results of the second-stage (instrumented) regressions are presented in Table 7. They are virtually identical to those obtained using establishment fixed effects. In particular, the ZEP impact on students’ academic achievement is never significantly different from zero, no matter what measure of achievement is used. The Sargan statistics, presented for each of regressions, support the validity of our instrumentation strategy.

4.5. *Nonlinear Model*

To further assess the robustness of our results and go beyond the “pass-fail” linear probability model, we also estimated a system of non-linear equations for students’ three possible outcomes at the end of their first year of 7th grade: admission to 8th grade, repeating 7th grade, or exiting to the vocational track. As explained earlier, the 7th grade “orientation” represented a crucial moment in schooling process in France, when many students chose or were directed to the vocational track. Repetition is also very common in the French educational system, particularly when the alternative is abandoning the main track.²⁶

The model we specify has a nested structure that reflects the institutional decision process followed by French schools. First, a binding determination is made, based primarily on grades, of

²⁶ Thus, among the students who entered 6th grade in 1980, 46% continued all the way to 12th grade but only 20% managed to do this in exactly 7 years, i.e. without any repetition.

whether or not admit the student into the 8th grade. For those not admitted, a non-binding (appealable) recommendation is also made as to whether the student should repeat or exit to the vocational track, followed later on by a binding decision on the matter (for those who appealed). In that second round some different (though obviously correlated) information is taken into account, such as the students' age or even quarter of birth, repetitions of earlier grades, etc. Formally, the model is a nested probit:

$$Y_i = \begin{cases} \text{moving up} & \text{if } \beta_1 Z_{i,j(i)} + \varepsilon_{1i} > 0 \\ \text{repeating} & \text{if } \beta_1 Z_{i,j(i)} + \varepsilon_{1i} < 0 \quad \text{and} \quad \beta_2 Z_{i,j(i)} + \varepsilon_{2i} > 0, \\ \text{vocational} & \text{if } \beta_1 Z_{i,j(i)} + \varepsilon_{1i} < 0 \quad \text{and} \quad \beta_2 Z_{i,j(i)} + \varepsilon_{2i} < 0 \end{cases}, \quad (5)$$

where $j(i)$ denotes the establishment in which student i did his or her first 7th grade, $Z_{i,j(i)}$ contains all the explanatory variables for that matched pair (students i 's characteristics during 7th grade as well as establishment $j(i)$'s characteristics that year, including its ZEP indicator), and the errors $(\varepsilon_1, \varepsilon_2)$ are assumed to be Normally distributed.

Among the variables that are potentially important predictors of children's achievement is the number of repetitions in primary school. This variable can be thought of as the lag of one of our endogenous variables (moving up to 8th grade), making the model dynamic. We therefore include in our analysis a third equation that models primary school repetition, which then acts as an initial condition in (5) (see Heckman (1981)). As students may repeat several times, this is modeled as an ordered probit:

$$R_i = \begin{cases} 0 & (\text{never repeated in primary school}) \quad \text{if} \quad \beta_3 X_i + \varepsilon_{3i} < 0 \\ 1 & (\text{repeated once in primary school}) \quad \text{if} \quad 0 < \beta_3 X_i + \varepsilon_{3i} < \mu, \\ 2 & (\text{repeated more than once}) \quad \text{if} \quad \beta_3 X_i + \varepsilon_{3i} > \mu \end{cases}, \quad (6)$$

where X_i contains only time-invariant individual variables and we allow the Normal errors $(\varepsilon_1, \varepsilon_2, \varepsilon_3)$ to be arbitrarily correlated.

The whole three-equation model (5)-(6) is estimated by maximum likelihood.²⁷ Then, in order to take into account the endogeneity of ZEPs, we compute "differences-in-differences" (the term is generally used for the linear case) in the relevant outcome probabilities, estimated separately on the 1980 panel using "future ZEP" dummies and on the 1989 panel using "actual ZEP" dummies, as explained in subsection 4.2. We also run instrumented regressions, replacing the ZEP variable in the nonlinear model by its predicted value from the first-stage regression on establishments:

$$1_{j=zep89} = X_j' \beta + \gamma P_j + \varepsilon_j, \quad (7)$$

²⁷ The specification of the likelihood function is available upon request.

where the X_j denote establishment characteristics (measured as averages from the 1980 panel) and P_j the vote share of the different parties in the 1981 parliamentary elections (for the ZEP-82) or in those of 1988 (for the ZEP-89 and ZEP-90).

The detailed estimation results for the nonlinear system are presented in the tables of Appendix C, while the more central results concerning the ZEP effects are summarized in Table 8.

4.5.1. Variables other than ZEP

The estimations for the probability of *moving up to 8th grade* (Table C.1) generally confirm the robustness of our earlier findings. One result that is different concerns class size: students in small classes have fewer chances of moving up to 8th grade. This apparently paradoxical result reflects what is known about the internal organization of French establishments: the best students are grouped into bigger classes, while smaller ones are reserved for those facing difficulties. This phenomenon is easily confirmed by regressing class size on the individual characteristics of students.²⁸ In any case, as in the linear model, excluding this variable does not change the ZEP results.

More puzzling is the positive impact of the share of the students having repeated a year in primary school on the probability of moving up. The most plausible explanation is the use of relative achievement criteria in promotion decisions. Thus, when a school sets a target fraction of students to be promoted to the next grade, the probability for a given student to move up is higher, the weaker are his “competitors”.

Among students not admitted into 8th grade, the main determinants of *repeating versus switching to the vocational track* (Table C.2) are sex and age: being a boy, having entered primary school late or having repeated grades there all increase the probability of being directed to vocational education.

Turning now to the determinants of *repetitions in primary school* (Table C.3), we find many results similar to those obtained for junior high schools: girls repeat less often than boys and children from single-parent families as well as those who entered school at a late age have greater risk of repeating. Our results also show that an increase in the number of years spent in preschool is associated to a decrease in this risk of repetition in primary school. This supports the more informal arguments of Moisan and Simon (1997), who suggest fostering early entry in preschools, particularly in priority zones.

4.5.2. The Impact of the ZEP Program

²⁸ These results are available from the authors and confirm empirically the hypothesis of Lazear (1999) on optimum class size.

Table 8 presents the estimation results for the impact of the ZEP program. The effects on the probability of moving up to 8th grade and on the probability of repeating 7th grade, conditionally on not moving up, are both included. The first column presents results for the 1980 panel, the second those for the 1989 panel and the third the difference between the two. The fourth column presents the results when the ZEP variable is instrumented. All the results are perfectly consistent with those from the nonlinear model estimates: the effects of ZEP's on academic achievement are essentially nil.

Focusing on the third column “differences-in-differences” estimates, we see that being in a ZEP-82 or ZEP-90 has a negative impact on the probability of moving up to 8th grade (significant only at the 10% level) whereas being in a ZEP-89 has a slightly positive but insignificant effect. As for the repetition/vocational track outcome, all ZEP coefficients on repetition are small and insignificant, but with opposite signs to those estimated for the probability of moving up.

