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**Muscle, Timing, and Priorities:
Teacher Unions and Education Quality in Mexico**

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1. Introduction

It is commonly believed that teachers' unions exert great influence over education and that this influence is not necessarily positive (Minter-Hoxby, 1996; Moe 2001; Eberts and Stone, 1987). Often, teachers' unions are seen as rent-seeking organizations whose top priority is to increase their power and influence, and obtain benefits for their members (Moe 2001). In countries with only one union or where one union represents a vast proportion of teachers, they can use their monopolistic position over labor relations between the State and the education sector, to benefit their agenda, one that is not always congruent with the goals of efficiency and improved educational quality.

In Mexico, there is ample evidence for this idea. Even though teachers' salaries rose in real terms over 1996-2004 in virtually all of the OECD countries, some of the largest increases were seen in Mexico (OECD, 2005). These raises were undertaken at a time where educational performance was not seen as improving and despite repeated calls to strike a better balance between wage and non-wage expenditures¹ and to "resist unjustified raises in teachers' real wage" (OECD, 2005). The recent announcement that the Mexican government will budget close to 4 billion dollars annually² to improve teachers' salaries even more was perceived by some as a concession to the teachers' union in exchange for political support during the 2006 elections.³

The *Sindicato Nacional de Trabajadores de la Educación* (SNTE), the national teachers' union in Mexico, represents over 1 million members, and is the largest union in

¹ By some estimates, wage expenditures take up more than 90% of the budget in Mexico (REF).

² The budget increase will take place gradually, until it reaches the agreed 4 billion dollar annual increase in 6-7 years time.

³ Among those voicing these opinions were prominent op/ed writers such as Miguel Ángel Granados Chapa (Reforma, Oct-18-2006), and academics like Carlos Ornelas (cited in <http://www.foros.gob.mx/read.php?3,261508>).

Latin America.⁴ More than half of SNTE's total membership is composed of primary and secondary teachers. Members include teachers, school administrators, education bureaucrats, janitors, cafeteria workers, and school aides. Figure 1 shows SNTE membership by state. States such as Veracruz, Estado de México, Puebla, and Jalisco have the largest SNTE memberships. This is, of course, tied to population as the number of teachers tends to grow proportionally to the school age population.

[Figure 1 here]

Because of various legal arrangements (included in the Federal Education Law) SNTE holds a virtual monopoly over labor relations between the education sector and the State. The mandatory fees it collects from members (around 1% of base salary) and the minimal accountability it must give to its members or the public over the use of these funds, give its leadership enormous financial power.

SNTE is governed by one Executive Committee (that is composed of the national leadership) and 55 sections distributed across the country. Thirty-one of these are federal sections, 18 are state-sections and 5 are "single" sections. One section small represents teachers in private schools.

Politically and ideologically speaking, SNTE is far from a uniform block. Even though for many years it supported the Partido Revolucionario Institucional (PRI), which ruled Mexico from the 1930s until 2000, serving as a virtual political arm (Arnaut, 1996; Bayardo, 1993), nowadays many sections within SNTE and even its leadership support

⁴ SNTE's membership figures (as well as most SEP teacher statistics) usually refer to "plazas" or teaching positions. Because teachers and other education workers can hold two or more teaching positions (for example a teacher in a morning shift school, and a school principal in an afternoon shift school), membership numbers overestimate the actual count of individuals belonging to the Union.

other parties and ideologies.⁵ Among the various political or fractions within SNTE, two can be clearly distinguished: the “institutional” faction which is aligned with SNTE’s national leadership (the Executive Committee), and the “dissident” faction grouped under the *Coordinadora Nacional de Trabajadores de la Educación* (CNTE) and representing more radical, left-leaning ideologies.

In a recent meeting in Mexico City with academics and the media, representatives from the OCDE declared that SNTE was one of the reasons why Mexico placed so low in international educational evaluations (La Jornada, 10/28/06). The majority of Mexican teachers themselves view the union with either distrust or indifference and do not think it contributes to increasing school quality, as a recent opinion survey showed (Ipsos-Bimsa 2006, quoted in Reforma, 12/21/06).

A recent study commissioned by the Ministry of Education, found that the union’s large power and the powers granted to it by Mexican Education Legislation, prevent the Ministry of Education of being able to effectively govern the education sector according to its own agenda. (Iaies et al., 2006). In fact, Iaies et al. argue that the fact that SNTE has virtual veto power over education policy and reform, SEP has limited governance over the education system in Mexico.

In 2007, the new government led by President Calderón, named Fernando Gonzalez, son-in-law of SNTE’s President Elba Esther Gordillo, as the new Undersecretary for Basic Education, one of the highest ranking positions in the Ministry of Education. Gonzalez’ militancy in SNTE as well as his close connection to Gordillo,

⁵ The animosity between SNTE’s President Elba Esther Gordillo and Roberto Madrazo, the PRI’s presidential candidate in the 2006 elections was widely known. It is generally believed that just as she had helped Vicente Fox to the presidency in 2000, she also politically maneuvered to defeat Madrazo in favor of Felipe Calderón. Calderón won the election and became Mexico’s President in December of 2006.

underscored an imminent conflict of interest, to which the new President remained oblivious. Lastly, even though teachers and other school personnel are government employees as well as Union members, it is the union aspect which seems to dictate their responsibilities and range of action. School administrators and supervisors, for example, have recognized that they respond more to Union than to SEP officials, and that their job descriptions include coordinating and serving as liaisons between the Union and SEP (Jaies et al., 2006).

Although it is generally accepted that the union holds large power over the education sector and to a large degree co-governs it with the Ministry of Education, its particular influence on education quality is far from established. Some authors studying education in Latin America found that unions per se do not have a detrimental effect on quality, but that its impact depends on the channels and political context in which unions operate (Murillo et al., 2002; Alvarez, et al., 2006; Stein et al., 2006). As the literature suggests and is also explored in this paper, there have been instances in which the unions and state cooperate to implement and gain consensus for progressive reforms that could be labeled anti-union, but nevertheless need union support to be implemented (Stein et al., 2006; OECD, 2005).⁶ One example is the implementation in 1992 of the National Modernization Agreement which decentralized education to the states and also instituted the teacher incentive program *Carrera Magisterial*. It has been acknowledged by several authors that without the Union's support, this agreement could not have been implemented (Santibañez et al., 2006, Ornelas, XXX). The question remains, however, as

⁶ Throughout this paper we refer to progressive reforms as those whose primary objective is to improve education quality and efficiency in the sector.

to whether union influence over these reforms alters them in such a fundamental way that in the long term they come to be regarded as Union wins (Santibañez et al., 2006).

In this paper, we use the case of SNTE in Mexico to provide further empirical tests for these contrasting views. First, we study the relationship between various measures of union influence and education quality. Using data from national standardized student exams we estimate a model that attempts to explain several state-level influences on education including measures of union strength, political inclination, and various state reforms. The second part of this paper explores some successful and unsuccessful instances of state-union cooperation in advancing progressive school reform. We focus on the states of Chiapas and Oaxaca to exemplify how this interaction and its ultimate outcomes were affected by the political timing and priorities at the state and federal levels.

Results from this paper will help further our understanding of the complex interaction between union factors and educational quality. They could help shed light on the conditions that make union-state cooperation more plausible and conducive to progressive reform. In addition, it will explore the conditions that appear to promote positive climates of Union-Government cooperation and suggest whether these are replicable to other situations.

2. Conceptual Framework

Assume the union's primary objective is to improve salaries and other pecuniary benefits for its members (for now assume the leadership's behavior dictates all of the

Union's behavior).⁷ The government, on the other hand, is primarily concerned with improving education quality and efficiency. This objective is more plausible in democratically elected governments, which need to garner enough public support to win elections.

