THE ECONOMIC EFFECTS OF UNIONS IN LATIN AMERICA: TEACHERS' UNIONS AND EDUCATION IN ARGENTINA

M.Victoria Murillo, Lucas Ronconi, Juan Sanguinetti y Mariano Tommasi[*]

Documento 56 **Agosto de 2001**

[*] María Victoria Murillo is Assistant Professor of Political Science at Yale University. Mariano Tommasi is Director of the Centro de Estudios para el Desarrollo Institucional (CEDI, Fundación Gobierno y Sociedad) and director of the Economics Department at Universidad de San Andrés. Lucas Ronconi and Juan Sanguinetti are researchers at CEDI. We thank the valuable research assistance of Emmanuel Abuelafia. We would also like to thank Peter Kuhn and Gustavo Marquez for their comments on various drafts of this paper. The participants at the seminars organized by the IADB and Centro de Estudios para el Desarrollo Institucional provided useful suggestions.

ABSTRACT

This paper constitutes a first cut at looking at the effects of trade unions in the education sector in Argentina. Even though we cannot draw strong conclusion or, even less, recommendations, we have provided a substantial amount of new information and we have found useful preliminary results on some of the channels of union influence on the performance of this crucial sector. We find evidence that those provinces where teacher unionism is fragmented, union density is higher and the political relation with the governor is more conflictive, have more strikes (less class days) and consequently students perform worst. We also find that union strength is related to the decision of tenuring teachers. And student learning improves when the teacher in front of the class is a tenured one. But since tenuring also seems to increase absenteeism, it might reduce the actual number of tenured teachers in front of the class, with uncertain net effect on student learning.

INDEX OF CONTENTS

INDEX OF TABLES

INDEX OF FIGURES

INTRODUCTION

Education is one of the main instruments to foster human capabilities and overall freedoms of people, so they can lead the kind of lives they have reason to value. Education is also essential in building democratic values, improving human development and contributing to economic growth. (Amartya Sen, 1999). Therefore, when an educational system is not performing well, the consequences are dire.

Several studies have pointed out that education remains a factor in reinforcing inequities rather than in reducing them due to the deficits of the Argentine educational system (IADB, 1996; Fiszbein, 1999). Low-income people do not have access to high quality education and they generally fail to complete secondary education. Furthermore, achievement is poor compared to other countries that invest similar amounts on education. Hence, although Argentina's net enrollment ratios for primary and lower secondary education are high, there is a perception of poor quality.

There is a consensus in Latin America that good teaching is key to school improvement. As a result, the attention on teachers' incentives and their impact on teaching performance have been growing in the region. In particular career regulations and mechanisms for recruitment, selection and promotion of teachers, are receiving much attention.[1] However, reforms in these areas have been hard to achieve, among other reasons due to the opposition of teachers' unions to policies perceived as hurting their members.[2]

The objective of this study is to provide some empirical evidence on the effects that teachers' unions have on the quality of education in Argentina. In particular, we analyze "education production functions" and the impact of teachers' unions on the variables that influence the learning experience of elementary students: days of class, teachers' tenure

[1] For more details see the IADB (1999) studies "Teachers in Latin America: Careers and Incentives".

[2] Corrales (1998) notes that "The magnetism and high levels of organization of teachers' unions, together with a union leadership that has a long-term horizon, no alternative career plan, no aversion to conflict, and a discriminating weapon against the government, explain why teachers' unions are to be expected to be intensely active in resisting reforms." See Murillo (1997), Maceira and Murillo (2001) for further discussion of the political economy of reform in the social sectors, and the role of unions.

status,[3] class size, budget allocations, and teachers' satisfaction. We also consider other factors, such as the special laws and rules that regulate teacher's careers and work environment, and their possible connection to the (political) role of unions.

This study provides empirical evidence that did not exist before and presents some empirical findings in the relation between unions and student performance. We find that higher union density combined with union fragmentation and adversarial political alignments tend to decrease the effective number of class days with an indirect negative effect on student performance. We also find a negative relation between union membership and job satisfaction, and students who have a more satisfied teacher perform better. Additionally, we find that teacher tenure, a persistent union demand, has a positive effect on student performance. We also find that unions have a positive effect on employment and thus, a negative effect on class size. Finally, we find that union monopoly and density increases the expenditures per student of the provinces whereas union fragmentation is associated with lower allocation of the provincial budget to education as well as to smaller allocation of this share to salaries. These empirical findings provide mixed conclusions regarding the role of unions on education, but provide a first picture of union influence in the learning process.

The paper is divided in six sections. Section 1 provides some brief background information on education in Argentina. Section 2 presents a sketch of the analysis to follow. Section 3 provides a brief description of the estimation of the education production function for elementary school students in Argentina. Section 4 describes teachers' unions and explains the empirical exercises to be performed to ascertain the impact of union characteristics on the variables that are important to explain educational outcomes. Section 5 presents the empirical results on the effects of unions. Section 6 concludes.

1.- BACKGROUND INFORMATION

Argentina has relatively high schooling rates. The enrollment ratio in primary education is 97%, literacy 96% and enrollment in secondary education is 67%. The system has a total

[3] In this paper we use "tenure status" (henceforth TENURE), to refer to whether the teacher has a permanent, full-right, assignment to that position, as opposed to a "temporary" assignment. (In Spanish, *titular* as opposed to *suplente*.)

of 9.7 million students (70% in primary education), 650.000 teachers (540.000 teaching positions) and 52.177 educational units; 76% of total enrollment attends public institutions. Average spending per student is around $900 ($740 in the case of primary education), although there are large variations across provinces.

TABLE 1. Public Expenditure on Education, 1997

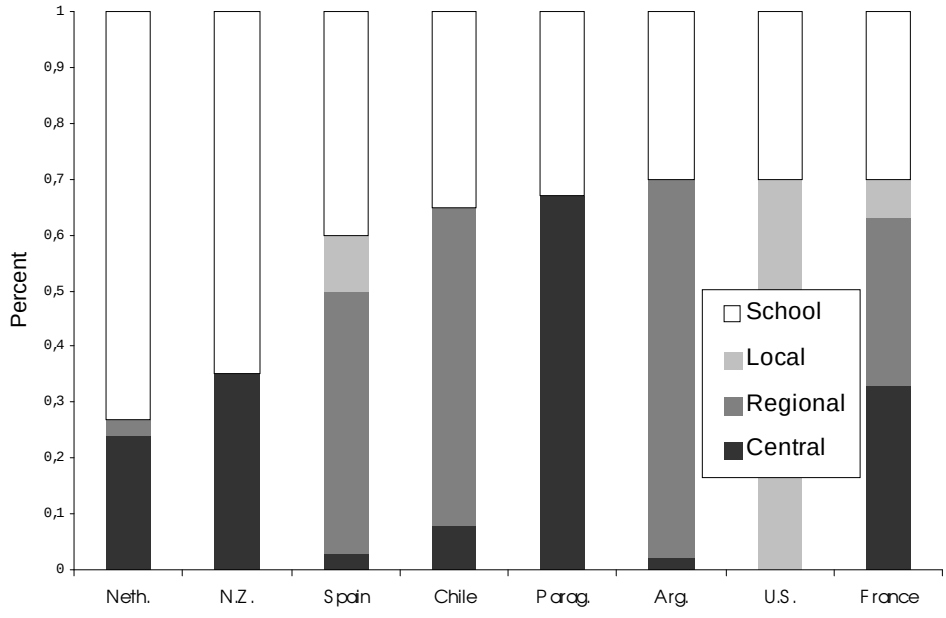
Province	millions of US$	% of Total expenditure	US$ per student	personal expenditure /total expenditure
City of BA	924	29,4%	1391	72,7%
Buenos Aires	3230	30,7%	881	78,7%
Catamarca	135	28,2%	1435	92,5%
Córdoba	739	26,1%	969	73,3%
Corrientes	209	23,0%	752	93,8%
Chaco	251	22,8%	912	90,3%
Chubut	145	20,9%	1202	88,9%
Entre Ríos	297	21,4%	947	83,4%
Formosa	135	16,6%	875	91,4%
Jujuy	166	30,9%	869	92,2%
La Pampa	113	22,5%	1575	81,6%
La Rioja	110	25,5%	1312	92,8%
Mendoza	362	30,0%	894	83,7%
Misiones	193	19,9%	672	97,8%
Neuquén	250	25,5%	1687	86,3%
Río Negro	182	25,9%	1061	86,3%
Salta	202	23,1%	629	92,0%
San Juan	160	23,6%	1001	88,1%
San Luis	95	25,5%	1014	76,2%
Santa Cruz	141	20,4%	2341	86,5%
Santa Fe	771	29,1%	961	74,9%
Sgo del Estero	204	31,5%	962	98,5%
Tierra del Fuego	79	21,4%	2566	78,4%
Tucumán	277	29,9%	829	86,4%
Total	9370	27,2%	966	81,6%

It is remarkable that almost 85% of spending is devoted to cover teachers salaries, although there is substantial inter-provincial variation. This level is high relative to the experience of other countries (See Appendix 3). This high percentage could be the result of union strength defending the salary share of the budget in a context of fiscal restraint. This view is supported by the priority granted by teachers' unions to salary demands as shown by an analysis of the demands of the main teachers' union in Argentina[4].

[4] Low salaries and payment delay represent almost half of the concerns expressed by teacher's unions. See Appendix 3 for more details.

Responsibility for primary and secondary education has been decentralized at the provincial level (primary mostly since 1978 and secondary in 1993). Indeed, even at the peak of centralization in 1952 only 43% of elementary schools as opposed to 75% of secondary schools and 83% of vocational schools were national. A new Federal Education Law No. 24,049 from 1993 regulates the distribution of responsibilities between the nation and the provinces. The provinces now play the leading role in financial, pedagogical and administrative matters; as well as in Labor Relations and teachers' career paths. The national government sets the national curriculum, evaluates the system, implements compensatory programs and promotes – with the provinces – teacher education programs.[5] The involvement of the provincial level rather than the school, municipal or the national level in the running of the Argentina educational system is high in international terms. The crucial role of the provincial level, as well as the very limited school autonomy could be glanced from the international comparison in Figure 1.

Figure 1: Level of Decisionmaking in Education Sector



Source: OECD, 1998

Because almost all schools depend on the provincial government; public education budgets, teacher's salaries, and working conditions and regulations (*Estatutos Docentes*

[5] There is, however still an important element of centralization of political conflict over teachers' wages. The main federation CTERA has called several national strikes and mobilizations. The most salient recent episode was the so-called "*carpa blanca*" a tent with teachers hunger-striking in front of the National Congress, which lead to the approval of a special national tax on automobiles to finance wage increases for teachers throughout the country (the so-called *incentivo docente*, i.e., "teaching incentive").

and *Convenios Colectivos*) are mainly decided in the subnational arena. Hence, because education is decentralized to the provincial level and most unions are organized at the provincial level as well, the most appropriate level of analysis for the political and the labor-relations effects of unions, is the provincial one [6/7].

2.- INFLUENCE OF UNIONS IN EDUCATION: A SKETCH OF OUR EMPIRICAL STRATEGY

There are several institutional features of the education system and of teachers' unions in Argentina, that differentiate it from the US system in a way that makes virtually impossible to replicate the pathbreaking study of Hoxby (1996). [8]

Education is "decentralized" to the provincial level and most unions are organized at the provincial level as well. Budgets, teacher's salaries, working conditions and regulations (*Estatutos Docentes* and *Convenios Colectivos*) are bargained between the provincial government and teacher's unions, and apply to all teacher's and schools independently of their affiliation or participation in the negotiation process, or in the election of union leaders. Consequently, all schools located in the same province are affected by teacher's unions behavior, even those where teachers are not unionized. This institutional feature complicates the possibility of school-level cross sectional analysis.[9]

[6] We do not discard that union exercise influence at the national level as well, and the 'teaching incentive' is an example of this influence.

[7] As described below we can also trace a micro-level relationship between unions and teachers' job satisfaction, which can have a direct impact on the learning process of individual students.

[8] One additional feature not emphasized in the text is that both unions' rules and the law, particularly the *Ley de Asociaciones Sindicales*, do not require unions to operate under democratic rules. Under such circumstances it might be inappropriate to assume that the union's objective function represents the preference of the "median" member.

