

Helping the Good Get Better, but Leaving the Rest Behind: How Decentralization Affects School Performance

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Abstract

The decentralization of public services from central to local control is a major feature of institutional innovation throughout the world. The main argument in support of decentralization is that it brings decisions closer to the people, alleviating information asymmetries, agency costs, and problems of collective decision. However, decentralization can also degrade provision in the presence of positive spillovers, lack of technical capabilities by local governments, or capture of low-level administrators by local elites. Moreover, decentralization may increase inequality if central provision guarantees similar provision across regions and social groups, whereas some groups are disadvantaged under decentralization. Given these theoretical ambiguities, the superiority of either centralized or decentralized provision of public services is an empirical question. And, despite its importance, there is little rigorous evaluation of decentralization efforts. We fill this gap by evaluating the impact of secondary school decentralization on student performance in Argentina. We study the overall effect of school decentralization on student performance and analyze the presence of differential impacts across areas. Our results show that decentralization had, on average, a positive and significant impact on student performance. Unfortunately, the effect seems negative for provinces running pre-decentralization fiscal deficits and for schools located in poor areas.

JEL: H40, H52, H70, I20

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1. Introduction

Decentralization is a major feature of current institutional innovation throughout the world. In Latin America, after a long tradition of centralized government, most countries implemented decentralization policies in the recent past (Burki, Perry, and Dillinger, 1999).¹ Argentina has not been the exception. In fact, the decentralization of education services from the federal to provincial governments was a component of the structural reforms undertaken in Argentina in the early 1990's.

The main argument in support of decentralization policies is that they bring decisions closer to the people. Information asymmetries, agency costs and problems of collective decision can be alleviated through decentralization. However, decentralization can also worsen the provision of public goods in the presence of positive spillovers, lack of technical capabilities by local governments, or capture of low-level administrations by local elites. Importantly, decentralization may have distributional effects. Central provision may guarantee similar provision across regions and social groups, while some groups may be at a disadvantage to exploit the benefits of decentralization. The theoretical literature has been unable to make the case for the unequivocal superiority of either centralized or decentralized provision of public services. Therefore, whether decentralization actually improves the provision of public services is an empirical question. And, despite its importance, there is little rigorous evaluation of decentralization efforts (Oates, 1998).

¹ Recent studies analyzing decentralization processes in Latin America include Lopez Murphy (1995), Bird and Vaillancourt (1998), Fukasaku and Hausmann (1998), Savedoff (1998), and Willis et al (1999). On Argentina, see Porto and Gasparini (1998), Grindle (2000), Tommasi, Saiegh, and Sanguinetti (2000), *inter alia*.

In this paper, we evaluate the effect of secondary school decentralization on education quality. Between 1992 and 1994, the Argentine national government transferred all its dependent secondary schools to the provincial governments. This political experiment generated an exogenous variation in the jurisdiction of administration of secondary schools across time and space. We exploit this instrument in order to identify the causal effect of school decentralization on education quality, measured by the outcome of a standardized test of Spanish and Mathematics administered to students in their final year of secondary school.

An advantageous feature of our study is that we not only control the performance of students on test scores by the evolution of observable variables but also by unobservable variables, by contrasting, in a two-way fixed effect error component model, public decentralized schools with public schools that were always administered by provincial governments. Thus, our estimator of the effect of school decentralization on test outcomes is the conditional difference in difference of the national public schools transferred to the provinces under the political experiment exploited in this paper and the always provincial public schools. Our results suggest that, on average, decentralization improved the performance of students in test scores.

We also hypothesize that decentralization has larger beneficial effects in better-managed provinces, in particular, that the effect of decentralization on test scores is stronger when schools are transferred to provinces that are fiscally better managed, and possibly negative for provinces that run significant fiscal deficits and are poorly managed. We test this using fiscal data from the three years prior to decentralization in order to avoid feedback bias from decentralization to provincial budgets. Finally, we find

that decentralization had negative effects in poor communities. We hypothesize that poorer communities may have less of a voice in exploiting the advantages of decentralization.

The organization of the paper is as follows. Section 2 discusses potential trade-offs in school decentralization. Section 3 explains the process of decentralization of secondary schools in Argentina. Section 4 and Section 5 describe our empirical exercise and data, respectively. Section 6 presents the results. In the last section, we summarize our conclusions.

2. Analytical framework

There is a large theoretical literature that debates the trade-offs of decentralization without making the case for the dominance of either centralization or decentralization in the provision of public services (e.g. Oates, 1972; Bardhan and Mookherjee, 1998; Lockwood, 1998; and Besley and Coate, 2003). Overall, the main theoretical argument in favor of decentralization is to bring decision-making closer to the people so their voice and heterogeneity in their needs can be better reflected in policy. The argument is that problems of information asymmetries over heterogeneous preferences, and the problems of collective decision and accountability in controlling political agents can be alleviated with decentralization. However, decentralization may worsen the provision of public goods if there are positive externalities, if low-level governments lack technical capabilities, or if local administrations are captured by local elites that face reduced political competition within the region. Theory also stressed that decentralization may induce a range of allocative distortions, regional inequality, and fiscal instability (Oates, 1972).

