

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

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## Abstract

We provide an assessment of the French ZEP (Zones d'Education Prioritaire), a program 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 program on four measures of individual student achievement: obtaining at least one diploma by the end of schooling, reaching 8<sup>th</sup> grade, reaching 10<sup>th</sup> grade and success at the Baccalauréat (the national examination at the end of high school). We take into account the endogeneity of the ZEP status by using both difference 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 program.

## **Introduction**

Many developed countries have adopted compensatory education policies that direct extra resources to disadvantaged schools. In the United States, this has been the case since 1965 with the Title I program. In Great Britain, the Education Priority Areas experiment of the early 1970's followed the Plowden report, a thorough review of primary education in England which had a considerable impact. This program re-emerged in 1997-1998 as the Education Action Zones and Excellence in Cities. A number of other countries, such as Portugal and Belgium, have similar programs.

In France, the idea of priority zones first spread among teacher unions in the 1970's and then became part of the political platform of the Socialist party, which came to power in 1981. Thus, 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 originally meant 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. The amount and nature of the extra resources given to the ZEPs were never specified, however, nor the actual procedure by which priority status was to be determined. Perhaps most tellingly, to this day the Ministry of Education's budget still contains no specific line item for "priority education".

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 the national ideal, 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. Most recently, in the wake of the riots which occurred in the poor suburbs of large cities in November 2005, the French government put forth a set of new measures intended to promote greater equal opportunity through subsidized housing projects and reforms of the education system and labor market regulation. The flagship decision in the education field is to be a new expansion and reform of the ZEP program.

In spite of the central place it occupies in French education policy and the political debate, there has been no systematic evaluation of the impact of the ZEPs on schooling outcomes. In this paper, we provide an assessment of the ZEPs along three dimensions: the resources effectively deployed, the mobility response of students and teachers, and the overall impact on academic achievement. Due to data limitations we study the period that covers only the first phase of the policy (1982-92) and focus on its implementation in lower secondary schools.

This evaluation presents particular challenges. In particular, the precise nature of the intervention is not well known: 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 inputs such as class size, weekly teaching hours, qualifications and seniority of the teachers, and size and composition of the student body. 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 with 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 secondary schooling. 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 secondary schools because of the available data, even though the ZEP program also concerns primary schools.

We address the endogeneity in the allocation of ZEP status using two methods, namely difference-in-differences (or establishment fixed effects) and instrumental variables. These techniques are applied with four different measures of academic achievement. Our instrumentation strategy relies on the fact that national political forces 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 this treatment translated into a continuous but extremely slow decrease in class sizes (-0.2 students per year on average) and increase in teaching hours per student (+1.2% per year); meanwhile, the experience of ZEP teachers declined slightly, in spite of the bonuses offered. Our results on the *change* in the composition of the student body show a large reduction in enrollments following a school’s classification as ZEP. This reduction did not come from an increase of the number of the students leaving these schools but from a decline in arrivals, and it did not lead to an obvious deterioration in

the socio-economic background of the students. Turning finally to the *effects* on student achievement of the overall ZEP treatment (including financial resources, the more qualitative aspects of the zones' educational projects and the effort and mobility responses of students and teachers), the results from both our methodologies lead to the same conclusion: during our sample period, the impact of the ZEPs on the subsequent academic achievement of pupils in the 6<sup>th</sup> and 7<sup>th</sup> grade (age 11 and 12) is nil.

The paper is organized as follows. In Section 1, we describe the general educational context and the main features of the ZEP program. The data are described in Section 2. 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. 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 (1<sup>st</sup> to 5<sup>th</sup> grades) and junior-high establishments (6<sup>th</sup> to 9<sup>th</sup> grades), plus a small number of high-schools (10<sup>th</sup> to 12<sup>th</sup> grades). Initially, the ZEPs 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, however, the program was not only maintained but substantially expanded, with many new zones created in 1989, 1990, 1994 and 1999.<sup>2</sup> It is now the main policy in France directed at helping students from disadvantaged backgrounds.

The operating principle of the ZEP program is to provide additional resources to schools in the most disadvantaged zones and allow them to develop specific initiatives and educational methods 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 Ministry administration (“recteurs”) 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 3<sup>rd</sup> grade test scores in a national student evaluation.

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<sup>2</sup> 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 Monde de l’Education* (2000) and the issue of *Education et Formations* devoted to the priority education, n° 61 (2001).

In 1997 nearly 700,000 students in primary schools and 400,000 in junior high schools benefited from “priority” treatment, representing respectively 11% and 15% of the respective totals.<sup>3</sup> 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 lunches<sup>4</sup>. 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. Concerning educational attainment, in 1995 37% of students entering the 3<sup>rd</sup> 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. Here again, considerable discretion was given to the regional heads of the education administration with respect to the amount and nature of the resources allocated to ZEP schools. The French education system is extremely centralized and the ZEP program was the first one whose aim was to give relative freedom of action to local authorities. One of the drawbacks was that the information about the extra resources was not collected at the centralized level. 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, of which €10 million took the form of bonuses paid to all employees of the schools – mostly teachers– while the rest was used to increase total teaching hours and reduce class sizes.<sup>5</sup> 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 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 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),

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<sup>3</sup> 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 ».