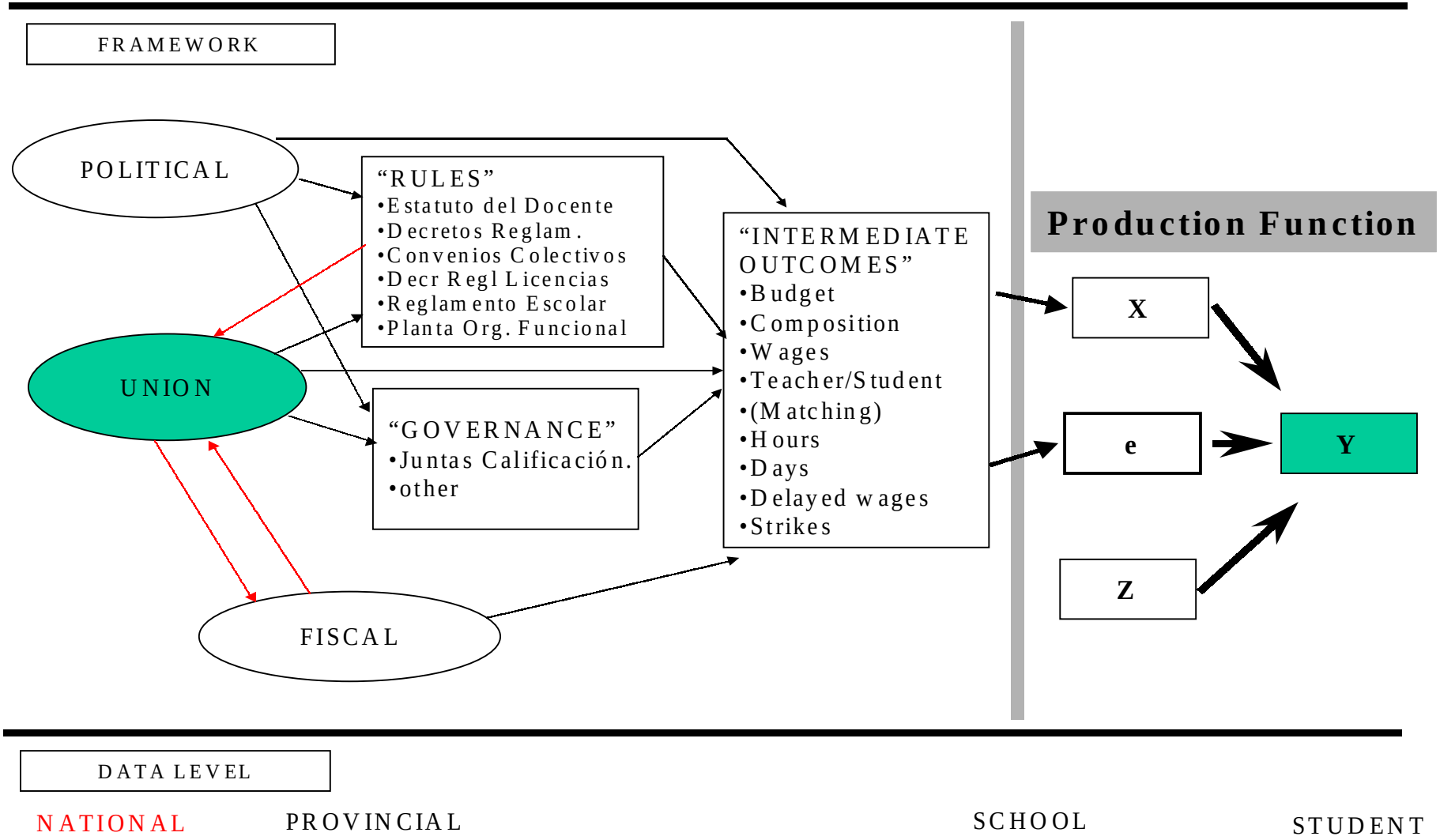
[9] That is, even if we had the information on whether particular teachers in a particular school are unionized, it is not clear whether we should expect that to have any impact on the relevant variables (such as student learning). Even if the empirical analysis would show an impact, it is unclear given the institutional features of the Argentine case whether that should be attributed to "union effects" or to personal characteristics of the teacher that are correlated to the decision on whether to affiliate. Nicer people, more concerned about social issues, can be more likely to affiliate and these might be better teachers, or alternatively, they can be just card-carrying trouble-makers with negative influence on learning. This caveat qualifies, thus, our analysis of the "unionization" – "job satisfaction" link with the micro-level data mentioned in footnote 7.

Hence, in order to look for the potential effect of unions on education, the most disaggregated level possible is that of the province; in both the provincial political and labor-relations arena.[10]

However, we are ultimately interested in education outcomes such as student learning. And learning depends not only on variables that are decided at the provincial level, but also on the socioeconomic characteristics of the student's family, and on school/classroom factors. Hence, our analysis requires to deal with different levels of aggregation.
Our analytical / empirical strategy can be best understood by reference to Figure 2

[10] Of course, it is also quite likely that in the Argentine case one of the most important channels of union influence is in the National political arena, a hypothesis that we will attempt to address more indirectly, for obvious empirical limitations.

Figure2


FRAMEWORK
POLITICAL
UNION
FISCAL
"RULES"
•Estatuto del Docente
•Decretos Reglam.
•Convenios Colectivos
•Decr Regl Licencias
•Reglamento Escolar
•Planta Org. Funcional
"GOVERNANCE"
•Juntas Calificación.
•other
"INTERMEDIATE OUTCOMES"
•Budget
•Composition
•Wages
•Teacher/Student
•(Matching)
•Hours
•Days
•Delayed wages
•Strikes
Production Function
X
e
Z
Y
DATA LEVEL
NATIONAL
PROVINCIAL
SCHOOL
STUDENT

We have a data set that contains test scores in Mathematics and Language of 7th graders in a number of schools throughout the country, that can be matched to student questionnaires, teacher questionnaires and school-principal questionnaires providing useful information about the "inputs" of such production function. In a simplified manner, we can postulate (as we do in the right end of Figure 2) that student achievement is a function:

(1) $Y_{ij} = f(X_j ; e_j ; Z_i)$

where Y_{ij} is the score of student i in school/classroom j; X_j is a vector of school/classroom variables (inputs), e_j is a vector of (possible unmeasured) "teacher" variables (such as effort, or "quality of the match") that are supposed to affect student learning, and Z_i is a vector of socioeconomic characteristics of the student's family. Presumably unions can affect some of the components of *X* or *e*, and hence, indirectly, educational outcomes.

Moving towards the left in Figure 2, unions operate mostly at the political level and to some extent at the labor-relations level, and hence they can directly affect some provincial-level variables which themselves, are either some of the *X*s, or determinants of some *X*s or *e*'s. For instance they can have an impact on provincial education budgets, on budget composition, on teachers' wages, on teacher/student ratios, on the quality of the match between teacher and school, on the number of hours of instruction, on the number of days of class, on strikes (and hence days of class lost, low morale, etc.), on whether wages to public teachers are paid on time or not, etc.[11]

There are several possible mechanisms/channels by which unions can affect those "intermediate" variables, although these mechanisms are somewhat different from those usually assumed in the "standard" empirical unions´ literature. One important difference is that in most provinces, collective bargaining has not been a practice in the educational sector due to legal limitations to public sector collective bargaining, which lasted until 1990. As a result, unions sometimes choose political strategies of influence through the discussion of public rules (teachers' statutes) of their work conditions or the representation in governance institutions, such as Qualification Boards, which impact on promotion and

[11] Occasionally, provincial sector employees, including teachers, are paid several months late. This has been one important source of labor conflict in the education sector.

tenure.[12] Indeed, in addition to their industrial action (i.e. strikes), they also chose expressive protests, such as the 'carpa blanca' to make their demands more effective. This political character of labor relations in the education sector is further reinforced by the attitudes of employers (i.e. provincial governments) and the fiscal consideration emerging from the complicated relationship between provincial and national government in a federal country. In particular, the interactions between presidents, governors, and unions, which are sometimes of different political affiliation and have different incentives regarding budget allocation and political unrest complicate the context in which the educational process is taking place. Hence, some are codetermined by more general political and even fiscal variables (left end of Figure 2). For example, days of class are affected by strikes, which in turn may sometimes come as a response to delays in wage payments, and whether that delay occurs and whether it leads to strikes will depend on the provincial fiscal situation as well as on the nature of the relationship between the provincial government and teachers' unions. More generally, the nature of the intertemporal relation between political authorities and unions can explain some of the rigidities in teacher labor laws (such as the *Estatutos Docentes*).[13]

We can postulate that the "intermediate variables" (such as class days) are a function of:

(2) $X_{jp} = g\ (\ U_p\ ;\ W_p\ )$

where X_{jp} are those inputs that affect student's performance and are presumably affected by union's behavior. (For example X_{jp} could be the number of class days in school j located in province p). U_p is a vector of provincial teacher's unions features; and W_p is a vector of control variables (i.e. provincial fiscal situation).

In order to explore the effect that teachers' unions have on students performance, and subject to data constrains, we have proceeded in two steps. The first one was to estimate the education production function (equation 1) clustering by schools. Then, to run separate cross-provinces regressions for each of the X that are presumably affected by teacher's

[12] The decisions on the professional career of teachers are handled by the teaching profession through Qualification Boards (*Juntas de Calificaciones*). These boards use a system of points in which diplomas, tenure and courses constitute the main factors. Those applicants with the highest scores have the first right to select among open positions, and school authorities and parents have no voice in the selection process. Presumably, teacher unions play an important role in some of the *Juntas*.

[13] See Spiller and Tommasi (2000) for a framework that explains overregulation as the outcome of the inability to strike efficient intertemporal political transactions.

unions[14]. This approach does not allow us to claim a conclusive result on the overall impact that unions have on education, but it provides evidence on the effect that unions have on some specific variables that affect students performance (i.e. class days, teacher's job satisfaction, tenure and class size). We understand, that taking into account the characteristics of the data we have, this is the most informative way to look at the data.

In Appendix 1, we present the results of two other approaches. The first one was to regress the reduced form from equations (1) and (2). While this strategy has the advantage of providing an estimate of the full effect of unions on education outcomes, it also has several disadvantages. First, we loose all the heterogeneity across families, and to some extent across schools, since we have to cluster across provinces. Second, we are not able to identify the partial effects that unions have: From a theoretical perspective, unions affect education through several channels; for example, unions call for strikes and hence students have less class days and presumably perform worst; but unions could also pressure the government for a higher education budget leading to better performance. Lastly, another potentially important disadvantage of the reduced form estimation is the omitted variables problem. Since we do not have information on provincial variables that might have important (direct or indirect) influence on student performance, this might induce biases in the coefficients of the union variables.

The second approach dealt with in the appendix consists of two steps. The first one, is to estimate the education production function including provincial dummies. And as a second step, to regress the provincial dummies coefficients with the union's variables and controls. This approach has similar disadvantages to the previous one, but also reduces significantly the number of observations (in the second regression we only have 24 observations).

In the next section we present the estimation of the Education Production Functions. In sections 4 and 5 we study the effects of the variables measuring union characteristics on (intermediate) educational outcomes.

[14] The system of equations (1) and (2) is recursive. Thus as long as the error terms in the two equations are

3.- EDUCATION PRODUCTION FUNCTION ESTIMATION

Most economic studies of school effectiveness follow the EPF (education production function) approach, asking the question of what manipulative inputs can increase outputs; personal, family and others factors are treated as inputs and the students' performance as the output of this EPF [15].

Educational Production Functions studies classify the factors that influence student's performance in:

a) personal factors such as sex, race etc.
b) family factors such as socioeconomic level, family size and parents education
c) factors relating to the place of residence
d) school and teacher factors: such as school structure, number of school days, teacher experience and teacher dedication.

In order to analyze school production it is essential to employ adequate measures of outcomes. This is not an easy task, since the objectives of education are multiple, and many of them hard to measure. A majority of studies in the EPF tradition measure output by standardized achievement test scores, although others have employed other measures such as student attitudes, school attendance rate, and high school continuation or dropout rates. In this study we are going to use test scores[16].

The problem in statistical terms is to describe the relationships between test scores, school and teacher processes and characteristics of the pupil intake. The econometric model that we are going to estimate assumes a linear relationship between test scores and the factors included in the regression.

Since 1993, the Ministry of Education has implemented a National Evaluation System, in order to quantify student's knowledge in a variety of subjects and reveal complementary

---

independent we can estimate each separately.

[15] There are several critiques of this approach. An excellent survey is Scheerens (1999).

[16] It is worth pointing out that an overall reading of the use of EPF throughout the world gives a grey picture, where results are sometime inconsistent and not very robust. (Hanushek 1986 and 1997, Scheerens 1999). This is particularly the case when the dependent variables are test scores. Yet, we are constrained by data availability.

information to analyze its determinants. The observational units are: the student, the student's family, the student's teachers and school. Different grades have been tested in different years, as shown below:

TABLE 2. SINEC Surveys

	Year						
Grade	1993	1994	1995	1996	1997	1998	1999
3rd		Lang.	Math	L & M	L & M	Math	L & M
6th				L & M	L & M		L & M
7th	L & M	L & M	L & M	L & M	L & M		L & M

We work only with data corresponding to 7th grade students attending public schools in 1997 and 1999. We choose these years because we have reliable data on union variables for the period 1997-1999 (see next section). We drop all private schools observations because there is only one national private teacher's union, therefore is virtually impossible to explore how private teacher's union affect outcomes through a cross-provinces analysis. In the regression, we include student and family factors such as parents' education, kindergarten attendance and the family wealth; classroom factors such as class size, peer effect and classroom structure; teacher's factors such as teacher experience, education, tenure, dedication, and job satisfaction. Finally, we consider school factors such as class days, principal's tenure and experience.

From the mentioned variables, there are four factors that deserve special consideration since they are potentially affected by teacher's unions behavior. They are class days, class size, teachers tenure (TENURE) and job satisfaction (JS). The relation between class days and students' scores is straightforward. We expect that more class days improves student performance. More complex are the relations between performance and class size, teacher's tenure, and teacher's job satisfaction.

One might expect a negative relation between class size and student learning. However, this is a well-studied relationship, [17] and to date there is no conclusive evidence.[18]

[17] For example Hanushek (1997); Hoxby (2000); Case and Deaton (1999) –for South Africa-; Krueger (2001); Molnar et al (2000).

