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Measuring the Relative Pay of Latin American School Teachers at the turn of the 20th Century

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Abstract

How much are teachers paid in comparison to those in other professions in Latin America? How have these differences evolved at the turn of the 20th century? This paper documents the extent to which teachers are underpaid vis-à-vis workers in other professional and technical occupations in thirteen Latin-American countries circa 2007. It also analyses the evolution of the earnings gaps between circa 1997 and circa 2007. After controlling the earnings differentials by observable characteristics linked to productivity, using the methodology developed in Ñopo (2008), we find that teachers are underpaid vis-à-vis other professionals and technicians in Latin America in both periods: circa 1997 and circa 2007. This has been the case for hourly earnings gaps at the main and secondary jobs. However, the analysis performed provides evidence that the earnings gap decreased during the decade of analysis, most of the drop is attributed to a general trend in earnings gap reduction rather than as a result of teachers' improvements on their observable characteristics. The earnings gap shows important heterogeneities, across countries and along the earnings distributions.

JEL classification: I2, J31, J44, J8, O54

Keywords: education, wage differentials, professional labor markets, national and international labor standards, Latin America, Caribbean

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Measuring the Relative Pay of Latin American School Teachers at the turn of the 20th Century

I. Introduction

Research shows that teacher's performance is a critical factor to explain students' academic success in the school system (Goldhaber and Brewer 1997; Rivkin et al 2005; Rockoff 2004, OECD 2009; Barber and Mourshed 2007; Clotfelter et. al. 2007; Kukla-Acevedo 2009). Also, the effectiveness of educational policies and the effect of other inputs depend on the quality of the daily work of teachers (Goldhaber et al, 1999).

In this context, the analysis of teachers' salaries is relevant since in many countries, and Latin America is no exception, they are often perceived to be lower than those of other professionals. This is especially the case among teachers and it affects their motivation to educate (OECD 2009; Figlio and Kenny 2006; Ortega 2010, Player 2009, Heutel 2009, Loeb and Page, 2000); causes good teachers to leave the profession (Imazeki 2005; Harris and Adams, 2007; Scafidi et al., 2007); and prevents good students from choosing an education major in college (Corcoran, 2007). These in turn would produce negative effects on students' learning. To improve the quality of education it is essential to pay special attention to teachers, and to implement policies to attract, motivate and retain the most talented individuals in the profession.

A series of studies have analyzed teachers' salaries, with mixed results regarding their relative under or over-payment in the labor markets. In fact, the available empirical evidence shows that the sign and the magnitude of the conditional wage differential between teachers and other workers crucially depends on the definition of the comparison group, even when differences in observable characteristics are accounted for, both in Latin America[1] and out of the region[2].

[1] Psacharopoulos et al. (1996), Liang (1999), and Hernani-Limarino (2005) analyze several Latin American countries. Saavedra (2004) examines Perú; Mizala and Romaguera (2005) Chile; Lopez-Acevedo and Salinas (2004) Mexico; Rivas and Lavarreda (2008) Guatemala; Herrero et al. (2003) Argentina; Piras and Savedoff

More recently Mizala and Ñopo (2011), analyzing representative samples of nine Latin American countries circa 2007, found that teachers' underpayment is stronger than what has been previously reported in the literature for Latin America. Teachers' underpayment with respect to other professionals and technicians was found to be more pronounced among males, older workers, household heads, part-timers, formal workers, those who work in the private sector, and (mostly) among those with complete tertiary education. Exploring the role of job schedules and job tenure (which are claimed to be more flexible and longer, respectively, for teachers) as compensating differentials, it was found that even after accounting for them the conditional earnings gap prevails. This paper builds up on these results, expanding them in three important dimensions: (i) expanding the number of countries to thirteen, improving its representativeness for the Latin America and the Caribbean region, (ii) exploring deeper into the role of individuals' unobservable characteristics by using information from their main and second jobs, and (iii) exploring the evolution of those conditional earning gaps between circa 1997 and circa 2007,.

The question of earnings differentials conditioning on observable characteristics is assessed with a non-parametric matching approach developed in Ñopo (2008). We find that, although underpaid, preschool and elementary teachers' earnings (vis-à-vis those of other professionals and technicians) improved during the decade, especially for the young, females, part-time workers and those holding only one job. It is found that this improvement responds to a general trend of decreasing earnings gaps in those segments of the labor market, which offsets an increase in the earnings gap due to changes in the distribution of individuals' observable characteristics.

(1998), Urquiola et al. (2000) and Urquiola and Vegas (2005) Bolivia. These pieces will be reviewed in the next section.

[2] Taylor (2008), Podgursky and Tongrut (2006), Harris and Adams (2007), Stoddard (2005) for United States, Asadullah (2006) for Bangladesh; Komenan and Grootaert (1990) for Cote D' Ivoire; Zymelman and DeStephano (1989) for Sub-Saharan African countries.

Moreover, since teachers more frequently report having more than one job compared to other professionals and technicians, we analyze earnings gaps at main and secondary jobs and document teachers' underpayment in both. Our study of the earnings gaps in both jobs suggests the existence of some sort of unobservable individuals' (job-independent) traits that make teachers underpaid. This issue may in turn call to attention of possible selection mechanisms of lower ability individuals into the teaching profession.

The rest of the paper proceeds as follows. In the next section we briefly discuss the literature, emphasizing on the lack of consensus about teachers' relative earnings. In section three we discuss the methodology and introduce the data sources, the approach to harmonize them across countries and some descriptive statistics comparing teachers with other professionals and technicians. In section four we present the main empirical analysis of earnings gaps decompositions, exploring not only the average earnings gaps but also its distribution along the earnings ladder and analyzing the role of some characteristics of the teaching profession: shorter and more flexible job schedules (with the consequent possibility of holding an extra job and enjoying extra vacation periods), and more job stability (distinguishing it between the private and public sectors). In section five we examine the evolution of the earnings gaps between 1997 and 2007. In section six we conclude.

II. A review of the Literature

A series of studies have analyzed teachers' salaries in Latin America examining whether they are under or over-paid.[3] Most of them use National Household Surveys to estimate Mincer wage equations with different control variables, and some use the Blinder-Oaxaca decompositions. The

[3] There are also several studies addressing this issue for non-Latin American countries, for instance, Taylor (2008), Allegretto et al (2008), Podgursky and Tongrut (2006), Harris and Adams (2005), Stoddard (2005) for United States, Asadullah (2006) for Bangladesh; Komenan and Grootaert (1990) for Cote D' Ivoire; Zymelman and DeStephano (1989) for Sub-Saharan African countries.

results are mixed. There is no robust empirical evidence showing that teachers receive lower/higher salaries than a comparative group of workers.

Psacharopoulos et al. (1996) use data for 12 Latin American countries to compare average wages without finding a clear pattern; in some countries teachers' pay is higher than the comparative group and vice versa. Liang (1999) finds that in 11 out of 12 countries analyzed, hourly wages for teachers are actually higher than their counterparts' in the labor force with similar observable characteristics. Hernani-Limarino (2005) examines the robustness of conditional wage differentials to the methods used and the definition of the comparable group for 17 Latin American countries. He concludes that in some countries (i.e. Chile) teachers earn more than the comparable workers; in others they receive lower salaries (i.e. Nicaragua), while in others the answer depends on the control group and the method used to estimate the wage gap. He also shows an increase in the unconditional earnings differentials in favor of teachers when these are compared with workers with lower productive endowments. Estimating conditional wage differentials for different quantiles of the conditional wage distribution, he concludes that teachers are over or under-paid depending on their position in such conditional distribution.

This Latin American empirical evidence shows that the sign and magnitude of the conditional earnings differential between teachers and other workers crucially depend on the definition of the comparison group. On that regard, it is important to highlight that our comparison group differs from those reported in the literature. We compare teachers to other professionals and technicians, aiming at comparing workers with similar or comparable skills. Table 1 contrasts our results for pre-school, elementary and high school teachers with those that the three regional pieces of the literature would deliver for the uncontrolled earnings gap using our data set and their definition of teachers and comparison groups. The previous literature have included Legislators, Managers, Armed forces and, especially, Office workers as part of the

comparison groups understating the magnitude of the earnings gaps faced by teachers. This is already an important departure point from this paper regarding the available literature.

In terms of country studies, Saavedra (2004) finds for Peru that earnings comparisons between teachers and other occupations depend on the geographic zone. In Lima teachers earn less than comparable workers, while in the rest of the country they enjoy a wage premium. Mizala and Romaguera (2005) find for Chile that, once differences in observed characteristics are accounted for, teachers' salaries are similar to those they would receive in other occupations; however, they find relevant differences between men and women, female teachers earn more than their counterparts, while male teachers earn less than similar workers in other sector of the labor market. Vegas et al (1998) find that over one-third of teachers earn incomes that are lower than they would earn in other occupations; however, teachers' comparative earnings vary greatly across cities. In Bolivia, Colombia, Guatemala and Mexico, the evidence points towards a teachers' wage premium, explained by the fact that they are public workers, i.e., teachers working in the public sector earn higher salaries than comparable private sector teachers and similar workers in other occupations (Piras and Savedoff 1998; Gaviria and Umaña, 2002; Rivas and Lavarreda 2008; Lopez-Acevedo 2004). Furthermore, Herreros et al. (2003) for Argentina; and Urquiola et al. (2000) and Urquiola and Vegas (2005) for Bolivia, show that whether teachers are well paid depends on the comparison group, even when differences in observable characteristics are accounted for. Conditional wage differentials are favorable to teachers when compared with all workers; nevertheless, the differentials are not favorable to teachers when compared with workers who had completed at least secondary education.

In sum, the available empirical evidence shows that the sign and the magnitude of the conditional wage differential between teachers and other workers crucially depend on the empirical strategy used (the comparison group and the econometric method). The methods

applied have evolved over time; most of the earlier papers estimate earnings equations by OLS. Later, new methods intending to correct for selection bias -due to the non-random allocation of individuals between professions/occupations- were implemented.

In addition, at least two issues should be taken into account when estimating wage gaps. First, it has been argued that estimating only the average wage gap is a drawback, given the heterogeneous behavior of wage differentials. In fact, there is some evidence of intra-country heterogeneity, for instance, regarding gender and geography (Mizala and Romaguera, 2005; Saavedra, 2004), as well as evidence of heterogeneity of the wage gap at different points of the conditional wage distribution (Hernani-Limarino, 2005).

Second, on the methodological side, earnings equations and the Oaxaca-Blinder decomposition have been criticized due to misspecification attributable to differences in the supports of the empirical distributions of individual characteristics for the two groups of workers being analyzed (Bellante and Ramoni, 2007; Ñopo, 2008). The problem is that these methods do not restrict the comparison to those individuals with comparable characteristics in both groups.

The existing literature on teachers' salaries does not address these issues in depth. We attempt to fill this gap, revisiting the question of conditional labor earnings differentials between teachers and other professionals and technicians in Latin America, but with a renewed methodological approach. Additionally, we explore some characteristics that may explain, to a certain extent, lower teachers' earnings in the form of compensating differentials, i.e., job tenure and job schedules. While the former is claimed to be longer among teachers, especially in the public sector; the latter are claimed to be more flexible among teachers (that is, more vacation weeks per year).

III. Data and Methodology

3.1 The Data

The data comes from nationally representative household and labor surveys of thirteen Latin-American countries circa 1997 and circa 2007. Table A1 in the Appendix reports the specifics of each data source: the country, the survey name, the year and the number of observations for the whole sample of workers ("Full Set") and the subsamples of workers that will be compared in this paper ("Pre-School and Elementary Teachers", "High School Teachers" and "Other Professionals and Technicians"). The expansion factors of each data set are used such that the relative size of each sample proportionally corresponds to the working population of each country. Table A2 in the Appendix shows the occupational categories per country that allowed us to identify teachers and other professionals and technicians. University teachers and those with particular specialties (e.g., teachers for students with special needs, language instructors, sports instructors, driving instructors, and dance or art instructors) are not considered for the analysis. They are neither part of the teachers' nor of the non-teachers' samples. Then, when we refer here to teachers or school teachers, we will be referring to both high school teachers and pre-school and elementary teachers.

The sample of interest (school teachers and other professionals and technicians) represents 10.2% and 14.4% of the working sample circa 1997 and circa 2007, respectively. Those who declare being teachers stand for 3.5% and 3.1%, and the other professionals and technicians stand for 6.6% and 11.3% of the working sample for each period, respectively. Outliers for income at the main occupation were dropped from the data set. This comprised 1% of the working sample for both periods under analysis (0.3% and 0.6% percent of the school teachers, and 6% and 5% percent of the other professionals and technicians for each period, respectively).