The instrumented estimates confirm these results. Once again, being in a ZEP-82 has a negative impact on the probability of promotion to 8th grade, but increases the probability of repeating rather than going to a vocational track. And being in a ZEP-89 has a slightly positive impact on moving up, while decreasing the probability of repeating rather than going to the vocational track.

5. Conclusion

Three main results can be derived from our analysis of the impact of the ZEP program that was put into place in French junior high schools in the 80s and early 90s.

First, the overall resources involved were relatively important: in 1990, they amounted to an extra 5% in expenditures per pupil and were allocated to a large fraction of the school population since approximately 10 % of all students in primary and junior high schools belonged to a ZEP. During our sample period, about one half of these expenditures were used for teacher bonuses and the other half for extra hours of teaching. The resulting decrease in class size was quite small and very progressive, and the bonuses and additional career incentives did not help in attracting or retaining the most skilled and experienced teachers. Had the same overall budget been more carefully targeted, the Ministry of Education could have, for instance, allocated an extra expenditure of 25% to 2% of the students. Even without altering the teacher share (which would have required going up against very powerful unions), this would have allowed a much more significant decrease in class size, of 6 students on average. The diffuse sprinkling that we bring to light may have been related to the political difficulties of giving up the deeply ingrained idea of “equality of treatment”, as well as to the pressures from most local constituencies to receive their share of the national budget.

Second, our results suggest that the signaling effect of the ZEP status was negative for both teachers and students. First, despite the bonuses offered, the teaching staff saw no improvement in qualifications or turnover and actually became less experienced over time. Second, the ZEP status led

to a decrease in the number of students enrolled, in particular among those from relatively privileged socio-economic backgrounds. We also found that this decrease occurred primarily through avoidance rather than exit: some students managed to avoid right from 6th grade on those junior high schools located in ZEPs. However, the relation between the priority status and avoidance is not entirely causal, since some of that decline seems to have started before the change of status of these schools.

Finally, and most importantly, the ZEP “treatment” has no discernable effect on any of our four measures of students’ academic achievement: obtaining at least one degree by the end of schooling, reaching the 8th or 10th grade, and success at the Baccalauréat. Perhaps most notable is the absence of impact at the lower end of the achievement distribution (exiting school without any degree), which was the intended target of the policy. These results mean that neither the modest increase in measured teaching inputs nor the more “qualitative” dimensions of the ZEP program (which was also meant to spur new educational projects, teaching methods, etc.) had any effect on academic achievement. The non-negligible increase in teacher compensation also had zero impact on students’ achievement. Interestingly, the payment of these bonuses was not related to teachers’ performance or their students’ progress.

We should emphasize that the negative results found here for junior high schools cannot be generalized without additional studies to other aspects of the overall ZEP policy, which in particular also covered primary schools. Thus, recent studies (Piketty (2004), Bressoux, Kramarz and Prost (2005)) find a strong effect of class size on 3th grade test scores, especially for pupils from disadvantaged backgrounds. The fact that these children are much younger than those we study is in line with the general consensus in the economics of education literature that interventions are most effective the earlier they occur (e.g., Heckman (2000)).

Our results also show, however, the difficulties that similar interventions targeted at “poor” schools are likely to face, in particular when the budgets involved are not clearly known (in this instance, neither by the public nor, more surprisingly, by the education authorities themselves) and when powerful professional and political interests come into play. Future programs that target aid to schools or students in under-privileged zones should incorporate these findings, as well three important lessons drawn from the experiences of other countries. First, there should be a concentration of resources on an initially small number of “targets” chosen on the basis of explicit and transparent criteria, with no ex-post administrative or political discretion. Second, modern methods of scientific evaluation, in which the treatment and the control groups are randomly selected within the target, should be used. Finally, those experiments that worked best should then be generalized but still

continuously evaluated, in particular because of the potential general-equilibrium effects that cannot be monitored in controlled experiments.²⁹

²⁹ For examples of how general-equilibrium effects of education policy interventions can be very different from partial equilibrium ones, due in particular to the endogenous sorting of students (across schools) or households (across neighborhoods), see, e.g., Bénabou (1996) on the theoretical side and Hsieh and Urquiola (2003) on the empirical side.

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Table 1: Number of Students and ZEP

	Number of Students	Number of Students in 6th Grade	Number of Students in 7th Grade	Number of Students in 8th Grade	Number of Students in 9th Grade	Number of Students per Class
Non-Zep Mean in 87	504	134	143	110	116	24.4
Mean for Zep 89 in 87	538	148	159	116	115	24.5
Mean for Zep 90 in 87	550	154	166	113	118	24.0
Zep89 starting in 88	-6.7 (4.7)	-4.6** (2.0)	-4.8** (2.0)	1.0 (1.7)	1.8 (1.8)	0.2* (0.1)
Zep89 starting in 89 (zep effect, level)	-3.9 (5.3)	-2.2 (2.2)	-2.0 (2.2)	-1.9 (1.9)	2.5 (2.0)	-0.2 (0.2)
Trend for Zep89 (zep effect, trend)	-6.5** (1.5)	-1.1* (0.6)	-2.3** (0.6)	-1.6** (0.5)	-1.5** (0.6)	-0.2** (0.0)
Zep90 starting in 88	0.3 (4.0)	-0.3 (1.6)	-4.3** (1.7)	3.1** (1.5)	1.7 (1.5)	0.0 (0.1)
Zep90 starting in 89	-5.2 (4.0)	0.3 (1.6)	-3.3** (1.7)	-3.2** (1.5)	1.0 (1.5)	-0.1 (0.1)
Zep90 starting in 90 (zep effect, level)	-6.1 (5.1)	-2.3 (2.1)	0.0 (2.1)	-2.1 (1.9)	-1.7 (1.9)	0.0 (0.1)
Trend for Zep90 (zep effect, trend)	0.5 (2.0)	0.5 (0.8)	0.1 (0.8)	0.9 (0.7)	-1.0 (0.8)	0.0 (0.0)

Source : FSE files, 1987-1992, 4 743 establishments per year.