To push for higher salaries, the Union must first, gather enough force ("muscle") to be taken seriously. In this context, Union force is derived from membership and cohesion. A union that concentrates most or all teachers and education workers in the State will be more powerful than one that does not. In addition, a cohesive Union that behaves as a compact unit could exert more influence over government than one that is fragmented and pulled in different directions.

Union Force = f (Membership, Cohesion)

While Union strength allows it to successfully organize protests and take to the streets, it is not always a sufficient condition to obtain what it wants. Often, unions need to make some concessions or provide Government with some valuable service so that it might increase its bargaining power. These could include arrangements with the government in the form of election votes, political support, financial resources⁸, or other. All of these can be thought of as measures of political favors or how much the government "owes" the Union. Together, Union force and arrangements with Government, allow Unions to negotiate more or less successfully to attain their agenda.

⁷ Before pushing for higher salaries, Unions might fight for reforms that allow it to improve their membership: more teaching positions, laws that give the Union monopoly power over Government-Education labor relations, lower class sizes, etc. We will assume that the Union has already gathered a critical mass of members, so that the primary objective becomes salaries.

⁸ Unions usually are well endowed, through the fees collected from Members. In Mexico, the teachers' union collects mandatory fees around 1% of salaries, for over one million education workers in Mexico. Some in Congress have estimated SNTE's annual receipts from member fees of around 200 million dollars ("Explotan SNTE y Gordillo \$2 mil millones anuales al magisterio: diputada del PRI", La Jornada, Nov-26-2005).

Governments are also subject to their own set of pressures. For discussion purposes, assume that citizens in a democratic country care about education. Thus, Governments will need to respond to parents and society's demands for better education. To simplify matters assume parents and society care about education quality and efficiency, above all other educational outcomes. Therefore, the Government must mediate two potentially conflicting agendas: the Unions' and Society's. The outcome of Union-Government interactions will then depend on the following three key bargaining forces:

$$\text{Outcome} = f(\text{Union Force, Political Arrangements, Society})$$

Table 1 illustrates some possible combinations of these three bargaining forces. Clearly, there are more combinations than this table presents. These only serve to suggest several hypotheses concerning the potential outcomes of Union-Government interaction under different bargaining scenarios.

[Table 1 here]

Table 1 suggests that Union strength alone is not enough, because the interplay of these various forces will affect the negotiation and its ultimate result. One important influence of the results of Union-Government negotiation not mentioned in Table 1 is the nature of the demand. If the salary demand is deemed unreasonable by the Government or falls outside its possibilities, the negotiation might result in other concessions to the Union (more professional development, more school resources, etc.). In addition, if the Government's demands are deemed unreasonable by the union, for example allowing school principals to fire teachers or abolishing tenure from teaching positions, the Union might offer to concede some less threatening policies such as allowing competitive

processes for entry into teaching, implementing teacher incentives systems that are tied to easy or flawed examinations, or allowing fuzzy evaluation and accountability mechanisms.

In sum, the main argument in this paper is that Union influence over educational matters depends not only on Union strength, but also on its ability to enter into valuable political arrangements with the Government. These political arrangements depend partly on the political conditions present at the time of the negotiation, and on society's priorities and demands regarding educational quality. The next section describes the variables that will be used to measure these various influences.

3. Research Questions and Methodology

The analysis focuses on trying to answer the following two research questions: (1) what is the relationship between union influence and student achievement? And (2) under what conditions (political and other) does union influence affect achievement more or less?

To answer the first research question, we will estimate a base model of the form:

$$Y_{its} = \alpha + \beta_1 U_e + \beta_2 STU_i + \beta_3 FAM_i + \beta_4 T_{ts} + \beta_5 SCH_s + \beta_6 E_e + \varepsilon_{its} \quad (1)$$

Where:

Y= Achievement (in primary) of student i , taught by teacher t , at school s

U= Union relevant variables (at the e or state level)

STU = Control variables at the individual student level i

FAM – Control variables at the family level for student i

T = Control variables at the teacher level for teacher t at school s

SCH = Control variables at the school level for school s

E = Control variables at the state level for state e

The model will be estimated cross-sectionally using individual-student level data for 2004. Due to survey design, results are representative at the state level. The variables

of interest are those related to the Union. A second model will be estimated that adds several interaction terms to equation (1), such as the interaction between union strength (membership) and public education accountability.

One common methodological concern with cross-sectional models attempting to capture the relationship between student achievement and a set of explanatory variables, is that by not including potentially relevant variables some of the relevant coefficients in the model might be biased. Bias of the kind arises when there is an omitted variable that is correlated both with the outcome of interest and one or more independent variables. This could happen, for example, when there is sorting of teachers in schools or classrooms with higher ability students, or sorting of high ability students into certain kinds of schools. If this were the case, coefficients on the variables trying to measure teacher or school quality would likely be biased since certain kinds of teachers (not necessarily the more competent ones) are more likely to sort into higher-ability classrooms, and certain kinds of schools (not necessarily the ones with higher quality) are likely to receive disproportionate shares of high performing kids. When this is the case, omission of relevant variables such as individual student ability or family and teacher preferences is often the main cause for the bias.

These concerns are usually alleviated either by using more data to generate proxies of those variables or using fixed effects with longitudinal data. These kinds of data, unfortunately, are not available for this study. There are some reasons to believe, however, that this kind of bias poses less of a threat to the validity of the results in the case of this analysis.

First, the Estandares data set is rich in individual, family, teacher and school level variables. It includes measures of students' motivations and expectations, as well as teachers' education, socio-economic status, and satisfaction. Although these variables might not be able to fully or even adequately capture the full range of influences over student achievement, they can help diminish omitted variable bias. Second, in this analysis the variables of interest are aggregated at the state level. Therefore, it is reasonable to assume little or no sorting of more or less able students at this higher level of aggregation, since States are expected to have more or less similar student ability distributions. Variations in school and teacher factors can be controlled by including state-level measures that could influence these variations such as state income, development indices, level of urbanicity, etc. Provided relevant factors such as income, SES and other relevant variables at both the individual and state level can be controlled for, the bias is likely to be reduced.

To try to answer the second research question, we will explore some successful and unsuccessful cases of union-state cooperation. Although the scope of this paper does not allow for in-depth case studies, studying the states of Chiapas and Oaxaca can help illustrate state-union conflict and how context and timing could lead to dramatically different results. Even though the main focus of the paper is the empirical analysis, it is our hope that the exploratory case-study section will shed some light on the complicated interaction between union and state in varying political contexts, and open up new questions and hypotheses for further research.

4. Data and Variable Description

In this section we describe the data used in the analysis. The full list of variables that will be used in this analysis as well as sources of data and dates available can be found in Table 2.

[Table 2 here]

To measure *student achievement* (a proxy for educational quality) student results in Estandares Nacionales (2003-2004), the national standardized test designed by the Instituto Nacional de Evaluacion Educativa (INEE) and administered to a nationally representative sample of primary and secondary students in Mexico are used. Data from this test are available for the 2004 application.⁹ The test is given to students in 6th grade (primary) and 3rd grade (secondary) in Spanish and Math. We focus only on primary students.

As part of Estandares, students and teachers fill out a context questionnaire containing questions about *family factors* (socio-economic status, learning environments and opportunities), *teacher quality* (education, professional development, school administrative support), and *school factors* (school facilities and resources, etc.). Answers from these questionnaires are used as control variables for students, families, teachers, and schools.