The first part of the analysis will focus on the most recent years for which there is available data. Table 2 shows the descriptive statistics and relative hourly earnings for observable characteristics in all countries' data sets circa 2007. Teaching is a predominantly female occupation as approximately nine out of ten pre-school and elementary teachers are women, and six out of ten high school teachers are so. On the other hand, the proportion of males among other professionals and technicians is roughly more than 50%. Teachers' educational achievement surpasses that of other professionals and technicians. Around 50% of pre-school and elementary teachers report living with children (12 years old or younger), while around 45% of high school teachers and non-teachers do so. Also teachers, particularly high school teachers, report living with elder people (65 years or older) in a higher proportion than the other groups. Household headship is less prevalent among teachers than among other professionals and technicians. The proportion of teachers working part-time (30 hours or less per week) is almost threefold than that of other professionals and technicians. Even more interesting, a higher proportion of teachers have a secondary job.

Earnings are computed as hourly earnings, measured in terms of purchasing power parity (PPP, US$, 2000). Hourly earnings for each individual are computed dividing the monthly income by 4.3 times the number of hours worked in a week.[4] Average school teachers' hourly earnings circa 1997 have been set equal to 100 for each country (i.e., the average hourly earnings of both, pre-school and elementary teachers and high school teachers altogether).

[4] The monthly income corresponds to the monthly earnings received from the main occupation in the month previous to the survey. The job schedule is captured with survey questions of the type, for example: "¿Quantas horas trabalhava normalmente por semana nesse trabalho? ¿Cuántas horas trabaja efectivamente en su empleo o actividad principal? Señale horas semanales, ¿cuántas horas efectivas al día trabajó la semana pasada? ¿Cuántas horas trabajó la semana pasada en la ocupación principal? El mes pasado, ¿cuántas horas a la semana trabajó en este negocio o empresa? ¿Cuántas horas por semana trabaja regularmente como...? ¿Cuántas horas, días y en qué jornada trabajo efectivamente la semana anterior?". So, it can be inferred that teachers are referring not only to their effective class time but to their whole job schedule (including preparation, grading, meeting times and the like).

Regarding earnings differences according to the observable characteristics of the populations the typical patterns arise. Men earn more than women, especially in the case of other professionals and technicians. Earnings increase along a worker's life span, as well as with higher educational attainment. People that live with kids, live with elder people, are not household heads and live with another wage earner tend to earn less that those who don't or are not. These differences tend to be more pronounced among other professional and technicians than among teachers. Additionally, part-time workers and those who report having more than one job earn more than those who don't.

At the aggregate level, on average, other professionals and technicians earn around 23.3% more than pre-school and elementary teachers and 4.5% less than high school teachers (although this last difference is not statistically significant at conventional levels). These statistics, however, are merely referential. They compare teachers with professionals and technicians that might substantially differ in terms of observable characteristics. Teachers and other professionals and technicians differ regarding their human capital, job characteristics and socio-demographic composition. Then, it is appropriate to think that these differences in observable characteristics play a role explaining the earnings differentials. Hence, controlling the earnings gap by observable characteristics becomes necessary for a better estimation of the underlying earnings gap.

3.2 The Matching Approach to assess Earnings Differentials

A traditional way to asses earning gaps and the role of observable characteristics has been using different variations of the Blinder-Oaxaca decompositions (Blinder, 1973; Oaxaca, 1973 and the enormous literature inspired by them). In this paper we use a non-parametric extension of it that allows not only a more precise and detailed assessment of the earnings gaps (and its

distribution), but also more econometric flexibility on the estimations of the role of observables. It is also intuitively easier to understand as it only requires the use of matching.

According to this matching approach we will compare teachers' and other professionals' earnings who share the same observable characteristics[5]: gender, age, education, presence of kids (12 or younger) in the household, presence of elders (65 or older) in the household, whether the workers is or not household head, presence of other wage earners in the household, whether the individual has a part-time work, and whether the individual holds a secondary job. As an example, the earnings of a male teacher, 38 years old, with college diploma, no kids at his household, no elders at his household, full-time worker and with no secondary job; will be compared to the earnings of a male professional with exactly the same characteristics (38 years old, with college diploma, no kids at his household, no elders at his household, full-time worker and with no secondary job).

In the nationally representative data sets we described above we search for all possible matches of teachers and other professionals with the same observable characteristics and perform the earnings comparisons. The econometric properties of this approach can be found in Ñopo (2008) but one that is important to point out here is that the matching estimators and those obtained from the Blinder-Oaxaca approach coincide when the estimations are restricted to the *common support* of observable characteristics.[6]

Table A3 in the appendix shows the resulting average unexplained earnings gap from different decompositions, comparing the results from matching and those from six possible linear regressions (combining three different specifications of the earnings equation and two possible ways of treating the common support of observable characteristics). Comparing the linear

[5] Earnings gap computed as the difference in average earnings between non-teachers and teachers, expressed as a percentage of teachers average earnings.

[6] The common support is the set of observable characteristics for which it is possible to find both types of workers (teachers and other professionals). More details can be found in Ñopo (2008).

specifications, the most notorious difference arises when the differences in the supports are taken into account. The estimations that take this into account deliver average unexplained gaps that are closer to those obtained from matching. At the average, matching and linear regressions (when restricted to the common support of observable characteristics) deliver similar gap decompositions. Beyond that, matching has the advantage of allowing easy explorations of the distribution of such unexplained component of the gap.

The next section presents computations of the earnings gaps between teachers (preschool and primary, and secondary) and other professionals and technicians after matching individuals according to their observable characteristics.

IV. Teachers' Earnings vis-à-vis those of Other Professionals and Technicians

4.1 The Earnings Gap Circa 2007 and its Distribution

The extent to which the earnings differentials can be attributed to differences in observable characteristics is explored next. This is done using matching comparisons such that each teacher is paired with a professional or technician with the same observable characteristics.

As previously mentioned, the characteristics are gender, age, education, presence of kids (12 or younger) in the household, presence of elders (65 or older) in the household, whether the workers is or not household head, presence of other wage earners in the household, whether the individual has a part-time work, and whether the individual holds a secondary job. All together these will be referred as the "full set" of observable characteristics. These variables are sequentially added as matching variables in the same order as mentioned here.

The decompositions are calculated for (i) pre-school and elementary school teachers and (ii) high school teachers, vis-à-vis other professionals and technicians. The results for the region as a whole are reported in Figure 1. The extremes of the boxes correspond to the limits of a 90%

confidence interval for the unexplained average gaps. The extremes of the whiskers correspond to those of a 95% confidence interval. The dots in the middle of the boxes correspond to the averages. In the figure, as one move to the right one variable is sequentially added to the set of matching variables. In this way, the first pair of bars corresponds to the original earnings gaps (the one that does not control for any observable characteristic), the second pair of bars corresponds to the earnings gaps after controlling for gender and the last pair of bars corresponds to the unexplained earnings gaps that remain after matching on all the characteristics of the demographic set of variables.

For high school teachers, the inclusion of education as a matching variable notoriously moves up the unexplained gap. High school teachers have more years of schooling than their counterparts working as other type of professionals and technicians, but this is not compensated in terms of wages. After the inclusion of all demographic variables teachers' underpayment with respect to other professionals and technicians is between 10% and 30%.

For pre-school and elementary school teachers the gap moves up after the inclusion of part-time job and it does not change after including the indicator for more than one job. The restriction of the labor supply at the intensive margin for teachers is linked to a more severe underpayment for teachers. At this point it is important to recall that more than half of the teaching body in this group works part-time. All in all, the underpayment of pre-school and elementary teachers with respect to other professionals and technicians, after matching on all demographic characteristics is between 30% and 40%, higher than the one facing high-school teachers.

Table 3 delves deeper into the earnings gaps reported in Figure 1 showing country-by-country disaggregation. The earnings gap shows important heterogeneity across countries. After controlling for the full set of demographic characteristics, Nicaragua and Peru are the countries

that show the biggest underpay for pre-school and elementary as well as high-school teachers, with respect to their peers who work as professionals and technicians.

As previously indicated one important advantage of using matching instead of the traditional regression-based Blinder-Oaxaca decompositions is the possibility of exploring beyond average earnings gaps. With the matching approach it is simple and straightforward to explore the distribution of the unexplained earnings gaps just reported above. Figure 2 shows earnings gaps at different percentiles of the earnings distributions of the populations under comparison. The plot reveals that the problem of teacher underpayment is focused at the high end of the distribution. The earnings gap in the bottom percentiles of the distribution do not considerably contribute to the aggregate measure of unexplained earnings differences between teachers and other professionals and technicians; the average earnings gap in Latin America is driven by pay differences at the top percentiles of the earnings distribution. Pre-school and elementary school teachers earn less than their peers in other professions for percentile 30 and above, while half of the teaching body in high-schools (percentile 50 and above) faces a negative earnings gaps with respect to their professional peers. This can be explained by the fact that in many countries teachers are rewarded through a single salary schedule which implies a salary structure much more compressed than the one of other professionals and technicians.

Figure A1 in the Appendix shows confidence intervals for the earnings gaps in different segments of the labor markets. The earnings gaps are higher for middle age workers (and this is specially faced by pre-school and elementary school teachers), for the highly educated, for those with kids in their households and those holding more than one job.

4.2 Exploring the Role of Certain Characteristics: Schedules, Vacations, Secondary Jobs and Tenure

"Typical policy discussions about the choice of a teaching career highlight some characteristics that come with a teaching job. Two of the most salient characteristics are the shorter (and flexible) job schedules, on the one hand, and the more stability that the profession enjoys, on the other. As it is typical in economics, these extra amenities have to come at a price. In this case such price would be expressed in terms of earnings disparities between teachers and their peers." (Mizala and Ñopo 2011). With these considerations we analyze the role of job schedules going beyond the measurement of earnings gaps in hourly terms at the main job.

Second job

We incorporate into the analysis an extra possibility that teachers enjoy regarding the use of their time, the holding of a second job. The shorter and flexible job schedules at the teaching profession imply, in turn, extra freedom for the possibility of holding such second job. This expands the income generation possibilities for teachers and may also be considered as an amenity linked to the profession. As highlighted in Table 2, teachers' propensity to have a second job is higher than that of other professionals and technicians, especially for those teaching at the high-school level (for this later group almost one in four teachers have a second job).

Many countries within our data report the existence of second jobs but only in nine of them it is possible to obtain data for earnings, hours worked per week and type of activity in the second job: Bolivia, Brazil, Costa Rica, Ecuador, Honduras, Nicaragua, Panama, Paraguay and Uruguay. The next part of the analysis will focus on these countries. It is important to highlight that the sample drops dramatically as a result of two combined restrictions on the data. First, this sample of nine countries approximately constitutes 1% of the observations that have been used for the previous

results. Second, within the six countries we restrict attention to those individuals who: (i) hold a second job, (ii) have information on earnings, hours worked per week and type of activity in the second job; and (iii) the second job activity is within the professionals and technicians group (i.e. we discard those individuals whose second job is under the occupational categories of Legislators, Managers, Armed forces and, especially, Office workers, to be consistent with our previous estimates and our critique to the previous literature). Combining the two restrictions, the resulting sample represents around 8.17% of the original teachers sample and 4.36% of the original non-teachers sample circa 2007. Brazil becomes utterly representative, holding around 58.53% of the observations.

Table 4 shows selected descriptive statistics for the sub-sample. The upper panel of the table (main job) depicts that part-time workers at their main job earn more than those who are not, and a greater share of teachers report working part time. The intermediate panel of the table shows data from the second job. Two results emerge. First, to an important extent the second job of teachers tends to be at another teaching position. Second, hourly earnings at second jobs are higher than those at the first jobs. The bottom panel of Table 4 shows descriptive statistics for main and secondary jobs combined (i.e., earnings are equal to the sum of main job and second job monthly earnings). The evidence still points towards a higher number of working hours, and higher earnings, for non-teachers than for teachers.

Table 5 shows the original and the unexplained earnings gap for main and secondary job (using hourly earnings), and the combination of both (using monthly earnings). Since we are restricting the sample to those workers that report having a second job, the "Full Set" specification does not include the "more than on job" variable. Additionally, we add another control variable: whether the worker's second job is related to school teaching or not after controlling by the full set of observable characteristics. The unexplained hourly earnings gaps at the second job are also

positive but smaller than those at the main job for both periods. Adding the control for teaching activities at the second job significantly change the unexplained earnings gaps, but in opposite directions for the two groups of teachers.

In all their second jobs, considering those involved or not with teaching duties, teachers face earnings gaps vis-à-vis other professionals and technicians. This may reflect the existence of some individuals' unobservable characteristics (or abilities) that the labor markets reward for which teachers fare worse than their peers. To further explore such possibility we estimate:

$$y_{ij} = \alpha + t_{ij}\beta + \mu_i + \varepsilon_{ij},$$

where:

y_{ij} represents the logs of earnings of individual *i* in job *j*;

t_{ij} is a dummy variable that takes the value 0 if the individual *i* is a teacher in her/his job *j* and 1 if she/he works as other professional or technician at such job;

μ_i is the unobserved (job-independent) individual heterogeneity, and

ε_{ij} is an idiosyncratic error term.