Standard Errors in parentheses (* : significant at the 10% level, ** : - 5% level)

Table 2: Teachers and ZEP

	Number of Teachers	Number of Teachers per student	Number of Annual Hours per student	Share of Young Teachers	Share of Non-Tenured Teachers
Non-Zep Mean in 87	39	0.07	125	0.12	0.03
Mean for Zep 89 in 87	43	0.07	129	0.20	0.05
Mean for Zep 90 in 87	45	0.07	129	0.14	0.03
Zep89 starting in 88	-0.6 (0.4)	0.000 (0.001)	0.8 (1.0)	-0.006 (0.008)	-0.002 (0.005)
Zep89 starting in 89 (zep effect, level)	-0.3 (0.5)	0.000 (0.001)	1.2 (1.2)	-0.014* (0.009)	0.010* (0.006)
Trend for Zep89 (zep effect, trend)	0.1 (0.1)	0.001** (0.000)	1.1** (0.3)	0.013** (0.002)	-0.003* (0.002)
Zep90 starting in 88	0.1 (0.4)	0.000 (0.001)	-0.3 (0.9)	0.000 (0.007)	0.005 (0.004)
Zep90 starting in 89	-0.3 (0.4)	0.000 (0.001)	0.8 (0.9)	0.008 (0.007)	0.004 (0.004)
Zep90 starting in 90 (zep effect, level)	-0.2 (0.5)	-0.001 (0.001)	-0.4 (1.1)	-0.014 (0.008)	-0.007 (0.005)
Trend for Zep90 (zep effect, trend)	0.4* (0.2)	0.001** (0.000)	1.5** (0.4)	0.009** (0.003)	0.012** (0.002)

Source : FSE files, 1987-1992, 4 743 establishments per year.

Standard Errors in parentheses (* : significant at the 10% level, ** : - 5% level)

Table 3: Social Composition of the Schools and ZEP

	Share of Students coming from private schools	Share of Students in cafeteria lunch plan
Non-Zep Mean in 87	0.02	0.56
Mean for Zep 89 in 87	0.01	0.25
Mean for Zep 90 in 87	0.01	0.36
Zep89 starting in 88	0.003 (0.002)	-0.007 (0.007)
Zep89 starting in 89 (zep effect, level)	-0.005** (0.003)	-0.005 (0.008)
Trend for Zep89 (zep effect, trend)	0.001 (0.001)	-0.005** (0.002)
Zep90 starting in 88	0.001 (0.002)	-0.006 (0.006)
Zep90 starting in 89	0.001 (0.002)	-0.013** (0.006)
Zep90 starting in 90 (zep effect, level)	0.001 (0.003)	-0.003 (0.008)
Trend for Zep90 (zep effect, trend)	0.001 (0.001)	-0.006** (0.003)

Source : FSE files, 1987-1992, 4 743 establishments per year.
Standard Errors in parentheses (* : significant at the 10% level, ** : -
5% level)

Table 4: Students' Mobility and Zeps

	Change of Establishment within the Region	Change of Establishment within the Region
Share having changed establishment within the region	0.049	0.049
Establishment became ZEP in 1982	-0.0134* (0.0071)	-0.0150** (0.0072)
Establishment became ZEP in 1989	-0.0151 (0.0124)	-0.0149 (0.0127)
Establishment became ZEP in 1990	-0.0085 (0.0089)	-0.011 (0.0091)
Establishment became ZEP in 1982 (parents engineers, professors,...)		0.0171 (0.0204)
Establishment became ZEP in 1989 (parents engineers, professors,...)		0.0232 (0.0413)
Establishment became ZEP in 1990 (parents engineers, professors,...)		0.0135 (0.0288)
Establishment became ZEP in 1982 (parents technicians, middle-level prof.)		0.0226 (0.0245)
Establishment became ZEP in 1989 (parents technicians, middle-level prof.)		-0.0343 (0.0482)
Establishment became ZEP in 1990 (parents technicians, middle-level prof.)		0.0851** (0.0434)
R-Square:	0.1425	0.1426

Sources: 1980 and 1989 panels. 89,376 observations. Regressions include 4,006 establishment effects. They also include individual characteristics.

Table 5: Linear model with establishment fixed effects: ZEP variable

	Getting one Degree		Moving up to 8th-grade	
	Coefficient	StdErr	Coefficient	StdErr
ZEP in 1982	-0.0428	0.0299	-0.0052	0.0293
ZEP in 1989	0.0068	0.0426	0.0339	0.0393
ZEP in 1990	-0.0030	0.0364	-0.0126	0.0364
R2	0.2077		0.2556	
Nb of obs	27831		28713	

	Moving up to 10th-grade		Success at Baccaauréat	
	Coefficient	StdErr	Coefficient	StdErr
ZEP in 1982	-0.0046	0.0330	-0.0200	0.0338
ZEP in 1989	0.0561	0.0497	0.0212	0.0457
ZEP in 1990	-0.0171	0.0432	-0.0494	0.0443
R2	0.3272		0.3179	
Nb of obs	27831		27831	

Notes: estimations based on the 1980 and 1989 panels together. There are about 3200 establishment fixed effects, in addition to the individual characteristics and school variables (averages of individual characteristics by school on each panel). The relevant school is the one where the student is in his or her 7th grade.

Table 6: Instrumentation of the ZEP indicator

Zep in 1989		Coef.	StErr
Share in the school of:			
Occupation of the parents:	Farmer	0.0328**	0.0084
	Worker in Agriculture	0.0609**	0.0199
	Craftsman	-0.0245**	0.0060
	Executive	-0.0175**	0.0063
	Teacher, Professor	0.0010	0.0093
	Technician, foreman	-0.01156**	0.0051
	Retail Employee	-0.0304**	0.0120
	Office Employee	-0.0163**	0.0058
	Unskilled Blue-Collar Worker	-0.0212**	0.0057
	Service Employee	-0.0390**	0.0109
	Inactive, unemployed	-0.0173**	0.0081
Nationality:	European born in France	0.0299**	0.0134
	European born outside France	0.0330	0.0209
	African born in France	0.0070	0.0112
	African born outside France	0.1541**	0.0130
	Asian born in France	0.0853**	0.0254
	Asian born outside France	0.0770**	0.0201
Schooling Information:	Extern	0.0215**	0.0037
	1 repetition in Primary school	0.0173**	0.0038
	2 repetitions in Primary school	-0.0715**	0.0078
	3 repetitions in Primary school	-0.4009**	0.0397
Family Structure:	Father in charge	0.0647**	0.0095
	Mother in charge	0.0119**	0.0053
	Other in charge	-0.0083	0.0132
Entry in Primary School:	5 at entry in Primary school	0.0052	0.0073
	7 at entry in Primary school	-0.0292**	0.0087
	8 at entry in Primary school	0.0456**	0.0187
Votes during parliamentary elections:			
	Extreme-Right	-0.0948**	0.0373
	RPR-UDF	-0.0213	0.0421
	Other Right	0.1609**	0.0476
	Other Left	-0.3355**	0.0793
	Communist Party	-0.3632**	0.0458
	Greens	0.0783	0.0977
	Extreme-Left	0.1846**	0.0590
Fisher statistics :		25.24	