<sup>4</sup> In France, lunches are subsidized for everybody but there are no free-lunch programs. Some of the students who do not have lunch at school have lunch at home because the family income is large enough that the mother (or father) does not work. But the majority of students who do not have lunch at school are those whose family cannot afford to pay for the lunches.

<sup>5</sup> Thus, a ZEP bonus of 1,046 Euros was paid to 96,000 teachers, accounting for 100 out of the 110 million.

which represent 77% of total costs on average, the increase was 13%.<sup>6</sup> 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 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%).

By comparison, the resources devoted to the EIC program in the United Kingdom amounted to £300 million in 2003 (around €440-460 million) and covered about a third of secondary school pupils (Machin, McNally, and Meghir, 2004). The funding was largely allocated on the basis of enrolment and the level of disadvantage in the school (as measured by the percentage of pupils known to be eligible for free school meals). In the United States, Title I programs provided \$11.7 billion in 2003 to schools with high concentrations of poverty (about 75% of elementary schools and nearly 50% of middle and secondary schools) and this funding represented roughly 5% of these schools' total budget, (van der Klaauw, 2006). The funds are allocated according to a formula that includes the number of school-aged children from poor families (measured as families receiving welfare benefits and/or children eligible for free lunch).

In terms of overall financial scope, these three different national programs are thus more or less comparable. They differ markedly, on the other hand, in how the additional resources are used. In the United Kingdom, the program includes very specific components aimed at extending learning opportunities through additional teachers, support units, or extra help for the most disadvantaged children. Teachers receive precise instructions on how to improving their educational effectiveness. In the United States, funds are explicitly targeted to disadvantaged children inside the school; the most frequently used program is the pull-out program, where students are taken out of the regular classroom to receive instruction by separate teachers, with dedicated materials and equipment. On the other hand, one of the more recent changes is to encourage schoolwide projects. In France, the nature of the intervention was left to each school's discretion: the idea of the ZEP program was just to impulse new educational projects and partnerships with local authorities.

Machin, McNally and Meghir find a positive, albeit small, improvement in pupil outcome measures for Mathematics (but not for English) and a strong reduction in absences within EiC schools. On the contrary, Van der Klaauw finds that the Title I program does not improve student achievement. He interprets this finding as related to the manner in which funds are spread thinly across a large

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<sup>6</sup> We can decompose this 13%:  $13 \times (110/400) = 3.6\%$  went to bonuses and the remaining 9.4% to increased hours of teaching per student. 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.

number of schools and to the apparent ineffectiveness of many Title I funded remedial education programs.

In France, existing evaluations are based on simple comparisons of average achievement between ZEP students and non-ZEP students (Meuret 1994; Caille, 2001). Our paper thus differs from these earlier analyses through the use of econometric techniques to address the endogeneity and selection-bias problems that are of primary concern in the literature on program evaluation, such as the nonrandom allocation of the ZEP status. 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 6<sup>th</sup> and 7<sup>th</sup> 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 6<sup>th</sup> grade (at age 11) in 1989 and in 1995.<sup>7</sup> 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.

## **2. The Data**

### ***2.1. The FSE Datasets***

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 (6<sup>th</sup> to 9<sup>th</sup> grades).<sup>8</sup>

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

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<sup>7</sup> We will analyze the same data source for the students that enter 6<sup>th</sup> grade in 1980 and in 1989, the period when the program was launched.

<sup>8</sup> Throughout the paper we will use "year" instead of the "school year"; for instance, year 1987 corresponds to the school year 1987-1988.



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 for the management of teachers. This source provides us with statistics on teacher 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 (see the descriptive statistics in Appendix A, table A.3).

## **2.2. The Panel Datasets**

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 6<sup>th</sup> 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 6<sup>th</sup> 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 6<sup>th</sup> grade in 1989 who were born on a specific day in each month (1/30<sup>th</sup>). 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, occupation of the head of the family, parent(s) legally responsible for the child, and number of years spent in nursery school and in primary school. Second, we have schooling information for each year from 6<sup>th</sup> 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.

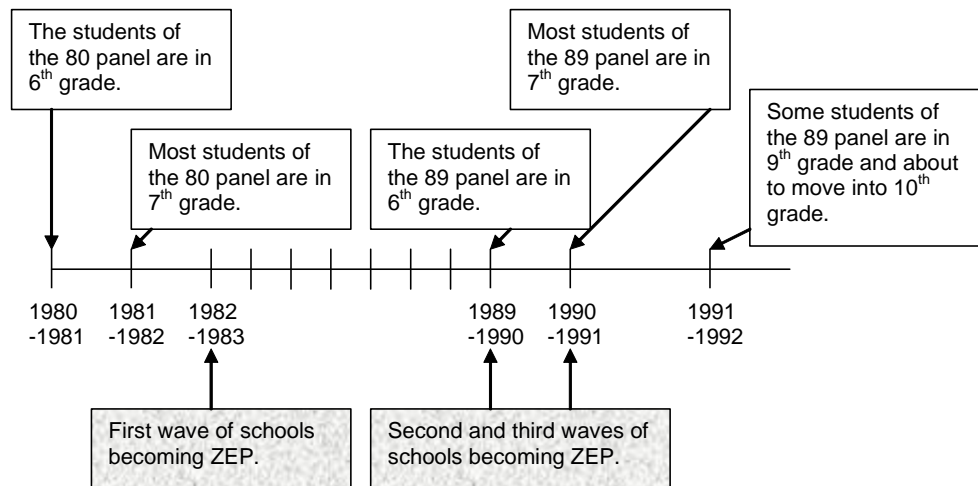
We now turn to measures of academic achievement. The panels unfortunately do not contain information on the grades received in national exams or national evaluations (the only national evaluation in high school is in 6<sup>th</sup> grade). We do know, however, whether the student passed or failed any 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 8<sup>th</sup> grade (versus switching to a vocational track at the end of 7<sup>th</sup> grade)
- Moving up to 10<sup>th</sup> grade (versus switching to a vocational track after the 7<sup>th</sup> or the 9<sup>th</sup> grade)
- Success at the "Baccalauréat", the French national exam at the end of high school, i.e. 12<sup>th</sup> 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.<sup>9</sup> 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 7<sup>th</sup> or 9<sup>th</sup> grades. For instance, only 46% of those entering 6<sup>th</sup> grade in 1980 continued their education in the regular track all the way to 12<sup>th</sup> grade. Reaching the 8<sup>th</sup> and 10<sup>th</sup> 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).