In this estimation we pool observations from circa 1997 and circa 2007, estimating separate regressions per year. For each regression we use the matching weights such that differences in observable characteristics between teachers and other professionals and technicians, at least those using in the matching[7], are vanished. Table 6 and Figure 3 show the estimation results for the two periods. Figure 3 shows the empirical distributions of the unobserved individual heterogeneity term for different groups of individuals according to the type of job they hold at their main and secondary jobs. Due to the small sample size for this exercise we pooled the data from circa 1997 and circa 2007 for this plotting (after the estimation of the fixed-effects regressions). The unobserved heterogeneity among teachers is at the left of that for other

[7] Gender, age, education, presence of children at home, presence of elders at home, an indicator for being a household head, an indicator for the presence of other income earner at home, part-time work and whether or not second job involves school teaching activities.

professional and technicians, providing additional support to the idea that there is some individuals' unobservable characteristics (or abilities) rewarded in the labor markets for which teachers fare worse than their peers.

Job-breaks and tenure

The next results on this section will be reported in hourly earnings, as before, but we will add a measure of "adjusted hourly earnings". This adjusted measure tries to capture the fact that job-breaks are not the same across occupations, but since information about vacation periods is not available in the household surveys we built a proxy. Adjusted hourly earnings are computed as follows: for teachers, we assume a two-month paid vacation period so that teachers hourly earnings are multiplied by a 12/10 ratio; for other professionals and technicians dependent workers we assume a one-month paid vacation period so that hourly earnings are multiplied by a 12/11 ratio; and for independent workers we assume no paid vacations so that their monthly earnings are multiplied by 12/12=1. Paid vacations might vary across (and within) countries and over the life cycle, so this proxy is just a coarse approximation and should be taken only as a ballpark figure of the role of these amenities on the earnigns gaps. Table 7 presents earnings gap decompositions for adjusted hourly earnings, for pre-school and elementary school teachers and for high school teachers (in both cases, vis-à-vis other professionals and technicians), the table reports that the earnings gaps computed using adjusted hourly earnings are smaller than that of non-adjusted hourly earnings.

Then, the other amenity we explore in this sub-section is tenure. It has been typically claimed that the teaching profession entails more job stability than others. This may in turn convert into a compensating differential that teachers are willing to accept in the form of lower salaries. Therefore, we assess the role of job tenure on the earnings gaps. Job tenure is defined

here as the approximate number of years an individual has remained in the same job at the moment of the survey. As in the previous case with second jobs, this analysis cannot be performed for the thirteen countries of the original analysis. We restrict our attention to eleven of them (Costa Rica and El Salvador do not have the necessary data). This implies restricting to 91.5% of the original data for teachers and 89% of the non-teachers' circa 2007. No descriptive statistic within this restricted data set is significantly different than those reported in Table 2 for the set of thirteen countries.

Table 7 shows the earnings gaps decompositions for pre-school and elementary school teachers and for high school teachers (vis-à-vis other professionals and technicians) using the current data subset, adding job tenure as a control variable. The earnings gap for preschool and elementary teachers in both periods and for all specifications reduces when adding job tenure as a control variable. These results give support to the idea that job stability acts as a compensating differential. These results suggest that job stability has higher intrinsic value nowadays. Table A4 Appendix) depicts similar results by country. These results, however, must be taken with caution due to the smaller sample size and (especially due to) the smaller size of the common support.

On this regard it is important to bring up another discussion, the earnings differences within the public and private sectors. We will see that not only a comparatively higher share of teachers work in the public sector, but that the differences regarding job stability within the sectors provide additional insights on whether and how job stability is a compensating differential.

4.3 Earnings differences within the public and private sectors

For the public-private part of the analysis we turn back to the original set of thirteen countries. The public sector is an important employer for teachers and moreover the worker's characteristics are different across both sectors. Among other professional and technicians there is

a higher prevalence of males in the private sector. Also, workers in the public sector tend to be older than those in the private sector. Among teachers, age is also a distinctive characteristic, being those in the public sector older as well. Additionally, teachers in the public sector tend to be household heads and to have children at home in a higher proportion than those in the private sector. These descriptive statistics are not shown in a table but available upon request.

Table 8 shows the earnings gaps decompositions for pre-school and elementary school teachers and for high school teachers (vis-à-vis other professionals and technicians) adding whether the individual works in the public sector or not as a control variable. Adding this variable as a control slightly increases the earnings gap for preschool and elementary teachers and for all specifications (adjusted and unadjusted hourly earnings?); and it does so slightly more for high school teachers. Table A5 (in the Appendix) shows the results by country. Interestingly, the earnings gaps are higher in the public sector than in the private one for both pre-school and elementary teachers and high school teachers.

4.4 The differentiating role of job tenure between the public and private sectors:

We next turn back to the eleven countries that report data on job sector and job tenure. Figure 4 presents Kernel density estimations of job tenure for teachers and other professionals and technicians, split by job sector. It can be highlighted from that figure that, in fact, public teachers enjoy nowadays a positive tenure gap vis-à-vis other professional and technicians working in the public sector. On the other hand, teachers in the private sector have slightly less job stability than other professionals and technicians.

Figure 5 presents the non-parametric regressions of tenure on earnings. The figure shows that other professional and technicians earn more than teachers in both sectors. However, differences appear to decrease with tenure, in fact, long-tenured (around 35 years or more) school

teachers in the public sector earn more than other professional and technicians. These results hold for every country considered. Nevertheless, this analysis does not take into account the role of observable characteristics. For that reason, we perform a matching exercise that controls for differences in observable characteristics next.

Table 9 shows the earnings gaps decompositions for pre-school and elementary school teachers and for high school teachers (vis-à-vis other professionals and technicians) using the data subset restricted on individuals that report job sector and job tenure, adding job sector and job tenure as control variables. As previously found, adding job sector as a control variable increases the earnings gap for both groups, pre-school and elementary teachers and high school teachers, and for all specifications, however, job tenure reduces it. Table A6 (in the appendix) shows the results by country. These results, however, must be interpreted with caution due to the small size of the common support.

V. Earnings Changes at the turn of the 20th Century for teachers vis-à-vis other professionals and technicians

This section of the paper examines the evolution, between circa 1997 and circa 2007, of teachers' salaries vis-à-vis other professional and technical occupations. We analyzes whether, after controlling the earnings differentials by observable characteristics linked to productivity, teacher earnings improved or deteriorated during the decade. We also study what is behind the change in earnings gap.

5.1 Evolution of Average Earnings Gaps (controlling for observable characteristics)

Table 10 shows the drop in earnings gaps between the teaching groups and their comparing group of other professionals and technicians for the period under analysis. The gap dropped for both the original and the controlled (after matching) measures and also for both the gap measured in hourly and adjusted hourly earnings. Table A7 in the appendix shows the same changes in earnings gaps by country.

Although some countries present negative original earnings gaps, unexplained earnings gaps after controlling for the full set of observable characteristics are either positive or statistically zero. The results also provide evidence of a notable cross-country heterogeneity behind the region averages reported in Figure 1. Looking at each country separately it can be seen that the original earnings gap between pre-school and elementary teachers vis-à-vis other professionals and technicians decreased in most countries of the region but it did specially for Bolivia, Brazil and Dominican Republic. The only countries where such gap increased were Costa Rica and Ecuador. The gap regarding high school teachers markedly decreased for Bolivia, Brazil and Uruguay; the gap increased for Paraguay, Nicaragua and El Salvador. All in all, the original and unexplained earnings gaps dropped for both pairs in comparison.

What is behind the decrease in earnings gap? The drops in unexplained earnings gaps can arise either as a result of a general trend of gaps decreasing in the segments considered of the labor markets (that is, those for professionals and technicians, where teachers are involved), or can also be the result of changes over time of the distribution of individuals' observable characteristics. To further explore the effects of labor market trends versus changes in labor markets composition, Table 11 presents a "matching after matching" exercise (Ñopo and Hoyos, 2010) disentangling both. The first stage of matching is performed with the full set of observable characteristics, matching teachers with other professionals and technicians in both moments

under consideration (circa 1997 and circa 2007), as it has already been performed. After that, the matching after matching exercise is performed for the two matched sets of workers, matching the circa 1997 data with the one from circa 2007. In this way not only teachers and non-teachers show no differences in observable characteristics, but also they show no changes in the distribution of those characteristics during the period under analysis. The results, shown in Table 11, indicate that there is more evidence of a general trend of decreasing earnings gaps than one of an improvement of teachers' characteristics. The change in earnings gaps due to changes in the distributions of observable characteristics is positive and higher for pre-school and elementary teachers, but compensated by the change in the counterfactual component.

5.2 Changes in the Distribution of the Unexplained Earnings Gap

After matching individuals on the basis of observable characteristics it is possible to explore not only the average but also the distribution of the earnings gaps in each period. In general, as reported in Mizala and Ñopo (2011), pre-school and elementary school teachers' underpayment is more pronounced among older and more educated workers, household heads, part-time workers, and those who report having more than one job. As reported in Table 11, during the period under analysis there is evidence of a general trend over all the labor markets for a reduction of earnings gaps. Within this matching exercise, nonetheless, it is possible to explore the segments of the labor markets for which the drops in gaps have been more pronounced. The bigger drops in earnings gaps for pre-school and elementary teachers occurred among younger individuals, those with higher education (secondary complete or more), with no elders at home, part-time workers and those with no secondary jobs. For high school teachers, the earnings gaps are more pronounced among household heads and those holding more than one job. Among these teachers there is no particular segment of the market for which the gap dropped particularly more than the

rest. Additionally, the drop in earnings gaps occurred mainly in the middle of the distribution of earnings for both teaching groups.[8]

VI. Conclusions

This paper examines teachers' earnings in Latin America with respect to those of other professionals and technicians; it also analyzes the evolution of the earnings gaps between circa 1997 and circa 2007. Since the available empirical evidence has shown that the sign and magnitude of the conditional earnings differential between teachers and other workers depend crucially on the definition of the comparison group, we build upon the results of Mizala and Ñopo (2011) using the methodology developed in Ñopo (2008). This approach emphasizes earnings differences in the supports of the distributions of observable characteristics and provides insights into the distribution of unexplained pay differences, which nurtures our comparison between periods. Furthermore, using a matching after matching approach we were able to provide further insights on the change of the earnings gap during the decade under analysis.

The results show that teachers are underpaid vis-à-vis other professionals and technicians in Latin America in both periods: circa 1997 and circa 2007; although these gaps decreased through the decade. Nonetheless, there is an important cross-country heterogeneity behind the region averages. In particular, Brazil affects greatly the region averages due to its size. Despite this, the main conclusions hold if we include Brazil or not: High school teachers are more educated than other professionals and technicians but their years of education are not properly rewarded in the labor market. Working part-time is a characteristic that explains teachers' underpayment –pre-school and elementary school teachers enjoy greater flexibility in the work. Teachers' lower earnings are being compensated through lower effective labor in the main job, which not only

[8] This last result is not shown but available upon request.

eases prospects of having a family but also eases the decision of having/finding a second job, accepting the possibility of lower (main job) earnings.

We find that teachers are also being underpaid in their second job vis-à-vis other professionals and technicians, although these differences are smaller than in their main job, and also decreased throughout the decade. This calls for the role of some possible unobservable characteristics that differ between teachers and their peers and seem to be explaining part of the gap. Additionally, job stability has been found as another salient characteristic within the teaching profession, especially in the public sector. The returns to job tenure among teachers, however, were found to be smaller than those among other professionals and technicians. This adds elements to portray the picture of a teaching profession as a labor market option for individuals that tend to have lower aspirations, lower ability. Being that the case, the issue of selection into the teaching profession becomes especially relevant and calls for policy attention.

In general we found that the earnings gap decreased for each of the segments of the population provided by the control variables. Even more interesting, preschool and elementary teachers' earnings gap decreased importantly during the decade, especially for those who are females, younger and work part-time. Furthermore, in the hypothetical situation of no changes over time in the distribution of characteristics, results suggest an important decrease in the earnings gaps driven by the unexplained component of the gap, particularly for pre-school and elementary teachers. All in all, the analysis performed provides evidence that the wage gap decreased during the ten year span of analysis, driven by the change in preschool and elementary teachers' underpayment throughout the time span and a decrease in non-teachers real income.

Moreover, important differences along the earnings distribution were found. Teachers in the highest percentiles of the earnings distribution earn less than other professionals and technicians, however, these earnings differences decreased throughout the decade. At the same

time, teachers in the bottom percentiles have similar or higher earnings than comparable workers. This can be explained because in many countries teachers are rewarded through a single salary schedule which implies a salary structure much more compressed than the one of other professionals and technicians.

This salary structure is appealing to teachers as a fair way to compensate everyone, because it does not make distinctions that might disturb relationships among them. In this scheme equal pay is provided regardless of differing efforts and abilities; salaries are unrelated to the activities performed at the schools; being seniority and, to a lesser extent, the level of education the primary basis for any pay increase, which means that in the teaching profession loyalty rather than actual job performance is rewarded.