Zep in 1990		Coef.	StErr
Share in the school of:			
Occupation of the parents:	Farmer	-0.0143	0.0098
	Worker in Agriculture	0.1453**	0.0231
	Craftsman	-0.0109	0.0069
	Executive	-0.0412**	0.0072
	Teacher, Professor	-0.0552**	0.0107
	Technician, foreman	-0.0203**	0.0059
	Retail Employee	-0.1190**	0.0139
	Office Employee	-0.0406**	0.0067
	Unskilled Blue-Collar Worker	-0.0580**	0.0066
	Service Employee	0.0092	0.0126
	Inactive, unemployed	-0.0420**	0.0094
Nationality:	European born in France	-0.0116	0.0155
	European born outside France	-0.2323**	0.0242
	African born in France	0.0790**	0.0130
	African born outside France	0.0101	0.0151
	Asian born in France	0.3392**	0.0294
	Asian born outside France	-0.0028	0.0233
Schooling Information:	Extern	0.0077*	0.0043
	1 repetition in Primary school	-0.0133**	0.0044
	2 repetitions in Primary school	-0.0408**	0.0090
	3 repetitions in Primary school	0.1886**	0.0459
Family Structure:	Father in charge	0.0135	0.0110
	Mother in charge	-0.0182**	0.0061
	Other in charge	-0.0091	0.0153
Entry in Primary School:	5 at entry in Primary school	-0.0215**	0.0084
	7 at entry in Primary school	-0.0668**	0.0101
	8 at entry in Primary school	0.1456**	0.0216
Votes during parliamentary elections:			
	Extreme-Right	0.4238**	0.0432
	RPR-UDF	0.0944*	0.0487
	Other Right	-0.1986**	0.0550
	Other Left	-1.1475**	0.0916
	Communist Party	-0.1434**	0.0529
	Greens	0.9149**	0.1129
	Extreme-Left	0.3613**	0.0682
Fisher statistics :		25.24	

Notes: 27832 observations. The regression includes approximately 3200 establishment fixed effects, individual characteristics and school variables (aggregation of individual characteristics by school on each panel). The political data are Cevipof data, for the years 1981 and 1988. The estimation is done with a linear probability model. The Fisher statistics is a test of the political variables equal to zero.

Table 7: Linear Model with Instrumental Variables

	Getting one Degree		Moving up to 8th-grade	
	Coefficient	StdErr	Coefficient	StdErr
ZEP in 1989	0.1622	0.5195	-0.0546	0.5177
ZEP in 1990	0.0106	0.3079	-0.1541	0.2915
R2	0.1001		0.1354	
Nb of obs	27831		28713	
Sargan test:	3.2728		2.4089	

	Moving up to 10th-grade		Success at Baccaauréat	
	Coefficient	StdErr	Coefficient	StdErr
ZEP in 1989	0.0062	0.6199	0.3879	0.6293
ZEP in 1990	-0.0608	0.3674	-0.5339	0.3730
R2	0.2161		0.1798	
Nb of obs	27831		27831	
Sargan test:	2.3147		5.9496	

Notes: 1980 and 1989 panels. The ZEP variable is instrumented by the school variables and the political variables. There are about 3200 establishment fixed effects, individual characteristics and school variables. The school is the one where the student is in 7th grade.

Table 8: Nonlinear Model

	Panel 1980	Panel 1989	Difference in	
	Probability (StdErr)	Probability (StdErr)	Difference Probability (StdErr)	Instruments Probability (StdErr)
Moving up to 8th grade				
ZEP in 1982	0.0164* (0.0104)	-0.0092 (0.0087)	-0.0256* (0.0136)	-0.0106** (0.0043)
ZEP in 1989	0.0246* (0.0144)	0.0250** (0.0092)	0.0004 (0.0171)	0.0046* (0.0030)
ZEP in 1990	0.0113 (0.0121)	-0.0104 (0.0092)	-0.0217* (0.0152)	-0.0009 (0.0048)
Repeating versus vocational track				
ZEP in 1982	-0.0125* (0.0095)	0.0072 (0.0074)	0.0198* (0.0120)	0.0072** (0.0024)
ZEP in 1989	-0.0180* (0.0131)	-0.0235** (0.0076)	-0.0055 (0.0152)	-0.0044** (0.0017)
ZEP in 1990	-0.0056 (0.0110)	0.0116* (0.0080)	0.0172 (0.0136)	-0.0030 (0.0025)

The results present the increase in the probability due to the Zep status for a student endowed with the average characteristics of the sample.

Notes : 1980 and 1989 panels. The regression includes all students' personal characteristics. (see appendix H for the full results).

Standard errors between parentheses (* : significant at the 10% level, ** : - 5% level)

Appendix A: Descriptive statistics on the students during their first 7th grade in ZEP and non ZEP schools (1989 panel).

Table A.1 : Statistics on students, ZEP and non ZEP schools

<u>Variables:</u>		<u>Means</u>			
		ZEP 1982	ZEP 1989	ZEP 1990	Non ZEP
Occupation of the parents:	Farmer	0.0115	0.0167	0.0163	0.0388
	Worker in Agriculture	0.0067	0.0033	0.0065	0.0056
	Craftsman	0.0720	0.0367	0.0708	0.1060
	Executive	0.0471	0.0383	0.0501	0.1387
	Teacher, Professor	0.0231	0.0267	0.0185	0.0412
	Technician, foreman	0.1268	0.1067	0.1329	0.1817
	Retail Employee	0.0115	0.0133	0.0142	0.0135
	Office Employee	0.0826	0.0683	0.1002	0.1034
	Skilled Blue-Collar Worker	0.3429	0.3767	0.3322	0.2432
	Unskilled Blue-Collar Worker	0.1604	0.2133	0.1580	0.0781
	Service Employee	0.0259	0.0150	0.0261	0.0148
	Inactive, unemployed	0.0893	0.0850	0.0741	0.0350
	Entry in Primary School:	5 at entry in Primary school	0.0327	0.0300	0.0272
6 at entry in Primary school		0.8847	0.8933	0.8932	0.9149
7 at entry in Primary school		0.0605	0.0533	0.0545	0.0312
8 at entry in Primary school		0.0221	0.0233	0.0251	0.0065
Nationality:	French born in France	0.7243	0.8033	0.7505	0.9199
	French born in DOM	0.0038	0.0000	0.0076	0.0021
	French born outside France	0.0106	0.0033	0.0142	0.0125
	European born in France	0.0355	0.0283	0.0272	0.0145
	European born outside France	0.0038	0.0050	0.0044	0.0047
	African born in France	0.0951	0.0767	0.1013	0.0213
	African born outside France	0.0720	0.0550	0.0545	0.0132
	Asian born in France	0.0221	0.0133	0.0087	0.0033
	Asian born outside France	0.0327	0.0150	0.0316	0.0083
Quarter of Birth:	Born first quarter	0.2027	0.2400	0.2277	0.2346
	Born second quarter	0.2911	0.3000	0.3028	0.2781
	Born third quarter	0.2546	0.2133	0.2538	0.2498
	Born fourth quarter	0.2517	0.2467	0.2157	0.2376
Siblings:	Only child	0.1009	0.0983	0.0959	0.1246
	Two children in family	0.3132	0.3000	0.3388	0.4204
	Three children in family	0.2478	0.2383	0.2484	0.2902
	Four children in family	0.1287	0.1317	0.1198	0.0925
	Five children in family	0.0874	0.0867	0.0882	0.0358
	Six + children in family	0.1220	0.1450	0.1089	0.0365
Position in Family:	First born	0.4256	0.4167	0.4150	0.4825
	Second born	0.3045	0.3117	0.3181	0.3440
	Third born	0.1345	0.1433	0.1416	0.1135
	Fourth born	0.0672	0.0533	0.0588	0.0335
	Fifth born	0.0682	0.0750	0.0664	0.0265