Union strength is measured using SNTE membership in each state (total number of teachers and other SEP personnel working in the state). To measure fragmentation (or

⁹ In late December we received the database for the results of INEE's new test "EXCALE" administered in 2005. While it was not possible for us to run the analyses in this draft using EXCALE, it is our intention to re-run all of the models using this newer database. We do not expect major changes to our results since EXCALE is very similar to ENLACE and has the same grade-level and subject coverage. For both set of tests, student test score information is psychometrically valid, statistically reliable, and representative at the state-level.

cohesion) the number of SNTE sections in each state is included. Fourteen states have one section, and seventeen have two sections. Distrito Federal is the state with most sections: four. Each section's political alignment with the national SNTE leadership is categorized in one of three groups: institutional, dissident, or moderate-dissident.¹⁰ Institutional factions are aligned with the executive committee of SNTE (the national leadership); dissident factions are those under the group "Coordinadora Nacional de Trabajadores de la Educación (CNTE) and are often in radical opposition to SNTE's national leadership. Moderate-dissidents often adopt a dissident position towards SNTE's national leadership but do not adhere to CNTE's more radical approaches. In some states with multiple sections, one will be labeled dissident and another one could be institutional or moderate. These states are categorized as "Both." Most sections are institutional, but particularly in the central and southern parts of Mexico dissident factions have become very powerful, such as in the states of Michoacán, Guerrero, and Oaxaca.

To measure *political or other arrangements* with the Government we focus on state governments, because at the national level there would be no variations in a cross-sectional analysis. A variable is included to measure the state government's ruling political party, and whether it is aligned with the state Union section's political inclination. In addition, several variables such as the number of teachers as a proportion of the state's population, and as a proportion of all state's professionals, as well as the salary gap between teachers and professionals in the state and the education gap between

¹⁰ The variables measuring each section's political inclination and alignment with the national SNTE leadership were constructed based on references from the literature (XXX and XXX). Because most of these references were from 10-15 years ago, we are in the process of conducting interviews with current SNTE members, journalists and academics. Therefore, the variable is still under construction until we have talked to a sufficient number of people that can confirm that all alignments are current.

teachers and the general population are included. These variables serve as indicators of whether teachers constitute an important group (in relative terms) within states. The more teachers constitute an “elite” in a state, the more voice and influence they are likely to have over political and other affairs. We also include variables to measure the number of federal congressmen (*diputados* and *senadores*) by state that are members of SNTE. Lastly, we include a variable that indicates whether the states’ education secretary is herself an active member of SNTE. The rationale for including these two variables is that the more high-level politicians in the state belonging to SNTE, the more likely it is that effective political arrangements will be sought and made between state authorities and the Union.¹¹

Table 3 shows descriptive statistics (at the state-level) for some of the variables discussed previously, such as numbers of sections, membership, political inclinations, and salary differentials between teachers and professionals.

[Table 3 here]

Table 3 suggests that states with institutional SNTE sections tend to have smaller union membership. In these states, the number of teachers as a proportion of state’s professionals is low, and the ruling parties tend to be PRI or PAN. In states where the PRD is the main political force, dissident sections have a stronger presence. Dissident states are also characterized by a high number of teachers as a proportion of all state’s professionals and teacher vs. professional salary differentials over one. This suggests that teachers are relatively well paid with respect to professionals in the state, lending support to argument that in these states teachers constitute more of an elite group than is the case

¹¹ These last two variables are still under construction. They are not included in this papers’ analyses, but will be included in subsequent drafts.

in others (particularly states where sections have more moderate or mixed political inclinations).

To measure the *potential influence of Civil Society* we include socio-economic variables at the state level. Moreover, we include additional controls at the municipal level, such as GDP per capita and a development index. The assumption is that better educated and higher income societies are more able to exert influence on state educational authorities.

To approximate the strength of *Civil Society's demands* for education quality, measures of whether the state has promoted progressive reforms are considered. The assumption is that parents will support and demand reforms that are thought to improve educational quality such as those promoting accountability and professionalism. These include instituting competitive exams for entry into the teaching profession and the teacher colleges or instituting state accountability systems.¹²

Labeling these reforms as “demands” might be problematic, because the existence of accountability systems or policies might not necessarily be due to Society’s direct demands. Other institutional or even inertial factors might be behind these. One opinion survey suggested that the community in general did not appear to be demanding higher quality, but showed a high degree of complacency with the current educational situation in the country (ENCRAVE, 2001 cited in Iaies et al., 2006). Because the details of this

¹² The variable measuring the degree of development of state accountability systems was based on Alvarez et al. (2006), and was constructed using a survey that was administered in person or by telephone to all 32 state evaluation authorities. We obtained responses from 30 out of 32 state evaluation authorities. The variable measures state evaluation system development on an index scale of 1-4, with 1 being the least developed and 4 being the most developed. State authorities were asked to fill a five-question questionnaire designed to provide accurate information to construct this index. The index was approximated for the 2 missing states using information from their websites. For subsequent drafts we will attempt to contact these two states and obtain responses to the survey. The data collected and the survey is available from the authors upon request.

survey remain unclear these finding should be taken with caution. In addition, the fact that the national media has been keen on education quality topics in the past few years, and several NGO and parent groups have begun to actively to push for a quality agenda, suggests that society is increasingly paying more attention to this issue.¹³ It is plausible to assume that organizations would not voluntarily want to become more accountable to the public unless they are somewhat pressured to do so. Since Unions seldom pressure the authorities for more accountability and evaluation, it is reasonable to assume that such pressure is at least in part arising from the public.

Table 4 describes how these variables are distributed among the states.

[Table 4 here]

As Table 4 shows, 19 out of the 32 states have implemented a system of competitive entry into teaching. Most of these systems have been around for a few years, and are found in states as different as Chiapas and Jalisco. This table also suggests that accountability reforms (state evaluation systems) and reforms to make teaching more competitive do not always go hand in hand. There are various cases with states having very developed evaluation systems and no competitive entry into teaching (Sinaloa), or poorly developed evaluation systems, but many years of competitive entry into teaching (Yucatán and Nayarit).

Lastly, a dummy variable indicating if education is one of top three priorities for policy and budget allocation of municipal governments is included. This will provide a

¹³ One of Mexico's leading newspapers, Reforma, has had a string of front page articles dealing with educational quality for the past couple of years. Examples of NGO and parent groups that have been very active working to improve accountability and transparency in the system, as well as overall quality are: Fundacion IDEA (www.fundacionidea.org.mx), Mexicanos Primero (www.mexicanosprimero.org.mx), Instituto de Fomento e Investigación Educativa (www.ifie.edu.mx), and Observatorio Ciudadano de la Educación (www.observatorio.org).

measure of how responsive the authorities would be to demands from the public for improved quality, and also from demands from the Union requesting more benefits. If education is not at all a priority for state governments, its motivation to engage in real negotiations with the union might be diminished.¹⁴

5. Empirical Results

Descriptive statistics for the variables used in these analyses can be found in Table 5. Results of estimating various versions of equation (1) are shown in Table 6. The first column shows estimation for the model that includes the union variables of interest in a model with student, school, teacher, family, and state controls. Column two shows results from a similar model that adds state-level reform variables (accountability, competitive entry into teaching). Column three adds interaction terms. An estimation of effect sizes for the first two models, in terms of standard deviations (i.e. percentage change in terms of standard deviation in the dependent variable for a one standard deviation change in the independent variable of interest), is also included. Table 5 shows only the coefficients of interest. In the next paragraphs we discuss some relevant results. All of these are statistically significant at least at the 95% confidence level.