This system implies that the teaching profession probably attracts people with a preference for job stability and security, and at the same time equal pay regardless of performance penalizes the highly effective teachers who should be earning more. Thus, the single salary schedule might not be attractive to high performing teachers, especially in the public sector. For this reason, several countries are reforming traditional systems of recruiting teachers as well as mechanisms of paying and rewarding them, in order to attract and retain highly qualified individuals into teaching (OECD, 2009).

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Table 1
Literature Review: Earnings Gaps for Different Comparison Groups

Reference	Teachers group		Comparison group		C= (B-A)/A Earnings gap* (as percentage of teachers' average earnings)
	Definition	A Average hourly earnings (purchasing power parity, US$, 2000)*	Definition	B Average hourly earnings (purchasing power parity, US$, 2000)*	
Psacharopoulos et al. (1996).	School and university teachers. The deffinition included other school staff in cases when disaggregation was not possible.	5.87	Public and private sector employees, excluding domestic servants and agricultural workers.	3.17	-46.0%
Liang (1999)	Preschool, special education, primary and secondary teachers; those employed in the formal sector –working more than 20 hours per week, not currently studying.†	5.17**	Workers employed in the formal sector –working more than 20 hours per week, not currently studying.	3.15**	-39.1%**
Hernani-Limarino (2005)	Preschool, primary, and secondary teachers.‡	5.29	Three alternative definitions: i) All workers ii) All workers that have at least completed secondary education iii) All workers that are identified either as office workers or professionals/technicians	i) 3.20 ii) 4.42 iii) 4.44	i) -39.6% ii) -16.3% iii) -16.0%
Mizala and Ñopo (this document)	School teachers excluding those with particular specialties (e.g., teachers for students with special needs, language instructors, sports instructors, and dance or art instructors)	5.29	Those workers classified as "professionals" and "technicians and associate professionals" according to the occupational codes in country-year each survey.	6.32	19.4%

† In Liang (1999), some university teachers are also selected by the author since his data does not permit a breakdown of different categories of teachers for El Salvador and Venezuela.

‡ In Hernani-Limarino (2005), for the cases of Argentina, Colombia, and Mexico, the author also included those working in special, technical, or higher education.

* Average hourly earnings for all comparisons are computed using the data set for this document, but the teachers and comparison group definitions of the different authors. In the case of Liang (1999), our data does permit a breakdown of different categories of teachers in El Salvador, so university teachers are not included. Earnings gaps are not being controlled by any observable characteristic.

** Ecuador and Bolivia are not included since our data does not report whether the individual is studying or not at the moment of the survey.

Source: Authors' calculations from household surveys.

Table 2
Descriptive Statistics and Relative Hourly Earnings at the Main Job, by Group (Circa 2007)

	Descriptive Statistics			Relative Hourly Earnings (Base: Average School Teacher Earnings in each Country=100)		
	Pre-School and Elementary Teachers	High School Teachers	Other Professionals and Technicians	Pre-School and Elementary Teachers	High School Teachers	Other Professionals and Technicians
Average Hourly Earninngs				93.8	119.1	118.2
Men						
No	86.9%	61.4%	42.8%	92.4	118.7	108.6
Yes	13.1%	38.6%	57.2%	102.9	119.8	125.4
Age groups						
24 and under	10.3%	7.9%	15.1%	60.8	79.2	67.7
25 to 34	31.4%	25.7%	33.8%	83.8	106.2	110.0
35 to 44	31.5%	30.7%	24.1%	98.7	121.6	129.7
45 to 54	19.8%	23.9%	18.0%	110.4	128.2	144.5
54 and over	7.0%	11.8%	9.0%	118.1	149.0	150.7
Education level						
None or primary incomplete	0.2%	0.0%	4.5%	49.5	32.8	60.9
Primary complete or secondary incomplete	3.0%	1.1%	8.3%	67.5	92.9	71.3
Secondary complete or tertiary incomplete	77.9%	65.5%	68.6%	91.9	117.0	115.9
Tertiary complete	18.9%	33.5%	18.7%	106.0	124.0	161.5
Presence of children (≤12 years) in the household						
No	51.6%	59.1%	53.3%	96.4	121.3	121.1
Yes	48.4%	40.9%	46.7%	91.0	116.0	114.0
Presence of elder (≥65 years) in the household						
No	85.5%	83.1%	86.1%	93.7	119.0	119.3
Yes	14.5%	16.9%	13.9%	94.0	119.8	111.8
Head of the household						
No	69.8%	56.9%	53.3%	89.1	113.5	102.9
Yes	30.2%	43.1%	46.7%	104.5	126.6	135.7
Presence of other household member with labor income						
No	85.5%	83.1%	86.1%	94.3	120.1	123.6
Yes	14.5%	16.9%	13.9%	93.6	118.8	116.1
Labor Characteristics						
Part time						
No	44.4%	51.3%	80.6%	84.9	1.1	114.2
Yes	55.6%	48.7%	19.4%	100.9	132.8	135.2
More than one job						
No	81.2%	72.1%	89.3%	91.4	116.2	115.3
Yes	18.8%	27.9%	10.7%	104.0	126.8	143.1

Source: Authors' calculations from household surveys.

Table 3
Unexplained Earnings Gap by Country Controlling by Observable Characteristics (Circa 2007)

Pre-School and Elementary Teachers vis-à-vis Other Professionals and Technicians										
Country	**Original gap**	**+Gender**	**+ Age**	**+ Education**	**+ Children living in the household**	**+ Elders living in the household**	**+ Household head**	**+ Another wage earner living in the household**	**+ Part-time Work**	**+ Has more than one job**
Bolivia	**-20.4%**	-23.9%	-11.9%	-1.9%	1.5%	0.1%	-4.8%	-3.0%	28.4%	33.5%
		(3.76)	(5.58)	(5.41)	(5.52)	(5.85)	(6.16)	(6.48)	(8.1)	(8.55)
Brazil	**27.0%**	17.7%	21.6%	26.5%	25.9%	25.8%	24.9%	25.4%	37.0%	37.8%
		(1.18)	(1.33)	(1.6)	(1.72)	(1.8)	(1.76)	(1.88)	(2.02)	(2.31)
Chile	**36.3%**	24.8%	22.5%	26.7%	26.2%	24.0%	21.4%	19.6%	19.4%	17.9%
		(1.95)	(3.27)	(4.91)	(5)	(5.18)	(5.12)	(5.21)	(5.48)	(5.49)
Costa Rica	**-3.6%**	-1.0%	-1.0%	9.5%	9.3%	10.5%	11.0%	8.5%	13.8%	18.9%
		(2.76)	(4.51)	(6.56)	(6.19)	(6.2)	(6.14)	(6.47)	(7.41)	(8.01)
Dom. Rep.	**25.5%**	19.3%	24.1%	32.7%	36.6%	25.0%	15.0%	18.2%	25.6%	23.2%
		(4.26)	(7.56)	(9.09)	(11.03)	(9.66)	(12.16)	(12.47)	(20.24)	(25.71)
Ecuador	**26.3%**	23.7%	26.6%	14.1%	17.3%	19.9%	16.9%	17.4%	35.3%	28.4%
		(3.16)	(4.3)	(4.49)	(4.71)	(5.09)	(5.25)	(5.4)	(7.49)	(7.69)
El Salvador	**-5.3%**	-5.9%	-0.3%	-10.1%	-6.9%	-13.0%	-11.7%	-17.2%	4.6%	5.6%
		(2.49)	(5.14)	(5.66)	(5.84)	(6.17)	(5.87)	(5.43)	(9.67)	(9.72)
Honduras	**-17.9%**	-21.0%	-23.1%	-20.2%	-18.7%	-18.4%	-12.7%	-9.1%	33.4%	36.3%
		(2.65)	(2.78)	(3.73)	(4.28)	(4.37)	(4.89)	(5.46)	(9.93)	(11.79)
Nicaragua	**98.8%**	91.2%	84.3%	56.2%	51.8%	50.1%	43.5%	32.9%	49.3%	57.3%
		(5.56)	(6.8)	(8.24)	(9.12)	(11.26)	(10.87)	(11.35)	(16.15)	(16.47)
Panama	**20.1%**	17.2%	19.1%	22.0%	18.3%	20.6%	23.7%	22.5%	25.8%	24.6%
		(2.82)	(3.83)	(4.92)	(5.1)	(5.79)	(6.13)	(6.28)	(6.96)	(6.84)
Paraguay	**39.3%**	46.4%	45.6%	17.1%	6.0%	-6.9%	-0.5%	4.0%	3.3%	-3.4%
		(5.17)	(9.42)	(8.66)	(7.84)	(7.98)	(9.13)	(10.76)	(15.2)	(9)
Peru	**33.7%**	24.5%	33.0%	37.8%	35.0%	36.8%	29.2%	26.1%	45.6%	42.4%
		(2.83)	(4.03)	(4.11)	(4.75)	(5.42)	(5.15)	(5.16)	(6.97)	(7.6)
Uruguay	**25.6%**	30.7%	26.6%	-7.9%	-9.1%	-8.6%	-12.8%	-4.0%	17.0%	19.0%
		(3.68)	(3.74)	(4.11)	(4.23)	(4.33)	(4.85)	(6.44)	(8.33)	(11.08)
Latin America (13 countries)	**26.1%**	18.5%	22.1%	25.1%	24.5%	24.3%	22.8%	23.2%	35.9%	36.3%
		(0.73)	(0.96)	(1.13)	(1.23)	(1.31)	(1.3)	(1.39)	(1.58)	(1.8)

High School Teachers vis-à-vis Other Professionals and Technicians										
Country	**Original gap**	**+Gender**	**+ Age**	**+ Education**	**+ Children living in the household**	**+ Elders living in the household**	**+ Household head**	**+ Another wage earner living in the household**	**+ Part-time Work**	**+ Has more than one job**
Bolivia	**-17.9%**	-18.9%	-12.0%	-2.6%	-1.1%	-0.7%	5.5%	0.0%	13.7%	17.1%
		(3.8)	(6.68)	(6.6)	(7.08)	(7.46)	(7.6)	(7.44)	(10.68)	(10.79)
Brazil	**-3.2%**	-6.5%	0.6%	9.7%	10.6%	10.6%	9.5%	8.9%	14.2%	16.4%
		(1.95)	(3.2)	(4.48)	(4.85)	(5.03)	(4.94)	(4.93)	(5.27)	(6.12)
Chile	**5.6%**	1.8%	4.6%	21.7%	19.1%	16.2%	13.8%	16.5%	17.5%	17.6%
		(4.45)	(8.39)	(12.82)	(10.93)	(10.24)	(9.65)	(8.83)	(8.76)	(8.41)
Costa Rica	**-13.6%**	-12.3%	-8.9%	2.3%	3.5%	0.8%	2.9%	5.1%	17.9%	13.6%
		(3.82)	(9.03)	(12.12)	(10.89)	(9.56)	(10.23)	(11.03)	(12.68)	(11.19)
Dom. Rep.	**13.1%**	11.7%	12.6%	29.2%	25.2%	13.2%	7.6%	20.8%	16.0%	4.8%
		(7.27)	(23.2)	(24.41)	(22.64)	(24.9)	(27.65)	(30.23)	(30.85)	(38.23)
Ecuador	**-4.5%**	-5.7%	9.6%	14.0%	12.2%	16.5%	15.9%	16.4%	41.4%	29.3%
		(3.74)	(6.84)	(7.74)	(7.41)	(8.08)	(8.33)	(9.28)	(11.92)	(12.75)
El Salvador	**7.8%**	7.6%	6.5%	33.7%	7.0%	-4.9%	-8.0%	-4.5%	-13.5%	-5.8%
		(6.19)	(22.79)	(57.5)	(21.77)	(18.89)	(18.85)	(20.44)	(22.85)	(16.36)
Honduras	**-19.0%**	-20.1%	-14.7%	8.4%	4.9%	3.6%	10.2%	9.6%	30.9%	12.0%
		(3.88)	(7.1)	(9.5)	(9.19)	(9.26)	(9.75)	(10.44)	(17.14)	(13.09)
Nicaragua	**60.9%**	58.9%	45.6%	70.9%	63.5%	74.3%	59.9%	42.5%	58.6%	51.5%
		(7.51)	(16.9)	(24.83)	(23.18)	(28.03)	(24.54)	(32.81)	(37.92)	(41.55)
Panama	**-3.7%**	-4.3%	-2.8%	15.8%	16.1%	19.3%	11.4%	10.4%	16.1%	21.5%
		(2.79)	(4.53)	(5.83)	(5.89)	(7.04)	(7.1)	(6.88)	(7.14)	(7.96)
Paraguay	**10.5%**	13.4%	49.2%	41.5%	39.5%	37.3%	41.0%	-11.9%	16.6%	40.9%
		(8.61)	(22.9)	(28.14)	(26.54)	(32.67)	(29.66)	(27.97)	(24.69)	(23.04)
Peru	**4.7%**	2.4%	8.8%	18.5%	18.9%	18.7%	17.3%	16.0%	43.2%	42.4%
		(3.45)	(5.27)	(5.82)	(6.04)	(6.67)	(6.63)	(6.65)	(9.74)	(12.66)
Uruguay	**16.9%**	19.0%	17.1%	-9.0%	-6.5%	-7.2%	-6.0%	-0.1%	2.3%	12.5%
		(4.2)	(5.17)	(5.54)	(5.96)	(6.17)	(7.21)	(8.68)	(8.81)	(11.33)
Latin America (13 countries)	**-0.8%**	-3.9%	3.1%	12.5%	12.6%	12.4%	11.3%	10.5%	18.7%	19.3%
		(1.28)	(2.14)	(2.89)	(3.1)	(3.35)	(3.4)	(3.43)	(4.07)	(4.78)

Source: Authors' calculations based on household surveys.
Note: Standard errors in parentheses.