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<sup>9</sup> Among students entering 6<sup>th</sup> 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 7<sup>th</sup> grade (except those who repeated 6<sup>th</sup> grade). By contrast, for the students in the 1989 panel, entry into 6<sup>th</sup> grade took place as 1989 wave of ZEPs was ongoing. And one year later, when most of them were in 7<sup>th</sup> grade, the 1990 wave was launched. Because conditions prevailing in the 6<sup>th</sup> and 7<sup>th</sup> 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 7<sup>th</sup> grade is located in a ZEP, and equal to 0 if not.<sup>10</sup> Note that this indicator is time-varying, since some students in the 1980 panel do their 7<sup>th</sup> grade in schools that will become ZEPs only in 1982, 1989 or 1990, while some in the 1989 panel do their 7<sup>th</sup> 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 7<sup>th</sup>. In particular, when examining the Baccalauréat outcomes, the impact of being in a ZEP in 6<sup>th</sup> or 7<sup>th</sup> 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 10<sup>th</sup> grade we need a variable that is measured for *all* students. Yet we saw that a large fraction leave the general track after the 7<sup>th</sup> grade, so using any ZEP variable available only in higher grades would create a potentially serious selection bias.

<sup>10</sup> Our results are robust to using instead an indicator equal to 1 if the student was in a ZEP in either the 6<sup>th</sup> or 7<sup>th</sup> grade, due to the low inter-establishment mobility between these two classes.

### 2.3. The Political Dataset

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.

## 3. The Impact of ZEP Status on School Characteristics

### 3.1. Number of Students and Class Size

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

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

where  $Y_{j,t}$  corresponds to characteristics for school  $j$  in year  $t$ ,  $\delta_t$  is an indicator for year  $t$  (year fixed effect),  $\delta_j$  an indicator for the establishment (school fixed effect),  $1_{j \in zep89}$  is equal to 1 if the school  $j$  becomes ZEP in 1989,  $1_{t \geq \tau}$  is equal to 1 if the year  $t$  is greater or equal to  $\tau$ ,  $T_{89}$  is a linear trend starting in 1989, and  $\varepsilon$  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  $\gamma_{change}^{zep89}$  and  $\gamma_{change}^{zep90}$  capture the change in the level of  $Y_{j,t}$  specifically associated to a

change in status. Similarly,  $\gamma_{trend}^{zep89}$  and  $\gamma_{trend}^{zep90}$  capture the linear trends specific to ZEP establishments after they became ZEP. Because a ZEP-specific trend could preexist, the coefficients  $\gamma_{88}^{zep89}$ ,  $\gamma_{88}^{zep90}$  and  $\gamma_{89}^{zep90}$  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 and 2 we only report  $\gamma_{88}^{zep89}$ ,  $\gamma_{88}^{zep90}$ ,  $\gamma_{89}^{zep90}$ ,  $\gamma_{change}^{zep89}$ ,  $\gamma_{change}^{zep90}$ ,  $\gamma_{trend}^{zep89}$  and  $\gamma_{trend}^{zep90}$ , 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). The means of all the variables in 1987 in both ZEPs and non-ZEPs are presented in Table A.3, Appendix A.

Concerning the size of the schools, Table A.3 shows that ZEP establishments tend to be about 7%-9% larger than others. Table 1 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 6<sup>th</sup> and 7<sup>th</sup> grades” regressions, but not in the overall “number of students” regression). Figure 1 illustrates this result through the means of the number of students according to the type of the schools. 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 student mobility (section 3.4), which will 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 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 6<sup>th</sup> and 7<sup>th</sup> graders.<sup>11</sup>

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 (see also Figure 2). 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

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<sup>11</sup> The results for the period 1987-1999 are available from the authors upon request.

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-ZEP<sup>12</sup>, 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.

### ***3.2. 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.<sup>13</sup> 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 weekly number of hours per teacher and per student. This ratio increased when a school acquired priority status, by 0.011 hour per week in the ZEP-89 and by 0.015 hour in the ZEP-90. Thus, once again, the increase was very slow and modest – in percentage terms, 0.8% 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 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

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<sup>12</sup> See, e.g., for 1997, Ministry of Education, note n° 98-15.

diplomas (“maîtres-auxiliaires”, who do not have the regular teaching certificate) also increased slightly in schools that became ZEP in 1990.<sup>14</sup> It is worth noting that in France, schools do not hire their teachers. Job assignment are instead determined at the national level, through a system in which teachers express preferred choices and priority is roughly determined according to seniority (tenure length). Hence, more experienced teachers are able to choose the schools they want, whereas younger ones tend to end up in less “desirable” establishments.