[Table 5 here]

[Table 6 here]

The results of the first model suggest that SNTE membership in the state is positively related to student test scores. Moreover, if the SNTE sections in the state are

¹⁴ As opposed to simply giving the Union all it wants, or enacting rhetorical reforms that might keep its population satisfied, in lieu of actual reforms that could lead to better quality and efficiency. This variable is still under construction.

aligned with SNTE's national leadership (i.e. they are labeled "institutional"), student test scores will tend to be higher on average. This could be due to institutional sections being less conflict-prone than dissident sections. Some authors argue that a large part of SNTE's conflicts arise from intra-union disputes for power, that is, union factions fighting themselves (Arnaut, 1998). Fewer conflicts result in fewer work stoppages and other interruptions to regular school activities and better coordination between government and teachers in general (Murillo, et al., 2002). These could be some of the reasons behind better educational indicators. The more sections the state has, however, produces the opposite effect. Higher union fragmentation (or less cohesion) appears to lead to lower student test scores, all else equal.

The salary gap between teachers and professionals has a positive relationship with test scores. This means that the more teachers earn with respect to professionals in their state, the higher student test scores are on average. This variable served as a proxy of whether teachers constituted an "elite" group (in relative terms) in their states. Our original hypothesis was that if teachers constituted an elite group in the state, they would be more able to advance their agenda (one that we hypothesized might not always be consistent with the objectives of educational quality). These results do not seem to support this idea. As it now stands, it appears to suggest that when teachers and professionals are earning similar salaries, an indicator that they have similar qualifications and that teachers are a much more professional group than in other states, students tend to benefit from these more qualified mentors.

Adding variables that attempt to capture state educational priorities and ability to implement reforms that could be labeled progressive and often times anti-union,

somewhat changes our findings. The results of Model 2 with respect to union alignment corroborate what was found in the earlier model: the more aligned the state section is with SNTE's national leadership, the higher the student test scores tend to be, on average. The magnitude of this estimate is slightly lower. The sign of the union force proxy coefficient (SNTE membership) is also consistent with Model 1. States with more teachers (union members) tend to have higher student test scores on average. This result runs counter to our original hypothesis that the union is more likely to engage in conflict or exert its influence over the education system in states where it has more strength, holding all else equal, and that the exercise of this force would be detrimental for quality. This estimate remains unchanged even when the model controls for school-age population, a driver for the number of teachers in the state (results not shown).

In Model 2, union fragmentation (i.e. having more than one section) is positively related to student test scores, all else equal. This is the reverse of what was found in Model 1. Perhaps controlling for governmental features (such as accountability, etc.), makes apparent that the relationship between union fragmentation and quality is one in which certain kinds of governments are able to implement divide-and-conquer strategies more often in situations with multiple (and often opposing) union factions.

The relationship between the salary gap between teachers and professionals and student test scores in the case of Model 2 remains positive, although much lower in magnitude. The interaction coefficient in Model 3 suggests that this relationship is somewhat strengthened in states with large SNTE memberships (or as was previously discussed, it slightly lessens the negative relationship between membership and test scores). This is a puzzling result and more variables are needed to understand this

relationship better (for example whether state educational authorities are SNTE members themselves, or whether SNTE has managed to place members in congress; these variables will be added in subsequent drafts of this paper).

In terms of state accountability systems, the positive coefficient indicates that more developed state accountability systems are associated with higher student test scores. Recall that this variable is coded with 6 being the most highly developed system and 1 being the least developed system. This result is consistent with the findings of Alvarez et al. (2006). As expected, states with competitive entry into teaching (particularly those that have had them for a few years) tend to have better student test scores, on average. The magnitude of the coefficient is large, and the effect size is close to one third of a standard deviation.

Model 3 adds interaction terms. All of these are statistically significant suggesting that union factors affect the relationships between reform and quality. Because the coefficient for membership in this model is negative, this tends to offset the positive interaction effects of membership with other variables (magnitudes are roughly similar). The one case where this negative relationship appears to increase is when membership and competitive entry into teaching are interacted. The negative interaction coefficient suggests that in states with high union membership, having competitive entry into teaching would actually be associated with lower test scores. This is a puzzling result. One way to interpret would be to say that states that implemented competitive entry exams where those where union strength was very great and the union was able to exercise power over teaching post assignment, etc. The negative coefficient could be interpreted as signaling that the reform was implemented in states where student test

scores were lower to begin with. This would certainly be the case of states such as Chiapas and Guerrero, but would not help explain cases like Aguascalientes, Baja California, or Sonora.¹⁵ Moreover, competitive entry into teaching is not likely to affect the majority of teachers in a state. In many states the actual number of new teaching spots available is in the hundreds.

A more likely explanation would be one in which competitive entry into teaching signals the relative power of state authorities over the union and its ability to advance its own agenda (SNTE has traditionally has opposed these kinds of reforms in Mexico). Some of these states have powerful and conflictive unions (Chiapas or Michoacán) while others not so much (Aguascalientes). The negative interaction coefficient could be suggesting that, holding all else equal, these reforms have a weaker relationship with quality in states with strong unions, even though their governments were skillful enough to be able to implement them.

6. Illustrative Cases

This section focuses on recent reforms and developments in the states of Chiapas and Oaxaca. It serves to illustrate Union-Government interaction with dramatically different results. Comparing these two states is an interesting proposition, given their socio-economic and educational similarities. Both states place at the bottom of the education quality and attainment rankings, both have high proportions of rural, disadvantaged and indigenous populations. GDP per capita is low relative to other states in Mexico. And both states have a history of conflicting union-state relationships resulting in frequent union strikes and teacher protests.

¹⁵ In fact, the correlation between having competitive entry into teaching and state gdp per capita or state development indices is positive.

In Chiapas, conflict and subsequent negotiations between state educational authorities and the two SNTE sections operating in the state, resulted in reforms such as requiring a competitive examination process for obtaining a teacher position. This was a radical departure in Chiapas from previous practices which included handing out half of the teacher positions in the state for the union to distribute as it saw fit, or the selling of teacher positions by both SNTE and ministry of education officials.

In Oaxaca, Union-Government relations took a dramatic turn in May 2006 when the state government's refusal to grant salary increases gave rise to a violent conflict that has kept downtown Oaxaca City in a virtual state of war ever since. The conflict arose from the Union's demand that state authorities concede an across-the-board salary increase of close to 20%. Failure to negotiate with the union resulted in months of armed conflict that even eventual salary concessions to the Union were not able to stop.

Among the conditions that we will explore in relation to the different results of union-state bargaining, are the influence of union fragmentation (Chiapas has two SNTE sections, Oaxaca only one), the political alignment of the sections with the state's ruling party and the key actors in negotiations. The nature of the original demands on the part of the union will also be considered. Other factors to be investigated are state and federal budgets for education, trends in education sector growth, and recent reforms. While in-depth case studies are beyond the scope of this paper, it is our expectation that these two illustrative cases will shed light on the complex union-state interaction, and open up new lines of research in this area.

6.1 Chiapas

Chiapas is one of the poorest states in Mexico. Its state GDP per capita (2004) was only \$2,463 dollars compared to the national average of \$6,040. and it ranks at the bottom of most educational rankings. The state faces many geographic, demographic and educational challenges. Twenty-five percent of its population inhabits localities with fewer than 500 people. Of the 19,000 localities (towns and cities) only 5 percent have more than 500 inhabitants. Together with Oaxaca, it is one of the states most populated by indigenous peoples. Over one quarter of Chiapas' population speaks an indigenous language, compared to only 7 percent in the rest of the country. The United Nations Development Program (UNDP) gave Chiapas in 2003 an index rating of 0.80 in health, and 0.74 in education (compared to the national average of 0.83 in health and 0.82 in education).