Table 4
Descriptive Statistics
(9 countries with data on second job, Circa 2007)

Sub-sample of workers that reported having a secondary job related either to school teaching or to other professional and technical occupations, the related activity, earnings and hours worked per week in this second job

	Pre-School and Elementary Teachers	High School Teachers	Other Professionals and Technicians
Main Job			
Part-time work			
Region Average	78.5%	67.0%	46.3%
Average hourly earnings (part-time workers)*			
Region Average	92.4	124.8	149.1
Average hourly earnings (non part-time workers)*			
Region Average	81.6	107.2	135.4
Second Job			
Second job involves school-teaching activities			
Region Average	90.7%	80.1%	5.9%
Average hourly earnings in second job*			
Region Average	120.6	150.2	328.2
Main and Second Jobs (combined)			
Average hours worked per week in main and second jobs			
Region Average	34.1	38.2	41.0
Works over-time (50 hours a week or more)			
Region Average	40.6%	48.0%	63.1%
Average monthly earnings in main and second jobs			
Region Average	92.0	116.6	196.9
Observations	661	469	2009
Expanded Observations	249130	132756	607364

Source: Authors' calculations based on household surveys.
* Average school teacher earnings in main job in each Country=100.
** Average school teacher monthly earnings in main and second jobs (combined) in each Country=100.

Table 5
Unexplained Earnings Gap Controlling by the Full set of Observable Characteristics and Teaching in the Second Job
(9 countries with data on second job, Circa 2007)

	Hourly Earnings					**Full Monthly earnings**		
	Main Job		**Second Job**			**Main and Second Job Combined**		
	Original gap	**Controlled by the full set of observable characteristics**	**Original gap**	**Controlled by the full set of observable characteristics**	**+ Second job: school teacher**	**Original gap**	**Controlled by the full set of observable characteristics**	**+ Second job: school teacher**
Pre-School and Elementary Teachers vis-à-vis Other Professionals and Technicians								
Region average	**124.3%**	94.7% (9.07)	**161.6%**	94.3% (9.72)	57.4% (39.63)	**145.6%**	86.5% (6.75)	42.1% (22.33)
High School Teachers vis-à-vis Other Professionals and Technicians								
Region average	**93.8%**	79.2% (13.75)	**92.2%**	54.9% (20.85)	29.6% (50.64)	**103.9%**	70.7% (13.17)	92.0% (38.71)

Source: Authors' calculations based on household surveys.

Note: Standard errors in parentheses. The Full Set specification does not include the variable "more than one job" as we are restricting our comparison to those who report having a second job.

Table 6

Fixed-effects estimation of the role of teaching on hourly earnings (6 countries with data on second job in Circa 1997 and Circa 2007)

	Dependent varaible: Logs of Hourly
Job does not involve teaching realated activities	0.0897***
	(0.0025)
Intercept	0.1580***
	(0.0021)
Correlation between μ_i and t_{ij}	**0.34**
Observations	**329**
Expanded Observations (weighted by matching distribution)	**319254**

Source: Authors' calculations based on household surveys.
Note: Standard errors in parentheses.

Table 7
Unexplained Earnings Gaps after Controlling by the Full set of Observable Characteristics and Job Tenure
(11 countries with data on job tenure, Circa 2007)

	Hourly earnings			Adjusted hourly earnings		
	Original gap	**Controlled by the full set of**	**+ Tenure**	**Original gap**	**Controlled by the full set of**	**+ Tenure**
Pre-School and Elementary Teachers vis-à-vis Other Professionals and Technicians						
Region average	**27.1%**	36.7% (1.85)	32.4% (2.87)	**13.7%**	22.2% (1.68)	20.0% (2.61)
High School Teachers vis-à-vis Other Professionals and Technicians						
Region average	**-0.5%**	19.3% (4.91)	13.0% (6.58)	**-11.0%**	7.1% (4.4)	2.2% (5.94)

Source: Authors' calculations based on household surveys.
Note: Standard errors in parentheses.

Table 8
Unexplained Earnings Gaps after Controlling by the Full set of Observable Characteristics and Job Sector
(13 countries with data on job sector, Circa 2007)

	Hourly earnings			Adjusted hourly earnings		
	Original gap	**Controlled by the full set of**	**+ Job in public sector**	**Original gap**	**Controlled by the full set of**	**+ Job in public sector**
Pre-School and Elementary Teachers vis-à-vis Other Professionals and Technicians						
Region average	**26.2%**	49.7% (1.78)	50.7% (1.8)	**12.9%**	33.7% (1.62)	36.4% (1.67)
High School Teachers vis-à-vis Other Professionals and Technicians						
Region average	**-0.7%**	34.9% (3.72)	38.6% (3.95)	**-11.1%**	20.9% (3.35)	25.6% (3.62)

Source: Authors' calculations based on household surveys.
Note: Standard errors in parentheses.

Table 9
Unexplained Earnings Gaps after Controlling by the Full set of Observable Characteristics and Job Sector and Job Tenure
(11 countries with data on job sector and job tenure, Circa 2007)

	Hourly earnings				Adjusted hourly earnings			
	Original gap	Controlled by the full set of	+ Job in public sector	+ Tenure	Original gap	Controlled by the full set of	+ Job in public sector	+ Job Tenure
Pre-School and Elementary Teachers vis-à-vis Other Professionals and Technicians								
Region average	**27.3%**	50.3% (1.83)	51.1% (1.84)	46.4% (3.67)	**13.9%**	34.2% (1.66)	36.7% (1.7)	33.7% (3.37)
High School Teachers vis-à-vis Other Professionals and Technicians								
Region average	**-0.4%**	35.0% (3.81)	38.8% (4.03)	21.7% (6.94)	**-10.9%**	21.1% (3.44)	25.8% (3.7)	11.1% (6.4)

Source: Authors' calculations based on household surveys.
Note: Standard errors in parentheses.

Table 10
Unexplained Earnings Gaps Controlling by the Full set of Observable Characteristics

	Hourly earnings				Adjusted hourly earnings			
	Original gap		Controlled by the full set of observable characteristics		Original gap		Controlled by the full set of observable characteristics	
	Circa 97	Circa 07	Circa 97	Circa 07	Circa 97	Circa 07	Circa 97	Circa 07
Pre-School and Elementary Teachers vis-à-vis Other Professionals and Technicians								
Region average	**80.5%**	**26.1%**	89.4% (2.13)	36.3% (1.8)	**61.4%**	**10.3%**	64.4% (2.35)	32.8% (1.73)
High School Teachers vis-à-vis Other Professionals and Technicians								
Region average	**21.4%**	**-0.8%**	31.7% (5.16)	19.3% (4.78)	**8.5%**	**-14.6%**	29.0% (5.26)	21.4% (3.86)

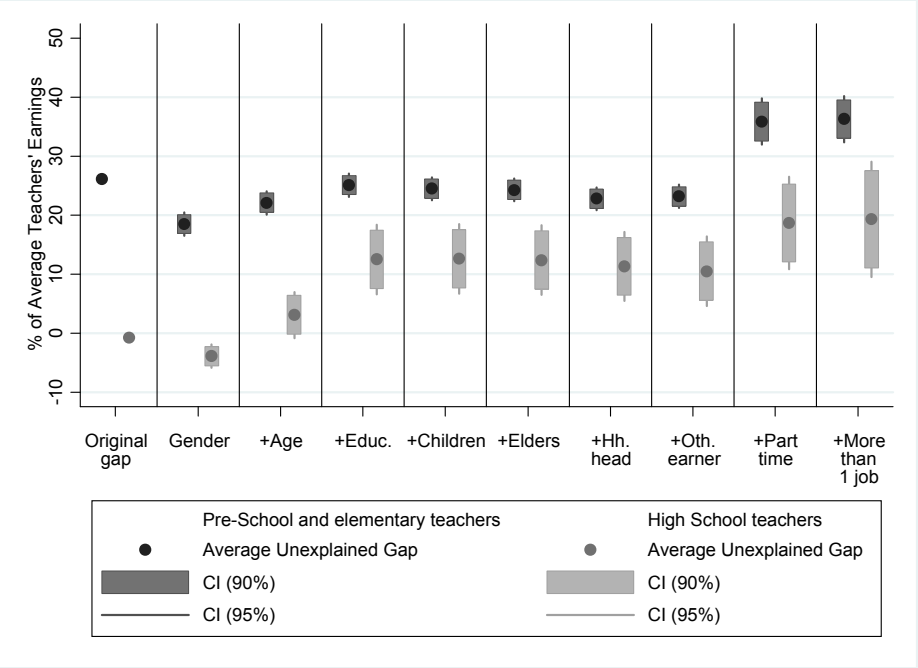
Source: Authors' calculations based on household surveys.
Note: Standard errors in parentheses.

Table 11
Decomposition of the Change in Unexplained Earnings Gap circa 2007- circa 1997
(after Controlling by the Full Set of Observable Characteristics)

	Counterfactual Change if no Change in X's	Part of the Change due to Change in X's	Total Change
Pre-school and Elementary Teachers vis-à-vis	-65.3%	11.2%	-54.1%
Other Professionals and Technicians	(4)	(0)	(0)
High School Teachers vis-à-vis Other	-22.0%	9.0%	-13.0%
Professionals and Technicians	(7)	(0)	(0)

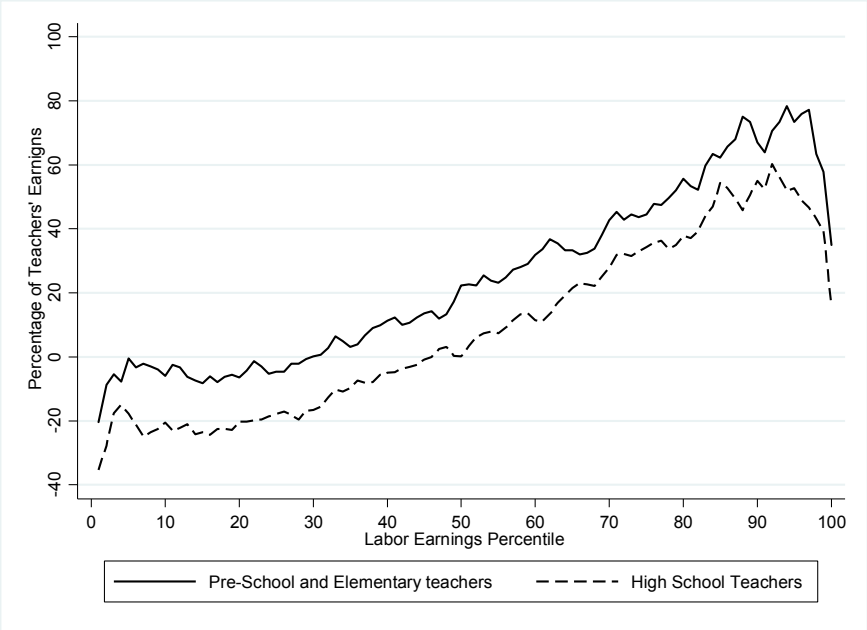
Source: Authors' calculations based on household surveys.
Note: Standard errors in parentheses.

Figure 1
Confidence Intervals for the Unexplained Earnings Gap Controlling by Observable Characteristics Pre-School/Elementary School and High School Teachers versus Other Professionals and Technicians
(Circa 2007)



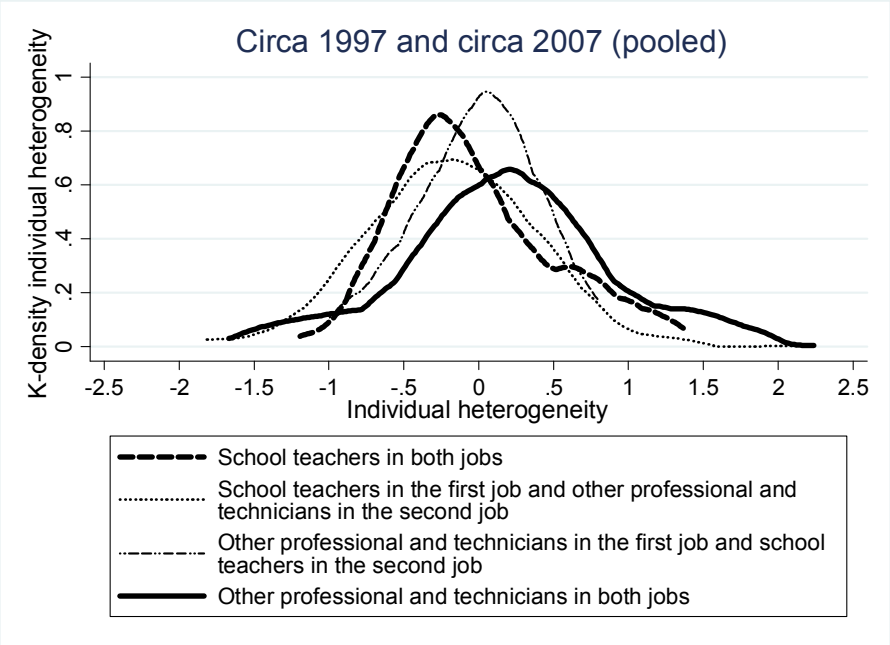
Source: Authors' calculations based on household surveys
Note: Boxes show 90 percent confidence intervals for unexplained earnings; whiskers show 95 percent confidence intervals.