Family Structure:	Father and mother in charge	0.8223	0.7933	0.7789	0.8451
	Father in charge	0.0163	0.0383	0.0425	0.0221
	Mother in charge	0.1479	0.1533	0.1721	0.1224
	Other in charge	0.0134	0.0150	0.0065	0.0105
Other Characteristics:	Sex (=1 if woman)	0.5524	0.4567	0.4978	0.4979
	At least 1 year of school outside France	0.0173	0.0067	0.0229	0.0124
Schooling Information:	Extern	0.6350	0.7333	0.6394	0.3775
	Lunch at the school's canteen	0.3650	0.2667	0.3606	0.6225
	English as first language	0.8703	0.8133	0.8824	0.8567
	German as first language	0.1095	0.1700	0.1089	0.1319
	Other first language	0.0202	0.0167	0.0087	0.0114
	Private school	0.0000	0.0000	0.0000	0.2257
	Scholarship	0.4400	0.5350	0.4248	0.2457
Size of Class:	Size of class: below 20	0.0480	0.0433	0.0414	0.0328
	Size of class: 20 or 21	0.0663	0.0600	0.0556	0.0454
	Size of class: 22 or 23	0.1979	0.1400	0.1961	0.1275
	Size of class: 24 or 25	0.2863	0.2333	0.3333	0.2561
	Size of class: 26 or 27	0.2613	0.2583	0.2473	0.2619
	Size of class: 28 or 29	0.1143	0.1933	0.0991	0.1816
Previous Repetitions:	Size of class: >=30	0.0259	0.0717	0.0272	0.0947
	0 repetition in Primary school	0.6513	0.6183	0.6612	0.7631
	1 repetition in Primary school	0.2661	0.3317	0.2603	0.1980
	2 repetitions in Primary school	0.0788	0.0483	0.0730	0.0364
Nursery School:	3 repetitions in Primary school	0.0038	0.0017	0.0054	0.0025
	No year in Nursery school	0.0836	0.0683	0.0566	0.0372
	1 year in Nursery School	0.0692	0.0633	0.0686	0.0775
	2 years in Nursery school	0.1892	0.1783	0.1906	0.1675
	3 years in Nursery school	0.5696	0.5600	0.5839	0.6021
	4 years in Nursery school	0.0884	0.1300	0.1002	0.1157

Note: Number of students 1041; 600; 918; and 19,450 respectively.

Source: 1989 panel

ZEP 1982 (resp. 1989, 1990) means "became ZEP in 1982" (resp. 1989, 1990)

Table A.2: Achievement at the end of 7th grade, in ZEP and non ZEP schools

	ZEP 1982	ZEP 1989	ZEP 1990	non ZEP
Move up to 8th grade	70%	76%	69%	78%
Repeat 7th grade	16%	9%	17%	12%
Vocational track	15%	15%	14%	11%
Number of students	1041	600	918	19450
Number of establishments	278	134	232	5294

Source: 1989 panel

ZEP 1982 (resp. 1989, 1990) means "became ZEP in 1982" (resp. 1989, 1990)

Appendix B: Linear model with establishment fixed effects

Table B.1: Getting at least one Degree

		Coef.	StErr	
	1980 panel	-0.1050**	0.0076	
Occupation of the parents:	Farmer	0.0724**	0.0130	
	Worker in Agriculture	-0.0078	0.0326	
	Craftsman	0.0222**	0.0101	
	Executive	0.0803**	0.0091	
	Teacher, Professor	0.0985**	0.0112	
	Technician, foreman	0.0471**	0.0083	
	Retail Employee	0.0035	0.0208	
	Office Employee	0.0394**	0.0098	
	Unskilled Blue-Collar Worker	-0.0200**	0.0101	
	Service Employee	-0.0025	0.0191	
	Inactive, unemployed	-0.0779**	0.0165	
Entry in Primary School:	5 at entry in Primary school	0.0473**	0.0091	
	7 at entry in Primary school	-0.1703**	0.0178	
	8 at entry in Primary school	-0.1232**	0.0392	
Nationality:	French born in DOM	0.0100	0.0504	
	French born outside France	0.0537**	0.0209	
	European born in France	0.0164	0.0218	
	European born outside France	-0.0025	0.0307	
	African born in France	0.0043	0.0211	
	African born outside France	0.0327	0.0272	
	Asian born in France	0.0117	0.0680	
	Asian born outside France	-0.0068	0.0394	
Siblings:	Only child	-0.0133	0.0084	
	Three children in family	-0.0060	0.0063	
	Four children in family	-0.0327**	0.0101	
	Five children in family	-0.0425**	0.0152	
	Six + children in family	-0.0924**	0.0186	
	Position in Family:	Second born	-0.0069	0.0057
Third born		-0.0121	0.0088	
Fourth born		-0.0180	0.0145	
Fifth born		-0.0402**	0.0190	
Family Structure:		Father in charge	-0.0883**	0.0234
	Mother in charge	-0.0376**	0.0100	
	Other in charge	-0.1351**	0.0302	
Other Characteristics:	Sex (=1 if woman)	0.0404**	0.0049	
	At least 1 year of school outside France	0.0089	0.0238	
Schooling Information:	German as first language	0.0434**	0.0067	
	Other first language	-0.0450**	0.0209	
	Scholarship	-0.0445**	0.0067	
Share in the School:				
Social status of parents:	Farmer	0.0551	0.0465	
	Worker in Agriculture	-0.0194	0.1324	
	Craftsman	-0.0205	0.0346	
	Executive	-0.0292	0.0353	
	Teacher, Professor	-0.0850	0.0542	
	Technician, foreman	0.0270	0.0297	
	Retail Employee	-0.0954	0.0711	
	Office Employee	-0.0148	0.0350	
	Unskilled Blue-Collar Worker	-0.0123	0.0349	
	Service Employee	-0.0913	0.0699	
	Inactive, unemployed	0.0021	0.0516	
	Nationality:	European born in France	0.0392	0.0764
		European born outside France	0.0016	0.1281
		African born in France	0.0357	0.0733
		African born outside France	0.0702	0.0819
		Asian born in France	0.0240	0.1775
Schooling Information:	Asian born outside France	0.1962	0.1320	
	Extern	-0.0284	0.0215	
	1 repetition in Primary school	-0.1240**	0.0235	
	2 repetitions in Primary school	-0.2878**	0.0493	
	3 repetitions in Primary school	-0.7196**	0.2160	
	Family Structure:	Father in charge	-0.0122	0.0588
		Mother in charge	0.0177	0.0318
Other in charge		0.1648*	0.0866	
Entry in Primary School:	5 at entry in Primary school	0.0187	0.0391	
	7 at entry in Primary school	0.0632	0.0597	
	8 at entry in Primary school	-0.1886	0.1278	
ZEP status:	ZEP in 1982	-0.0428	0.0299	
	ZEP in 1989	0.0068	0.0426	
	ZEP in 1990	-0.0030	0.0364	