Most of the advantages and disadvantages of decentralization are potentially relevant when it comes to analyzing the provision of educational services in Argentina. Lack of expertise of local management, and capture by corrupt local elites (Bardhan and Mookherjee, 1998; Rose-Ackerman, 1999) are potentially pertinent in our context. Adam Smith and Alfred Marshall have pointed out the presence of positive externalities in education. Becker (1964) and Lucas (1988) argue that education social returns exceed private returns. In our context, however, it is arguable whether these externalities are exhausted at the province level, or whether they spill to the whole country.

A small empirical literature finds advantages of having “policy closer to the people.” Faguet (2001)’s results on Bolivian decentralization suggest that local government have better knowledge of idiosyncratic preferences. Using cross-sectional data Eskeland and Filmer (2002) find a positive correlation of school decision autonomy and parental participation on primary school performance for Argentina, and Paes de Barros and Mendonca (1998) find no effect on test performance of school financial autonomy and school boards in Brazil, but register positive effects of decentralized director appointment. Decentralization seems to lower citizens’ costs of putting pressure on the schools to improve their services through voice and participation in El Salvador and Nicaragua (Jimenez and Sawada, 1999; King and Ozler, 2000). Using data at the province level, Galiani and Schargrotsky (2002) find an improvement in school performance associated with decentralization. Potential inequality effects of decentralization are not measured in this previous literature. Our research should add substantially to this limited body of empirical research.

3. School decentralization in Argentina

The school system in Argentina was traditionally organized in three levels: pre-school (1 year), primary school (7 years), and secondary school (5 to 6 years). Historically, both federal and provincial schools provided public secondary school services. Specifically, before decentralization, federal secondary schools represented one third of total public secondary schools, while the provinces administered about two thirds of the schools themselves.²

In December of 1991, the Argentine Congress passed a law ordering the transfer of all federal secondary schools to the provincial governments.^{3,4} This devolutionary decentralization of education services was part of an extensive program of fiscal and structural reforms undertaken in Argentina during the early 1990's. The transfer of schools to provincial control took place between 1992 and 1994 following a decentralization schedule determined through bilateral agreements between the federal government and each province.⁵

The fact that, for historical reasons, a significant group of schools had always been under provincial administration provides us with a potential control group to investigate the impact of decentralization on school outcomes. Indeed, we will be able to estimate the effect of decentralizing public secondary schools administered by the federal government

² For a historical description of the Argentine educational system, see Dussel (1995) and Llach et al (1999). According to Tedesco (1986), the development of federal secondary schools during the second half of the XIXth century had the political objective of fostering national integration after the establishment of Argentina as a federal country under the Constitution of 1853.

³ Federal primary and pre-schools had been decentralized in 1978.

⁴ Federal secondary schools in the City of Buenos Aires were transferred to the city government. Although it is not a province but a federal district, we treat the City of Buenos Aires as a province in this study.

⁵ This transfer schedule was unrelated to educational quality, but depended on political negotiations between the national and provincial governments (Rhoten, 1999; Corrales, 2003). Spearman rank

using public schools administered by the province in the same communities as controls, exploiting a school level panel data.⁶

In order to allow the provinces to bear the additional expenditures generated by the operation of the transferred schools, the decentralization Law included a financial guarantee clause. Argentine provinces regularly receive a share of tax collection from the federal government according to a Federal Tax-Sharing Agreement (FTSA) (i.e., *Ley de Coparticipación Federal*).⁷ At the time of the reform, the FTSA transfers from the federal government were increasing together with the growth of the economy. The law set that the federal government would cover the difference if at any point in time the increase in FTSA transfers resulted smaller than the increased expenditures borne by the provinces. Nicolini et al (2000) show that the increase in FTSA transfers was always superior to the cost of the transferred services during the period of analysis.

The explicit reason for the school transfer in Argentina was to increase efficiency through proximity to demand and unification of management and control at the province level (Llach et al, 1999). Most of the important education decisions were devolved to the provincial levels. Provincial government took over budget, resource allocation, and personnel decisions in the formerly national schools. They now hire, assign, sanction and fire principals, teachers and staff, set wages, define the calendar year, supervise school operation, establish curriculum contents, and open and close schools and sections. The

coefficients do not reject independence between the order of the transfer date, and the test score provincial rankings.

⁶ The availability of control public schools located in the same localities is obviously helpful since other shocks could have affected school performance during the period of analysis. In particular, another law affected the Argentine education system after school decentralization. The Education Federal Law replaced the seven years of primary school and five (or six) years of secondary school with a nine-year uniform cycle (EGB, *Educación General Básica*) and a three-year specialized cycle (*Polimodal*). Preschool and EGB were made mandatory.