Figure 2
Unexplained Earnings Gaps along Percentiles of the Earnings Distribution
(After Controlling by the Full set of Demographic Characteristics)
Pre-School/Elementary School and High School Teachers versus Other Professionals and Technicians
(Circa 2007)



Source: Authors' calculations based on household surveys

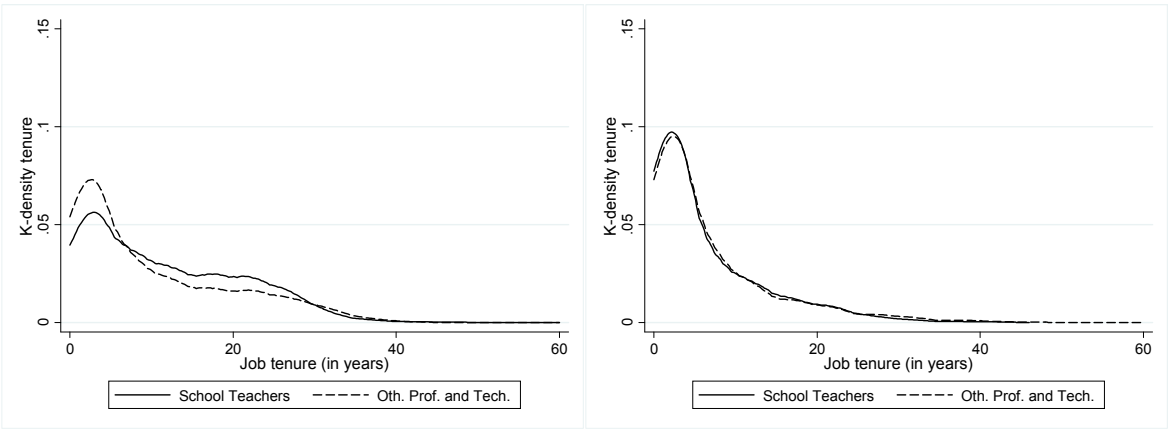
Figure 3
Estimated Kernel Distributions of Individual Heterogeneity of School Teachers and Other Professional and Technicians
(6 countries with data on second job)



Source: Authors' calculations based on household surveys.
Bandwidth: 0.2.

Figure 4
Estimated Kernel Distributions of Job Tenure
(11 countries with data on job sector and job tenure)

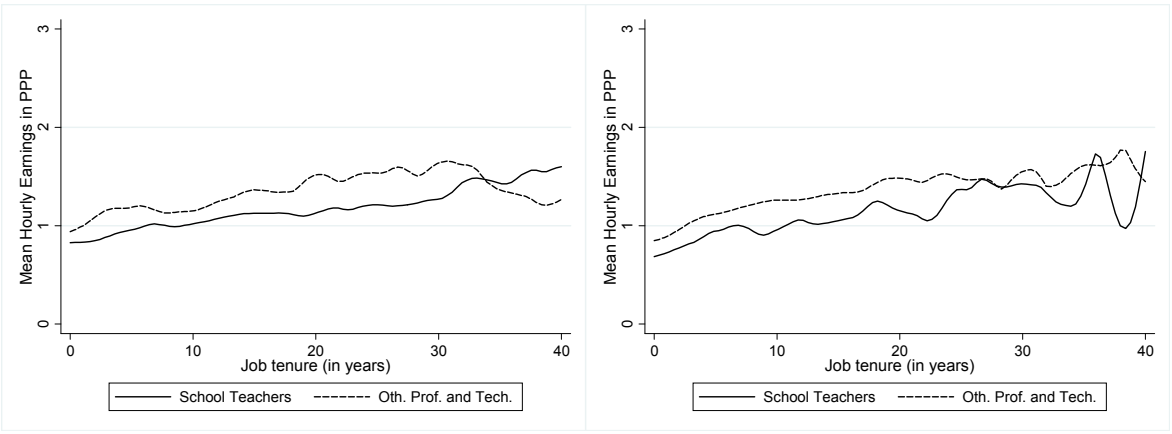
a. Public Sector workers **b. Private sector workers**



Source: Authors' calculations based on household surveys.
Bandwidth: 2.

Figure 5
Estimated Kernel Regression Functions: Hourly Earnings vs. Job Tenure
(11 countries with data on job sector and job tenure)

a. Public sector workers **b. Private sector workers**



Source: Authors' calculations based on household surveys.
Bandwidth: 2.

On-line Appendix

Table A1
Data Sources and Sample Sizes, by Group

Country	Name Of The Survey	Year	Other Professionals and Technicians/Teachers (non tertiary) Working Populations*							
			Full Set		Pre-School and Elementary Teachers		High School Teachers		Other Professionals and Technicians	
			Number of observations	Expanded observations	Number of observations	Expanded observations	Number of observations	Expanded observations	Number of observations	Expanded observations
Bolivia	Encuesta Nacional de Empleo (ENE or EE)	1997	10288	2218471	350	69377	197	41673	708	158542
		2009	8537	1478942	254	36549	181	25730	1360	206769
Brazil	Pesquisa Nacional por Amostra de Domicilio (PNAD)	1995	110093	49700000	3406	1546106	719	313631	6217	2715156
		2009	162632	78400000	3976	1918232	1150	542706	18352	9006210
Chile	Encuesta de Caracterizacion Socioeconomica Nacional (CASEN)	1998	61492	4966500	1388	123222	365	40524	4524	579730
		2009	82904	6021472	1535	113719	278	31928	8324	1003972
Costa Rica	Encuesta de Hogares de Propósitos Múltiples (EHPM)	1995	12199	966662	218	16900	81	6541	720	68506
		2009	18107	1797512	345	34639	211	19625	3047	366669
Dominican Republic	Encuesta Nacional de Fuerza de Trabajo (ENFT)	2000	8078	3096833	159	62525	29	10793	828	295452
		2008	10810	3479268	252	80158	64	19633	757	356222
Ecuador	Encuesta de Empleo, Desempleo y Subempleo (ENEMDU)	2000	9374	1967617	257	46650	38	4720	441	92618
		2006	21694	5219747	529	117720	255	56533	1372	369388
El Salvador	Encuesta de Hogares de Propositos Multiples (EHPM)	1995	10950	1553995	265	33192	25	3672	691	110980
		2009	24299	1961864	518	41415	54	4758	1733	198244
Honduras	Encuesta Permanente de Hogares de Propósitos Múltiples (EPHPM)	1995	9005	1539817	232	36542	78	11974	536	70158
		2007	26588	1936852	719	53219	211	15042	2755	184566
Nicaragua	Encuesta Nacional de Hogares sobre medicion de Niveles de Vida (EMNV)	1998	5739	1078232	181	31456	27	4920	324	71975
		2005	11023	1652223	377	48401	64	9292	578	115217
Panama	Encuesta de Hogares (EH)	1995	11318	722732	316	17680	207	13360	924	65954
		2007	18843	1269338	395	24953	220	14764	1638	126569
Paraguay	Encuesta de Hogares por Muestra (Mano de obra)	1996	4452	1163769	83	22291	48	11779	264	68067
	Encuesta Permanente de Hogares (EPH)	2006	6302	1692845	129	26241	51	10119	441	126717
Peru	Encuesta Nacional de Hogares (ENAHO)	1997	10036	8506517	247	153138	180	141606	774	832518
		2009	33905	11600000	670	227592	388	130361	2897	1148469
Uruguay	Encuesta Continua de Hogares (ECH)	1998	21202	979846	335	15388	257	12233	1710	81865
		2007	25295	530153	592	12238	418	9023	2810	60406

Source: Authors' compilations from household surveys.
Note: Working populations in each country are identified as those earning a salary in the main occupation.

Table A2
Occupational Codes Included in the Definition of Teachers and Comparison Groups

Standard Classification Source	Pre-School and Elementary Teachers	Cod	High School Teachers	Cod	Other Professionals and Technicians	Cod	Country (year)
ISCO-88	Primary and pre-primary education teaching professionals	233	Secondary education teaching professionals	232	Professionals	2	Bolivia (2007), Chile (1997, 2007), Costa Rica (2007), Dominican Republic (1997, 2007), Ecuador (1997, 2007), El Salvador (1997, 2007), Honduras (2007), Nicaragua (1997, 2007), Paraguay (2007) and Uruguay (2007)
	Primary education teaching associate professionals	331			Technicians and associate professionals	3	
	Pre-primary education teaching associate professionals	332					
MECOVI	Profesores de enseñanza de ciclo básico	334	Profesores de enseñanza de ciclo medio	332	Profesionales, científicos e intelectuales	2	Bolivia (1997)
	Profesores de enseñanza pre-escolar	335	Profesores de enseñanza de ciclo intermedio	333	Técnicos y profesionales de nivel medio	3	
	Professor de 5ª a 8ª série	214	Professor de 2º grau	213	Profissionais das ciencias ê das artes	1	Brazil (1997)
	Professor de 1ª a 4ª série	215	Professor formação profissionalizante	218	Técnicos del nível médio	2	
	Professor de 1º grau	216					
	Professor de pre-escolar	217					
	Maestros de enseñanza primaria	62	Profesores de enseñanza media, académica, técnica y comercial	61	Profesionales y técnicos	0	Costa Rica (1997) and Uruguay (1997)
	Maestros de enseñanza primaria	63					
	Profesores y maestros de enseñanza primaria y parvularia	200-207	Profesores de escuelas secundarias y vocacionales	189-199	Profesionales, técnicos y ocupaciones afines	0	Panama (1997)
	Profesores y maestros de enseñanza primaria y parvularia	380-387	Profesores de escuelas secundarias y vocacionales	360-370	Profesionales, técnicos y ocupaciones afines	0	Paraguay (1997)
Composição dos Grupamentos Ocupacionais	Professores (com formação de nível superior) da edução infantil	2311	Professores (com formação de nivel superior) das disciplinas da edução geral do ensino médio	2321	Profissionais das ciencias ê das artes	2	Brazil 2007
	Professores (com formação de nível superior) das disciplinas da edução geral de 1ª à 4ª series do ensino fundamental	2312	Professores (com formação de nivel medio) no ensino profissionalizante	3313	Técnicos del nível médio	3	
	Professores (com formação de nível superior) das disciplinas da edução geral de 5ª à 8ª séries do ensino fundamental	2313					
	Professores (com formação de nível médio) na edução infantil	3311					
	Professores (com formação de nível médio) no ensino fundamental	3312					
	Professores leigos na edução infantil e no ensino fundamental	3321					
CELADE (1988)	Maestro de escuela primaria	1249	Maestro de colegio, secundaria	1231	Profesionales	0	Honduras (1997)
	Maestro de enseñanza preescolar	1273			Técnicos y profesionales de nivel medio	1	
INEI (1996)	Profesionales de la enseñanza primaria y pre-escolar	243, 244	Profesionales de la enseñanza secundaria	242, 246	Profesionales	2	Peru (1997, 2007)
					Técnicos y profesionales de nivel medio	3	

Source: Authors' compilations from household surveys.

Table A3
Comparison Among Different Decompositions of the Earnings Gap (Circa 2007)

	Original Gap	*Matching* by the full set of observable	*Linear specifications*					
			(Identifying differences in supports)			*(without identifying differences in supports)*		
			Specification 1*	**Specification 2****	**Specification 3*****	**Specification 1***	**Specification 2****	**Specification 3*****
Pre-School and Elementary Teachers vis-à-vis Other Professionals and Technicians								
Region average	**26.1%**	36.3% (1.6)	34.6% (0.1)	34.6% (0.1)	34.7% (0.1)	37.9% (0.1)	38.5% (0.1)	37.8% (0.1)
High School Teachers vis-à-vis Other Professionals and Technicians								
Region average	**-0.8%**	19.3% (4.8)	20.3% (0.1)	20.6% (0.1)	20.3% (0.1)	21.4% (0.1)	22.1% (0.1)	21.4% (0.1)

** Specification 1: age (as a continuous variable), age squared; dummies measuring educational attainment; dummies for presence of children, elders and another household member with labor income in the household, as well for head of household, part-time work, and whether the individual holds more than one job; dummies for each country and their interactions with all the previous variables.*
*** Specification 2: age (as a continuous variable), age squared; dummies measuring educational attainment and their interactions with age and age squared; dummies for presence of children, elders and another household member with labor income in the household, as well for head of household, part-time work, and whether the individual holds more than one job; dummies for each country and their interactions with all the previous variables.*
**** Specification 3: dummies for each value of age; dummies measuring educational attainment; dummies for presence of children, elders and another household member with labor income in the household, as well for head of household, part-time work, and whether the individual holds more than one job; dummies for each country and their interactions with all the previous variables.*
Source: Authors' calculations based on household surveys.
Note: Standard errors in parentheses. The variables included in both linear specifications are the same variables used as controls in the matching.