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. 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.<sup>15 16</sup>

The estimation is similar to the previous one, but now on the panels of individual student data. Only two years are compared: 1981, when students from the Panel 1980 are in their 7<sup>th</sup> grade and 1990, when students from the Panel 1989 are in that same grade. These students are the ones who will be used in Section 4 to estimate the ZEP effect.

The model is:

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

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<sup>13</sup> 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.

<sup>14</sup> Other measures of skills, such as the proportion of those with the highest teaching diploma (“agrégation”), remained virtually unchanged (results not reported here).

<sup>15</sup> For recent empirical studies of such externalities, see for instance Sacerdote (2001) and Hoxby (2000).

<sup>16</sup> In Section 4, we will estimate the impact of ZEP status on student achievement with a difference-in-differences approach. Thanks to the panel datasets, we will compare students being in a ZEP school to those being in a non-ZEP school, with school variables and school fixed effects controlling for stable differences between establishments. But if there is deterioration in the social composition of ZEP schools relative to the others, our school variables may not be sufficient to control for that and the estimated ZEP effect may underestimate the “pure” impact of the ZEP treatment (effect of the extra resources and educational projects).

where  $1_{characteristic}(i)$  is a dummy variable for a student characteristic (for example, occupation of the head of the family = executive) of student  $i$ ;  $j(i)$  and  $t(i)$  denote respectively the establishment and year where and when the student was in his or her 7<sup>th</sup> grade;  $\delta_{j(i)}$  is an indicator for the establishment where the student was in his or her 7<sup>th</sup> grade and  $\delta_{i \in 80\ panel}$  an indicator equal to 1 if the student belonged to the 1980 panel. Indicators  $1_{j \in zep82}$ ,  $1_{t \geq 82}$ , etc, are defined in the same way as before.

Table 3 presents the results. It seems that the composition of the students did not change much in the ZEP schools, except regarding students' nationalities. In 1982, the ZEP schools already had a larger share of African and Asian students than the other schools (Appendix A, Table A.1). This share increased more than elsewhere between 1982 and 1990 (Table 3). But it is worth noting that according to several studies<sup>17</sup>, children from immigration have in France similar or better achievement than other children, all other factors being equal. Our results on the achievement regressions, in Section 4, lead to the same conclusions.

There is no strong evidence of deterioration of the social composition in ZEP schools. Concerning the parents' occupations, the only significant change is more skilled blue-collar workers and less white-collar workers in the schools that became ZEP in 1990. There is also no change in the fraction having lunch at the school cafeteria.<sup>18</sup> As mentioned earlier, in France children who are enrolled in the cafeteria plan typically come from more advantaged backgrounds than those who do not. On the opposite, the fraction of students receiving need-based stipends increased in the ZEP schools, compared to the others, which could indicate that students in ZEPs became poorer than they used to be. But financial assistance programs change frequently, so it could also reflect a change in eligibility criteria, such as family income.

### **3.4. Student Mobility**

The establishment data showed a decrease in the total student enrolment in the ZEP schools. Did this decrease, which occurs when a school acquires priority status (especially the ZEP-89), reflect an escape strategy on the part of certain parents, an avoidance strategy at the entrance into junior high school (6<sup>th</sup> grade), or both? To address this question, we use the student panels 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

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<sup>17</sup> See for instance Caille, Vallet (1995) and Gary-Bobo, Prieto, Picard (2006).

<sup>18</sup> This information is also available in the FSE data, The same estimation as in 3.1 and 3.2 shows that the fraction of students having lunch at the school cafeteria decreased slightly in the ZEP schools after 1989 and



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

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  $\delta_j$ , 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  $\gamma_{82}$ ,  $\gamma_{89}$  and  $\gamma_{90}$  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.

Table 4 presents the results.<sup>19</sup> 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. Therefore the decrease in the school size is more likely to come from some families who avoid sending their children to ZEP schools altogether, 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

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1990 compared to 1988 and to the other schools (see our working paper). This decrease may have followed an increase between 1982 and 1988.

<sup>19</sup> We limit the analysis to the years of junior high school (6<sup>th</sup> to 9<sup>th</sup> grades), in order to be consistent with our other estimations.

offered to teachers in ZEP schools could have contributed to improving their motivation,<sup>20</sup> 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 teacher experience improves student attainment, the increase in the fraction of younger teachers 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.

#### ***4.1. 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 difference-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 differences approach 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.

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<sup>20</sup> 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.

Our second method for dealing with potential selection biases uses instrumental variables, described in subsection 4.3.

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.