[18] Econometric studies that show an insignificant effect are many. Also, as Hanushek observes (as cited by Bracey, 1999) "Japanese class sizes are much larger than U.S. class sizes. Japanese students performance is, on average, much better than U.S. student performance". On the other hand, in the United States a series of

The provincial teachers' labor codes (*Estatutos Docentes*) are very complex and protectionist, particularly for the tenured teachers (TENURE). For tenured teachers firing is extremely difficult, and absence regulations very profitable[19]. Therefore, it could be argued that tenured teachers do not have the incentives to dedicate much effort to their work. However, it is also plausible that the restrictions specified in the *Estatutos* prevent political discretion, and provide a feeling of security to the tenured teacher, leading to better teaching quality.

Finally, is reasonable to expect that more satisfied teachers devote more effort to their duties, improving teaching quality[20]. However, because job satisfaction (JS) reflects both objective and subjective factors, such as teacher's psychological state, it is more complex to interpret than standard economic variables.

In Table 3 we present the results for the 1997 math test score (RENMAT). A summary of the other three regressions, variables description and basic statistics are in Appendix 2.

---

experiments done during these last years have proven quite the contrary (such as the California initiative and the Tennessee experiment). Some of these approximations state that the effects differ by level of the class size variable, and therefore equal effects should not be expected for class sizes of 20 students and class sizes of 15 or lower (Nye, at al., 2000). Additionally, Gursky (1998) indicates that reducing class size can improve student achievement, particularly in earlier grades and low achieving and low income students.

[19] There are jurisdictions, such as the City of Buenos Aires or the province of Chaco, where tenured teachers can take on average, more than one hundred absence days during one year. See Appendix 4.

[20] Hammermesh (1999) argues that a more satisfied worker is more likely to invest in firm-specific human capital, and increase his commitment. Locke (1976) suggests that job satisfaction could be used as a proxy to capture aspects of the workplace, such us mode of supervision, physical work conditions, and so forth that are not generally measured on data files, and that could have an impact on outcomes such as worker's

TABLE 3. Regression Result
Dependent Variable: LOG(RENMAT)
(OLS clustered by School)

	Variable	Coefficient	t-value
Student and Family	Gender (female= 1)	-0.019	2.051
	Father Education	-0.002	0.076
	Mother Education	0.012	3.400
	Kindergarten	0.043	2.871
	Density at home	-0.012	2.708
	Repeated	-0.158	12.714
	Wealth	0.00002	2.700
Classroom Factors	**Class Size**	**0.004**	**1.859**
	Positive Peer effect	0.046	6.211
	Negative Peer effect (-)	-0.015	1.256
	Classroom Structure	0.008	1.816
Teacher's Factors	**Job Satisfaction**	**0.041**	**2.246**
	TENURE	**0.018**	**0.761**
	Teacher Dedication	0.020	0.919
	Teacher Experience	0.013	1.776
	Teacher Education	0.011	0.831
School Factors	**Class Days**	**0.004**	**4.076**
	Principal titular	0.029	1.076
	Principal experience	0.012	0.849
	Observations	11791	
	R2	0.14	

We find that students perform better when they have more class days and when their teacher is more satisfied with her job. The coefficients are highly significant in the four regressions we have run (math and language, 1997 and 1999). One additional day of class results in an improvement of approximately 0.4% in student's performance.

We did not find a clear relation between students performance and class size. While the coefficients for the 1997 language and math evaluations (shown above) are positive, we found a negative and statistically significant relation for the 1999 tests (see Appendix 2).

productivity. He also suggests that JS could impact on the worker's mental health and hence affect her productivity.

Regarding teacher tenure, we find higher scores among those students who have a tenured teacher (even after controlling for teacher experience), but the coefficient is not statistically significant in any of the four evaluations. However, there is a second and more important reason to interpret this result with extreme caution: The National Evaluation Survey only includes those teachers who are effectively teaching during the day the evaluation is conducted; all those teacher's who are on leave of absence are not surveyed. We presume that our sample might have a severe bias: Our analysis of the *Estatutos Docentes* shows that tenured teachers have an impressive number of absence days they can take during the year compared to *interinos* and *suplentes*. Thus, we presume "tenuring" increases the incentives/odds the teacher has to be on leave[21] (See Appendix 4). Therefore, while we find evidence that students who have an active tenured teacher perform better than those who have an active non-tenured teacher, we are much less confident to claim that "tenuring" teachers is an appropiate policy to improve education quality.

4.- TEACHERS' UNIONS

I. Background

Argentine teachers' unions, organized mainly at the provincial level, have shown a very militant stance. Approximately 350 thousand teachers are unionized, showing one of the highest unionization rates in the country. Additionally, teachers' unions have not only been active in the development of the educational system, but also have organized more demonstrations and strikes than most other sectors[22].

TABLE 4. Sectoral union participation in total conflicts.

Sector	1996-97	Sector	1990	Sector	1988
Civil Service	25%	**Teachers**	**29%**	Civil Service	26%
Teachers	**23%**	Civil Service	14%	**Teachers**	**15%**
Transport workers	7%	Steelworkers	6%	Physicians	4%
Municipal employees	5%	Mechanicals	4%	Municipal employees	4%
Energy	5%	Railway carmen	4%	Railway carmen	3%

[21] Regrettably, it is impossible to compare the ratio (active tenure teachers / total active teachers) relative to (tenured teachers / total teachers) using census data. From the last national survey, conducted in 1994, we know that 57% of the total population of teachers are tenured. From our 1997 and 1999 samples of active teachers results that 60% and 52% of active teachers are tenured.

[22] Among them, the *marcha blanca* and the *carpa blanca* had a significant impact. The *marcha blanca* took place in 1988, and was the major historical teachers mobilization. The *carpa blanca* was set up by teachers in front of Congress in 1997 in demand of a higher public education budget. *The carpa blanca* influenced political discourse and finally enabled the teachers' union to participate in the design and Congressional approval of an extremely polemic financial law aimed at increasing teachers' salaries. (For a detailed analysis see Behrend, 1999).

Steelworkers	4%	Banking	3%	Banking	3%
Aeronautics	3%	Physicians	3%	Health	2%
Banking	3%	Paper Mill workers	2%	Oil workers	2%
Oil workers	3%	Port workers	1%	Postmen	2%
Mechanicals	3%	Meat-cutters	1%	Port workers	2%

Source: Centro de Estudios para la Nueva Mayoría

The origins of teachers' unions can be traced to the end of the nineteenth century. In 1892 the *Liga de Maestros* was born in the province of San Juan, being the first teacher association in Argentina. Other provincial teacher associations followed in Buenos Aires, Córdoba, Tucumán, Mendoza, Corrientes, Santiago del Estero, Misiones, Entre Ríos, Catarmarca and Rio Negro, which failed several times to organize a national federation. The first national organization, the Union of the Argentine Teacher, was created in 1950, under the influence of the Peronist government and later became the UDA (Union of Argentine Teachers) (Vásquez and Balduzzi 2000).

Hence, most of teachers' organizations created thereafter emerged in a decentralized fashion with some exceptions, such as UDA and AMET (Association of Teachers of Technical Schools), which affiliate teachers under national jurisdiction and had a national coverage from the start. A group of 147 provincial unions founded in 1973, the Confederation CTERA (*Central de Trabajadores de la Educación de la República Argentina*). CTERA is the largest teacher organization in Argentina and has 200,000 members nation-wide. Because it was originated in an attempt to reduce the fragmentation of the sector, successive mergers reduced their component unions to a single union per province (CTERA 1992). This confederation of provincial unions, which often had different partisan sympathies, opposed the education policies of both Menem administrations and the Federal Education Law.[23] Additionally, its national leadership has sought collective centralization of demands to negotiate with the central government and had attempted to implement national collective bargaining after the approval of new labor relations regulations for the public sector in 1990.

[23] CTERA joined the Peronist CGT (General Confederation of Labor) in the mid-1980s after Mary Sanchez, a Peronist leader, won the national elections of the union. However, in 1989, after President Menem abandoned his populist campaign promises, CTERA joined the anti-government CGT Azopardo first and later founded with other public sector unions the Congress of Argentine Workers (CTA) with a clear opposition stance while Mary Sanchez left the Peronism and joined a new opposition party (Murillo 2001).

CTERA, however, competes with other unions in almost every province. Rival provincial unions, together with SADOP (private teacher's union), UDA and AMET have opposed some of CTERA's strategies. The fragmentation of the sector, thus, was not solved by CTERA and, at the provincial level, there are currently more than 150 unions that operate on primary and public education. In addition to political diversity, teachers' unions present significant differences across provinces on their density, legal recognition, and political ideology. Table 5 presents some information about teachers' unions in the provinces.

TABLE 5. Teachers´ Unions (Primary and Public education, 1999)

	Number of unions	Unions with *personería gremial*	Affiliates*	Jurisdictional coverage
Buenos Aires	96	14	100965	(P, L)
Catamarca	2	0	2540	(P)
Chaco	9	1	13856	(P, L)
Chubut	1	1	4178	P
City of Bs.As.	8	1	21299	P
Córdoba	5	2	27874	(P,L)
Corrientes	4	1	9075	(P,L)
Entre Ríos	1	1	17651	P
Formosa	6	0	1718	(P,L)
Jujuy	1	1	3478	P
La Pampa	1	0	2785	P
La Rioja	1	0	3735	P
Mendoza	1	1	11835	P
Misiones	1	1	6370	P
Neuquén	1	1	7492	P
Río Negro	1	1	8214	P
Salta	3	1	15025	P
San Juan	1	1	5621	P
San Luis	1	0	1510	P
Santa Cruz	1	1	3535	P
Santa Fe	1	1	29344	P
Santiago del Estero	4	1	4646	P
Tierra del Fuego	1	0	790	P
Tucumán	1	1	8988	P

Note: P for the province and L for local. (*See note 27 regarding affiliates)
Source: Authors' calculation based on data from Dirección Nacional de Asociaciones Sindicales

II. Data

In this section we review the principal data sources used in this study (Appendix 3 contains additional details) to analyze the impact of teachers' unions on education in Argentina. In particular, we want to emphasize that despite the limitations of the data, we have created the first database of its kind for the empirical study of teachers' unions in Argentina. In doing so, we have relied on two sources of data. The first one is the official record of

unions and affiliates provided by the Ministry of Labor and the second one is the *Encuesta de Desarrollo Social*, run by the Ministry of Social Development.

In the data set of the Ministry of Labor, the unit of analysis is the union. The information includes the number of affiliates to the union, its legal status, and its jurisdictional coverage. The data set also provides some information about how these variables have changed during the last decade. The *Encuesta de Desarrollo Social* is a survey with national coverage conducted in 1997 with more than 70.000 observations, where approximately 1600 people reported to work as teachers. From this survey we are able to determine several characteristics of teachers, among others, if he/she participates on a labor union and the province where he/she lives. We have used these two data sets along with some interview-derived information to construct indexes on the characteristics that teacher's unionism has on each province. We present the union variables below; section 5 presents the measurements, including both the indexes and the results of the empirical analysis.

In order to know teachers' unions objectives and demands we have relied on two sources. First, we have reviewed the corresponding literature on public sector unionism. Second, we have conducted interviews and analyzed teachers' unions internal documents where they report the demands and goals they have. From those documents is evident that their main concern is teacher's wages. Low salaries and delay in payments are the most important issues for teacher's unions (almost half of total demands reported are related to salaries). "Tenuring" and job security are also important issues according to what unions report.

TABLE 6. What do unions report to care about?

Demand	Percentage of total demands reported
Salaries	41%
Tenuring-Absence days	21%
Job security	11%
Employment	9%
Health insurance	7%
Unions Participation*	7%
Teacher Training	5%

Source: Own elaboration based on CTERA (2000). *"Informe de la Situación en todas las Provincias"*
* Includes demands for a higher union participation in the education system, such us collective bargaining and *Juntas de Clasificación*.

III. Estimating Union Influence:

As explained previously, there are a number of institutional features of the education system and of teacher unionization in Argentina that prevent the type of analysis dissaggregated at the level of, say, school, or school district, that has been provided in the US. For that reason most of our analysis of the impact of unions is performed at the provincial level.

The "intermediate variables" we attempt to relate to (provincial level) union characteristics are variables that: (a) are significant predictors (or possible determinants of significant predictors) of educational outcomes in the education production function estimation, and (b) could be related to the theories on union effects. These include: days of class, teacher's tenure status, class size, and budget size and composition. Additionally, there is one variable found to be significant in the education production function, which is teacher satisfaction, for which we are able to provide more dissaggregated analysis, using a complementary data set.[24]

Union Variables

Most of the "intermediate" variables we are attempting to explain (i.e. days lost, tenure, budget allocation) are linked to the interaction between unions and their employers—in the Argentine case, provincial governments. Hence this variables are affected by characteristics of the unions and by their political relationship to the provincial government. We consider the impact of union strength, coordination, legal recognition, and political alignment on the (intermediate) dependent variables under study.

Strength: we consider both measures of union density (members/teachers) and of union participation (teachers answering that they have union participation). Membership or density is a traditional measure of union strength, which increases not only the effect of

[24]We have also explored other channels for union effects, through the study of the *Estatutos Docentes* and of *Juntas de Clasificaciones.* *Estatutos Docentes* are the by-laws ruling labor relations, which define job stability, leaves of absence, etc. These rules are believed to have a large impact on teachers' incentives, and teachers' unions report to care about them. The role of *Juntas de Clasificaciones* as well as some preliminary empirical analysis is provided in Appendix 4.

work stoppages but also provides financial resources for the organization and eases the provision of selective incentives to continue increasing affiliation by members (Golden 1997, Olson 1970).