⁷ For a description of Argentine fiscal structure see Jones et al (2000).

federal government remained in charge of establishing minimum curriculum contents, and providing technical assistance and supervision of teacher training programs, while it started the evaluation of student performance through standardized tests. In both always-provincial and decentralized institutions, the choice of textbooks, teaching methods, evaluation methods, and course contents has always been decided at the school level. Table I summarizes the main changes in school administration responsibilities brought up by decentralization.⁸

Evidence from case studies suggests that, in many provinces, decentralization brought beneficial changes in school operation. In Mendoza, a province with high institutional and administrative capabilities, Rhoten (2000) finds that decentralization opened opportunities for local participation and educational advancement. Pedagogical and administrative autonomy, local decision-making and participation developed at the school level.⁹ In Córdoba, City of Buenos Aires, Misiones and Santa Fe, schools now adapt curriculum contents to the local identity and diagnoses of schools' situation are performed (Rhoten, 1999). Córdoba, Rio Negro, Mendoza, Santa Fe, Buenos Aires (Province) and Buenos Aires (City) have actively encouraged local participation (Filmus, 1997). The province of San Luis went even further in decentralization launching an innovative program of charter schools and instituting a selection process of school principals based on merit and open competition (Gorostiaga 2001, Corrales, 2003).

Decentralization also seems to have improved supervision in some districts. Studies for the Province and the City of Buenos Aires show that the frequency of

⁸ See also Table 4.2, Burki et al (1999); Table 9, Llach et al (1999); and Appendixes 3.5 and 3.6, Rhoten (1999). Hanushek (1986, 1997) provides careful surveys of the educational production literature.

supervision improved after decentralization.¹⁰ National decentralization has also allowed for some budgetary school autonomy. In Argentine schools, maintenance repairs, classroom materials, and dining room operation are usually paid by *cooperadoras* (school associations financed and managed by students' parents). Under national administration, *cooperadoras* did not receive funds from the federal government. Instead, the Province of Buenos Aires, the City of Buenos Aires and Mendoza (see Dussel and Thisted (1995), Macri (2001), and Rhoten (1999), respectively) decentralized these expenditures directly transferring provincial funds to the *cooperadoras*, thus providing flexibility to address local needs.

These case studies, however, show that the effect of decentralization has been heterogeneous across regions, depending on local potentialities and realities. For example, Rhoten (2000) contrasts the success in Mendoza with the decentralization experience in Jujuy. In Jujuy, a poor province with low administrative and institutional capacities, decentralization is described as “political abandonment” by the national government. Attempts to establish school councils and implement local decision-making failed because the provincial government actively discouraged them, while local politicians abused the new resources under their control.¹¹ Dussel and [Thisted](#) (1995) point out that the decentralization of expenditures through the *cooperadoras* in the

⁹ “In Mendoza, the process of education decentralization has led to a system of “devolution” in which local government agencies and schools not only execute public policies but local society and market actors also possess the authority to make decisions regarding public policies and practices,” Rhoten (2000, pp. 614-5).

¹⁰ “Federal schools had their authorities in the National Ministry and they never saw them. They now have a frequent contact with us” (Buenos Aires provincial authority interviewed by Dussel and Thisted (1995), p. 63, our translation). “I went to a school which had not been visited by a supervisor for seven years” (Buenos Aires city authority interviewed by Macri, 2001, p. 22, our translation).

¹¹ One of the teachers interviewed by Rhoten (2000, p. 613) in Jujuy explains that “The obstacles to decentralization in this province are not economic, our problems are political problems, problems with power. Our politicians are façades. There is no real commitment to decentralization or to democratization in terms of sharing power and responsibility.”

Province of Buenos Aires implies that the allocation of funds depends on community participation.¹² Within the same province, schools with weak *cooperadoras* receive fewer funds. Gorostiaga (2001) points out that “many provincial administration lacked the necessary technical expertise and resources to manage the new system”, while Rhoten finds that “some actors report not having the necessary financial resources or authority to undertake the new responsibilities.” Although the case studies suggest substantial improvements in school operation in some areas, they also warn of growing inequality among schools.

4. Empirical Strategy

Our objective is to estimate the effect of school decentralization on quality measured by standardized test scores. In principle, we would like to compare test scores when schools are centrally administered compared to the counterfactual—i.e. test scores for the same schools under local administration at the same point in time. Since the counterfactual is never observed, we must estimate it. Therefore, in the absence of a controlled randomized-trial we are forced to turn to non-experimental methods that mimic it under reasonable conditions. In this paper we exploit a political experiment which generated an exogenous variation in the jurisdiction of administration of secondary schools across time and space using the always administered by provincial governments as control group.

¹² “The school principal sometimes has a good *cooperadora*, but sometimes she/he is alone. But the money only comes earmarked to the *cooperadora*, so that the school needs an active *cooperadora*. Sometimes this system works very well, sometimes does not” (School authority interviewed by Dussel and Thisted (1995), p. 49, our translation).

A major concern is that the schools that were centrally administered before decentralization could be different from the schools that have always been locally administered, and that these differences may be correlated with test scores. For example, provincial schools could be located in poorer urban areas while central schools are in wealthier areas. In this case, the correlation between decentralization and test scores would be confounded with the wealth effect.

In principle, many of the types of (unobservable) characteristics that may confound identification are those that vary across schools, but are fixed over time. A common method of controlling for time invariant unobserved heterogeneity is to use panel data and estimate difference in differences models.