#### 4.2. Difference-in-Differences Estimates

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

$$1_{achievmt}(i) = \alpha X_i + \delta_{i \in 80 \text{ panel}} + \delta_{j(i)} + \gamma_{82} \cdot 1_{j(i) \in zep82} \cdot 1_{t(i) \geq 82} + \gamma_{89} \cdot 1_{j(i) \in zep89} \cdot 1_{t(i) \geq 89} + \gamma_{90} \cdot 1_{j(i) \in zep90} \cdot 1_{t(i) \geq 90} + \varepsilon_i \quad (3)$$

where  $1_{achievmt}(i)$  is an indicator for achievement (moving up to 8<sup>th</sup> grade, to 10<sup>th</sup> 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 or her 7<sup>th</sup> grade;  $\delta_{j(i)}$  is an indicator for the establishment where the student was in his or her 7<sup>th</sup> 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  $\gamma_{82}$ ,  $\gamma_{89}$  and  $\gamma_{90}$ , 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 8<sup>th</sup> 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.<sup>21</sup> The identification of the ZEP

<sup>21</sup> 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

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 7<sup>th</sup> grade of each student. When estimating the other three equations –for obtaining a degree, moving up to 10<sup>th</sup> 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 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 7<sup>th</sup> grade of each student.<sup>22</sup>

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 8<sup>th</sup> grade than learning English, which in turn leads to better outcomes than choosing some other language, such as Spanish.<sup>23</sup>

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 8<sup>th</sup> and 10<sup>th</sup> 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 is always negative, reflecting the nation-wide policy of increasing promotion to higher grades and raising exam success rates that was adopted 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.

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

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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.

<sup>22</sup> The idea here was to minimize the time interval between the 7<sup>th</sup> grade ZEP / non-ZEP treatment and the 10<sup>th</sup> grade or Baccalauréat outcome. Using the first 7<sup>th</sup> grade instead makes no difference to the results, however.

<sup>23</sup> In the French education system, choosing German as a first foreign language plays the role of a pure Spenserian 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.

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.<sup>24</sup> Moreover, the coefficients are identified from time variation in these regressors across the establishments present in both panels. If these school 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.

#### ***4.3. 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 at 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 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 Lionel Jospin, Minister of Education between 1988 and 1992. Even Lionel Jospin recognized that the attribution of the ZEP status was linked to political considerations: in a June 1998 speech at the “Assises nationales des ZEP” in Rouen, when he was now Prime Minister, he criticized the fact that 39% of junior high school students in Nièvre were

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<sup>24</sup> Unfortunately, it was not possible to use the FSE files since they are available only since 1987.

in a ZEP school against only 19% of students in Seine-Saint-Denis, a very poor “département” where the riots started in November 2005.

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 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 (the level at which the ZEP / non-ZEP classification operates), 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 “department” 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

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

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 “départements” 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 for the significance tests of the instrumental variables, 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  $\chi^2$  over-identification tests, presented for each of the regressions, support the

validity of our instrumentation strategy: they do not reject the null hypothesis of orthogonality of the IV residuals to the instruments.

## 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 but were allocated to a large fraction of the school population: approximately 10 % of all students in primary and junior high schools belonged to a ZEP, and in 1990, the extra resources amounted to an extra 5% in expenditures per pupil. During our sample period, about one half of these resources 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.

Second, our results suggest that the signaling effect of the ZEP status was negative for teachers. Despite the bonuses offered and additional career incentives, the teaching staff saw no improvement in qualifications or turnover and actually became less experienced over time. Moreover, the ZEP status led to a decrease in the number of students enrolled. On the other hand, there is no clear evidence of deterioration in the socio-economic background of students, at least between 1982 and 1990.

Finally, and most importantly, the ZEP “treatment” had 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 8<sup>th</sup> or 10<sup>th</sup> 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 the combination of the increase in measured teaching inputs and the more “qualitative” dimensions of the ZEP program (which was meant to spur new educational projects, teaching methods, etc.) had no effect on academic achievement. This outcome could in part be the result of an adverse effect due to the small deterioration of the teaching staff. But it seems quite consistent with the small decrease in class size and with the large variance in the nature of ZEP-educational projects, which has led frequent concerns about their average effectiveness. Some of these projects may have been effective, but on the other hand it is known that some ZEP schools did not manage to develop any new educational project at all. Moreover, because of the lack of overall coherence in the ZEP program, there was no clear mechanism by which successful projects could spread to other schools (even assuming that successful projects were identified successful in spite of the lack of systematic evaluation).

We should, on the other hand, 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 3<sup>th</sup> 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)). Targeting the decrease in class size in primary schools could thus lead to much more of an improvement in pupil achievement. 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 our study 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. It is interesting to note that in the United States and the United Kingdom, similar compensatory education programs cover an even much larger share of the students.

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. They should also be continuously evaluated, in particular because of the potential general-equilibrium effects that cannot be monitored in controlled experiments.<sup>25</sup>

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<sup>25</sup> 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
Zep89*1988 dummy	-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*1989 dummy (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)
Zep89*Trend starting in 1989 (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*1988 dummy	0.3 (4.0)	-0.3 (1.6)	-4.3** (1.7)	3.1** (1.5)	1.7 (1.5)	0.3** (0.1)
Zep90*1989 dummy	-5.2 (4.0)	0.3 (1.6)	-3.3** (1.7)	-3.2** (1.5)	1.0 (1.5)	-0.2 (0.1)
Zep90*1990 dummy (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 (0.2)
Zep90*Trend starting in 1990 (zep effect, trend)	0.5 (2.0)	0.5 (0.8)	0.1 (0.8)	0.9 (0.7)	-1.0 (0.8)	-0.2** (0.1)
R-Square:	0.97	0.94	0.94	0.93	0.93	0.75