The relationship between strength and strike propensity is not obvious. Following the Hicks's paradox on the impossibility to explain strikes when there is complete information, strikes are usually explained as a result of asymmetric information (Kennan 1986). In that case, strikes can result from the search of information by one of two parties. For instance, the union wants to know how much would the employer give in or the employer wants to know the concession threshold of the union (Hayes 1984). Tsebelis and Lange (1997), thus, model strikes as 'bluffing' from unions that try to get better conditions of employers that what their real strength allows them. This interpretation also follows Hicks's view that the striking union may be trying to maintain a "reputation for toughness" (Kennan, 1986). In this case, strikes occur when employers try to probe the union real strength. This argument also predicts that the propensity for strikes should be lower for strong unions, which do not need to bluff, or for weak unions, which cannot bluff, but higher for those in between. In particular, those unions whose density is decreasing and their strength is unclear but they still have a reputation should be more prone to strike. The alternative view of strikes poses that union strength facilitates collective action and increases the propensity of the union to strike by increasing its ability to obtain concession by striking (Francosi, 1995).

Regarding the other dependent variables, the relation between union density and union demands (such as tenure, budget allocation, and employment) is more straightforward; these are traditional goals of unions. Stronger unions are in a better position to bargain with the government over these issues controlling for other fiscal and legal factors (Freeman and Medoff, 1986).

Fragmentation/Coordination: We can assume that coordination is more complicated with more than a single union having to bargain with the provincial government. Coordination problems tend to increase the propensity to strike because they make bargaining more difficult, in particular if at least one of the unions is a bellicose one (Golden 1993, Murillo 2001). In this case, although each union is weak, they are more likely to go on strike due

to their difficulties to coordinate negotiation and their incentives to appear as more effective than their rivals in a sector where employees are discontent with salaries and work conditions. The existence of multiple unions, thus, makes coordination more difficult and weakens their bargaining power. Hence, other things being equal (e.g. density, sector, laws), a monopolistic union is stronger than multiple competing unions in the same sector. For that reason, monopolistic unions are more likely to obtain their demands regarding teachers' tenure, budget allocation, employment, and even policy preferences. However, their demands or policy preference can be the result of coordination problems, which combined with different political alignments, can radicalize the positions of teachers' unions regarding policy issues in addition to making bargaining more difficult.[25]

Recognition. We also consider the legal status of the union (if the union is *inscripta* or if it has *personeria gremial*). In Argentina, those unions with *personeria gremial* have several exclusive rights, such as representing all workers in collective negotiations, enforce the labor legislation and social security regulations, cooperate with the government in dealing with problems affecting workers. Therefore, we presume that in those provinces where the principal teacher union has *personería gremial,* this union is more likely to obtain its demands.

Political alignment: The political alignment of teachers' unions can induce a propensity to strike by providing national coverage, which makes unions more 'strike-prone' according to Golden (1998). Alternatively, it can influence the union attitude towards the government of the provinces based on the provincial and national political dynamics because channels of communication and trust based on a long-term relationship where previous iterations were beneficial for both parties (Murillo 2000). This second argument follows the literature on 'power resources' (Korpi, 1978) and the 'political exchange' (Pizzorno, 1978). That is, the idea that when unions lack political access to an allied government they are more likely to use industrial resources, such as strikes. Hence, we would expect that a positive political alignment with the government increases the trust and communication between the teachers' union and the government facilitating bargaining over strike. It can also influence the attitudes of union leaders and the formation of preferences regarding

[25] For the case of very large provinces, we discard those unions having less than 10% of affiliated teachers because these must be either too small or specialized to guide a coordinated action against the provincial government..

policies of uncertain effect based on the politically created trust. The opposite is true for the lack of positive political alignments.

In Argentina, membership with CTERA, which rejected Menem's policies at the national level, interacting with a Peronist or conservative government should increase the propensity of the union to strike. Additionally, we will also explore the combination of political alignment and union fragmentation following the argument that when political alignment facilitates trust between the provincial government and the union, union monopoly induces restraint and negotiation. However, union fragmentation contributes to increasing conflict even when some of the unions bear a good relationship with the provincial government because they are afraid of being singled out as "sold-out" by rival unions in front of teachers (Murillo, 2000). Additionally, the construction of the index of political alignment considered the diversity in partisan affiliations in CTERA unions across provinces as well as the existence of alternative unions and their own political alignments.

Operationalizing the variables. To summarize, there are four key aspects that describe the characteristics of teacher unionism in each province: The number of members, the number of unions, their legal status and their political relation with the government. In Table 7 we provide a description of the variables we use in the empirical estimation:

TABLE 7. Union variables description

Variable	Description	Source
PARTICIP	Percentage of teachers who report participation in a labor union.	EDS
AF_T	Affiliates/Teachers ratio	Ministry of Labor
UF	Number of unions with more than 10% of affiliated teachers.	Ministry of Labor
U_AFF	Unions per 10 thousand teachers.	Ministry of Labor
RECOG	Legal status. Is a dummy variable, where 1 means that the union has legal monopoly (*personeria gremial*).	Ministry of Labor
POL_AL	Political Alignment between the principal union[26] and the governor. Values range from to 0 to 1, where 0 means a highly conflictive relation.	Interviews with union leaders and experts, and press information

See Appendix 3 for more details[27]
Note: For all the variables the province is the unit of analysis.

Dependent Variables:

i. Lost Days: The section on EPF estimation describes the impact of days of class on student performance. The relationship between union influence and lost days is relatively straightforward. The number of effective class days is affected by strikes. Unions are needed to organize a strike although they need to have a reason to call their members into a work stoppage. Hence, the employer, in this case provincial governments, also has an impact on the emergence of conflicts in the education sector. For instance, delay in the payment of salaries provoked the reaction of public sector workers and teachers in many cases, following the argument that it is not low salaries, but the absence of income the source of mobilization (Scott 1976). Hence, the loss of class dates results from the interaction between provincial governments and teachers' unions; we will control for this effect with variables such as delay in payments. Additionally, other variables affect the cost of striking

[26] In most provinces there is only one teacher's union. In those where there is more than one union we have considerate only the most important union (in terms of density and legal status). Finally, in those provinces where any union could be defined as principal (such as Buenos Aires), we have compute POL_AL taking the average political relation between the governor and the unions.

[27] A note should be devoted to the operationalization of union density. One natural measure would have been the affiliates/teachers ratio (AF_T). However, the official record of affiliates provided by the Ministry of Labor presents several problems: For some unions there is no information about affiliation; there are also some cases where a single provincial unions present a number of affiliates higher than the total number of provincial teachers. Thus, we have decided to use PARTICIP as a proxy of union density instead of AF_T in the regressions.

and thus, the capacity of unions to call for work stoppages. In particular, attendance bonuses have an impact on the cost for individual teachers and will be used as control variables.[28]

ii. Teacher Tenure: According to the results of the EPF, teachers' tenure has a positive effect on student performance. Unions generally demand tenure for teachers. In fact, the "titularización" or "tenuring" is the second most mentioned demand of CTERA following low wages[29]. Unions demand tenure for their members because temporary employees are in a more precarious situation in terms of rights and also in terms of the risk they are willing to bear in collective action. Hence, tenure not only benefits temporary teachers, but also increases the homogeneity among union members and reduce the risks of striking because it is usually associated with job stability, thus making collective action easier for unions.

iii. Class Size: Public sector unions have a preference for a larger workforce. A growth in employment implies a larger constituency to represent that can increase the strength of the union, in particular in a sector characterized by job stability and where the salaries are defined in fiscal and political terms rather than according to productivity as they are for tradable sectors. Additionally, teachers' unions have traditionally demanded a low teacher/student ratio to improve the work conditions of their affiliates. We are concerned with the impact of their demand for enlarging employment in the education sector, and whether larger employment results in a smaller student/teacher ratio. That is, if they demand increasing employment but also obtained easier conditions for leaves or new employment results in a expansion of administrative positions, it is possible that the student/teacher ratio remains unchanged. Hence, we test the effect of union on the effective student/teacher ratio.

[28] There are significant differences among provinces in this regard. For instance, the attendance bonus in Santa Cruz represents one third of the basic salary but in Neuquén, it does not exist.

[29] For example, SUTEBA (one of the main teacher's union in Buenos Aires) claims: "*The Ley de Titularización was finally approved. We obtain job security for more than 40000 teachers in Buenos Aires. It's a triumph for SUTEBA, thanks to the unity and organization of our union. To pass the law we had to confront the government and the provincial legislature, but also the Federación Sarmiento (the other main teacher union in Buenos Aires) who were against the interest of the teachers*". (Our own translation from SUTEBA's web page www.suteba.org.ar)

iv. Education Budget We cannot derive a direct effect from budget allocation to the education function defined above. However, the education budget should have an indirect effect in the learning process. Hoxby (1996) argues that whether unions perform a rent seeking role or a collective voice role, they are always expected to increase the overall budget. Teachers' unions also affect the budget composition, pressing for higher wages. Thus, strong unions should lead to higher education budgets and salaries, or at least to a higher allocation of salaries in the education budget. In particular, we are interested in the effect of our measures of union characteristics on the expenditures per student in each province, to assess their indirect impact on student performance.

v. Job satisfaction: According to the results of the education production function, teacher's satisfaction has a positive effect on students performance. But, what is the impact of unions on job satisfaction? Unions are supposed to improve the working conditions of the covered workers, therefore they should express greater satisfaction with their jobs than otherwise comparable nonunion workers. However, most empirical studies have found a negative relation between unionized workers and job satisfaction[30]. Several reasons might explain this result. It is important to note that job satisfaction is a subjective variable[31]; so its not necessarily related to the "objective" conditions of each employee relative to others (e.g. lower wages, poorer working conditions). Freeman and Medoff (86), argue that unions galvanize worker discontent in order to make a strong case in negotiations with management. However, it is also possible that unionized workers report less satisfaction because they are truly worse off. As emphasized earlier, we believe that these measures of "unionization" at the individual level might be capturing personal characteristics of the worker. For instance, teachers who are more prone to conflict and dissatisfaction, are also more likely to join an organization such as a labor union.

[30] Freeman (1977), Freeman y Medoff (1986).

[31] According to Locke (1976), job satisfaction depends not only on the objective circumstances in which an individual finds himself but also on his psychological state and thus on aspirations, willingness to voice discontent, the hypothetical alternatives to which the current job is compared, and so forth. Kalleberg (1977) provides a similar definition from the sociological perspective. He argues that job satisfaction depends on the personality of the worker and on the nature of the job he performs (which includes wages, fringe benefits, hours of work, degree of control, promotional opportunities, etc).

Expected results

- We expect more strikes (and fewer class days) in the cases in which union density is high in combination with legal recognition and the lack of political alignment between teachers' union and the provincial governor. We also expect more strikes in those provinces where unionism is fragmented. Membership provides unions with the ability to call strikes (Francozi, 1995), whereas union fragmentation and the lack of political alignment increase the incentives for conflict due to the lack of trust and coordination problems that make negotiation more difficult.

- We know that teachers' unions demand tenure. Hence, we expect stronger unions (in terms of density, union monopoly and legal recognition) to be more effective on reaching tenure for their members.

- We also expect stronger unions to be more able to increase employment and therefore to impact in the size of the class.

- We expect that stronger unions in terms of density, union monopoly and legal recognition have the ability to obtain higher allocations of the education budget to salaries and a higher education budgets. Positive political alignments should enhance the bargaining power of monopolistic unions. In contrast, we expect union fragmentation and lower density to result in lower education budgets and wages.

- We do not have any particular expectation regarding the relation between union membership and job satisfaction. While unions are supposed to improve teachers working conditions and hence improve their satisfaction, there are several reasons to expect a negative correlation.

5.- EMPIRICAL RESULTS

In a previous section we found that students scores are higher when they have more class days, when the teacher is satisfied with her job, and when she has tenure. In this section we

attempt to provide some new and initial evidence on the relation between teacher's unions characteristics and the mentioned intermediate outcomes.

Regrettably there is not a unique data set linking students' performance and teacher's unions in Argentina. But, there are also certain characteristics in the labor relations in education that require a more aggregate analysis. Therefore, we consider that an "indirect approach" (as explained in section 2) is the most appropriate methodology to explore the relation between students performance and unionism.

In addition, this section also analyzes factors such as education budgets and teachers salaries. These are all-important concerns according to what unions report to care about, and we have presumptions that they could have an impact on students performance[32].

I. Lost Days and STRIKES

We expect more strikes (and thus fewer class days) in those provinces where teacher's unions are fragmented, have legal recognition, higher density, and a conflictive relation with the provincial government. We also expect attendance bonuses to have a negative effect on strikes and payment delays to have a positive effect.

Complete information about teacher's strikes in Argentina was not available before we started this study. After searching and merging different sources of information we had constructed the variable STRIKES for the period 1997-1999[33]. $STRIKES_{it}$ measures the number of lost days by province, and by year, due to teacher's unions strikes. The variable presents high variation across provinces; for example in the province of Neuquén an average of 20 days per year were lost due to teacher's unions strikes, while in Santa Cruz there were almost no strikes. Variation over time of provincial averages is lower: The

[32] The last link is an issue that needs further work. Intuitively, it seems obvious that higher expenditure per pupil should improve performance, but if the quality of education is inadequate, increasing expenditures should not necessary improve performance (IADB 1996). In Argentina, it is also not obvious that higher wages would improve teachers effort and productivity since there are several barriers that restrict the selection of teachers. But, even in the case where expenditure per pupil and teachers salary have a positive effect on student's performance, it would be difficult to measured them adequately through a cross-sectional analysis. Prices and other characteristics vary across the provinces; hence, higher wages do not necessarily indicate higher quality since they could be capturing a higher cost of living or undesirable characteristics of the school.