Notes: estimations based on the 1980 and 1989 panels together. There are about 3200 establishment fixed effects, in addition to the individual characteristics and school variables (averages of individual characteristics by school on each panel). The relevant school is the one where the student is in his or her last 7th grade.

Table B.2: Moving up to 8th Grade

		Coef.	StErr	
	1980 panel	-0.0513**	0.0076	
Occupation of the parents:	Farmer	0.0457**	0.0137	
	Worker in Agriculture	-0.0355	0.0326	
	Craftsman	0.0635**	0.0097	
	Executive	0.15111**	0.0084	
	Teacher, Professor	0.1613**	0.0097	
	Technician, foreman	0.0985**	0.0082	
	Retail Employee	0.0428**	0.0194	
	Office Employee	0.0600**	0.0098	
	Unskilled Blue-Collar Worker	-0.0457**	0.0101	
	Service Employee	-0.0152	0.0188	
	Inactive, unemployed	-0.0476**	0.0160	
	Entry in Primary School:	5 at entry in Primary school	0.0581**	0.0077
7 at entry in Primary school		-0.233**	0.0172	
8 at entry in Primary school		-0.1895**	0.0388	
Nationality:	French born in DOM	0.0431	0.0449	
	French born outside France	0.0905**	0.0175	
	European born in France	0.0086	0.0214	
	European born outside France	-0.0188	0.0288	
	Africans born in France	0.1357**	0.0205	
	Africans born outside France	0.1273**	0.0255	
	Asians born in France	0.1819**	0.0571	
	Asians born outside France	0.1517**	0.0353	
	Only child	0.0021	0.0076	
Siblings:	Three children in family	-0.0174**	0.0061	
	Four children in family	-0.0677**	0.0101	
	Five children in family	-0.1074**	0.0149	
	Six + children in family	-0.1486**	0.0181	
	Position in Family:	Second born	-0.0180**	0.0055
		Third born	-0.0189**	0.0085
Fourth born		-0.0085	0.0141	
Fifth born		-0.0214	0.0186	
Family Structure:		Father in charge	-0.0573**	0.0229
	Mother in charge	-0.0147	0.0096	
	Other in charge	-0.2064**	0.0303	
Other Characteristics:	Sex (=1 if woman)	0.1088**	0.0047	
	At least 1 year of school outside France	0.0051	0.0215	
Schooling Information:	German as first language	0.0586**	0.0061	
	Other first language	-0.0885**	0.0202	
	Scholarship	-0.0713**	0.0065	
Share in the School:			0.0065	
Social status of parents:	Farmer	0.1087**	0.0472	
	Worker in Agriculture	0.0742	0.1175	
	Craftsman	0.0059	0.0342	
	Executive	-0.1008**	0.0324	
	Teacher, Professor	-0.0530	0.0467	
	Technician, foreman	-0.0463	0.0295	
	Retail Employee	-0.0342	0.0664	
	Office Employee	-0.0384	0.0335	
	Unskilled Blue-Collar Worker	0.0554	0.0347	
	Service Employee	-0.1258*	0.0655	
	Inactive, unemployed	0.0042	0.0507	
	Nationality:	European born in France	0.1328*	0.0757
		European born outside France	-0.1419	0.1302
		African born in France	0.1563**	0.0712
		African born outside France	0.0485	0.0803
		Asian born in France	-0.1536	0.1622
	Schooling Information:	Asian born outside France	0.0937	0.1145
Extern		0.0222	0.0205	
1 repetition in Primary school		-0.2225**	0.0237	
Family Structure:	2 repetitions in Primary school	-0.5037**	0.0503	
	3 repetitions in Primary school	-0.6772**	0.2328	
	Father in charge	0.0190	0.0626	
	Mother in charge	-0.0136	0.0314	
Entry in Primary School:	Other in charge	0.2284**	0.0750	
	5 at entry in Primary school	0.0246	0.0367	
	7 at entry in Primary school	0.0860	0.0537	
ZEP status:	8 at entry in Primary school	-0.2298*	0.1281	
	ZEP in 1982	-0.0052	0.0293	
	ZEP in 1989	0.0339	0.0393	
	ZEP in 1990	-0.0126	0.0364	

Notes: estimations based on the 1980 and 1989 panels together. There are about 3200 establishment fixed effects, in addition to the individual characteristics and school variables (averages of individual characteristics by school on each panel). The relevant school is the one where the student is in his or her first 7th grade.