Table A4
Unexplained Earnings Gaps after Controlling by the Full set of Observable Characteristics and Job Tenure, by country
(11 countries with data on job tenure, Circa 2007)

Pre-School and Elementary Teachers vis-à-vis Other Professionals and Technicians							High School Teachers vis-à-vis Other Professionals and Technicians					
Country	Hourly earnings			Monthly earnings			Hourly earnings			Monthly earnings		
	Original gap	Controlled by the full set of observable	+ Tenure	Original gap	Controlled by the full set of observable	+ Tenure	Original gap	Controlled by the full set of observable	+ Tenure	Original gap	Controlled by the full set of observable	+ Tenure
Bolivia	**-20.4%**	33.5% (8.55)	9.5% (18.44)	**34.7%**	46.9% (8.63)	26.3% (14.71)	**-17.9%**	17.1% (10.79)	-27.8% (10.52)	**45.1%**	28.4% (11.46)	-28.4% (15.8)
Brazil	**27.0%**	37.8% (2.31)	33.8% (3.35)	**67.2%**	43.4% (2.68)	43.5% (4.21)	**-3.2%**	16.4% (6.12)	13.4% (7.33)	**18.4%**	21.9% (7.15)	18.7% (8.84)
Chile	**36.2%**	18.1% (5.62)	15.0% (6.59)	**51.6%**	23.5% (6.09)	18.8% (6.62)	**5.9%**	17.6% (8.36)	-4.1% (10.7)	**11.8%**	13.7% (9.99)	-10.1% (12.57)
Dom. Rep.	**12.7%**	23.7% (25.3)	-42.5% (40.06)	**48.0%**	47.9% (29.3)	-36.2% (40.43)	**1.5%**	-4.3% (31.6)	-40.1% (53.73)	**14.5%**	9.3% (35.38)	-6.0% (81.62)
Ecuador	**26.3%**	28.4% (7.69)	13.3% (18.34)	**74.2%**	31.7% (10.44)	29.9% (25.06)	**-4.5%**	29.3% (12.75)	74.0% (34.73)	**39.8%**	50.2% (18.74)	50.0% (42.04)
Honduras	**-17.9%**	36.3% (11.79)	6.2% (18.58)	**20.4%**	28.7% (9.76)	12.7% (17.72)	**-19.0%**	12.0% (13.09)	-8.8% (25.38)	**-4.5%**	22.6% (16.44)	19.6% (19.54)
Nicaragua	**98.8%**	57.3% (16.47)	40.9% (43.95)	**157.0%**	85.5% (21.5)	61.0% (48.11)	**60.9%**	51.5% (41.55)	-26.0% (74.85)	**112.4%**	127.6% (73.02)	-25.1% (76.83)
Panama	**20.1%**	24.6% (6.84)	3.2% (13.39)	**31.4%**	35.4% (7.93)	19.5% (13.66)	**-3.7%**	21.5% (7.96)	14.1% (19.26)	**4.2%**	32.2% (8.78)	17.2% (23.02)
Paraguay	**39.7%**	-3.4% (9)	-17.4% (6.19)	**62.1%**	15.2% (12)	-6.8% (5.02)	**10.9%**	40.9% (23.04)	20.3% (0)	**54.8%**	45.8% (33.87)	8.1% (0)
Peru	**33.6%**	42.5% (7.58)	31.3% (14.77)	**82.4%**	49.5% (8.8)	34.8% (20.27)	**4.7%**	42.4% (12.66)	17.2% (20.03)	**70.4%**	63.0% (15.28)	42.4% (26.81)
Uruguay	**25.6%**	19.0% (11.08)	-12.1% (28.04)	**74.6%**	9.9% (11.06)	11.8% (39.75)	**-0.9%**	12.5% (11.33)	130.5% (46.98)	**-0.9%**	9.0% (11.62)	141.7% (44.15)
Latin America (11 countries)	**27.1%**	36.7% (1.85)	32.4% (2.87)	**66.4%**	42.5% (2.13)	41.4% (3.55)	**-0.5%**	19.3% (4.91)	13.0% (6.58)	**26.1%**	26.4% (5.87)	19.2% (8.15)

Source: Authors' calculations based on household surveys.
Note: Standard errors in parentheses.

Table A5

Unexplained Earnings Gaps after Controlling by the Full set of Observable Characteristics and Job in Public Sector, by country (13 countries with data on job sector, Circa 2007)

Pre-School and Elementary Teachers vis-à-vis Other Professionals and Technicians							High School Teachers vis-à-vis Other Professionals and Technicians					
	Hourly earnings			Adjusted hourly earnings			Hourly earnings			Adjusted hourly earnings		
Country	Original gap	Controlled by the full set of observable	+ Job in public sector	Original gap	Controlled by the full set of observable	+ Job in public sector	Original gap	Controlled by the full set of observable	+ Job in public sector	Original gap	Controlled by the full set of observable	+ Job in public sector
Bolivia	**-22.0%**	38.3% (8.73)	27.5% (8.96)	**-29.1%**	26.8% (8.16)	16.8% (8.54)	**-20.2%**	34.4% (11.03)	46.2% (11.99)	**-27.4%**	23.8% (10.24)	34.4% (11.24)
Brazil	**27.0%**	37.0% (2.02)	37.1% (2.03)	**13.4%**	22.0% (1.84)	24.0% (1.89)	**-3.2%**	14.2% (5.27)	16.0% (5.13)	**-13.5%**	2.0% (4.73)	5.1% (4.7)
Chile	**36.3%**	19.4% (5.48)	16.9% (5.07)	**22.6%**	8.0% (4.97)	6.0% (4.63)	**5.6%**	17.5% (8.76)	4.7% (8.43)	**-5.0%**	6.3% (7.93)	-6.0% (7.65)
Costa Rica	**-3.6%**	13.8% (7.41)	22.6% (7.88)	**-13.2%**	3.1% (6.74)	11.3% (7.29)	**-13.6%**	17.9% (12.68)	9.8% (11.18)	**-22.2%**	6.7% (11.36)	-0.2% (10.35)
Dom. Rep.	**25.5%**	25.6% (20.24)	28.4% (21.26)	**12.4%**	12.3% (18.5)	14.9% (19.38)	**13.1%**	16.0% (30.85)	24.4% (35.85)	**1.3%**	3.9% (35.85)	11.4% (31.96)
Ecuador	**26.3%**	35.3% (7.49)	36.1% (8.5)	**13.3%**	23.8% (6.87)	25.1% (7.85)	**-4.5%**	41.4% (11.92)	52.3% (12.5)	**-14.4%**	27.8% (10.72)	37.9% (11.38)
Honduras	**-25.9%**	22.7% (9.19)	43.2% (12.44)	**-32.6%**	12.5% (8.45)	31.1% (11.45)	**-27.1%**	6.7% (11.01)	9.6% (11.65)	**-33.8%**	-2.3% (10.23)	0.2% (10.97)
Nicaragua	**98.8%**	49.3% (16.15)	66.5% (21.35)	**79.2%**	35.5% (14.75)	52.2% (19.52)	**60.9%**	58.6% (37.92)	95.3% (89.1)	**45.0%**	45.0% (34.57)	78.5% (81.04)
Panama	**20.1%**	25.8% (6.96)	31.2% (6.54)	**8.2%**	14.0% (6.41)	19.2% (6.04)	**-3.7%**	16.1% (7.14)	23.2% (9.91)	**-13.2%**	5.2% (6.6)	11.7% (9.12)
Peru	**33.7%**	45.6% (6.97)	30.3% (6.71)	**20.1%**	30.6% (6.33)	18.4% (6.31)	**4.7%**	43.2% (9.74)	40.1% (10.4)	**-5.9%**	29.9% (8.85)	27.8% (9.57)
Paraguay	**39.3%**	3.3% (15.2)	17.2% (42.18)	**24.6%**	-6.0% (14.04)	6.7% (38.57)	**10.5%**	16.6% (24.69)	-3.4% (54.72)	**-1.0%**	4.9% (21.68)	-19.0% (42.92)
El Salvador	**25.6%**	17.0% (8.33)	22.8% (12.69)	**12.1%**	4.8% (7.71)	11.1% (11.71)	**2.0%**	16.5% (25.9)	18.4% (24.56)	**-7.3%**	6.9% (23.78)	8.7% (22.64)
Uruguay	**25.6%**	17.0% (8.33)	22.8% (12.69)	**12.1%**	4.8% (7.71)	11.1% (11.71)	**16.9%**	2.3% (8.81)	6.5% (9.9)	**4.3%**	-8.1% (8.09)	-2.5% (9.29)
Latin America (13 countries)	**26.2%**	49.7% (1.78)	50.7% (1.8)	**12.9%**	33.7% (1.62)	36.4% (1.67)	**-0.7%**	34.9% (3.72)	38.6% (3.95)	**-11.1%**	20.9% (3.35)	25.6% (3.62)

Source: Authors' calculations based on household surveys.
Note: Standard errors in parentheses.

Table A6

Unexplained Earnings Gaps after Controlling by the Full set of Observable Characteristics and Job in Public Sector and Job Tenure, by country (11 countries with data on job sector and job tenure, Circa 2007)

	Pre-School and Elementary Teachers vis-à-vis Other Professionals and Technicians								High School Teachers vis-à-vis Other Professionals and Technicians							
	Hourly earnings				Adjusted hourly earnings				Hourly earnings				Adjusted hourly earnings			
Country	Original gap	Controlled by the full set of observable characteristic	+ Job in public sector	+ Tenure	Original gap	Controlled by the full set of observable	+ Job in public sector	+ Tenure	Original gap	Controlled by the full set of observable characteristic	+ Job in public sector	+ Tenure	Original gap	Full set	+ Job in public sector	+ Tenure
Bolivia	**-22.0%**	38.3% (8.73)	27.5% (8.96)	14.2% (16.72)	**-29.1%**	26.8% (8.16)	16.8% (8.54)	7.4% (16.47)	**-20.2%**	34.4% (11.03)	46.2% (11.99)	-25.3% (11.13)	**-27.4%**	23.8% (10.24)	34.4% (11.24)	-28.4% (10.97)
Brazil	**27.0%**	37.0% (2.02)	37.1% (2.03)	48.2% (4.37)	**13.4%**	22.0% (1.84)	24.0% (1.89)	35.4% (4.02)	**-3.2%**	14.2% (5.27)	16.0% (5.13)	24.7% (8.38)	**-13.5%**	2.0% (4.73)	5.1% (4.7)	14.1% (7.73)
Chile	**36.2%**	19.7% (5.6)	16.9% (5.2)	17.7% (7.5)	**22.5%**	8.2% (5.07)	6.0% (4.74)	7.6% (6.7)	**5.9%**	17.7% (8.7)	4.8% (8.39)	-2.9% (9.18)	**-4.7%**	6.4% (7.88)	-5.9% (7.61)	-12.3% (8.61)
Dom. Rep.	**12.7%**	21.1% (19.06)	22.7% (19.81)	7.0% (59.19)	**2.5%**	9.8% (17.6)	11.2% (18.29)	-2.2% (54.15)	**1.5%**	5.8% (28.84)	12.9% (32.28)	-40.1% (53.73)	**-7.7%**	-3.7% (26.47)	2.8% (29.63)	-47.5% (50.37)
Ecuador	**26.3%**	35.3% (7.49)	36.1% (8.5)	36.7% (37.29)	**13.3%**	23.8% (6.87)	25.1% (7.85)	24.6% (34.43)	**-4.5%**	41.4% (11.92)	52.3% (12.5)	136.5% (35.81)	**-14.4%**	27.8% (10.72)	37.9% (11.38)	109.5% (28.39)
Honduras	**-25.9%**	22.7% (9.19)	43.2% (12.44)	7.3% (12.65)	**-32.6%**	12.5% (8.45)	31.1% (11.45)	2.2% (11.94)	**-27.1%**	6.7% (11.01)	9.6% (11.65)	4.7% (33.28)	**-33.8%**	-2.3% (10.23)	0.2% (10.97)	-4.3% (31.84)
Nicaragua	**98.8%**	49.3% (16.15)	66.5% (21.35)	98.8%	**79.2%**	35.5% (14.75)	52.2% (19.52)	198.1%	**60.9%**	58.6% (37.92)	95.3% (89.1)	60.9% (53.66)	**45.0%**	45.0% (34.57)	78.5% (81.04)	-25.7% (49.05)
Panama	**20.1%**	25.8% (6.96)	31.2% (6.54)	1.2% (15.07)	**8.2%**	14.0% (6.41)	19.2% (6.04)	-6.9% (14.69)	**-3.7%**	16.1% (7.14)	23.2% (9.91)	9.1% (17.99)	**-13.2%**	5.2% (6.6)	11.7% (9.12)	0.8% (16.66)
Paraguay	**39.7%**	3.3% (15.2)	17.2% (42.18)	-44.0% (32)	**25.0%**	-6.0% (14.04)	6.7% (38.57)	-51.3% (30.89)	**10.9%**	16.6% (24.69)	-3.4% (54.72)	0.0%	**-0.7%**	4.9% (21.68)	-19.0% (42.92)	0.0%
Peru	**33.6%**	45.7% (6.98)	30.3% (6.71)	48.1% (17.53)	**20.0%**	30.7% (6.34)	18.4% (6.32)	36.0% (16.18)	**4.7%**	43.2% (9.74)	40.1% (10.4)	8.3% (14.86)	**-5.9%**	29.9% (8.85)	27.8% (9.57)	-1.7% (13.87)
Uruguay	**25.6%**	17.0% (8.33)	22.8% (12.69)	-2.7% (40.25)	**12.1%**	4.8% (7.71)	11.1% (11.71)	-14.5% (39.03)	**16.9%**	2.3% (8.81)	6.5% (9.9)	13.3%	**4.3%**	-8.1% (8.09)	-2.5% (9.29)	7.1%
Latin America (11 countries)	**27.3%**	50.3% (1.83)	51.1% (1.84)	46.4% (3.67)	**13.9%**	34.2% (1.66)	36.7% (1.7)	33.7% (3.37)	**-0.4%**	35.0% (3.81)	38.8% (4.03)	46.4% (3.67)	**-10.9%**	21.1% (3.44)	25.8% (3.7)	33.7% (3.37)