[33] For more details see Appendix 3.

average number of class days lost due to strikes per province was 5.0 during 1997, 4.7 in 1998 and 8.7 in 1999.

TABLE 8. Class days lost due to strikes

Provinces grouped by number of class days lost due to strikes	Average number of days lost	Teachers Participation Rate (PARTICIP)	Union Fragmentation (UF)	Political Alignment (POL_AL)
Less than 3 days	1,2	3,1	1,3	0,44
Between 3 and 10	4,8	4,3	1,6	0,39
More than 10 days	17,6	7,2	1,4	0,18

Source: CEDI

In Table 8, we have grouped the provinces according to the annual average number of class days lost due to teacher's unions strikes during the period 1997-1999. We observe higher union density and a more conflictive relation with the government in those provinces with more class days lost.

While the previous table illustrates the potential relation between teacher's unions characteristics and strikes, we need to control the results for presumably important factors such as attendance bonus (ATT_BON) and payment delays (DELAY).[34] Table 9 reports the results of pooled provincial regressions.[35]

TABLE 9. Regression Result
Dependent variable: STRIKES
OLS robust

Variable	Coefficient	t-value
PARTICIP	0.40	2.53
UF	1.24	2.79
RECOG	0.54	0.45
POL_AL	-4.12	-2.96
DELAY	0.77	8.92
ATT_BON	-0.22	-3.58
_cons	-1.74	-0.99
R-adjusted	0.90	
Observations	24	

[34] Regrettably, data on wage payment delays for public sector teacher's does not exist. According to what we have discussed with unions leaders and public bureaucrats, we have decided to use the number of provincial civil service strikes as a proxy for payment delays.
[35] We discard panel data specifications since most of the explanatory variables do not change over time.

We found evidence suggesting that higher density, union fragmentation and a conflictive relation with the government result in more strikes.[36] A ten percentage point increase on union density results in a reduction of 4 class days. In those provinces where there are two unions, students have 1.2 class days less compared to those provinces with only one union. Finally, in those provinces where there is a highly conflictive political relation between the governor and teacher's unions, there are 4.1 class days less than in those provinces with no conflict.

Taking into account the positive effect that class days have on students performance, there is a reason to criticize the role unions play. However, union's leaders argue that strikes are an instrument to improve teacher's working conditions, increase the education budget, and consequently could lead to a better education system. We are not able to check the validity of this claim, but at least, we have shown that the *means* unions use to obtain their demands have negative effects on students learning.

We also found evidence that attendance bonus and payment delays are significant factors explaining strikes. We should mention that the variable DELAY is clearly the most important explanatory variable in our regression, since most of the variation in strikes across provinces is explained by payments delays[37]. Thus, the government could reduce the number of class days lost by paying wages on time(!).

II. Tenure

We found that tenured teachers *in active service* (i.e. not on leave) are good for the performance of students. Unions report an important concern for "tenuring", thus one is tempted to presume a positive effect of unions on students performance through this channel. But as we mentioned before, this result should be taken with caution since tenure and active service are presumably negatively related, due to the more generous treatment granted to leaves of tenured teachers.

[36] The coefficient for RECOG is positive but not significant.
[37] When we take DELAY out of the regression, the R-adjusted reduces to 0.54.

"Tenuring" is one of the most important concerns for teacher's unions. Thus, we expect a higher proportion of tenured teachers (compared to *suplentes and interinos)* in those provinces where unionism is "stronger" (higher density, lower fragmentation and legal recognition). Regarding the relation between tenure and union's political alignment we consider that those governors who have a more conflictive political relation with the unions will be less likely to accept unions demands, leading to a lower number of tenured teachers.

Regrettably, we only have reliable data about teacher's tenure for the year 1994. So we are not able to provide strong evidence on the relation between unions characteristics and teacher's tenure. In table 10 we have correlated the variable TENURE[38] with different characteristics of unions. The results are neither robust, nor clear. Political Alignment and legal recognition are positively associated with TENURE as expected, but only the last coefficient is clearly different from zero. Fragmentation and density are negatively or positively correlated with TENURE depending upon the proxy we use.

TABLE 10: Tenure and Unions characteristics
Correlation Coefficient

Unions Characteristics	TENURE
Density (AF_T)	0.11
Density (PARTICIP)	-0.26
Fragmentation (U_AF)	-0.45
Fragmentation (UF)	0.15
Recognition (RECOG)	0.49
Political Alignment (POL_AL)	0.07

An alternative procedure to provide empirical evidence on the effect teachers unions have on tenure consist on the analysis of "tenuring laws". We have been searching for information regarding "tenuring laws" (TLAW) approved since 1994. The idea is to explain TLAW with the unions variables, after controlling for the percentage of tenure teachers in 1994. But the data we have compiled present several shortcomings, the most important one is the lack of information for several provinces. In Appendix 3 we present the results.

[38] TENURE is defined as the percentage of tenured teachers over the total number of teachers in each province.

III. Class Size

Teacher's unions bargain for higher employment. Therefore, we expect a lower number of students per teacher in those provinces where unions have higher density and lower fragmentation. These expectations seem to be borne by the data, as shown in table 11.

TABLE 11: Class Size and Unions characteristics

Provinces grouped according to the students per teacher ratio	Average number of students per teacher	Union Density (PARTICIP)	Union Fragmentation (UF)
Less than 15 students per teacher	13,4	6,5 %	1,2
Between 15 and 18	16,6	3,2 %	1,1
More than 18	19,4	3,7 %	1,9

Note: Provinces are grouped according to the average number of students per teacher during the period 1997-1999.
Source: CEDI

While teacher's unions characteristics are probably important factors explaining the students/teachers ratio (SPE_TPE), there are also other variables that should be considered, such as the provincial fiscal situation or regional GDP per capita.

Regarding the econometric specification, we apply the same methodology used in the STRIKES regression (pooling the original panel across provinces).

TABLE 12. Regression Result
Dependent Variable: Students/Teachers (SPE_TPE)
OLS robust[39]

Variable	Coefficient	t-value
PARTICIP	-0.08	-0.62
UF	0.89	1.52
RECOG	-0.06	-0.06
POL_AL	1.46	0.95
GDPpc	-0.001	-4.47
GPTpc	-322.5	-0.32
_cons	20.3	8.15
R2	0.42	
Observations	24	

All the coefficients have the expected sign, but none of the union variables is significant at a 90% level of confidence. (Only union fragmentation (UF) is significant at an 85% level of confidence: Those provinces where there is only one single union have a lower number of students per teacher). Most of the variation across provinces is explained by GDP per capita: richer provinces have more teachers per student.

In the previous regression we have included all the teachers, without distinguishing between teachers *in active service* from those on leave. Considering that unions demand tenuring and tenure might be negatively correlated with active service, it is possible that the relation found between unions and teachers per student could change after controlling for activity. Therefore, we explore the relation between union's characteristics and the student / teachers-*in-service* ratio (SPE_TPEA).

In addition to the control variables we have used in the previous regression, we also include a proxy of absence days regulations (DCHO_L)[40]. Presumably, those provinces where the *Estatuto Docente* provides a high number of absence days to the teachers, would be more likely to have a lower percentage of teachers *in service.*

TABLE 13. Regression Result
Dependent Variable: Students / Teachers in service
OLS Robust

Variable	Coefficient	t-value
PARTICIP	-0.10	-0.84
UF	1.20	1.64
RECOG	-0.69	-0.54
POL_AL	0.42	0.21
DCHO_L	0.002	1.16
GDPpc	-0.001	-4.03
GPTpc	-192.7	-0.19
_cons	21.3	6.29
R2	0.40	
Observations	24	

[39] Variables description and basic statistics are in Appendix 3.
[40] We have constructed this variable from the *Estatutos Docentes.* See Appendix 4.

The effect that union variables have on the student/teacher-*in-service* ratio are very similar to those found for SPE_TPE. As expected, we also found that provinces where leave regulation is more lax, have a lower ratio of teachers *in service* per student[41].

Concluding, we found weak evidence that those provinces where teacher's unions are "stronger" also tend to have a higher number of teacher's per student and smaller class sizes. In a previous section we have explored the relation between class size and student performance and we did not find any clear pattern. Therefore, we can not claim any effect of unions on performance through this channel.

IV. Budget, Composition and Wages

We expect that stronger unions in terms of density, legal recognition and union monopoly have the ability to obtain higher education budgets and a higher allocation of the budget to salaries. Provincial educational budgets also depend on local revenues, but as Sanguinetti and Nicolini (2000) argue, national transfers to the provinces are also important, since the federal coparticipation regime is highly redistributive.

In order to explore these issues we run three regressions. In the first one, the dependent variable is the log of public expenditure on education per student (logGPE_ST). The second one looks at the share of public education spent on wages (GPW_GPE). Finally, we explore the variation on teachers wages (relative to the average provincial income) across provinces. In the first and third regressions we use means from a panel data for the period 1997-1999. The second regression is based on information for a single year (1997).

[41] In the last regression, we have assumed that absence regulations and union variables are independent, although we presume they might not. (See appendix 4).

Table 14 Regression Results
Dependent Variable: Educational Expenditure and Wage
OLS Robust
(t-statistics in parentheses)

Variable	LogGPE_ST	GPW_GPE	WAGE
PARTICIP	-0.001 (-0.18)	0.003 (1.07)	-0.484 (-0.46)
UF	0.038 (0.71)	0.014 (0.85)	2.296 (0.25)
RECOG	-0.185 (-1.68)	0.058 (1.89)	21.74 (1.22)
POL_AL	-0.071 (-0.45)	0.011 (0.28)	-2.448 (-0.84)
LogLOCAL_REV	0.417 (8.38)	-0.052 (-4.33)	3.600 (0.56)
LogN_TRANSFER	0.193 (1.92)	0.070 (2.84)	43.13 (3.06)
Constant	3.603 (4.28)	0.618 (2.82)	-194.8 (-1.49)
R2	0.85	0.61	0.45
Observations	24	24	24

We found that education expenditure per student (logGPE_ST) is higher in those provinces where local revenues (logLOCAL_REV) and national transfers (logN_TRANFER) are higher. None of the teacher's unions variables is statistically significant, and they have the opposite sign than the ones we expected.

However, we find that those provinces where teacher's unions have higher density and legal recognition present a higher share of education budget allocated to wages, as expected. (Only RECOG is significant at a 90% level). Regarding the fiscal variables, national transfers have a positive and significant coefficient, but local revenues have a negative effect.

Finally, we do not find any statistically significant relation between teachers unions and teacher's wages (relative to the average provincial income). The only significant factor is national transfers, that has a positive effect.

These results are somehow puzzling, and we consider that they should be taken with extreme caution since the quality of the data (the information on teachers' wages) is not

very reliable. However, we also believe that the general message is correct: provincial education budgets, and teacher's salaries are mainly determined by fiscal variables such as national transfers.[42]

V. Job Satisfaction

In the education production function estimation we found that students perform better the more satisfied their teacher is. There is also the presumption that teachers job satisfaction and union membership are related, so it could be argued that unions affect students performance through their impact on teachers' job satisfaction. However, from a theoretical perspective the relation between unions and satisfaction is unclear. Since the objective of this research is to provide new and initial evidence on the relation between unions and students performance, we will emphasize the empirical analysis over the theoretical discussion.

The *Encuesta de Desarrollo Social* (EDS) provides a useful micro data set to explore these issues. It contains information for 1534 teachers spread across all the provinces: We are able to know if the teacher participates on a labor union, if she is satisfied with her job, and other important characteristics such as gender, age, income, and education.

TABLE 15. Job satisfaction and Union participation

	Are you satisfied with your job?	
	YES (JS= 1)	NO (JS= 0)
Union Member	7.6%	12.7%
Not Member	93.4%	87.3%

Source: EDS

As shown in table 15, job satisfaction and union participation appear to be negatively correlated. While 12.7% of the "dissatisfied" teachers participate on a labor union, only 7.6% of the satisfied teachers are union members.

[42] This does not mean that teacher's union have no impact. Actually, teacher's unions impose strong pressure for higher wages and budgets, but they have do it in a centralized fashion. The most salient recent episode was the so-called "*carpa blanca*", a demonstrations organized by CTERA, where teachers have been hunger-striking in front of the National Congress. This demonstration lead to the approval of a special

Regrettably, we do not have enough information to know the temporal relation between job satisfaction and participation. In other words, we are not able to discern if job dissatisfaction was a consequence of union participation; or if dissatisfaction preceded the decision to participate on an union. Consequently, we are not well suited to analyze what does this negative correlation means. As we mentioned before, there are at least three possible explanations for this pattern: The first is the "voice" argument provided by Freeman and Meedof (1986). The second reason is that unions worsen teachers working conditions. The third possibility is that negative relation between job satisfaction and union participation might be capturing personal characteristic of the teacher. For instance, teachers who are more prone to conflict and dissatisfaction are also more likely to join an organization such as a labor union.