Table B.3: Moving up to 10th Grade

		Coef.	StErr	
	1980 panel	-0.0881**	0.0098	
Occupation of the parents:	Farmer	0.0867**	0.0164	
	Worker in Agriculture	-0.0695**	0.0326	
	Craftsman	0.1068**	0.0125	
	Executive	0.3438**	0.0114	
	Teacher, Professor	0.3682**	0.0135	
	Technician, foreman	0.2014**	0.0105	
	Retail Employee	0.0490**	0.0237	
	Office Employee	0.1009**	0.0121	
	Unskilled Blue-Collar Worker	-0.0424**	0.0110	
	Service Employee	-0.0096	0.0199	
	Inactive, unemployed	-0.0062	0.0167	
	Entry in Primary School:	5 at entry in Primary school	0.1602**	0.0112
		7 at entry in Primary school	-0.2504**	0.0150
8 at entry in Primary school		-0.1847**	0.0353	
Nationality:	French born in DOM	0.0441	0.0566	
	French born outside France	0.1026**	0.0250	
	European born in France	-0.0190	0.0236	
	European born outside France	0.0065	0.0287	
	African born in France	0.1281**	0.0233	
	African born outside France	0.1506**	0.0287	
	Asian born in France	0.1104	0.0783	
	Asian born outside France	0.1407**	0.0428	
Siblings:	Only child	-0.0082	0.0105	
	Three children in family	-0.0385**	0.0078	
	Four children in family	-0.0734**	0.0117	
	Five children in family	-0.0998**	0.0159	
	Six + children in family	-0.1473**	0.0180	
	Position in Family:	Second born	-0.0448**	0.0071
Third born		-0.0344**	0.0102	
Fourth born		-0.0334**	0.0152	
Fifth born		-0.0337*	0.0183	
Family Structure:		Father in charge	-0.0825**	0.0253
	Mother in charge	-0.0224**	0.0113	
	Other in charge	-0.2151**	0.0281	
Other Characteristics:	Sex (=1 if woman)	0.1073**	0.0057	
	At least 1 year of school outside France	0.0082	0.0260	
Schooling Information:	German as first language	0.1160**	0.0082	
	Other first language	-0.0909**	0.0207	
	Scholarship	-0.1063**	0.0078	
Share in the School:				
Social status of parents:	Farmer	0.0782	0.0605	
	Worker in Agriculture	-0.0228	0.1518	
	Craftsman	-0.0614	0.0437	
	Executive	-0.1635**	0.0426	
	Teacher, Professor	-0.1468**	0.0666	
	Technician, foreman	-0.1055**	0.0369	
	Retail Employee	-0.0751	0.0850	
	Office Employee	-0.0336	0.0424	
	Unskilled Blue-Collar Worker	-0.0215	0.0416	
	Service Employee	-0.1193	0.0753	
	Inactive, unemployed	-0.0349	0.0557	
	Nationality:	European born in France	0.0643	0.0971
		European born outside France	0.0548	0.1497
		African born in France	-0.1127	0.0839
		African born outside France	0.1363	0.1030
Asian born in France		-0.2173	0.2273	
Schooling Information:	Asian born outside France	0.0750	0.1412	
	Extern	0.0074	0.0263	
	1 repetition in Primary school	-0.3118**	0.0271	
	2 repetitions in Primary school	-0.3260**	0.0507	
Family Structure:	3 repetitions in Primary school	-0.3211	0.2615	
	Father in charge	-0.1393**	0.0683	
	Mother in charge	-0.0127	0.0373	
Entry in Primary School:	Other in charge	0.1014	0.0887	
	5 at entry in Primary school	0.0605	0.0472	
	7 at entry in Primary school	-0.0198	0.0622	
	8 at entry in Primary school	-0.0993	0.1236	
ZEP status:	ZEP in 1982	-0.0046	0.0330	
	ZEP in 1989	0.0561	0.0497	
	ZEP in 1990	-0.0171	0.0432	

Notes: estimations based on the 1980 and 1989 panels together. There are about 3200 establishment fixed effects, in addition to the individual characteristics and school variables (averages of individual characteristics by school on each panel). The relevant school is the one where the student is in his or her last 7th grade.

Table B.4: Success at the Baccalauréat

		Coef.	StErr	
	1980 panel	-0.2032**	0.0099	
Occupation of the parents:	Farmer	0.0612**	0.0161	
	Worker in Agriculture	-0.0585*	0.0318	
	Craftsman	0.0646**	0.0124	
	Executive	0.2889**	0.0122	
	Teacher, Professor	0.3214**	0.0155	
	Technician, foreman	0.1525**	0.0106	
	Retail Employee	0.0112	0.0235	
	Office Employee	0.0874**	0.0120	
	Unskilled Blue-Collar Worker	-0.0303**	0.0107	
	Service Employee	-0.0084	0.0199	
	Inactive, unemployed	-0.0049	0.0163	
	Entry in Primary School:	5 at entry in Primary school	0.1458**	0.0127
		7 at entry in Primary school	-0.2321**	0.0145
		8 at entry in Primary school	-0.1002**	0.0356
Nationality:	French born in DOM	-0.0099	0.0570	
	French born outside France	0.0963**	0.0263	
	European born in France	0.0501**	0.0233	
	European born outside France	0.0177	0.0287	
	African born in France	0.1035**	0.0225	
	African born outside France	0.1393**	0.0285	
	Asian born in France	0.0275	0.0729	
	Asian born outside France	0.0985**	0.0418	
Siblings:	Only child	-0.0023	0.0106	
	Three children in family	-0.0307**	0.0079	
	Four children in family	-0.0584**	0.0115	
	Five children in family	-0.1158**	0.0154	
	Six + children in family	-0.1458**	0.0178	
	Position in Family:	Second born	-0.0229**	0.0072
Third born		-0.0219**	0.0102	
Fourth born		-0.0101	0.0150	
Fifth born		0.0029	0.0180	
Family Structure:		Father in charge	-0.0869**	0.0251
	Mother in charge	-0.0415**	0.0114	
	Other in charge	-0.2101**	0.0266	
Other Characteristics:	Sex (=1 if woman)	0.1175**	0.0058	
	At least 1 year of school outside France	0.0437*	0.0260	
Schooling Information:	German as first language	0.1223**	0.0086	
	Other first language	-0.0680**	0.0208	
	Scholarship	-0.0894**	0.0077	
Share in the School:				
Social status of parents:	Farmer	0.1144*	0.0602	
	Worker in Agriculture	0.0810	0.1400	
	Craftsman	-0.0504	0.0434	
	Executive	-0.1561**	0.0440	
	Teacher, Professor	-0.1478**	0.0668	
	Technician, foreman	-0.0934**	0.0367	
	Retail Employee	0.0024	0.0924	
	Office Employee	-0.0528	0.0427	
	Unskilled Blue-Collar Worker	-0.0293	0.0417	
	Service Employee	-0.1788**	0.0724	
	Inactive, unemployed	-0.0683	0.0560	
	Nationality:	European born in France	0.0534	0.0995
		European born outside France	-0.0576	0.1581
		African born in France	-0.1199	0.0847
		African born outside France	-0.0213	0.0991
		Asian born in France	-0.3155	0.2049
Schooling Information:	Asian born outside France	0.1577	0.1425	
	Extern	0.0229	0.0266	
Family Structure:	1 repetition in Primary school	-0.2388**	0.0270	
	2 repetitions in Primary school	-0.2673**	0.0529	
	3 repetitions in Primary school	-0.3265	0.2632	
Entry in Primary School:	Father in charge	-0.1095	0.0686	
	Mother in charge	0.0301	0.0373	
	Other in charge	0.1360*	0.0794	
ZEP status:	5 at entry in Primary school	-0.0770	0.0507	
	7 at entry in Primary school	0.0383	0.0627	
	8 at entry in Primary school	-0.1789	0.1317	
ZEP status:	ZEP in 1982	-0.0200	0.0338	
	ZEP in 1989	0.0212	0.0457	
	ZEP in 1990	-0.0494	0.0443	

Notes: estimations based on the 1980 and 1989 panels together. There are about 3200 establishment fixed effects, in addition to the individual characteristics and school variables (averages of individual characteristics by school on each panel). The relevant school is the one where the student is in his or her last 7th grade.

Appendix C: Nonlinear model, separate panel estimations. Main variables.