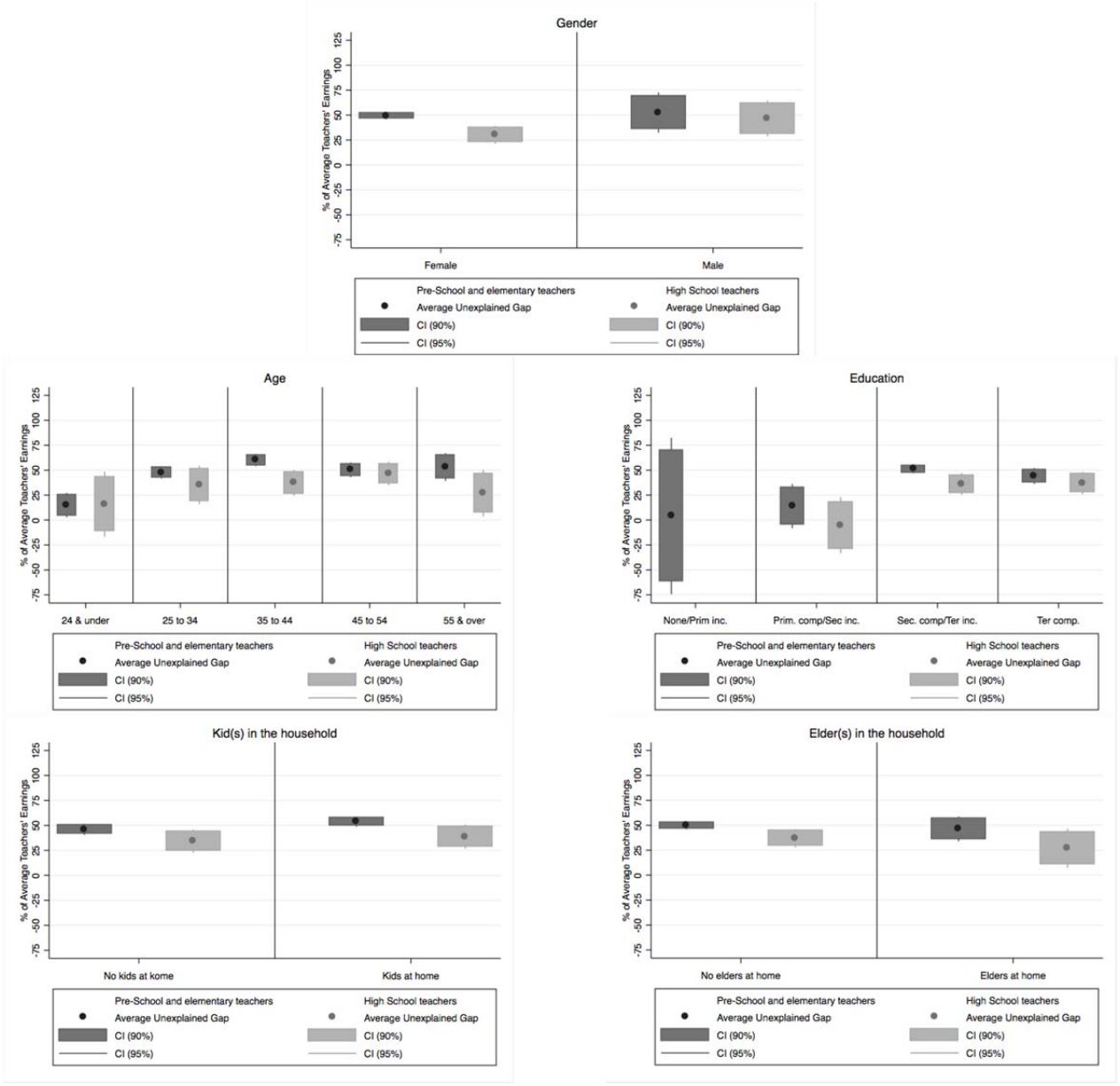
Source: Authors' calculations based on household surveys.
Note: Standard errors in parentheses.

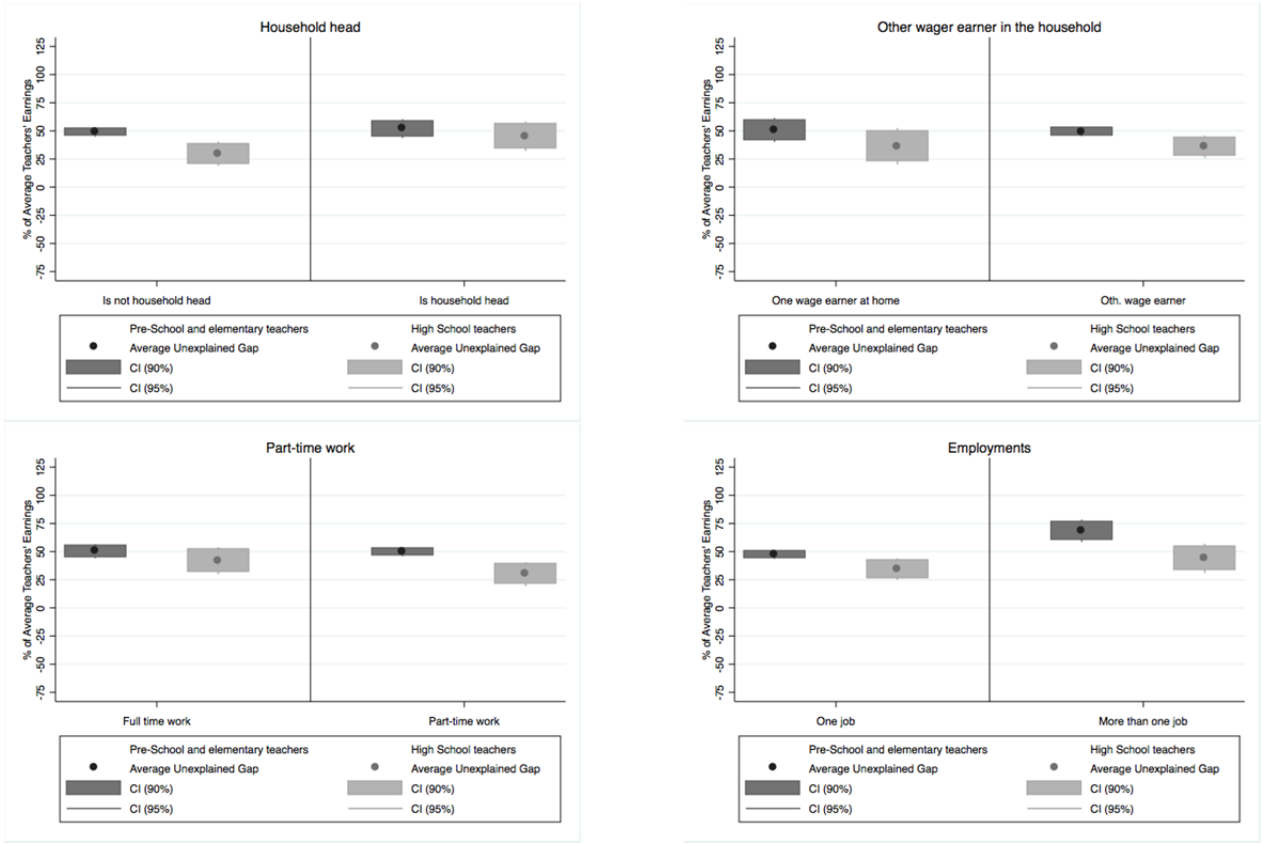
Table A7
Unexplained Earnings Gaps Controlling by the Full set of Observable Characteristics, by country

Country	Pre-School and Elementary Teachers vis-à-vis Other Professionals and Technicians				High School Teachers vis-à-vis Other Professionals and Technicians			
	Original gap		Controlled by the full set of obsrvable characteristics		Original gap		Controlled by the full set of obsrvable characteristics	
	Circa 97	Circa 07	Circa 97	Circa 07	Circa 97	Circa 07	Circa 97	Circa 07
Bolivia	**81.2%**	**-20.4%**	94.5% (0.2)	33.5% (8.55)	**35.1%**	**-17.9%**	61.4% (0.24)	17.1% (10.79)
Brazil	**112.5%**	**27.0%**	97.2% (0.03)	37.8% (2.31)	**23.9%**	**-3.2%**	27.1% (0.07)	16.4% (6.12)
Chile	**45.4%**	**36.3%**	52.0% (0.06)	17.9% (5.49)	**26.2%**	**5.6%**	52.2% (0.11)	17.6% (8.41)
Costa Rica	**-4.6%**	**-3.6%**	-15.4% (0.06)	18.9% (8.01)	**-12.0%**	**-13.6%**	-10.7% (0.26)	13.6% (11.19)
Dom. Rep.	**78.1%**	**25.5%**	43.2% (0.16)	23.2% (25.71)	**24.9%**	**13.1%**	66.0% (0.58)	4.8% (38.23)
Ecuador	**9.0%**	**26.3%**	33.5% (0.19)	28.4% (7.69)	**-7.0%**	**-4.5%**	28.3% (0.17)	29.3% (12.75)
El Salvador	**-1.9%**	**-5.3%**	11.3% (0.11)	5.6% (9.72)	**-0.9%**	**7.8%**	-1.6% (0.18)	-5.8% (16.36)
Honduras	**-0.9%**	**-17.9%**	8.5% (0.07)	36.3% (11.79)	**-22.2%**	**-19.0%**	-2.4% (0.09)	12.0% (13.09)
Nicaragua	**112.4%**	**98.8%**	151.8% (0.45)	57.3% (16.47)	**28.9%**	**60.9%**	28.2%	51.5% (41.55)
Panama	**37.5%**	**20.1%**	24.1% (0.1)	24.6% (6.84)	**-0.6%**	**-3.7%**	37.9% (0.13)	21.5% (7.96)
Paraguay	**75.0%**	**39.3%**	2.4% (0.24)	-3.4% (9)	**6.5%**	**10.5%**	-21.1% (0.03)	40.9% (23.04)
Peru	**36.4%**	**33.7%**	50.3% (0.26)	42.4% (7.6)	**8.9%**	**4.7%**	24.2% (0.18)	42.4% (12.66)
Uruguay	**42.9%**	**25.6%**	67.8% (0.1)	19.0% (11.08)	**44.0%**	**16.9%**	62.5% (0.13)	12.5% (11.33)
Latin America (13 countries)	**80.5%**	**26.1%**	89.4% (2.13)	36.3% (1.8)	**21.4%**	**-0.8%**	31.7% (5.16)	19.3% (4.78)

Source: Authors' calculations based on household surveys.
Note: Standard errors in parentheses.

Figure A1
Confidence Intervals for the Unexplained Earnings Gap by Different Characteristics (Circa 2007)
(after controlling by the full set of Observable Characteristics)





Source: Authors' calculations based on household surveys.
Note: Boxes show 90 percent confidence intervals for unexplained earnings; whiskers show 95 percent confidence intervals.