From the evidence we found in this paper, we tend to believe that the second hypothesis should be discarded (as we have shown, unions seem to increase teachers wages and employment).[43] To explore the validity of the third hypothesis we analyze the relation between union participation and satisfaction "controlling" by participation in other *liberal(?)* organizations such as ecological or human rights groups.

Table 16. Job satisfaction and participation in ecological or human rights groups

	Are you satisfied with your job?	
	YES (JS= 1)	NO (JS= 0)
Participates	2.1%	1.4%
Does NOT participate	97.9%	98.6%

Source: EDS

We observe a very low rate of participation on these organizations, and a little higher among satisfied teachers. Thus, the third hypothesis might not be an appropiate explanation for the negative relation we found between satisfaction and union participation.

national tax on automobiles to finance wage increases for all teachers throughout the country (the so-called *incentivo docente*, i.e., "teaching incentive").

[43] Although that might possibly come at the expense of dissatisfaction along other dimensions; or unions might raise expectations and demand levels, widening the gap between expectations and actual work conditions.

Since we are not able to solve the endogeneity problem between PARTICIP and JS, so we present partial correlation between teacher's job satisfaction (JS) and union participation (PARTICIP), "controlling" by age (AGE), gender (GENDER), teachers education (YRSCHO), income (W) and participation on ecological or human rights groups (PART_G).

TABLE 17. Partial Correlation Coefficients of Job Satisfaction

	Column 1		Column 2	
	Correlation	Significance	Correlation	Significance
PARTICIP	-0.05	0.04	-0.05	0.03
PART_G			0.02	0.54
AGE	0.07	0.01	0.07	0.01
GENDER	-0.02	0.54	-0.02	0.53
YRSCHO	0.01	0.95	0.01	0.97
W	0.07	0.00	0.07	0.00
Nº Observ.	1517		1517	

We find a negative and significant relation between job satisfaction (JS) and union participation (PARTICIP). We also observe that the negative relation found in column 1, does not disappear after controlling for participation in other *liberal(?)* organizations (column 2). We interpret this result as evidence against the third hypothesis. Therefore, as a very first approximation we tend to conclude that the "voice" hypothesis presented by Freeman is possibly the best argument to explain the negative relation we found between job satisfaction and union membership.

6.- CONCLUSION

This paper constitutes a first cut at looking at the effects of trade unions in the education sector in Argentina. Even though we cannot draw strong conclusion or, even less, recommendations, we have provided a substantial amount of new information and we have found useful preliminary results on some of the channels of union influence on the performance of this crucial sector.[44] In the next few paragraphs we highlight some of this main channels.

[44] It is worth noting at this point that we believe that there are broader "political" factors not considered in this analysis which might have a bigger impact than union activity on the quality of education in Argentina.

We find that union characteristics have an important effect on days of class lost to strikes. Days lost are also related to fiscal problems and delayed payment of wages by provincial authorities. Furthermore, the nature of the political relationship between the unions and provincial authorities is a factor influencing strike activity.

With days of class being one of the stronger explanatory variables for student learning, there is a reason to criticize the role of unions in this regard. However, union leaders argue that strikes are an instrument to improve teachers' working conditions, increase education budgets and consequently improve education outcomes. While we are not able to confirm or to dispute this claim, we have shown that the *means* unions use to obtain their demands are negative for student learning.

We also find that union strength is related to the decision of tenuring teachers. And student learning improves when the teacher in front of the class is a tenured one. But since tenuring also seems to increase abscentism, it might reduce the actual number of tenured teachers in front of the class, with uncertain net effect on student learning.

To conclude, we want to emphasize some of the limitations of this analysis for a more complete assessment of the overall impact of unions on education. We have only looked at the effect that cross-provincial union characteristics have on education outcomes. This understates the total effects of teachers' unions, since much of their activity operates at the national level, by influencing national legislation, overall budgets, etc. Also, there is an "intercept" of union influence in the weakest-union province which we are not estimating; we only look at the marginal effect of additional union strength in cross-provincial comparisons. This "lower bound" in turn is also related to national level factors. As an example, legislation such as *Estatutos Docentes* (which is uniformly opposed by teacher unions throughout the country) has its historical origin in national legislation and is believed to have strong negative incentive effects. We leave the exploration of this matters for future work.

BIBLIOGRAPHY

Ashenfelter, Orley, and George E. Johnson. 1969. "Bargaining Theory, Trade Unions and Industrial Strike Activity." *American Economic Review* 59 (40): 35-49.

Behrend, J. 1999. “The Carpa Blanca –Civil Society and Democratic Process: A study of teachers' protest and political response in Argentina, 1997-1999” Mphil thesis in Latin American Studies, St Anthony’s College. University of Oxford. Cambridge: UK.

Cossa, R. 2000. “Determinants of Schooling Attainment in Argentina: An Empirical Analysis with Extensions to Policy Evaluation”. Bs. As, Argentina. Mimeo

CEDI 1999. “La Educación Privada en la Argentina: Historia, Regulaciones y Asignación de Recursos Públicos”. Documento de Trabajo N° 38. Bs. As., Argentina: CEDI-Fundación Gobierno y Sociedad.

CTERA 2000. “Informe de la Situación en todas las provincias”. Bs. As, Argentina. Mimeo

Corrales 1998. “The Politics of Education Reform Implementation Bolstering the Supply and Demand; Overcoming Institutional Blocs”. Amherst College. Mimeo.

Díaz y Saavedra 2000. “La Carrera de Maestro: Factores institucionales, incentivos económicos y desempeño”. Working Paper N° R-410. Washignton, US: OCE-IADB.

Eskeland, G. and Filmer, D. 2000. “Does decentralization improve learning? Autonomy and parental participation in Argentine School”. Washington, US. World Bank. Mimeo.

Fiszbein, A. 1999. “Institutions, Service Delivery and Social Exclusion: A case Study of the Education Sector in Buenos Aires”. Documento de Trabajo N°35. Bs. As., Argentina: CEDI-Fundación Gobierno & Sociedad.

Franzosi, Roberto. 1995. *The Puzzle of Strikes. Class and State Strategies in Postwar Italy*. Cambridge, UK: Cambridge University Press.

Freeman, R. 1977. “Job Satisfaction as an Economic Variable”. NBER Working Paper No. 225.

-----. 1986: “Unionism Comes to the Public Sector” *Journal of Economic Literature*. 24 (1): 41-83.

Freeman, R. and Medoff, J. 1986: *What Do Unions Do?* New York. Basic Books.

Flanagan, R. 1993. “Can Political Models Predict Union Behavior?”, in Trade Union Behavior, Pay Bargaining and Economic Performance. Cambridge, UK: Clarendon Press Oxford.

Galbraith, J. 1969. *The Affluent Society*. Boston, US: Houghton Mifflin.

Golden, M. 1993. "The Dynamics of Trade Unionism and National Economic Performance." *American Political Science Review* 87(2): 439-455.

Golden, M. 1997. *Heroic Defeats. The Politics of Job Loss*. New York, US: Cambridge University Press.

Hammermesh, D. 1999. “The Changing Distribution of Job Satisfaction”. NBER Working Paper No. 7332.

Hanushek, E.1971. “Teacher Characteristics and Gains in Student Achievement: Estimation Using Micro Data” *The American Economic Review*. 61 (2): 280-288

----. 1986. “The Economic of Schooling: Production and Efficiency in Public Schools”, *Journal of Economic Literature*. 24(3): 1141-1177.

Hanushek, E. Kain, J. and Rivkin, S. 1998. “Teachers, Schools, and Academic Achievement” Working Paper 6691. Cambridge, US. National Bureau of Economic Research.

Hayes, Beth. 1984. "Mirrors and Strikes of Assymetric Information." *Journal of Labor Economics* 2: 57-83.

Hoxby, C. 1996. “How Teachers Unions Affect Education Production”. *Quarterly Journal of Economics* 111: 671-717.

IADB 1996. Informe de Progreso Económico y Social. Washington, US: IADB.

IADB 1998. “Los Maestros en Latinoamérica: Carreras e Incentivos” Call for Proposals Research Department. Washington, US: IADB.

Kennan, John. 1986. "The Economics of Strikes." In *Handbook of Labor Economics*, vol. 2. Orley C. Ashenfelter and Richard Layard, eds. Amsterdam. North Holland.

Korpi, Walter. 1978. *The Working Class in Welfare Capitalism*. London UK: Routledge & Kegan Paul.

Kalleberg, A. 1977. “Work Values and Job Rewards: A Theory of Job Satisfaction”. *American Sociological Review*. 42 (February): 124-143

Llach, J.J., Montoya, S. and Roldán, F. 1999. *Educación para Todos*. Bs. As. Argentina: Ed. IERAL

Locke, E. 1976. “The Nature and Causes of Job Satisfaction” In *Handbook of Industrial and Organizational Psychology*. M. Dunnette. Rand McNally.

Milgron and Roberts 1993. *Economics, Organization and Management*. New Jersey, US: Prentice Hall.

Murillo, V. 1997. “Recovering Political Dynamics: Teachers' Unions and the Decentralization of Education in Argentina and Mexico” *Journal of Interamerican Studies and World Affairs* 41 (1).

Murillo, V. 1994. “Latin American Unions and the Reform of Social Service Delivery Systems: Institutional Constraints and Policy Choice” Working Paper 332. Washington, US: OCE-IADB

Murillo, V. 1999: “Sindicalismo Docente y Reforma Educativa en América Latina: Estado del Arte” Bs. As., Argentina. Mimeo

Murillo, V. and Maceira, D. 2000. “Social Sectors Reform in Latin America and the Role of Unions” Bs. As., Argentina. Mimeo.

Navarro, J.C., Carnoy, M. And Castro, C. 1999. “Education Reform in Latin America: A Review of Issues, Components and Tools” in *Institutional Reforms Growth and Human Development in Latin America*. New Haven, US: The Yale Center for International and Area Studies.

Navarro, J.C. y Cruz 1997. “La Organización Industrial de Servicios de Educación en Venezuela” Documento de Trabajo R-303. Washington, US: IADB.

Nores, M. 1999: “Teachers’ Unions in Argentina” CEDI-Fundación Gobierno & Sociedad. Bs. As., Argentina. Mimeo.

Olson, M. 1971. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge, US: Harvard University Press.

Pizzorno, Allesandro. 1978. "Political Exchange and Collective Identity." In *The Resurgence of Class Conflict in Western Europe Since 1968*, vol. II. Colin Crouch and Alessandro Pizzorno, eds. New York, US: Holmes & Meier Publishers, Inc.

Scheerens, J. 1999. “School Effectiveness in Developed and Developed Countries, a Review of the Research Evidence” Washington, US: Mimeo

Scott, James C. 1976. *The Moral Economy of the Peasant. Rebellion and Subsistence in Southeast Asia*. New Haven, US: Yale University Press.

Sen A. 1999. *Development as Freedom*. New York, US: Knopf

Spiller, P. and Tommasi, M. 2000. “The Institutional Determinants of Public Policy: A Transactions Approach” CEDI-Fundación Gobierno & Sociedad. Bs. As. Argentina. Mimeo.

Tiramonti, G. (sin fecha): “Sindicalismo Docente y Reforma Educativa en América Latina de los 90” Bs. As., Argentina. Mimeo.

Vazquez, S. and Balduzzi J. 2000. *De Apóstoles a Trabajadores., Historia de Ctera I*, Bs. As., Argentina. Instituto de Investigaciones Pedagógicas Marina Viltes, CTERA,

Velez E., Schiefelbein E., Valenzuela J. 1993. “Factors Affecting Achievement in Primary ducation: A review of the Literature for Latin America and Caribbean” Washington, Us: World Bank. Mimeo.

Appendix 1

In Table 18 we present the results for the 1997 math test score (RENMAT) averaged by class.

TABLE 18: Regression Results
Dependent Variable: logRENMAT (t-values in parentheses)

		Model I	Model II	Model III	Model IV
Student and Family Factors	Gender (female= 1)	-0.497 (0.595)	0.024 (0.309)	0.062 (0.859)	-0.047 (1.059)
	Father's Education	-0.006 (0.230)	0.028 (1.125)	0.033 (1.383)	0.001 (0.037)
	Mother's Education	0.046 (1.575)	0.036 (1.354)	0.037 (1.484)	0.043 (1.577)
	Kindergarten	0.178 (1.788)	0.096 (1.195)	0.128 (1.666)	0.224 (1.568)
	Density at home	-0.075 (2.470)	-0.069 (2.398)	-0.083 (3.001)	-0.066 (2.815)
	Repeated	-0.243 (3.327)	-0.247 (3.451)	-0.229 (3.367)	-0.246 (3.288)
	Wealth	0.0001 (2.290)	0.0008 (1..342)	0.00001 (1.872)	0.00002 (2.185)
Classroom Factores	CLASS SIZE	0.003 (1.808)	0.004 (2.179)		
	Classroom Structure	0.008 (1.824)	0.004 (0.722)	0.005 (1.154)	0.007 (1.215)
	Job Satisfaction	0.045 (2.128)	0.046 (2.304)		
	Teacher TENURE	0.011 (0.429)	-0.028 (0.964)		
	Teacher's Dedication	0.028 (1.167)	0.007 (0.272)	-0.0002 (0.010)	0.028 (1.279)
	Teacher Experience	0.020 (2.245)	0.029 (2.911)	0.022 (2.808)	0.020 (2.822)
	Teacher Education	-0.005 (0.325)	-0.007 (0.560)	-0.007 (0.531)	-0.003 (0.835)
School Factors	CLASS DAYS	0.003 (3.420)	0.002 (1.926)		
	Principal Tenure	0.029 (1.234)	0.023 (0.931)	0.010 (0.404)	-0.008 (0.249)
	Principal's experience	0.007 (0.574)	-0.025 (0.269)	-0.001 (0.172)	0.006 (0.677)
Union Variables	Coordination (UF)				0.022 (1.374)
	Participation (PARTICIP)				0.0003 (0.794)
	Recognition (RECOG)				0.053 (2.132)
	Political Alignment (POL_AL)				0.007 (0.086)
Provincial Factors	GDP per capita				0.00001 (1.256)
	Public Education Expenditure p/c				-57.298 (2.036)
	Climate				-0.00005

				(1.080)
Provincial dummies	NO	YES F-test = 5.49	YES F-test = 5.79	NO
Observations	687	687	687	687
R – squared	0.30	0.38	0.36	0.31

As mentioned in section 2, we have a system of two equations:

(1) $Y_{ij} = f (X_j ; e_j ; Z_i)$ where *i* refers to students and *j* to schools.