Table C.1: nonlinear model, equation for moving up to 8th grade

		1980 panel		1989 panel	
		Coef.	StErr	Coef.	StErr
Entry in Primary School:	5 at entry in Primary school	0.4396**	0.0619	0.3296**	0.0764
	7 at entry in Primary school	-0.5867**	0.0656	-0.5638**	0.0606
	8 at entry in Primary school	-0.6020**	0.1733	-0.5729**	0.1396
Nationality:	French born in DOM	0.1407	0.1739	0.2065	0.2297
	French born elsewhere	0.3053**	0.0977	0.2163**	0.101
	European born in France	0.0946	0.0835	0.0109	0.0925
	European born outside France	0.1152	0.0934	0.0892	0.1743
	African born in France	0.2268**	0.0847	0.2281**	0.0702
	African born outside France	0.5027**	0.1071	0.3044**	0.0919
	Asian born in France	0.5726**	0.1693	0.2477*	0.1575
	Asian born outside France			0.5311**	0.1157
Family Structure:	Father in charge	-0.0929	0.1043	-0.1405**	0.0853
	Mother in charge	-0.0496	0.0483	-0.1551**	0.0415
	Other in charge	-0.5147**	0.1063	-0.5042**	0.1066
Sex:	Sex (=1 if woman)	0.3514***	0.0234	0.3965**	0.0228
Schooling Information:	German as first language	0.2342**	0.0348	0.3320**	0.0416
	Private establishment	0.2022**	0.0325	0.0558**	0.0292
	Scholarship	-0.1254**	0.0292	-0.1468**	0.0301
Size of Class:	below 20	-0.2978**	0.0576	-0.3909**	0.0536
	20 or 21	-0.0978**	0.0458	-0.1668**	0.0483
	22 or 23	-0.0724**	0.0267	-0.0450*	0.0338
	26 or 27	-0.0246	0.0337	-0.0501**	0.0286
	28 or 29	0.0807**	0.0449	0.0101	0.0331
	>=30	0.0025	0.0621	0.1277**	0.0463
Previous Repetitions:	1 repetition in Primary school	-0.5182**	0.1828	-0.5201**	0.1832
	2 repetitions in Primary school	-0.8788**	0.3195	-0.7779**	0.3132
	3 repetitions in Primary school	-0.5456	0.4915	-0.4939	0.4756
Share in the School:					
Schooling Information:	1 repetition in Primary school	0.2766**	0.0804	0.2748**	0.0597
	2 repetitions in Primary school	0.5216**	0.1603	0.4088**	0.1257
	3 repetitions in Primary school	1.2279**	0.6482	-0.3453	0.4233
ZEP status:	ZEP in 1982	0.0778*	0.052	-0.0535	0.049
	ZEP in 1989	0.1188*	0.0732	0.1644**	0.067
	ZEP in 1990	0.053	0.0582	-0.0601	0.0507

Table C.2: nonlinear model, equation for repeating 7th grade, conditional on not moving up to 8th grade

		1980 panel		1989 panel	
		Coef.	StErr	Coef.	StErr
Entry in Primary School:	5 at entry in Primary school	0.9972**	0.2018	0.1779	0.1531
	7 at entry in Primary school	-1.2967**	0.2124	-0.4933**	0.123
	8 at entry in Primary school	-2.4314**	0.3346	-0.9027**	0.275
Nationality:	African born in France	0.4481**	0.15	0.3651**	0.116
Sex:	Sex (=1 if woman)	0.4090**	0.1504	0.1307**	0.061
Size of Class:	below 20	-0.2804**	0.1441	0.2728**	0.0781
	20 or 21	-0.1380*	0.0864	0.0553	0.071
	22 or 23	0.0133	0.0582	-0.005	0.052
	26 or 27	-0.0127	0.0618	0.0679*	0.0448
	28 or 29	-0.0607	0.1003	0.0692	0.0536
	>=30	-0.1002	0.1277	-0.0651	0.0831
Previous Repetitions:	1 repetition in Primary school	-1.4284**	0.2818	0.2128	0.2984
	2 repetitions in Primary school	-2.6566**	0.4817	0.1229	0.5589
	3 repetitions in Primary school	-3.3261**	0.807	-0.0112	0.8976
ZEP status:	ZEP in 1982	0.0526	0.0951	0.0194	0.0739
	ZEP in 1989	0.1106	0.1382	-0.1888**	0.1042
	ZEP in 1990	0.1294*	0.0969	0.1114*	0.0799
<i>Correlation with the regression model of moving up to 8th grade</i>		0.1094	0.6774	-0.5620**	0.1805

Table C.3: Nonlinear model, equation for repeating in primary school

		1980 panel		1989 panel	
		Coef.	StErr	Coef.	StErr
Entry in Primary School:	5 at entry in Primary school	0.1679**	0.0449	0.2377**	0.0468
	7 at entry in Primary school	-0.2024**	0.0548	-0.0349	0.0482
	8 at entry in Primary school	-1.3396**	0.1466	-0.8402	0.1104
Nationality:	French born in DOM	0.3678**	0.1431	0.0811	0.1906
	French born outside France	-0.1195	0.0945	0.0534	0.0897
	European born in France	0.1307**	0.0699	0.2822**	0.0651
	European born outside France	0.3025**	0.0724	0.3695**	0.1234
	African born in France	0.1482**	0.0697	-0.0862	0.0519
	African born outside France	0.0825	0.0864	0.3547**	0.0626
	Asian born in France	0.0262	0.1229	0.008	0.12
	Asian born outside France			0.0789	0.0879
Quarter of birth:	Born first quarter	-0.0507**	0.0284	-0.0466**	0.0277
	Born third quarter	0.1819**	0.0275	0.2188**	0.026
	Born fourth quarter	0.291	0.0272	0.3741	0.026
Family structure:	Father in charge	0.3274**	0.0877	0.3457**	0.0554
	Mother in charge	0.1872**	0.0386	0.2609**	0.029
	Other in charge	0.5128**	0.0766	0.4228**	0.0826
Sex:	Sex (=1 if woman)	-0.2045**	0.0195	-0.2150**	0.0189
Nursery School:	No year in Nursery school	0.2635**	0.0349	0.1229**	0.043
	1 year in Nursery School	0.1261**	0.0278	0.0799**	0.0335
	2 years in Nursery school	0.1001**	0.0244	0.0330*	0.0245
	4 years in Nursery school	-0.0787**	0.0443	-0.1143**	0.0319
<i>Corr. with the regression model of moving up 8th grade</i>		-0.2262**	0.1185	-0.2364**	0.1182
<i>Corr. with the regression model of repeating 7th grade</i>		0.0953	0.2541	-0.5198**	0.2345

Estimated by maximum likelihood. 1980 panel: Mean log-likelihood -1.37350, 18567 students
1989 panel: Mean log-likelihood -1.11801, 22009 students