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

**Table 2: Teachers and ZEP**

	Number of Teachers	Number of Teachers per Student	Number of Weekly Hours per Student	Share of Young Teachers	Share of Non-Certified Teachers
Zep89*1988 dummy	-0.6 (0.4)	0.000 (0.001)	0.008 (0.010)	-0.006 (0.008)	-0.002 (0.005)
Zep89*1989 dummy (zep effect, level)	-0.3 (0.5)	0.000 (0.001)	0.012 (0.012)	-0.014* (0.009)	0.010* (0.006)
Zep89*Trend starting in 1989 (zep effect, trend)	0.1 (0.1)	0.001** (0.000)	0.011** (0.003)	0.013** (0.002)	-0.003* (0.002)
Zep90*1988 dummy	0.1 (0.4)	0.000 (0.001)	-0.003 (0.009)	0.000 (0.007)	0.005 (0.004)
Zep90*1989 dummy	-0.3 (0.4)	0.000 (0.001)	0.008 (0.009)	0.008 (0.007)	0.004 (0.004)
Zep90*1990 dummy (zep effect, level)	-0.2 (0.5)	-0.001 (0.001)	-0.004 (0.011)	-0.014 (0.008)	-0.007 (0.005)
Zep90*Trend starting in 1990 (zep effect, trend)	0.4* (0.2)	0.001** (0.000)	0.015** (0.004)	0.009** (0.003)	0.012** (0.002)
R-Square:	0.96	0.82	0.79	0.66	0.63

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

**Table 3: Social Composition of the Schools and ZEP**

	Occupation of the Head of the Family:				
	Executive	Middle Manager	White-Collar Worker	Skilled Blue-Collar Worker	Unskilled Worker
Establishment became ZEP in 1982	-0.0486 (0.0317)	-0.0031 (0.0276)	-0.0226 (0.0244)	0.0355 (0.0279)	0.0388 (0.0293)
Establishment became ZEP in 1989	-0.0268 (0.0447)	0.0001 (0.0390)	-0.0154 (0.0344)	0.0596 (0.0394)	-0.0175 (0.0413)
Establishment became ZEP in 1990	0.0058 (0.0382)	0.0046 (0.0333)	-0.0618** (0.0294)	0.0901** (0.0336)	-0.0388 (0.0353)
R-Square:	0.2103	0.1323	0.1279	0.1648	0.1792

	Nationality:	Schooling Information:	
	African, Asian	Scholarship	No Lunch at the Canteen of the School
Establishment became ZEP in 1982	0.0888** (0.0142)	0.1424** (0.0332)	0.0228 (0.0326)
Establishment became ZEP in 1989	0.0600** (0.0201)	0.1031** (0.0469)	0.0526 (0.0460)
Establishment became ZEP in 1990	0.0454** (0.0172)	0.0353 (0.0401)	0.0466 (0.0393)
R-Square:	0.2252	0.2030	0.2929

Sources: 1980 and 1989 panels. 28,713 observations. Regressions include 3,200 establishment effects. The relevant school is the one where the student is in his or her 7th grade. Standard Errors in parentheses (\* : significant at the 10% level, \*\* : - 5% level)

Executive includes the categories: Farmer, Craftsman, Executive, Professor, Teacher

Middle Manager includes the categories: Technician, Foreman

White Collar includes the categories: Retail Employee, Office Employee

Unskilled Worker includes the categories: Unskilled Blue Collar, Service Employee, Worker in Agriculture, Inactive, Unemployed

**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.

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

**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 Baccalauréat	
	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	

Sources: 1980 and 1989 panels. Regressions include about 3,200 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.

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

**Table 6: Instrumentation of the ZEP indicators**

<b>Zep in 1989</b>		<b>Coef.</b>	<b>StErr</b>
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
F-stat for the significance of the instruments		25.24	
(p-value)		(p<0.01)	

<b>Zep in 1990</b>		<b>Coef.</b>	<b>StErr</b>
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
F-stat for the significance of the instruments		63.97	
(p-value)		(p<0.01)	

Sources: 1980 and 1989 panels. 27,831 observations. Regressions include about 3,200 establishment fixed effects, in addition to the individual characteristics and school variables (averages 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 the significance test of the political variables.

The relevant school is the one where the student is in his or her 7th grade.

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



**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	
$\chi^2$ over-identification test (p-value)	3.2728 (p=0.86)		2.4089 (p=0.93)	

	Moving up to 10th-grade		Success at Baccalauréat	
	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	
$\chi^2$ over-identification test (p-value)	2.3147 (p=0.94)		5.9496 (p=0.55)	

Sources: 1980 and 1989 panels. Regressions include about 3,200 establishment fixed effects, in addition to the individual characteristics and school variables (averages of individual characteristics by school on each panel).

The ZEP variable is instrumented by the school variables and the political variables.

The relevant school is the one where the student is in his or her 7th grade.