Therefore, without the benefit of a controlled randomized trial, we turn to a difference in differences approach, which compares the change in outcomes in the treatment group, the decentralized schools, to the change in outcomes in the control group, the always-provincial schools. By comparing changes, we control for observed and unobserved time-invariant school characteristics as well as time-varying factors common to both controls and treatments that might be correlated with decentralization decision as well as with test scores. The change in the control group is an estimate of the true counterfactual—i.e. what would have happened to the treatment group if there were no intervention. Another way to state this is that the change in outcomes in treatment groups controls for fixed characteristics and the change in outcomes in the control groups controls for time varying factors that are common to both control and treatment schools.

One of the major threats to the validity of the difference in difference model is that there may be omitted non-common time-varying factors that are correlated with both

decentralization and test scores. There are two ways in which this might happen. First, the timing of where and when decentralization occurs could have been based on local shocks correlated with test scores, such as income shocks. In other words, the government purposively included location-specific time-varying information in its decentralization decisions. In the case of the Argentina, school decentralization was a national policy that was a small part of a massive institutional reform in response to the economic crisis in the late 1980s. Schools were decentralized rapidly over a two-year period. Moreover, the control group is the set of schools that had historically been under provincial management. Hence, bias from the endogeneity of program placement is not likely to be an issue in our analysis. In any event, we are able to include in our models province-year fixed-effects, which will control for this concern.

The second way in which omitted time-varying factors could confound the analysis is if there were other location-specific time-varying policies or environmental factors that affect test scores differently in for the treatment observations than for the control observations. Again, this is unlikely to be true for two reasons. First, after schools decentralized, both control and treatment schools were under the same administrative control and we know of no explicit within-province differentiation in policy towards the always provincial and the newly provincial schools. Second, the control group consists of a set of schools that were always provincial and are located in the same municipalities as treatment schools. Therefore, since both control and treatment schools are located in small geographic areas in the same governmental administrative regions, changes in non-education policies and in environmental factors that affected one group almost surely affected the other.

Formally, the difference-in-differences model can be specified as a two-way fixed effect linear regression model:

$$y_{ijt} = \alpha dI_{ijt} + \beta \mathbf{x}_{jt} + \lambda_t + \mu_i + \varepsilon_{ijt} \quad (1)$$

where y_{ijt} is the test score in school i in province j and year t , dI_{ijt} is an indicator variable that takes on the value one if school i 's is administered locally in year t and 0 otherwise, \mathbf{x}_{jt} is a vector of control variables that vary both across provinces and time, λ_t is a time fixed effect common to all schools in period t –alternatively, it can be replaced by λ_{jt} , a province time fixed effect common to all schools in province j and period t , and μ_i is a fixed-effect unique to school i . ε_{ijt} is a school time-varying error term, which is zero mean and independent of the observed right side variables and the fixed effects.

The \mathbf{x}_{jt} 's are time-varying community level controls such as income, inequality and unemployment. The year dummies capture all time-varying controls that are common to controls and treatments, and the school level dummies capture all school and community level factors that vary across schools but are fixed over time.

In this model, α is the difference in difference estimate of the (average) effect of decentralization on test scores. While α measures the overall impact of decentralization, we also test the hypotheses concerning whether decentralization differed by community characteristics by interacting dI_{it} with variables such as poverty and the financial performance of the province prior to decentralization.

The model specified in equation (1) assumes that decentralization affects test scores immediately and that the effect is constant over time. However, it may take time to implement policy changes suggesting that the impact of decentralization may be stronger

later than earlier. Moreover, students take the test in their last year of secondary school, which introduces variation in the length of exposure to decentralization. For example, students who took the test one year after decentralization had four years of school under central administration and one year (the last) under decentralized administration, whereas students who took the test five years after decentralization studied in a decentralized system for all five years. If the impact of decentralization on test scores is cumulative, then test scores should be correlated with the length of exposure to the treatment.

In order to capture length of exposure, we estimate a more general version of equation (1):

$$y_{it} = \sum_{s=0}^5 \alpha_s dI_{its} + \beta x_{it} + \lambda_t + \mu_i + \tau_j + \varepsilon_{it} \quad (2)$$

where s indexes the number of years school i has been under local administration in year t , $s = 0$ is the year of decentralization, and all exposures greater than $s = 5$ are restricted to have the same impact as five years of exposure. However, we place no other restriction on the functional form of the estimated impact of length of exposure on test scores since we allow the left out category to be the always provincial schools.

5. Data and measurement

Our dataset contains information on 3,456 public schools, accounting for approximately 97 percent of all public secondary schools.¹³ Of these, 2,360 were always provincial and 1096 were transferred from the national government to the provincial government between 1992 and 1994. A school is defined as “Always Provincial” if it was

under provincial control prior to 1991. A school is defined as “Decentralized” if it was transferred from central to provincial control.

We use standardized Mathematics and Spanish test scores at the school level to measure school quality.¹⁴ While the national government transferred its dependent schools to provincial control, it started to monitor students’ performance through the administration of standardized tests. Since 1994, the Argentine National Education Ministry annually tests fifth-year secondary school students in Spanish and Mathematics through the National System of Education Quality Evaluation (SINEC).¹⁵ The Ministry provides average test score at the school level and the number of students who took the test.