Educational indicators in Chiapas are among the worst in the country. It is the state in Mexico with most out-of-school kids. Out of the 1.2 million people aged 5-14 who do not go to school, over 10 percent are located in Chiapas (the national mean is 5.6). Most students in Chiapas attend rural elementary and secondary schools (tele-secundarias), which tend to be of lower quality than their urban counterparts. Chiapas ranked well below national averages in international and national evaluations such as PISA and ENLACE. And dropout rates in elementary and secondary schools are worse than the national mean: 2.1 in primary (compared to 1.2 nationally), and 7.7 in secondary (compared to 7.1 nationally).

With respect to the union, there are two SNTE sections in the state: Section 40 and Section 7. Section 40 is the smaller section (membership is estimated at XXX) and represents teachers that were hired by the state system (*estatales*) before the

decentralization reforms of the early 1990s transferred federalized teachers to state educational authorities. Section 7 is the larger section (membership estimated at XXX) and represents teachers that, although administered by state authorities, are still paid using federal funds. These teachers are known as *federalizados*. Section 7's political inclination is dissident. This section falls under the umbrella of the CNTE.

Chiapas has traditionally been the locus of intense union conflict. Between 2001 and 2005 there have been at least two large teacher strikes that lasted for months. All of these had to do with teachers demanding more wages and more teacher positions. The Union in Chiapas is also very powerful. For decades, it had been in control of assigning half of the newly created teaching posts in the state (the state authorities assigned the other half). Many of these posts were in fact sold by union leaders or exchanged for political or other favors (Street, 2006). Teacher and administrator promotions and the overall administration of teaching colleges, were also under the union's control.

In 2001, after many years of PRI governments, Chiapas elected its first opposition governor in the ex-PRI militant Pablo Salazar Mendiguchía. Mr. Salazar was postulated by a coalition of PRD-PAN and other smaller parties. Because in Chiapas the PRD is larger than the PAN, the new coalition governor was largely perceived to be PRD. It was a close election, but the broad coalition lent the new governor support from many social groups that had been traditionally relegated by PRI. Gov. Salazar named Alfredo Palacios Espinosa as its new Secretary of Education in Chiapas. Although there is only one Secretary of Education, there are in fact two Education ministries: the state ministry and the federal ministry. Each of these has separate offices and personnel and in fact runs like a separate operation. The new Secretary of Education possessed an ideal resume for the

job. He had been a longtime advisor of state education authorities (particularly of Gov. Juan Sabines G. in the 19XXs), had been himself a teacher, teacher college professor, and administrator. He was also an active member of Section 40 (the state section), and as part of SNTE's organization had been in charge of teacher colleges as well as of several executive committees.

The new government of Pablo Salazar began its administration in 2001 facing enormous challenges to improve the education in the state in terms of access, coverage, quality, and equity. Relationships with both union sections were not easy even though the Secretary of Education was himself member of one section and knew very well the inner workings of the Union as well as all the key actors.

Between 2001 and 2005, however, Gov. Salazar's administration took unprecedented steps to enact progressive reforms to the state's education system. All of these reforms were strongly opposed by the union, particularly by Section 7. Even though the actual impact of these reforms won't be known for a long time, it is impressive that a state like Chiapas was able to pull off these feats, given its history of union-state conflict.

Education Reforms and Union Demands in Chiapas (2001-2006)

Between 2001-2005, state educational authorities enacted the following major reforms and actions:

- Instituted in 2002 a competitive (exam-driven) process for obtaining a position in the state's education system (*plaza*), including positions for teachers, school administrators, supervisors, and academic and regional directors.
- Closed the boarding school of the rural teaching college (*normal rural*) "Mactumatzá" and subjected its students to competitive examinations for entry

into teaching along with the rest of teacher college graduates (before this time, Mactumatzá graduates had been guaranteed a teaching position upon completion of their studies)

- Updated the State Education Law and increasingly applied rule of law

All of these reforms, but particularly the first two encountered considerable resistance from the union, particularly from Section 7. Thousands of teachers left their classrooms and took to the streets several times to protest instituting competitive examinations and closing Mactumatzá; to protest what they saw as an unfair and socially unjust measure, subjecting them to competitive examination and taking away their guaranteed teaching position, Mactumatzá students closed streets and highways, kidnapped buses and ordinary citizens and took over their school as well as other universities (Street, 2006). The Government, however, assumed a strong position and did not back down from its intended agenda. It threatened teachers with withholding their salaries for every day spent outside of the classroom. It also incarcerated some student leaders and striking teachers accused of punishable offenses such as kidnapping citizens or blocking highways.

To implement the competitive examination process, the Government struck a deal with Section 40 in 2002 and with that formally opened the process. Teachers, realizing that their salaries were indeed being withheld, and that the government was not backing down, finally relented. Even though as of 2006, Section 7 had not formally agreed to the competitive examination process, teachers belonging to it must nevertheless subject to it every year. The boarding facilities at the rural teaching college Mactumatzá were closed in 200X and all its students must now subject to the competitive examination process.

Results from the last round of examinations (2005) show that Mactumatzá students receive some of the lowest scores in the exam and are often not able to obtain entry into teaching (Valora, 2006).

Why was the government in Chiapas able to stay the course and sustain its position? Why was it able to strike a deal with Section 40 even though this section had initially joined forces with Section 7 to oppose the government's agenda? What conditions allowed the Government to solve all of these conflicts, implement its agenda, and give minimal concessions to the union and the students in a state like Chiapas where teachers as an organized force had a history of getting what they wanted?

There are several hypotheses. One of these posits that the fact that the Governor placed key SNTE members, all with progressive inclinations, inside its administration. These members knew the inner workings of the union, could negotiate with all the relevant actors with whom they could speak a common language. Another hypothesis suggests that because the state has two sections, the Government was able to implement a divide and conquer strategy that worked to its advantage. Still another explanation might have to do with the fact that having a governor that emerged from a coalition of mostly leftist-inclined parties and groups, allowed it to more effectively govern over various groups and organizations. There are some institutional and organizational theorists that argue that governments that are liberal (or conservative), for example, are more able to implement anti-liberal (or anti-conservative) reforms than those who are not (INSERT BRUNSSON REF). [this section will be completed in the next version of this paper]

6.2 Oaxaca

Oaxaca is also one of the poorest states in the country and one with the worst educational indicators. It has only one SNTE section, Section 22. Section 22 is one of the largest in the country with 57,572 members. Furthermore, Section 22 represents both state and federal education workers.

Section 22 broke relations with the national SNTE leadership in 1979 because of complaints that SNTE had become undemocratic. The section is part of the dissident CNTE since 1989. For instance, they do not accept an institutional representative in their section and reject an institutional supervisor in the salary negotiations with the state government. Section 22 is not a uniform political block. It includes many political factions such as the “Bases Magisteriales”, “Cordinadora Democratica”, “Union de Trabajadores de la Educación” and “Cuadernos Sindicales”, each with its own set of views and political inclinations. However, Section 22 bylaws prohibit any member from establishing an institutional relationship with any one political party (personal affiliations are allowed).¹⁶ The Section, however, is often politically aligned with the PRD. Out of the 80 local mayors who are members of Section 22, 21 were from PRD, 19 from PRI and 7 from PAN¹⁷. This plurality can be seen as a strategy of the CNTE’s elite because, the neutrality gives them moral authority to maintain their legitimacy and credibility.

Section 22 plays a very important role in all of the state’s educational affairs. The state ministry of education (created in 1992) was designed to try to withstand pressures from the union. Building an institution where the state government and the political teacher union groups can coexist in a peaceful manner has been a challenge. Frequent

¹⁶ This information is found in the document “Principios rectores del Movimiento Democrático Magisterial de los Trabajadores de la Educación del Estado de Oaxaca”. See Aldo Muñoz Armenta. Pag 219.