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

Figure 1: Number of students

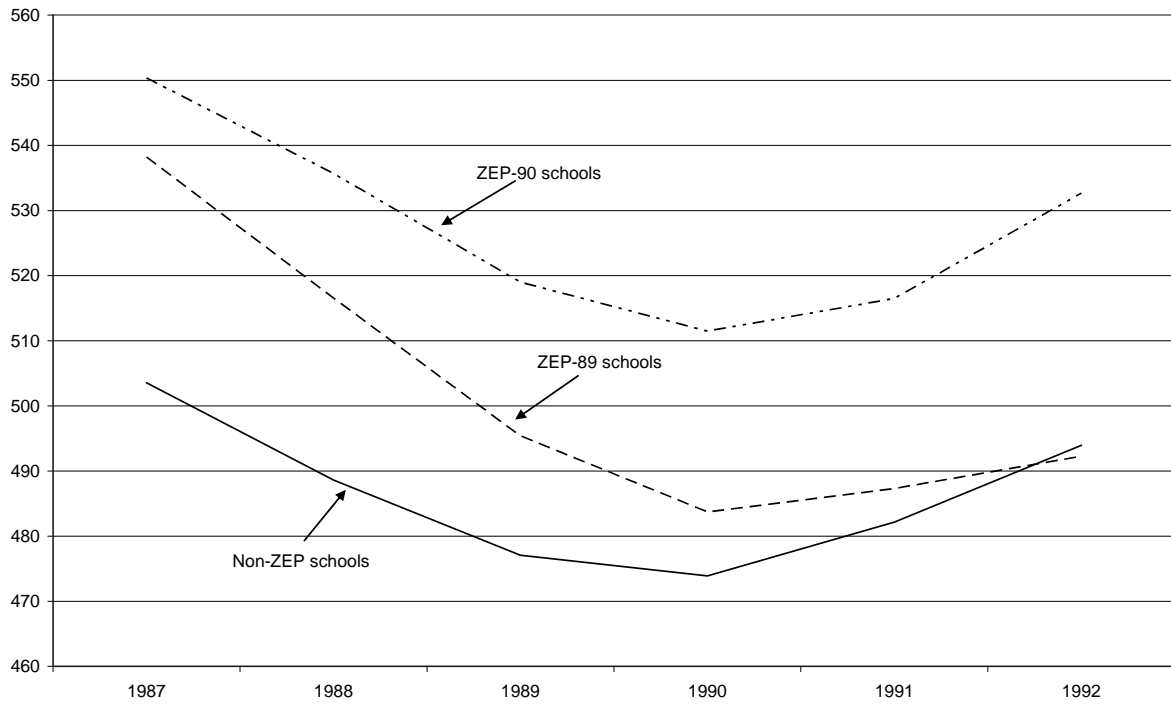
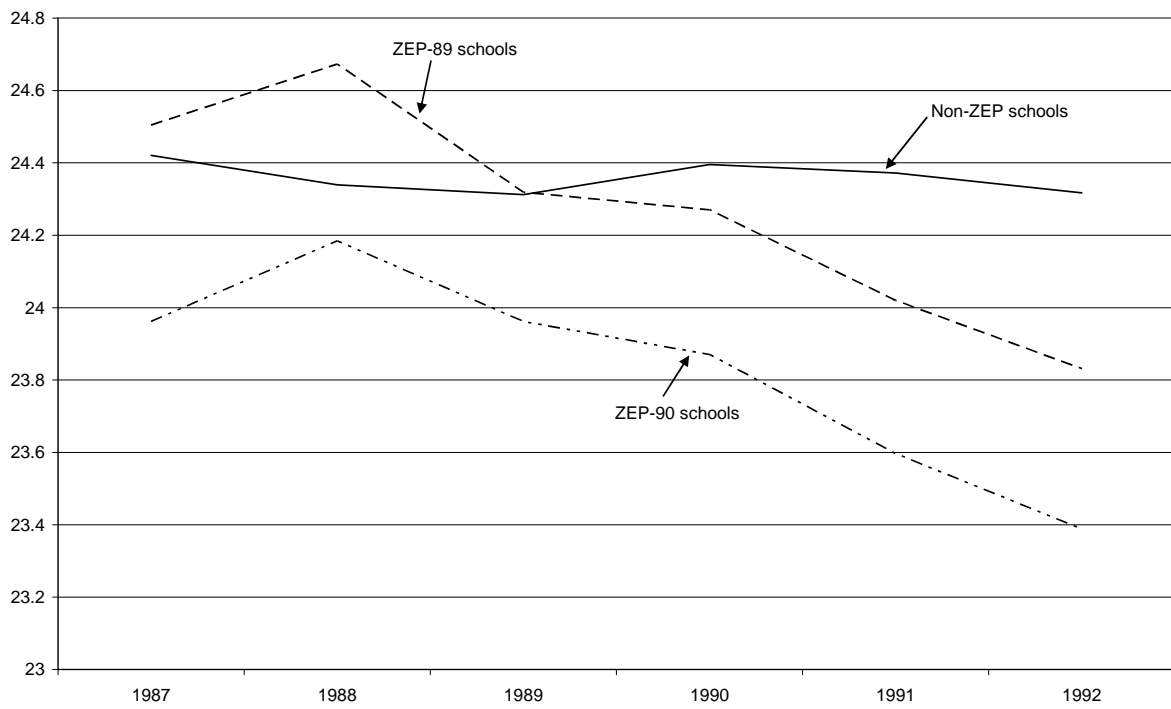