From 1994 to 1996, the tests were administered only to a random sample of fifth-year students, since 1997 every fifth-year student takes the test. To address the problem of sampling variability, we estimated the parameters of the model in equation (2) by means of a Feasible Generalized Least Squares Dummy Variables Estimator in which each observation is weighted by the inverse of an estimate of the standard error of the test score for that year and school. Unlike the Least Squares Dummy Variables Estimator, and in the presence of independent errors, this estimator has the advantage that the estimator of the variance-covariance matrix of the parameter vector is consistent.

¹³ A tiny number of secondary schools that belong to national universities, security forces or armed forces remained under federal administration.

¹⁴ Other studies use coverage variables such as the school enrollment rate, the grade repetition rate, and the on-time graduation rate to measure school performance. We prefer to use nationally administered test scores, which are uniform and monotonic measures of school performance, although we recognize that standardized test scores do not capture all of the dimensions of student achievement. One concern with our measure is that teachers could intentionally train students to maximize test scores instead of teaching general skills and knowledge. In this case, the test scores would not reflect school quality, but rather how well schools prepared students to take the test. However, this is less likely in Argentina where there are no rewards or punishments for teachers or schools based on test outcomes. Moreover, most of the alternative measures are not available in Argentina or are not meaningful at the school level.

¹⁵ A pilot measurement, not available at the school-level, was performed in 1993.

A second implication of the data is that the transfer of the schools took place between 1992 and 1994 (after the passing of the Law in December 1991), so that the first year of performance data coincides with the last year of school transference. However, we still have variation in the number of years students were exposed to decentralization. Since the exam is taken in the last (fifth) year of secondary school, students could be exposed from 1 to 5 years of studies in decentralized versus centralized schools. Therefore, we will be investigating the effect of up to five years versus one year of exposure to decentralization.

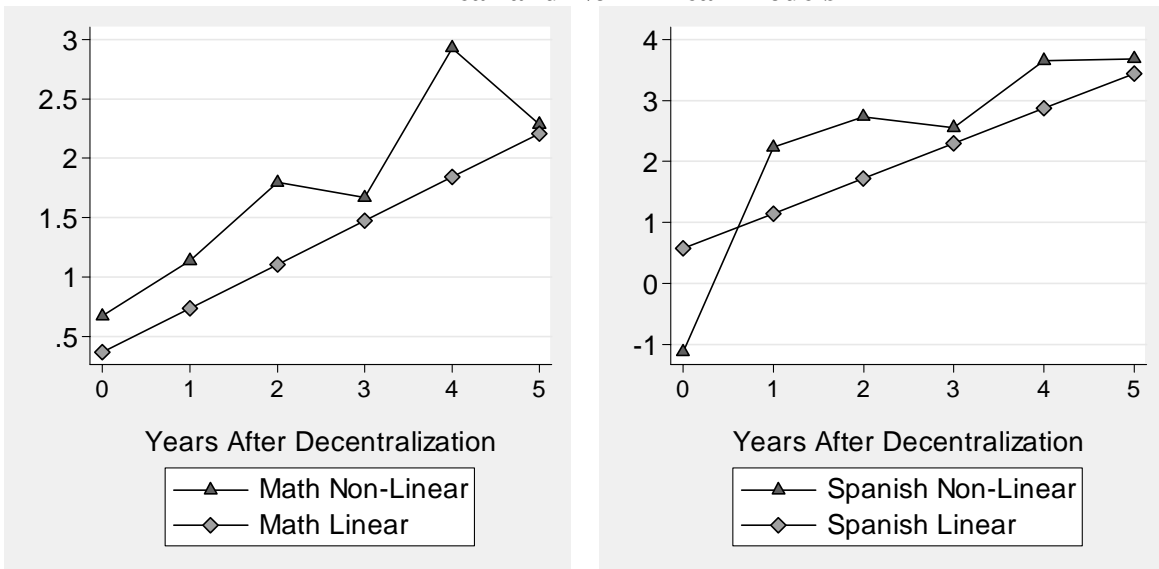
There are two potential losses from this restriction. The first is that we are unable to evaluate the impact of one year of decentralization versus none, which should not be too much of a problem as it is likely that the changes introduced from decentralization were not fully implemented in the first year and the effect of these changes should depend on the years of exposure of the students. Second, since we do not have multiple periods of pre-intervention data we are not able to test whether pre-intervention trends are the same for treatment and control groups as recommended by Heckman and Hotz (1995) for assessing the validity of the underlying assumptions of the difference in difference estimator.

6. Results

In this section, we present the results of our analyses. Table II presents the overall results. Both Math and Spanish test scores increase over time since decentralization. Thus, on average, decentralization improved the performance of the transferred schools. On columns (1) and (2) we report the results of the fully-flexible model without local socioeconomic controls but including school and common year fixed-effects without

restricting the sample at all. In columns (3) and (4) we add three time varying controls at the province level: The fiscal result to the gross domestic output (Fiscal Result), gross domestic output per capita (GDP per capita) and the unemployment rate (Unemployment). Finally, in columns (5) and (6) we restrict the model by imposing a linear effect of decentralization on test scores. The data accepts this parsimonious model quite well (See Figure I). In order to provide a sense of the order of magnitude of the average impact of school decentralization on those schools that were transferred from the central government to the provincial governments, we estimate, using the linear models, the gain in test scores as a proportion of the baseline test scores in the transferred schools. They are a 3.7 % for Math and 5.1 % for Spanish.