¹⁷ Op cit.

internal fights for political motives take place, and educational concerns often fall in second place. Civil participation in educational issues in Oaxaca is limited. Recently state authorities have supported the creation of school boards, but Section 22 blocked this initiative.¹⁸

Education Reforms and Union Demands in Oaxaca (2001-2006)

In May of 2006 the state government announced a teacher salary increase of X%. As is traditionally the case in most states in Mexico, teachers rejected this offer and took to the streets demanding higher raises. In Oaxaca, Section 22 organized a strike demanding an across-the-board salary increase of 20% and the “rezoning” of thousands of teachers.¹⁹ The State Government refused to grant these demands and threatened to withhold salaries of striking teachers (just as had been done in Chiapas). Teachers remained on strike.

By June all negotiations had failed and the government had the police try to forcefully remove by force 60,000 teachers had decamped to downtown of Oaxaca. The strategy was unsuccessful and teachers remained on strike. Other groups in Oaxaca were outraged by what they viewed as repressive mechanisms and members of Section 22 received support from various civilian and peasant organizations and formed a new group named APPO (Asamblea Popular de los Pueblos de Oaxaca). APPO’s main demand was no longer just improving teacher salaries. It went one step further and sought to destitute the state’s Governor Ulises Ruiz. Failure to negotiate with the APPO prolonged the

¹⁸ Op cit.

¹⁹ There are two salary zones in Mexico. The higher salary zone was intended to compensate for different cost of living. Oaxaca teachers were demanding that all teachers in the state were re-categorized into the higher salary zone.

armed conflict for months. Around 1,200,000 students lost 128 school days until the state, together with the federal government, acquiesced to all of the union's demands.

This, however, did not end the conflict. Even though teachers and Section 22 broke away from APPO some time after the government met their demands, APPO remained in their downtown strongholds and kept pushing for the Governor's resignation. [this section will be completed in the next version of this paper]

7. Concluding Remarks and Directions for Future Research

The findings of this paper suggest that when looking at the effects of unions on education quality, there is much more that affects it than merely union strength (membership). Variables such as the union's fragmentation and political alignment with mainstream factions appear to affect student test scores. In addition, measures of the union's influence such as whether teachers constitute a more highly paid group in the state (similar to professionals) also appear to affect test scores and increase or attenuate the effects of union strength. Other state-level factors, such as whether the state has implemented a well developed accountability system, or whether it has instituted progressive reforms such as making entry into teaching a competitive process, also appear to influence student test scores, and change the nature of the union-quality relationship, sometimes in unexpected ways.

The illustrative cases of Chiapas and Oaxaca, served to shed some light on these unexpected ways in which union-government relationships might affect quality. Both states face similar socio-economic and educational challenges, and both have a history of conflictive union-government relationships and the presence of strong dissident (sometimes radical) union factions within their states. Yet, state educational authorities in

Chiapas were able to pull off impressive reforms to the state education system, while in Oaxaca the conflict degenerated into a violent battle that continues to this day, even after the government conceded all of the union's demands [more to be inserted later]

Caveats

There are some caveats to our analysis that is worth pointing out. The first has to do with potential sources of bias in these estimates. Even though we believe that a rich-enough data set and state-level aggregation might attenuate this bias, it remains a concern that should be addressed in future versions of this paper.

Second, the focus of this paper is on union-government interaction and union effects on student quality. The research design and the data used to implement it, though, are far from ideal to establish such causal relationships. Union variables that measure force, cohesion, political inclination, etc., and variables that measure state factors such as accountability systems, might themselves be the result of factors and conditions we are not fully accounting for. This problem is very much related to the omitted variable bias discussed earlier, which we recognize is still a concern. We have tried to address this concern by avoiding making casual statements throughout the paper.

Lastly, some of the variables categorized as measuring a construct (e.g. membership as a measure of Union strength) could in fact be measuring something else (e.g. membership as a measure of a large bureaucratic apparatus). Therefore, effects or relationships attributed to the Union could just as well be attributed to other forces and lead to a different set of conclusions. The intention of the conceptual framework laid out at the beginning of the paper is to attempt to paint a sufficiently coherent story of union influence on education so as to justify the interpretations laid out in this analysis.

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Table 1. Union-Government Interaction under Various Scenarios

Bargaining Scenario	Union-Govt Interaction Result	Impact on Outcomes
Union Force-Strong Pol. Arrang. -Weak Civil Soc. -Neutral or Weak	Conflict	Uncertain
Union Force -Strong Pol. Arrang. -Strong Civil Soc. -Neutral or Weak	Union has the upper hand	Increases in Union members' Benefits with no considerations for quality or efficiency
Union Force -Strong Pol. Arrang.-Strong Civil Soc. - Strong	Negotiation	Increases in Union members' benefits with concessions to improve quality or efficiency
Union Force -Strong Pol. Arrang.-Weak Civil Soc. - Strong	Conflict (govt. doesn't make concessions; union has enough force to organize protests, etc.)	Uncertain, depends on how much force Union has.
Union Force -Weak Pol. Arrang.-Weak Civil Soc. - Strong	No negotiation, government has upper hand	Increases in quality or efficiency, through whatever mechanism Government deems more appropriate

Table 2. Variables and Data Sources

Conceptual Category	Variable	Data Source	Variable description	Status
Education Quality	Student achievement in Spanish and Math	INEE	Average test scores of 6 th graders in Spanish and Math in Prueba EXCALE (2005) or Estándares (2004). Scores are at the school level. <u>Note:</u> Analysis will be run using Estándares data if EXCALE data are not available	Obtained (Estándares), In progress (EXCALE)
Union Membership	SNTE Membership	SEP	Number of teachers by state (2004)	Obtained
	SNTE Membership by section	SEP, SNTE (sections), literature	Number of teachers belonging to each section (2004)	In progress
Union cohesion	Sections	SNTE's webpage	Number of SNTE sections in each state (2005)	Obtained
	Political alignment	Literature, interviews with experts and SNTE Members	Political inclination of each SNTE section. Categorized as mainstream (aligned with the executive committee of SNTE), dissident (CNTE), moderate dissident, moderate mainstream, no clear alignment.	In progress
Political arrangements	State ruling party	Internet, state websites	State governor's party (mode from 2002-2004).	Obtained
	Political alignment of Union section with state government	Literature, interviews with experts and SNTE Members	Political inclination of each SNTE section. Categorized as aligned with state government, not aligned or in opposition, neutral.	In progress
	Salary Gap 1	Encuesta Nacional de Empleo (INEGI)	Average teacher salaries as a proportion of total salaries in the state (2004)	Obtained
	Salary Gap 2	Encuesta Nac. Empleo (INEGI)	Average teacher salaries as a proportion of professional salaries in the state (2004)	Obtained
	Teacher education Gap	Encuesta Nacional de Empleo (INEGI)	Average teacher education vs. education of professionals in the state (2004)	Obtained
	State secretary of education is SNTE Member	Interviews with state secretaries, SEP	Measures whether the state secretary of education (in 2004 and 2005) is a member of SNTE	In progress
	Number of federal congressmen from SNTE by state	Congressmen CV's available at Congress' website	Measures the number of federal congressmen (diputados and senadores) from each state that are members of SNTE (past and current legislature)	In progress
Civil Society demands	Competitive entry into teaching	SEP	Whether state has a competitive exam for obtaining a teaching position (2005)	Obtained