Figure 2: Class size



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

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

Variables:		Means			
		ZEP 1982	ZEP 1989	ZEP 1990	Non ZEP
Occupation of the Head of the Family:	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
Entry in Primary School:	Service Employee	0.0259	0.0150	0.0261	0.0148
	Inactive, unemployed	0.0893	0.0850	0.0741	0.0350
	5 at entry in Primary school	0.0327	0.0300	0.0272	0.0475
	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
Nationality:	8 at entry in Primary school	0.0221	0.0233	0.0251	0.0065
	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
Position in Family:	Six + children in family	0.1220	0.1450	0.1089	0.0365
	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
Family Structure:	Fifth born	0.0682	0.0750	0.0664	0.0265
	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 Characteristics:	Other in charge	0.0134	0.0150	0.0065	0.0105
	Girl	0.5524	0.4567	0.4978	0.4979
Schooling Information:	At least 1 year of school outside France	0.0173	0.0067	0.0229	0.0124
	No Lunch at the Canteen of the School	0.6350	0.7333	0.6394	0.3775
	Lunch at the Canteen of the School	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
	Size of class: >=30	0.0259	0.0717	0.0272	0.0947
Previous Repetitions:	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
	3 repetitions in Primary school	0.0038	0.0017	0.0054	0.0025
Nursery School:	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, ZEP and non ZEP schools

Variables:	Means			
	ZEP 1982	ZEP 1989	ZEP 1990	Non ZEP
Getting at least one Degree	0.8013	0.8125	0.8290	0.8989
Moving up to 8th Grade	0.8066	0.8304	0.8159	0.8672
Moving up to 10th Grade	0.4973	0.5036	0.4986	0.6121
Success at the Baccalauréat	0.4857	0.4929	0.4986	0.6196

**Note:** Number of students 941; 560; 690; and 17,995 respectively.

**Source:** 1989 panel

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

Table A.3 : Statistics on ZEP and non ZEP schools

Variables:	Means in 1987				
	ZEP 1982	ZEP 1989	ZEP 1990	Non ZEP	
Number of Students:	Number of Students	514	538	550	503
	Number of Students in 6th Grade	146	148	154	134
	Number of Students in 7th Grade	152	159	166	143
	Number of Students in 8th Grade	106	116	113	110
	Number of Students in 9th Grade	110	115	118	116
	Number of Students per Class	24.1	24.5	24.0	24.4
Teachers:	Number of Teachers	43	43	45	39
	Number of Teachers per Student	0.075	0.073	0.073	0.073
	Number of Weekly Hours per Student	1.31	1.29	1.29	1.25
	Share of Young Teachers	0.13	0.20	0.14	0.12
	Share of Non-Certified Teachers	0.03	0.05	0.03	0.03

**Note:** Number of schools 293; 138; 198; and 4,107 respectively.

**Source:** FSE files, 1987

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 Head of the Family:	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:	Girl	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	

Sources: 1980 and 1989 panels. 27,831 observations. The regression includes about 3,200 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.  
Standard Errors in parentheses (\* : significant at the 10% level, \*\* : - 5% level)

Table B.2: Moving up to 8th Grade

		Coef.	StErr	
	1980 panel	-0.0513**	0.0076	
Occupation of the Head of the Family:	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	
Siblings:	Asians born outside France	0.1517**	0.0353	
	Only child	0.0021	0.0076	
	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	
	Father in charge	-0.0573**	0.0229	
Family Structure:	Mother in charge	-0.0147	0.0096	
	Other in charge	-0.2064**	0.0303	
	Girl	0.1088**	0.0047	
Other Characteristics:	At least 1 year of school outside France	0.0051	0.0215	
	German as first language	0.0586**	0.0061	
	Other first language	-0.0885**	0.0202	
Schooling Information:	Scholarship	-0.0713**	0.0065	
			0.0065	
Share in the School: 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	
	2 repetitions in Primary school	-0.5037**	0.0503	
	3 repetitions in Primary school	-0.6772**	0.2328	
	Family Structure:	Father in charge	0.0190	0.0626
Mother in charge		-0.0136	0.0314	
Other in charge		0.2284**	0.0750	
Entry in Primary School:	5 at entry in Primary school	0.0246	0.0367	
	7 at entry in Primary school	0.0860	0.0537	
	8 at entry in Primary school	-0.2298*	0.1281	
ZEP status:	ZEP in 1982	-0.0052	0.0293	
	ZEP in 1989	0.0339	0.0393	
	ZEP in 1990	-0.0126	0.0364	

Sources: 1980 and 1989 panels. 28,713 observations. The regression includes about 3,200 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.  
Standard Errors in parentheses (\* : significant at the 10% level, \*\* : - 5% level)

Table B.3: Moving up to 10th Grade

		Coef.	StErr	
	1980 panel	-0.0881**	0.0098	
Occupation of the Head of the Family:	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:	Girl	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	
3 repetitions in Primary school		-0.3211	0.2615	
Family Structure:		Father in charge	-0.1393**	0.0683
		Mother in charge	-0.0127	0.0373
	Other in charge	0.1014	0.0887	
Entry in Primary School:	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	

Sources: 1980 and 1989 panels. 27,831 observations. The regression includes about 3,200 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.

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

Table B.4: Success at the Baccalauréat

		Coef.	StErr	
	1980 panel	-0.2032**	0.0099	
Occupation of the Head of the Family:	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:	Girl	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	

Sources: 1980 and 1989 panels. 27,831 observations. The regression includes about 3,200 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.

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