(2) $X_{jp} = g (U_p ; W_p)$ where *j* refers to schools and *p* to provinces.

Model I estimates the education production function in equation (1) using the school as the unit of analysis. (We have pooled all the *Yi* and *Zi* computing means for each school). In the absence of any direct effect of unions in the production function all the effects from unions should come from the effects on the inputs as described in equation (2). In the second model we introduce provincial dummies to capture the effect of any unobservable factor that affect performance and operate at the provincial level. We find evidence that the provincial dummies are jointly statistically significant, and increase the R-squared from 30% to 38%.

Of course, in this particular case the provincial dummies are a catch-all variable for everything that causes variation in outcome and is determined at the provincial level. An interesting exercise is to replace (or to explain) this provincial dummies by variables that capture variation at the provincial level in many different dimensions from unions and fiscal situation to climate.

Therefore, in model III we compute the provincial dummies coefficients excluding all those *X*'s that are presumably affected by unions. Then we explore the variation across these provincial dummies using teacher's unions and provincial characteristics as explanatory variables. (This result is shown in the next table)

Table 19. Regression Result
Dependent variable: Provincial dummies estimated in model III
OLS robust

Variable	Coefficient	t-value
Fragmentation (UF)	0.0286	0.739
Participation (PARTICIP)	0.0004	0.632
Recognition (RECOG)	0.0571	0.906
Political Alignment (POL_AL)	0.0250	0.260
GDP per capita	0.000007	0.817
Educational Expenditure per capita	-31.5930	0.509
Climate	-0.00005	0.637
R squared	0.22	
Observations	24	

We find that those provinces with higher educational outcomes, also have higher union fragmentation, higher union density, legal recognition and a less conflictive political relation between the union and the provincial government. However, none of these variables is statistically significant.

Another possibility is to estimate the reduced form of the model. This is what model IV does. We find that students perform better in those provinces where at least one teacher union has legal recognition (significant at the 95% level) and where teacher's unionism is fragmented (significant at the 80% level). Performance is also better in those provinces where union density is higher and the political relation is less conflictive, but these two results are not robust.

APPENDIX 2

The database we have provides information about 23.952 7^{th} grade students, 1.761 teachers and 991 principals.

The next table provides a description of the variables we use and their basic statistics:

TABLE 20. EPF Basic Statistics

Variable Name	**Description**	**Values**	**1997 mean**	**1999 mean**
Gender	Student's sex	1 female 0 male	0.50	0.51
Kindergar.	If the student has attended kindergarten	0 no 1 yes	0.87	0.86
Dehome	Density of people living at home	0 to 11	1.50	1.59
FaEduc	Father's education	1 Incomplete Elementary school 2 Completed Elementary school 3 Incomplete High School 4 Completed High school 5 Incomplete University formation 6 Completed University formation	3.09	3.01
MoEduc	Mother's education	1 Incomplete Elementary school 2 Completed Elementary school 3 Incomplete High School 4 Completed High school 5 Incomplete University formation 6 Completed University formation	3.17	3.11
Repeated	Has the student repeated a course?	1 yes 0 no	0.29	0.25
FamilyWealth	Wealth measured in pesos	0 to 17000	8276.47	8910.97
ClassSize	Number of classmates		25.18	25.82
Teacher Experience	Teacher's experience	1 if TE is less than 1 year 2 if TE is between 1 and 5 years 3 if TE is between 6 and 10 years 4 if TE is between 11 and 15 years 5 if TE is between 16 and 20 years 6 if TE is between 21 and 25 years 7 if TE is between 26 to 30 years 8 if TE is more than 30 years	3.62	3.71
Dedication	Teacher's dedication at school	1 full- time 0 part-time	0.72	0.64
Teacher Education	Teacher's education	1 Maestro normal 2 prof. enseñanza primaria no univers. 3 prof. enseñanza primaria universti. 4 profesor no universitario 5 profesor universitario 6 profesional universitario	1.98	2.22
Teacher Tenure	If the teacher is *titular*	1 yes 0 no	0.61	0.53
ClassDays	How many schools days she had during the year?	115 if its less than 121 days 125 if it's between 121 and 130 days 135 if it's between 131 and 140 days 143 if it's between 141 and 145 days 148 if it's between 146 and 150 days 153 if it's between 151 and 155 days 158 if it's between 156 and 160 days 163 if its more than 161 days	156.83	120.48
Job Satisfaction	Teacher's Job Satisfaction index	1 Very Low 2 Low 3 High 4 Very High	3.20	2.70
Ptitular	If principal is titular	1 yes o no	0.38	0.33
Peap	Principal's experience as principal	1 if peap is between 1 and 5 years 2 if te is between 6 and 10 years 3 if te is between 11 and 15 years 5 if te is between 16 and 20 years 6 if te is more than 20 year	1.80	1.88

When we characterize the dependent variable for each case, language test scores are on average higher than math ones, having different means for each year.

Year	Math		Language	
	mean	median	mean	Median
1997	50.31	47.37	56.03	55.81
1999	49.76	50.00	54.80	53.00

Ciudad de Buenos Aires has the best test results on average for all the tests and years we have analyzed. The other top five provinces are Santa Fe (every test), Mendoza, Buenos Aires and La Pampa (3 out of 4 tests). And in the bottom five are Tucumán and Chubut (3 out of 4 tests).

Opposed to the Coleman's Report, we find strong evidence that several school and classroom factors affect student's performance. The next table summarizes our findings obtained using the EPF for the 1997 and 1999, math and language regressions.

TABLE 21: Regression Result for 1997 language test and 1999 math and language test
OLS clustered by school
(t values in parenthesis)

	Dependent Variable:	log(renlen97)	log(renmat99)	log(renlen99)
Student and Family Factors	Gender (female= 1)	0.086	0.005	0.129
		(10.431)	(0.397)	(10.547)
	Father's Education	0.001	-0.003	-0.001
		(0.215)	(0.637)	(0.355)
	Mother's Education	0.010	0.011	0.002
		(3.391)	(2.376)	(1.505)
	Kindergarten	0.048	0.034	0.030
		(3.752)	(1.610)	(1.638)
	Density at home	-0.015	-0.022	-0.023
		(3.914)	(3.802)	(3.977)
	Repeated	-0.150	-0.128	-0.145
		(14.323)	(7.101)	(9.253)
	Wealth	0.00001	0.00002	0.00001
		(1.709)	(2.172)	(1.707)
Classroom Factors	**CLASS SIZE**	**0.002**	**-0.003**	**-0.002**
		(1.750)	**(1.874)**	**(1.921)**
	Classroom Structure	0.011	0.013	0.012
		(3.063)	(1.975)	(1.527)
	Job Satisfaction	**0.021**	**0.031**	**0.027**
		(1.787)	**(1.980)**	**(1.847)**
	Teacher TENURE	**0.002**	**0.037**	**0.041**
		(0.106)	**(1.261)**	**(1.626)**
	Teacher's Dedication	0.007	0.001	-0.019
		(0.430)	(0.058)	(0.863)
	Teacher Experience	0.009	0.028	0.010
		(1.430)	(3.133)	(1.177)
	Teacher Education	0.014	-0.016	-0.017
		(1.563)	(1.476)	(1.468)
School	**CLASS DAYS**	**0.002**	**0.003**	**0.0001**
		(2.876)	**(1.974)**	**(1.205)**

Factors	Principal Tenure	0.037	-0.048	-0.007
		(1.895)	(1.673)	(0.308)
	Principal's experience	-0.005	-0.008	-0.008
		(0.557)	(0.769)	(0.838)
	Observations	11263	9312	8959
	R – squared	0.14	0.11	0.14

APPENDIX 3

TABLE 22. Teacher Unionism across provinces.

(Means for the period 1997-1999)

Province	PARTICIP	UF	U_AFF	RECOG	POL_AL
Buenos Aires	2.3	4	9,5	1	0,33
Catamarca	3.8	1	7,9	0	0,33
Chaco	3.3	1	6,5	1	1
Chubut	0,1	1	2,4	1	0,33
Ciudad BsAs	4.5	3	3,8	1	1
Cordoba	4.3	1	1,8	1	0,33
Corrientes	3.5	3	4,4	1	0,66
Entre Rios	4.1	1	0,6	1	0,33
Formosa	11.8	2	34,9	0	0,33
Jujuy	1.9	1	2,9	1	0
La Pampa	6.3	1	3,6	0	0,33
La Rioja	0,6	1	2,7	0	0
Mendoza	3.9	1	0,8	1	0,33
Misiones	10.1	1	1,6	1	0,33
Neuquen	13.5	1	1,3	1	0
Rio Negro	12.3	1	1,2	1	0,33
Salta	0,4	2	2,0	1	0,66
San Juan	1.9	1	1,8	1	0
San Luis	7.5	1	6,6	0	0,66
Santa Cruz	7,0	1	2,8	1	0
Santa Fe	0,8	1	0,3	1	0,33
Santiago Estero	2,0	2	8,6	1	1
Tierra Fuego	0,1	1	12,7	0	0
Tucuman	4.7	1	1,1	1	0

Source: CEDI

I. Strikes

Description

Variable	Description	Source
STRIKES	Number of class days lost due to teacher's unions strikes.	Our own elaboration based on Ministry of Labor, CTI, and newspapers
DELAY	Number of provincial civil service strikes. We consider is a good proxy for payment delays in the public sector.	Ministry of Labor and CTI
ATT_BON	Attendance bonus as a percentage of wages.	Ministry of Education

Note: The province is the unit of analysis.

Basic Statistics

Variable	Nº Obs	Mean	Std. Dev	Min	Max
STRIKES	72	6,13	10,88	0	76
PARTICIP	72	4,60	3,90	0.1	13,5
UF	72	1,42	0,82	1	4
RECOG	72	0,75	0,44	0	1
POL_AL	72	0,36	0,33	0	1
DELAY	72	3,36	10,85	0	81
ATT_BON	72	6,08	7,63	0	26

Source: CEDI

II. Tenure

TABLE 23. Tenured teachers across provinces.

Province	Percentage of Tenured Teachers (1994)	Province	Percentage of Tenured Teachers (1994)
BUENOS AIRES	59%	MENDOZA	67%
CATAMARCA	32%	MISIONES	58%
CHACO	49%	NEUQUEN	46%
CHUBUT	56%	RIO NEGRO	43%
CORDOBA	65%	SALTA	67%
CORRIENTES	64%	SAN JUAN	63%
Ciudad BS.AS.	57%	SAN LUIS	65%
ENTRE RIOS	56%	SANTA CRUZ	47%
FORMOSA	41%	SANTA FE	59%
JUJUY	65%	SANT. DEL ESTERO	43%
LA PAMPA	48%	TIERRA DEL FUEGO	38%
LA RIOJA	50%	TUCUMAN	61%

Source: Censo Nacional Docente (1994)

Teacher's "Tenuring"

Teacher's tenuring is supposed to be regulated by the *Estatutos Docentes* and done in an individual basis. The procedure is quite similar across provinces: Only those teacher's that satisfy certain conditions, such as age, education, training courses and in some cases only those who approve an exam are able to be tenured. In some provinces, the *Junta de Calificaciones* (where unions have representatives) are the boards in charge of the evaluation. However, this mechanism is usually delayed as a consequence of burocractic procedures or political convenience.