	Competitive entry into teacher colleges	SEP	Whether state has a competitive exam for entering the public teacher colleges (2005)	Obtained
	State accountability	Surveys state evaluation authorities	Rating of state evaluation system on a scale of 1-4, based on Alvarez et al. (2006).	Obtained
	GDP per capita	INEGI	GDP per capita at the state level and/or municipal level (YEAR)	Obtained
	Development index	PNUD	PNUD development index at the municipal level (YEAR)	Obtained
Student Controls	Gender Age, mothers' education, expectations	INEE	Variables will be taken from the context questionnaires of Estandares (2004) or EXCALE (2005) and averaged at the school level.	Obtained (Estandares), In progress (EXCALE)
Teacher Controls (averaged at the school level)	Teacher highest degree earned, seniority, SES, etc.	INEE	Variables will be taken from the context questionnaires of Estandares (2004) or EXCALE (2005) and averaged at the school level.	Obtained (Estandares), In progress (EXCALE)
	Teacher satisfaction, adm. support, and working conditions	INEE	Variables from the context questionnaires of Estandares (2004) or EXCALE (2005) and averaged at the school level. Indices will be constructed using factor analysis.	Obtained (Estandares), In progress (EXCALE)
School Controls	School facilities and resources	INEE	Variables from context questionnaires of Estandares (2004) or EXCALE (2005) and averaged at the school level. Indices will be constructed using factor analysis.	Obtained (Estandares), In progress (EXCALE)
	Carrera Magisterial	CM	School-level averages on the last 4 years of teacher scores in CM teacher tests will be constructed using the CM data from 1999-2003.	Obtained
Other	Education is priority	PNUD – Survey of municipal mayors	Mayors labeled education as one of top three priorities (YEAR)	Obtained

Table 3. Union membership, sections, and other variables by state

State	SNTE Membership ¹ (2004)	SNTE Sections ² (2006)	Section(s) Political Inclination ³ (2006)	State Ruling Party ⁴ (2002-2004)	Teachers to Professionals ⁵ (2004)	Teachers and Professionals' Salary Gap ⁶ (2004)
Aguascalientes	16,762	1	Institutional	PAN	0.068	1.135
Jalisco	100,214	16 & 47	Institutional	PAN	0.039	1.063
Morelos	23,913	19	Institutional	PAN	0.038	1.220
Nuevo León	58,555	50	Institutional	PAN	0.015	0.718
Querétaro	22,225	24	Institutional	PAN	0.041	1.175
Baja C. Sur	8,331	3	Institutional	PRD	0.030	1.287
Tlaxcala	15,384	31 & 55	Institutional	PRD	0.095	1.131
Yucatán	28,864	33, 57	Institutional	PRD-PAN	0.031	0.928
Campeche	12,082	4	Institutional	PRI	0.024	1.280
Coahuila	38,381	5	Institutional	PRI	0.060	0.712
Colima	9,469	39	Institutional	PRI	0.051	0.852
Durango	26,482	12 & 44	Institutional	PRI	0.069	0.913
Hidalgo	38,769	15	Institutional	PRI	0.069	0.780
Edo. México	183,156	36 & 17	Institucional	PRI	0.051	0.501
Puebla	79,953	23 & 51	Institucional	PRI	0.048	0.958
Quintana Roo	14,630	25	Institutional	PRI	0.025	0.725
San Luis Potosí	40,754	26 & 52	Institutional	PRI	0.031	0.634
Tabasco	28,990	29	Institutional	PRI	0.022	0.774
Tamaulipas	36,115	30	Institutional	PRI	0.047	0.719
AVERAGE	41,212				0.045	0.921
Michoacán	60,553	18	Dissident	PRD	0.029	0.784
Guererro	53,953	14	Dissident	PRI	0.081	1.509
Oaxaca	56,630	22	Dissident	PRI	0.095	1.051
AVERAGE	57,045				0.068	1.115
Guanajuato	69,809	13 & 45	Moderate Dis.	PAN	0.052	0.822
Chihuahua	43,614	8 & 42	Moderate Dis.	PRI	0.053	0.929
AVERAGE	56,712				0.053	0.875
Baja California	39,731	2 & 37	Both	PAN	0.044	0.602
Chiapas	64,764	7 & 40	Both	PRD	0.095	1.238
Distrito Federal	175,009	9, 10, 11, 43	Both	PRD	0.014	0.809
Zacatecas	22,561	58	Both	PRD	0.050	0.899
Nayarit	16,511	20 & 49	Both	PRD-PAN	0.050	1.039
Sinaloa	42,404	27 & 53	Both	PRI	0.046	0.774
Sonora	35,133	28 & 54	Both	PRI	0.034	0.792
Veracruz	107,806	32 & 56	Both	PRI	0.039	1.081
AVERAGE	62,990				0.047	0.904

¹ Number of Teachers in the Education Sector, State Average. Source: Ministry of Education (2004).² Source: SNTE (2006).

³ Source: Hugo Esteve Díaz (1998) “Retos y Perspectivas del SNTE ante los cambios actuales”, Aldo Muñoz Armenta (2005) "El sindicalismo mexicano frente a la reforma del estado", PROCESO (2006-12-19) and La jornada (2000-2006).

⁴ Source: Institute for Federalism and Municipal Development, INAFED (2002-2004).

⁵ Proportion of Teachers to professionals (defined as people with a university degree), by State. Source: National Survey of Employment (2004). National Institute of Statistics, Geography and Data Processing, INEGI.

⁶ State average teachers' salaries as a proportion of professional salaries (2004). A ratio of one means that, on average, teachers and professionals in the state earn the same monthly salary. Source: National Survey of Employment (2004). National Institute of Statistics, Geography and Data Processing, INEGI.

Table 4. Competitive Entry into Teaching and State Evaluation Systems (2005)

State	There is a competitive entry into teaching ¹	Years of having competitive entry into teaching system ¹	State Evaluation System Index ²
Aguascalientes	YES	1	6
Baja California	YES	1	5
Baja California Sur	YES	4	4
Campeche	NO	0	1
Chiapas	YES	4	5
Chihuahua	YES	2	5
Coahuila	NO	0	6
Colima	YES	2	5
Distrito Federal	NO	0	n.a.
Durango	NO	0	3
Guanajuato	NO	0	5
Guerrero	YES	2	2
Hidalgo	YES	1	2
Jalisco	YES	3	5
Edo. de Mexico	NO	0	4
Michoacán	YES	3	2
Morelos	YES	3	3
Nayarit	YES	4	1
Nuevo León	YES	3	6
Oaxaca	NO	0	3
Puebla	YES	1	5
Querétaro	NO	0	5
Quintana Roo	YES	4	3
San Luis Potosí	NO	0	4
Sinaloa	NO	0	5
Sonora	YES	1	5
Tabasco	YES	2	5
Tamaulipas	YES	2	3
Tlaxcala	NO	0	5
Veracruz	NO	0	2
Yucatán	YES	4	3
Zacatecas	NO	0	3

¹ Source: General Direction of Public Evaluation, Ministry of Education (2006). "Participation of the General Direction of Public Evaluation on the Competitive Initial Posts Assignations and Labor Promotions on States". Internal Document.

² Source: Own survey administered in 2006 to all state evaluation authorities. Scores: 6= Very Highly Developed (State administers international, national and state exams and use results for educational policy evaluation and design and gave several examples of this practice, authorities ranked their evaluation system as highly developed. 5=Highly Developed (State administers international and National exams and use

results for educational policy evaluation giving at least one example of this practice; authorities ranked their own evaluation system as Highly Developed). 4=Developed (State administers international and National exams and use results for educational policy evaluation giving at least one example of this practice; authorities ranked their own evaluation system as Developed). 3=Not Very Developed (State administers either International or National exams and uses results for educational policy evaluation giving at least one example of this practice; authorities ranked their own evaluation system as Not very developed). 2= Poorly Developed (State administers either International or National exams, and say it uses results for educational policy evaluation, but did not give specific examples of this practices; authorities ranked their own evaluation system as poorly developed). 1=Very Poorly Developed (State administers either International or National exams, but does not use results for educational policy evaluation; authorities ranked their own evaluation system as poorly developed).