**Figure I: The Effect of Decentralization on Test Scores.
Linear and Non-Linear Models**



In columns (7) and (8), we restrict the sample to municipalities where there is at least a school in both treatment and control groups. This seeks to control for unobserved time-varying shocks at the municipality level that may affect school performance. The results are not altered at all.

In Table III we report a series of robustness checks. First, columns (1) and (2) repeat the baseline model from columns (7) and (8) in Table II. In columns (3) and (4) we add to the estimated model province-year fixed-effects. Both coefficients increase slightly, but the differences with the baseline estimates in columns (1) and (2) are not statistically significant at conventional levels. Thus, we stick to the more parsimonious specification in columns (1) and (2). Finally, it turns out that the treated schools are larger than those in the control groups. The average number of students taking the exam is larger in the decentralized schools. Our models control these by conditioning on school fixed-effects but it may be that larger schools not only depart in average performance but in its performance over time confounding treatment effect with unobserved heterogeneous trends. In order to control this possible nuisance, we match schools by their size in 1999, the last year in our sample. First, we trimmed schools at the 5 % of the distributions of class size in that year, that is, we drop from the treatment group the larger 5 % of schools and from the control group the smaller 5 % of schools. The estimates, reported in columns (5) and (6), are almost identical to those in the baseline specification. However, even after trimming, schools in the treatment group are on average larger than those in the control group. Thus, in columns (7) and (8) we report the estimates obtained by trimming the samples at the 25 % of the distribution of class size in 1999. Again, the results are identical to those reported from our baseline specification. Thus, we conclude

that the average treatment effect of school decentralization on test scores on the treated schools 5 years after decentralization are 3.7 % for Math and 5.1 % for Spanish.

Although “bringing decisions closer to the people” may be generally optimal, the advantages of decentralization may dilute when local governments lack technical capabilities. We use a set of measures of fiscal deficits and fiscal institutions to proxy for the quality of province governments. Provincial fiscal disorders in Argentina are frequent and typically associated with misgovernments. Moreover, provincial fiscal results may have an important impact on the education sector. In several occasions, provincial fiscal deficits generated reductions and delays in teachers’ wage payments that prompted long strikes. We first interact provincial fiscal results (normalized by province gross output) with our policy variable. We report the interaction of decentralization with a dummy variable that takes the value of one if the Average Fiscal Result at the province level for the period 1990-1992 — just before decentralization— is above – 1 % and zero if its below that threshold. Columns (1) and (2) in Table IV show that the positive effect of decentralization on test scores comes entirely from the improvement of schools in the well-administered provinces. This result is confirmed in columns (3) to (6) where years since decentralizations is interacted with two indexes of Fiscal Institutions taken from Jones et al. (2000) and FIEL (1997).¹⁶ When evaluated at the mean value of these indexes, the impact school decentralization on test scores is still positive.

We also interact decentralization with a dummy variable that takes the value of one if the school is located in a poor area and zero otherwise. The Unmet Basic Needs (UBN) obtained from the 1991 Census measures poverty. Poverty is one if UBN is greater than

30 %. This interaction investigates whether poor localities have a differential gain from decentralization. This interaction is important since it may be that although “bringing decisions closer to the people” is generally optimal, the advantages of decentralization may dilute when, on average, the population does not have the ability to raise their voice. Columns (1) and (2) in Table V confirms this hypothesis: Poor localities also display a lower gain from decentralization.

In the rest of Table V we explore other hypotheses related to the theory of decentralization.¹⁷ Finally, in Table VI we add all interactions together in order to test the relative merit of the alternative hypothesis considered. It turns out that only the fiscal result and poverty dummies interactions are statistically significant. Thus, in Table VII we report the effect of school decentralization on test scores for 4 types of schools using the estimates in columns (3) and (4) of Table VI: 1) Schools in well-administered provinces and non-poor localities; 2) Schools in well-administered provinces and poor municipalities; 3) Schools in badly- administered provinces and non-poor municipalities; and 4) schools in badly-administered provinces and non-poor municipalities.

The results suggest that schools in non-poor localities and well-administered provinces improved substantially their performance. All the gains disappear when the school is in a poor area or a badly-administered province. Finally, schools in poor areas

¹⁶ Jones et al. (2000) Index of Fiscal Institutions is normalized to have a mean value equal to 1. It varies between 0.1 and 0.4. FIEL (1997) Index of Business and Institutional Environment is also normalized to have a mean value equal to 1. It varies between 0.76 and 1.35.

¹⁷ Columns (3) and (4) interact decentralization with a dummy variable that takes on the value 1 if the party governing the province changed at least once since the return to democracy in 1983, and zero otherwise. In columns (5) and (6) decentralization is interacted with a dummy variable that equals 1 if the municipality was governed by the same political party as the province in 1992. Finally, in columns (7) and (8) decentralization is interacted with a variable reflecting provincial preferences for education. The value of school preferences for each province is obtained as the fixed effects of panel data regression having as dependent variable per capita education expenditure, and as independent variables GDP per capita, Per Capita total expenditure, and Per Capita Fiscal resources transferred from the National Government.

and in provinces that are poorly administered did worse than under centralization. Thus, there is a clear trade-off between efficiency and equity associated to decentralization. Although “bringing decisions closer to the people” may be generally optimal, the advantages of decentralization may dilute when provinces are poorly administered and when people are extremely poor.