In Argentina, a significant proportion of teachers have been tenured trough a different mechanism: "Tenuring Laws". These laws apply to hundreds or even thousands of teacher's at the same time, and do not require teacher's to fulfill any condition (such as age or education) to be tenured. Tenuring laws are usually consequence of the pressure

exercised by teacher's unions over the provincial government (see note 29). We have compiled legislative information regarding tenuring laws, but it was impossible to construct a complete and reliable data set. The next table presents our findings:

TABLE 24. Provincial "Tenuring Laws"

Province	Law number and year
Buenos Aires	Ley 12.609 (2000)
Catamarca	Ley 4.804 (1994), Ley 4.503 (1987)
Chaco	Ley 4.619 (1999)
Chubut	Ley 4.021 (1994), Ley 3.178 (1988)
Ciudad de Buenos Aires	Ley 283 (2000)
Córdoba	Ley 8.399 (1994), Ley 7.614 (1987), Ley 7.462 (1986)
Corrientes	Without information
Entre Ríos	Without information
Formosa	Without information
Jujuy	Without information
La Pampa	Ley 1.286 (1991)
La Rioja	Ley 6.322, 6.380 (1997), Ley 6.102 (1993), Ley 5975 (1991)
Mendoza	Without information
Misiones	Ley 3742 (2000), Ley 2.831, 2991 and 3052 (1993)
Neuquen	Without information
Río Negro	Without information
Salta	Ley 6.756 (1992)
San Juan	Ley 6.867 (1998), Ley 6644 (1995), Ley 6670 (1993), 6205 (1991)
Santiago del Estero	Ley 5.637 (1987)
San Luis	Ley 5.039 (1995), Ley 4988 (1994)
Santa Cruz	Without information
Santa Fé	Ley 11.100 (1993)
Tierra del Fuego	Without information
Tucumán	Without information

Source: CEDI

II. Class Size

Description and basic statistics

Variable	Description	Mean	Source
TPE	Number of teachers on primary and public schools	9999	Ministry Education
TPEA*	Number of teachers-in-active-service on primary and public schools	8558	Ministry Education
SPE	Number of students attending primary and public schools	172489	Ministry Education
SPE_TPE	Ratio	16.34	
SPE_TPEA	Ratio	19.40	
GDPpc	Provincial GDP per capita	6538	Ministry of the Economy
GPTpc	Total public expenditure per capita	0.0014	Ministry of the Economy
DCHO_L	Number of Absence days the tenured teacher can take during 25 years	1978	Our own analysis of the *Estatutos Docentes*

*Caveat: Since there is information about teachers "on activity / on leave" only for 1994, we have constructed the variable TPEA for the period 1997-1999, assuming this ratio did not change over time.

IV. Budget and Wages

TABLE 25. Expenditure on Education: International Comparison (1997)

Country	Public Expenditure on education (as % of GNP)	Expenditure on teachers wages as a % of total current education expenditure	Student / Teacher ratio	Duration
Argentina	3,5	84,1	17	10
Australia	5,4	54,2	12	10
Brazil	5,1	-	23	8
Canada	6,9	62	16	10
Chile	3,6	-	30	8
Colombia	4,1	81,9	25	5
Korea Rep.	3,7	-	31	9
Mexico	4,9	-	28	6
Peru	2,9	40,1	28	6
Uruguay	3,3	41,5	20	6

Source: World Development Indicators

Variables Description

Variable	Description	Source
GPE	Public expenditure on Education	Ministry of Education
ST	Number of Students	Ministry of Education
GPE_ST	Ratio	
GPW_GPE	Share of total public education expenditure spent on teacher's wages.	Ministry of Education
WAGE	Ten years tenured teacher's wages relative to provincial GDP per capita.	Ministry of Education / M. Of the Economy
N_TRANSFER	National transfers to the provinces	Ministry of the Economy
LOCAL_REV	Provincial local revenues	Ministry of the Economy

V. Job Satisfaction

Variables Description

Variable	Description	Source
JS	1 if the teacher is satisfied with her job, 0 otherwise	EDS
PART_G	1 if the teacher participates on ecological or human rights asociations	EDS
AGE	In years	EDS
GENDER	1 if male, 0 if female.	EDS
YRSCHO	Number of years of schooling	EDS
W	Wage, in pesos	EDS

Note: Teachers are the unit of analysis.

Basic Statistics

Variable	If the teacher IS satisfied (JS=1)			If the teacher is NOT satisfied (JS=0)		
	Obs.	Mean	Std.Dev.	Obs.	Mean	Std.Dev.
PARTICIP	1463	0,076	0,265	71	0,127	0,335
PART_G	1462	0,021	0,144	71	0,014	0,119
AGE	1463	36,419	9,853	71	32,155	8,309
GENDER	1463	0,159	0,365	71	0,183	0,390
YRSCHO	1448	14,432	1,871	70	14,314	2,137
W	1463	501,99	397,18	71	334,80	309,01

APPENDIX 4

There are other channels of (possible) union influence in the educational sector. These are the *Estatutos Docentes* (main laws regulating teachers working conditions), and the *Juntas de Clasificación* (boards that intervene in ranking teachers for purposes of assignment priorities). We were unable to collect the necessary information to provide robust empirical evidence on these relations. However, we presume that teacher's unions play an important role opposing any attempt to reform the *Estatutos Docentes* and in the government of the *Juntas de Clasificaciones*. In the next pages we describe the main characteristics of both issues, leaving the empirical analysis for further work.

I. Estatutos Docentes

Unions are expected to lobby for special interest legislation that would strengthen their power. In Argentina the *Estatutos Docentes* are a good candidate to analyze, since they regulate working conditions such us fringe benefits, severance pay, and teachers career. We expect that provinces with stronger unions are likely to have more benefits for teachers. However, we need to be careful since there is a potential problem of endogeneity (reverse causality). In some provinces the *Estatutos Docentes* were approved before unions were born, and in others it seems that unions strength grew after the statute was implemented. In any case, unions are the main opposition force against the reform of *Estatutos Docentes*, so that if we uncover the effect of the *Estatutos* on performance, these can be partially be attributed to union effects.

The *Estatutos Docentes* constitute the fundamental rule that regulates the labor relationship between public teachers and the provincial administration. The Teachers' Acts also establish the rights and the duties of the teachers, the enrollment requirements in the

teaching career, the labor stability system, the evaluation mechanisms, the filling of vacancies and promotions, the paying criteria and the discipline and incompatibilities systems. Some acts include in their articles leaves of absence regulations. But also the teachers' acts regulate aspects related to the educational system organization, aspects that are not truly connected with the contractual relationship between the provincial state and the teachers.

The first preceding regulation about teachers' activity goes back to 1954. In 1958, it was approved the law number 14.473 that defined a new act for national teachers[45].

From the national legislation the provinces were passing their own legislation. In 1957, Córdoba passed the first labor contract for the provincial teachers. In 1958 Salta[46] and Santiago del Estero provinces did the same. In the sixties and seventies another nine provinces did the proper: La Rioja, San Juan, Jujuy, Entre Ríos, Misiones, Río Negro, Catamarca and Tucumán. All the remaining provinces implemented their own legislation in the eighties.

During the nineties several provinces implemented reforms in their teachers' acts (Salta, Neuquén and Formosa, among others). From this chronology of the *Estatutos Docentes,* we can group the provinces in three categories: a) Those provinces that maintain the original acts passed between the fifties and sixties; b) Those provinces in which their rules in force were passed during the eighties; and c) Those provinces that have reformulated their regulation in the nineties.

From now on we will try to give some elements that may be useful to characterize this labor contract, so as to show some differences between districts.

(a) Rights and Duties

The acts gives to the teachers a great quantity of labor rights. Among other things, they guarantee labor stability, mobility in the career, changes and transfers to other teaching

[45] This law lost validity in 1992 when the process of decentralization of the educational services to the provinces took place.

[46] In 1995, Salta has approved a new labor act for their teachers.

institutions, concentration of tasks in a single institution, accumulation of weekly teaching, extraordinary absences, the liberty to form a union and the participation in the educational government. In some provinces these rights are common to tenured and *interinos* teachers, in others, they are mainly restricted to tenured teachers. In table 26 we indicate in terms of percentage, the quantity of rights that the acts gives to *suplentes* and *interinos* teachers relative to the tenured teachers (see column 1). We also indicate the number of absence days that a tenured teachers can have during a period of 25 years of service (column 2). Absence regulations are extremely profitable for public teachers compared to the private labor contract law. This absence system is presumably the main cause of the considerable high level of *suplentes* that we observe in the argentine educational system.

(b) Hiring and Firing Mechanism

The teachers' labor code regulates the enrollment and promotion in the teaching career. It is organized by a sole entry port and a strict promotion system in the hierarchy*. Only those teachers who have accumulated a certain number of points (training courses, etc) are able to enter the public sector, and they start at the bottom of the hierarchy. Promotions and tenuring are based on public preceding and opposition tournaments. These mechanisms generate a closed labor market that discourage competition and privilege the seniority and permanence in the system to make their way up the scale. However, this mechanism is usually delayed as a consequence of burocratic procedures or political convenience. Finally, the *Estatutos Docentes* introduce strong restrictions to the personnel firing.

(c) Supervision and Control Mechanism

In Argentina, as in other countries of Latin America, the supervision and control mechanisms of teachers' performance are really poor[47]. This system relays on a conceptual and individual evaluation made by the school directors. This subjective evaluations are put in the professional acting registry of each teacher. The lack of an incentives and supervision system is one of the mains deficits of these evaluation and control of the teachers' performance systems.

[47] For more details see, Peru and Venezuela studies “Teachers in Latin America: Careers and Incentives”.

(d) Unions' Rights

All the *Estatutos Docentes* establish the right of liberty to form a union and to participate in the educational government through the teachers' classification board. In some provinces, those teachers who are union delegates have extraordinary permissions to leave their school duties (go to union congresses, etc.) without loosing their salaries. For example, in Santiago del Estero union delegates can take 20 days during the year with no reduction on their wages (column 3).

(e) Wage Mechanism

Teacher's wage is based on the *Estatuto Docente*. In all cases the wage system includes the payment by office, hierarchy and seniority. This last component awards the teacher's experience in the activity and allows the promotion in the payment scale. The wage system does not give incentives for a major professional training nor for a better performance in the class. In some provinces the teacher's wage includes an attending bonus (column 5).

Finally, we have constructed two indicators that may be useful to identify some differences across provinces in the degree of regulations. In column 6 we present an index that quantifies the number of situations that are regulated by the *Estatuto*. We also have constructed an indicator to measure how these acts have changed over time (column 7).

TABLE 26: Estatutos Docentes Indicators

Province	*Suplentes* rights (as a percentage of tenured teachers rights)	Number of absence days a tenured teacher can take during 25 years of service	Permissions for unions' delegates (days per year)	Permissions for unions' offices	Attendance Bonus (as a % of total salary)	Index of over-specification (measured by the number of regulated issues)	Number of modifications per year
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Private Labor Contract	n/c	889					
First Generation of Acts	*83%*	*1858*			*4%*	*21*	*0.2*
National Act	Without data	Without data			n/c	24	n/c
Córdoba (1957)	75%	1,868		yes (100% salary)	20%	21	0.4
Santiago del Estero (1958)	90%	2,438	20 (100% salary)	yes (100% salary)	6%	20	0.1
La Rioja (1960)	88%	1,696	12 (100% salary)	yes (0% salary)	5%	21	0.2
San Juan (1960)	50%	2,078	12 (100% salary)	yes (0% salary)	0%	22	0.5
Jujuy (1960)	90%	1,969		yes (0% salary)	0%	15	0.1
Entre Ríos (1962)	90%	1,861		yes (100% salary)	0%	15	0.0
Misiones (1963)	90%	2,500		yes (100% salary)	7%	25	0.4
Río Negro (1964)	90%	1,931		yes (0% salary)	0%	26	0.3
Catamarca (1976)	90%	1,657	4 (100% salary)	yes (0% salary)	0%	26	0.0
San Luis (1961)	88%	1,154		yes (0% salary)	5%	22	0.0
Tucumán (1967)	70%	1,292		yes (0% salary)	0%	19	0.3
Second Generation	*53%*	*2,149*				*23.3*	*0.6*
Buenos Aires (1987)	10%	1,723	12 (100% salary)	yes (0% salary)	21%	21	0.7
Chubut (1980)	50%	2,609	48 (100% salary)	yes (100% salary)	18%	15	1.5
Ciudad de Bs As (1985)	50%	2,743		yes (0% salary)	4%	33	0.7
Corrientes (1982)	50%	1,876		yes (0% salary)	0%	25	0.5
Mendoza (1984)	90%	1,359		yes (0% salary)	7%	24	0.3
Tierra del Fuego (1985)	70%	2,586		yes (0% salary)	0%	22	0.1
Third Generation	*55%*	*2,343*			*6%*	*29*	*1.1*

Formosa (1990)	30%	2,495		yes (100% salary)	8%	26	0.2
La Pampa (1989)	50%	2,006		yes (100% salary)	16%	27	0.6
Chaco (1989)	60%	2,773		yes (100% salary)	0%	31	3.7
Neuquen (1991)	80%	2,096		yes (0% salary)	0%	31	0.0
Fourth Generation							
Salta (1995)	90%	1,391	3 (0% salary)	yes (0% salary)	7%	17	0.5
Without Classification							
Santa Cruz		1,516		yes (100% salary)	26%		
Santa Fé	0%	1,866	12 (100% salary)	yes (0% salary)	16%	11	n/c

Source: Elaborated by the authors based on the provincial Labor Code's

II. JUNTAS DE CALIFICACIONES

The decisions on the professional career of teachers in public schools are handled by the teaching profession through special boards (*Juntas de Calificaciones*). These boards use a system of points in which diplomas, tenure and courses constitute the main factors. Those applicants with the highest scores have the first right to select among open positions, and school authorities and students' parents have no voice in the selection process. Teachers' unions play a major role in the Juntas for two reasons: While in theory the members of these boards could be non-union teachers, in practice they are generally affiliated to a union -- in the City of Buenos Aires all the members of the Junta are unionized (Morduchowicz and Marcón, 1996). Furthermore, teachers' unions' representatives form a special commission in charge of establishing points for different diplomas, tenure and courses. Regrettably we were unable to collect data on unions role and participation in the Juntas.