Table 5. Descriptive Statistics of Variables Used in the Analysis

Variable	Mean	Std. Dev.	Min	Max
Student test scores	43.139	14.391	7.000	86.000
Student's age	11.884	0.873	10.000	16.000
Student speaks Spanish (1-Yes, 0-No)	0.907	0.291	0.000	1.000
Student's mother is literate (1-Yes, 0-No)	0.901	0.298	0.000	1.000
Student went to preschool (1-Yes, 0-No)	0.859	0.348	0.000	1.000
Student wants to go to university (1-Yes, 0-No)	0.599	0.490	0.000	1.000
Family lives in house with electricity (1-Yes, 0-No)	0.926	0.262	0.000	1.000
Hours worked by teacher	8.694	8.868	1.000	99.000
Teacher's mother has primary or less (1-Yes, 0-No)	0.803	0.398	0.000	1.000
Teacher is female (1-Yes, 0-No)	0.479	0.500	0.000	1.000
Teacher speaks spanish (1-Yes, 0-No)	0.865	0.342	0.000	1.000
Teacher lives close to school (1-Yes, 0-No)	0.817	0.387	0.000	1.000
Teacher seniority	18.134	9.000	-19.000	52.000
Teacher took professional development (1-Yes, 0-No)	0.763	0.425	0.000	1.000
Teacher has Normal Basica (1-Yes, 0-No)	0.059	0.236	0.000	1.000
Teacher has Normal Basica 4-year plan (1-Yes, 0-No)	0.242	0.428	0.000	1.000
Teacher has Normal Superior (1-Yes, 0-No)	0.162	0.369	0.000	1.000
Teacher has University in education (1-Yes, 0-No)	0.201	0.401	0.000	1.000
Teacher has University degree in other (1-Yes, 0-No)	0.037	0.188	0.000	1.000
Teacher has Masters degree (1-Yes, 0-No)	0.047	0.212	0.000	1.000
Teacher has PhD (1-Yes, 0-No)	0.000	0.022	0.000	1.000
School stratum	2.460	0.831	1.000	4.000
School shift	1.210	0.550	1.000	4.000
Student motivation score	-0.086	1.618	-5.828	3.276
SNTE Section political alignment	2.189	2.041	1.000	6.000
Number of SNTE sections in state	1.710	0.527	1.000	3.000
SNTE Membership in state (number of teachers)	45,489	35,827	8,331	183,156
Ratio of teachers to professionals	0.771	0.251	0.345	1.386
There is competitive entry into teaching	0.604	0.489	0.000	1.000
Years of competitive entry into teaching	1.478	1.412	0.000	4.000
There is competitive entry into teaching colleges	1.346	0.476	1.000	2.000
State evaluation system ranking	4.000	1.363	1.000	6.000
Teacher and professional salary gap	0.943	0.249	0.448	1.531
N	50,559			

Table 6. Results

	Model 1 Coeff.	Effect Sizes/a	Model 2 Coeff.	Effect Sizes	Model 2 Coeff.
Alignment SNTE Section to CEN SNTE	1.58 (11.67)**	0.22	1.11 (8.45)**	0.16	1.24 (10.20)**
Number of SNTE sections in state	-2.36 (6.68)**	-0.09	2.02 (6.52)**	0.07	5.38 (13.79)**
SNTE membership in state	0.00 (14.59)**	0.25	0.00003 (9.22)**	0.07	-0.0001 (4.14)**
Prop. of teachers vs. professionals in state	11.17 (13.61)**	0.20	0.00 (.)	0.00	0 (.)
State has competitive entry into teaching			9.15 (11.10)**	0.31	0 (.)
Years of competitive entry into teaching			0.87 (4.49)**	0.09	5.29 (16.92)**
State evaluation system ranking			1.71 (12.62)**	0.16	1.63 (8.22)**
Gap btw teacher and professional salaries	15.81 (19.11)**	0.27	10.61 (13.18)**	0.18	0 (.)
SNTE Membership x eval. system rank					0.00003 (6.79)**
SNTE Membership x competitive entry					-0.00013 (11.93)**
SNTE Membership x Teacher/Prof Salary Gap					0.0001 (13.56)**
Observations	40787		39886		39886
R-squared	0.93		0.93		0.93
State dummies	Yes		Yes		Yes

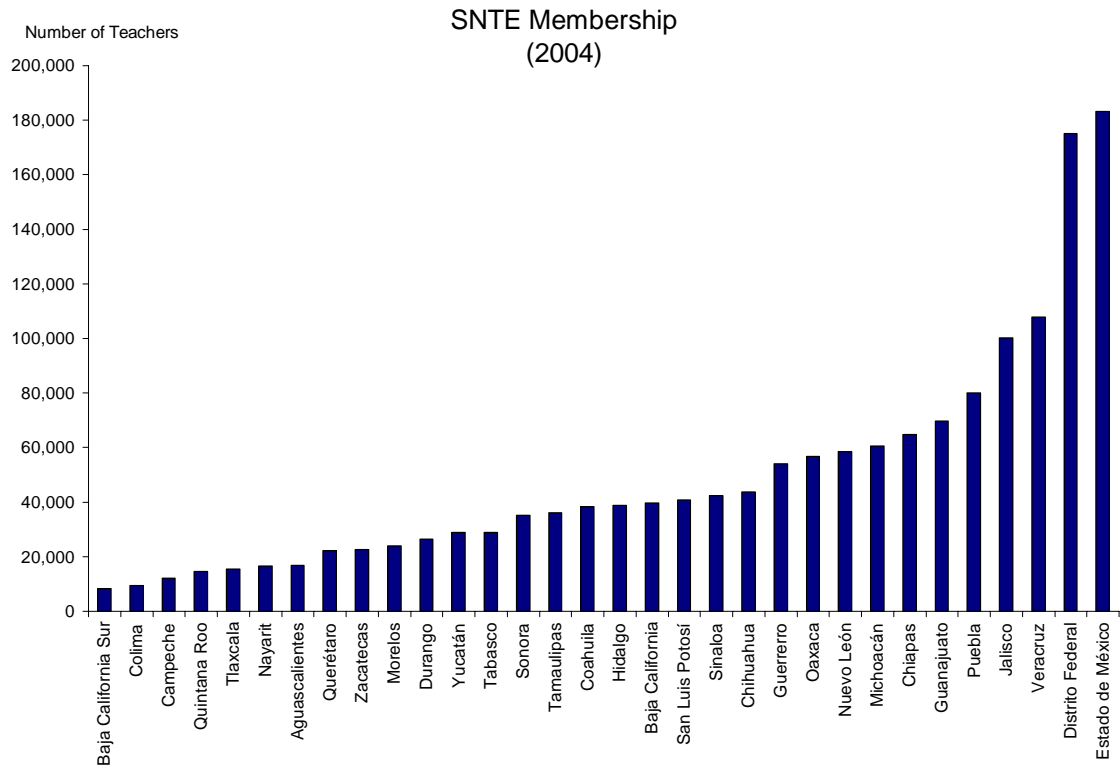
t-statistics in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

/a Effect sizes are interpreted as the magnitude of the change in terms of standard deviations in the dependent variable, for a change in one standard deviation in the independent variable.

Dependent variable: Total student-level score in Estandares test, for 6th grade students (2003-04)

Controls: student age, native language, mother's education, went to preschool, wants to go to university, student motivation score (reported by teacher), house has electricity, teacher hours worked, teacher's education and seniority, teacher attended professional development, teacher's mother's education, teacher speaks Spanish, teacher lives near school, school SES stratum and school shift.

Figure 1: SNTE membership by state (thousands of teachers)



Source: Number of Teachers, SEP (2004).