7. Conclusions

The theoretical literature obtains trade-offs without absolute superiority of either centralization or decentralization in the provision of public services. Our contribution is to evaluate empirically the impact of the Argentine secondary school decentralization program of the early 1990’s on students’ standardized test scores.

School decentralization has been advocated by public officers and international organizations throughout the world. The decentralization of public services and, in particular, of educational services has become a standard recommendation promoted and financed by international organizations that was followed by several countries. Unfortunately, this enthusiasm has run ahead of substantial evidence on the success of these policies. This paper intended to fill that void by studying the effect of a nation-wide school decentralization program.

The Argentine decentralization program generated an exogenous variation in the jurisdiction of administration of secondary schools across time and space that provides an instrument to identify the causal effect of school decentralization on education quality. Our identification strategy uses the fact that, for historical reasons, a significant fraction

of secondary schools was already under provincial administration, providing a natural control group for our experiment.

Our results suggest that, after five years of decentralization, schools in non-poor localities and well-administered provinces improved substantially their performance. The gain is much lower when the province is not well administered. Finally, schools in poor areas and in provinces that are poorly administered did worse than under centralization. Thus, there is a clear trade-off between efficiency and equity. Although “bringing decisions closer to the people” may be generally optimal, the advantages of decentralization may dilute when provinces are poorly administered and when people are extremely poor.

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Table I: School Administration Responsibilities of National and Provincial Authorities Before and After Decentralization

Function	Before decentralization	After decentralization
Financing of Operating and Capital Costs	National Ministry financed expenditures for national schools, while Provinces financed expenditures for provincial schools	Province finance costs of both decentralized and always provincial schools. The National government finances some special grants and compensatory programs through provinces.
Curriculum Design and Content	National Ministry established curriculum contents for national schools, while Provinces established contents for provincial schools.	National Ministry establishes minimum curriculum contents. Provinces approve these minimum contents and develop supplemental provincial curriculum framework.
Teacher Training	National Ministry and Provinces administered teacher training institutions.	Teacher training provided by Provinces. The National Ministry provides technical assistance and supervises teacher training programs.
Teacher (and Staff) Management	National Ministry and Provinces hired, paid, assigned, sanctioned and fired teachers in national and provincial schools, respectively.	Provinces hire, pay, assign, sanction and fire teachers in both decentralized and always provincial schools.
Program Supervision	National Ministry and Provinces supervised pedagogical activities of national and provincial schools, respectively.	Provinces supervise pedagogical activities of both decentralized and always provincial schools. National Ministry implements special compensatory programs.
Planning and Budget	National Ministry and Provinces planned budget and expenditures for national and provincial schools, respectively.	Provinces plan budget and expenditures for both decentralized and always provincial schools.
Student Evaluation and Grade Promotion	Grade promotion decided by schools. No uniform evaluation system.	Grade promotion decided by schools. Implementation of standardized tests administered by the National Ministry.
Textbooks and Educational Materials, Course Contents, and Classroom Methods	No approval function by National Ministry or Provinces. Decided by schools.	No approval function by National Ministry or Provinces. Decided by schools.

Source: Based on Appendixes 3.5 and 3.6, Rhoten (1999).

Table II: The Impact of School Decentralization on Test Scores

Independent Variables	All Municipalities						Municipalities where there is at least a school in both treatment and control groups	
	Math Test Scores	Spanish Test Scores	Math Test Scores	Spanish Test Scores	Math Test Scores	Spanish Test Scores	Math Test Scores	Spanish Test Scores
Year of Decentralization	2.695 (2.581)	1.143 (1.771)	0.670 (2.252)	-1.121 (1.947)				
1 year after decentralization	2.694 (1.898)	4.156** (1.921)	1.137 (1.631)	2.233 (1.766)				
2 year after decentralization	2.622 (2.123)	3.876** (1.679)	1.795 (1.938)	2.735** (1.411)				
3 year after decentralization	2.537* (1.510)	3.671*** (1.430)	1.668 (1.273)	2.555** (1.153)				
4 year after decentralization	3.621*** (1.344)	4.559*** (1.387)	2.928** (1.198)	3.655*** (1.116)				
5 year or + after decentralization	3.287** (1.321)	4.946*** (1.425)	2.285** (1.198)	3.683*** (1.160)				
Years since decentralization					0.368*** (0.134)	0.574*** (0.121)	0.352*** (0.127)	0.537*** (0.104)
Fiscal Result			0.3556* (0.1925)	0.3363 (0.2163)	0.3315* (0.1981)	0.3200 (0.2172)	0.3650* (0.1870)	0.3275 (0.2028)
GDP per capita			0.0002 (0.0002)	0.0004*** (0.0001)	0.0002 (0.0002)	0.0004** (0.0002)	0.0002 (0.0002)	0.0004*** (0.0001)
Unemployment			-0.099 (0.252)	-0.072 (0.231)	-0.084 (0.253)	-0.056 (0.232)	-0.124 (0.251)	-0.087 (0.241)
School Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of schools	3350	3350	3273	3273	3273	3273	2920	2920
Number of observations	12314	12314	11987	11987	11987	11987	10688	10688

Note: Standard errors are clustered at the provincial level.

Table III

Independent Variables					Trimmed at 5 %		Trimmed at 25%	
	Math Test Scores	Spanish Test Scores	Math Test Scores	Spanish Test Scores	Math Test Scores	Spanish Test Scores	Math Test Scores	Spanish Test Scores
Years since decentralization	0.352*** (0.127)	0.537*** (0.104)	0.494*** (0.099)	0.621*** (0.084)	0.390** (0.153)	0.500*** (0.117)	0.358* (0.196)	0.533*** (0.149)
Control Variables	Yes	Yes	No	No	Yes	Yes	Yes	Yes
School Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Provincial Year Effects	No	No	Yes	Yes	No	No	No	No
Number of schools	2920	2920	2920	2920	2510	2510	1771	1771
Number of observations	10688	10688	10688	10688	9343	9343	6601	6601

Note: All regressions are for Municipalities where there is at least a school in both treatment and control groups. Standard errors are clustered at the provincial level.

Table IV: The Impact of School Decentralization on Test Scores

Independent Variables	Math Test Scores	Spanish Test Scores	Math Test Scores	Spanish Test Scores	Math Test Scores	Spanish Test Scores
Years since decentralization	-0.066 (0.301)	0.245 (0.277)	-1.196** (0.474)	-0.580 (0.482)	-2.112** (0.822)	-1.595** (0.780)
Interaction with Fiscal Result (=1 if Surplus)	0.885*** (0.303)	0.611** (0.300)				
Interaction with Jones' Index of Fiscal Institutions			5.846*** (1.349)	4.197*** (1.456)		
Interaction with FIEL Index of Fiscal Institutions					2.233*** (0.636)	1.929*** (0.586)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
School Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of schools	2920	2920	2920	2920	2920	2920
Number of observations	10688	10688	10688	10688	10688	10688

Note: All regressions are for Municipalities where there is at least a school in both treatment and control group.
Standard errors are clustered at the provincial level.

Table V

Independent Variables	Math	Spanish	Math	Spanish	Math	Spanish	Math	Spanish
	Test Scores	Test Scores	Test Scores	Test Scores	Test Scores	Test Scores	Test Scores	Test Scores
Years since decentralization	0.425*** (0.147)	0.614*** (0.120)	0.276 (0.403)	0.252 (0.380)	0.230 (0.184)	0.502*** (0.117)	-1.395 (4.222)	0.189 (3.662)
Interaction with Poverty (=1 if Poor Municipality)	-0.871** (0.430)	-0.891*** (0.319)						
Interaction with Dummy for Political Alternance in the Province (=1 if there was alternance)			0.098 (0.528)	0.369 (0.453)				
Interaction with Dummy for Same Political Party at Government in the Province and Municipality (=1 if same political government)					0.189 (0.249)	0.055 (0.206)		
Interaction with Regression based Index of Preferences							0.282 (0.690)	0.056 (0.591)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of schools	2920	2920	2920	2920	2920	2920	2920	2920
Number of observations	10688	10688	10688	10688	10688	10688	10688	10688

Note: All regressions are for Municipalities where there is at least a school in both treatment and control groups. Standard errors are clustered at the provincial level.

Table VI

Independent Variables	Math Test Scores	Spanish Test Scores	Math Test Scores	Spanish Test Scores
Years since decentralization	0.270 (4.982)	1.569 (4.573)	0.015 (0.311)	0.338 (0.274)
Interaction with Fiscal Result (=1 if Surplus)	0.831*** (0.323)	0.551* (0.318)	0.835*** (0.277)	0.554** (0.264)
Interaction with Poverty (=1 if Poor Municipality)	-0.703** (0.309)	-0.773*** (0.231)	-0.683** (0.305)	-0.771*** (0.196)
Interaction with Dummy for Political Alternance in the Province (=1 if there was alternance)	-0.016 (0.349)	0.269 (0.332)		
Interaction with Dummy for Same Political Party at Government in the Province and Municipality (=1 if same political government)	0.166 (0.227)	0.019 (0.206)		
Interaction with Regression based Index of Preferences	-0.056 (0.799)	-0.239 (0.727)		
Control Variables	Yes	Yes	Yes	Yes
School Fixed Effect	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes
Number of schools	2920	2920	2920	2920
Number of observations	10688	10688	10688	10688

Note: All regressions are for Municipalities where there is at least a school in both treatment and control groups
Standard errors are clustered at the provincial level.

Table VII

	Fiscal Result = 1		Fiscal Result = 0	
	Math Test Scores	Spanish Test Scores	Math Test Scores	Spanish Test Scores
Poverty = 0	0.850*** (0.201)	0.892*** (0.189)	0.015 (0.311)	0.338 (0.274)
Poverty = 1	0.167 (0.324)	0.121 (0.284)	-0.668* (0.350)	-0.433 (0.324)

Note: All regressions are for Municipalities where there is at least a school in both treatment and control groups

