Does Raising the School Leaving Age Reduce Teacher Effort? Evidence from a Policy Experiment

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Abstract

This paper examines the effect of an increase in the compulsory school leaving age on a measure of high school teachers' effort. Difference-in-Difference estimates using count data methods demonstrate that the policy increased teacher work absence by roughly 15%. This result implies that raising the compulsory school leaving age reduces teaching inputs, and hence schooling quality. A policy implication is that these laws should be coupled with measures to compensate teachers for the additional disutility. These results also suggest that IV estimates of returns to education that utilise these law changes for identification may be downwardly biased.

KEY WORDS: Absenteeism, Compulsory Schooling Laws, Count data, Teachers

JEL Classification: J22, J38.

Acknowledgements: The authors would like to thank Ian Walker, Alfredo Paloyo and Fernando Lozano for helpful comments. María Navarro gratefully acknowledges financial support from the Spanish Ministry of Science and Innovation Postdoctoral Grant 2008-0583, FEDEA and the CYCIT project ECO2008-06395-C05-03. Correspondence to: Colin Green, Economics Department, Lancaster University, Lancaster, LA1 4YX, UK. E-mail: c.p.green@lancaster.ac.uk

I. Introduction

Raising the compulsory school leaving age (henceforth RoSLA) is a key policy instrument used to increase minimum educational attainment levels. Moreover, there is an ongoing debate in a number of countries, such as the UK and Spain, regarding further increases in the minimum high school leaving age. In addition, RoSLA has been widely used in the literature on returns to education as a source of exogenous variation in years of schooling/educational levels (see for instance Harmon and Walker (1995) for the UK, Pischke and von Wachter (2008) for Germany and Pons and Gonzalo (2002) who use the 1970 RoSLA in Spain).

However, teachers who take classes in the 'affected' years of schooling are unlikely to be indifferent to this policy change.[1] Increasing the compulsory schooling age increases the number of students in those years, but also changes the distribution of ability and motivation of students that teachers have to instruct. For instance, teachers at the latter part of compulsory secondary school will now have lower ability students and/or those with less interest in formal schooling in their class, along with those students who would have voluntarily chosen post-compulsory schooling in the absence of the legislative change. Teaching (and managing) these students is likely to be more difficult. In the absence of compensating differentials it is difficult to imagine that this will not affect teacher motivation and effort.[2]

[1] i.e. teaching previously non-compulsory years of schooling that became mandatory.

[2] To our knowledge generally, and in the particular case we examine, compulsory schooling changes were not introduced with an increase in either the supply of high school teachers, or improvements in teacher salaries and/or conditions (Boyd-Barret and O'Malley, 1995).

This paper is the first to our knowledge that investigates this motivational effect of compulsory schooling laws on teachers. Specifically, we examine the impact of the increase in the school leaving age that occurred in Spain in the academic year 1998-1999 on one element of high school teacher behavior, absenteeism. Employing Spanish labor force survey data that covers the relevant policy reform period we estimate difference in difference models of absenteeism using count data approaches. We demonstrate that raising the compulsory schooling age lead to an increase in teacher absenteeism. This is a matter of concern as previous research has demonstrated a negative causal effect of teacher absence on student achievement (Duflo, Hanna, and Ryan, 2005; Miller, Murnane, and Willett, 2007, 2008), and one that is more severe for students from lower socioeconomic backgrounds (Clotfelter, Ladd, and Vigdor, 2009). This may be the result of absent teachers being replaced by less qualified substitutes and/or the disruption inherent in the use of replacement teachers.

This leads to a concern that increasing the compulsory school leaving age may decrease the quality of educational provision in the affected years. Furthermore, this has implications for estimation of the returns to education that rely upon RoSLA reforms as an instrumental variable. Namely, that if the education treatment due to RoSLA is of lower quality, then the local average treatment effect of education on wages will be biased downwards.

II. Data

The policy reform examined consisted of an extension of free, compulsory and comprehensive education from 14 to 16 years old.[3] Specifically, from the last quarter of 1998, students that otherwise would have dropped out (in the previous academic year were in the last year of compulsory schooling) were obliged to stay two more years at school. This leads to compulsory education comprising a total of 10 years, divided into two educational levels: Primary education (6 to 12 years old) and lower Secondary Education that it is ordinarily completed from the ages of 12 to 16 years old.[4]

Increasing the school leaving age may, due to the need to increase the teaching labour force, lead to a distributional change in teacher characteristics. This is similar to the point raised by Jepsen and Rivkin (2009) regarding the consequence of decreasing class sizes. Increasing the teaching workforce to cope with an increased student body may lead to, for instance, less qualified or less experienced teachers being hired who may be more frequently absent. Alternatively, increased compulsory schooling could lead to larger class sizes which could increase teacher disutility and increase absence. It does not appear, however, that high school class sizes increased at the time of RoSLA in Spain. In fact there was a small decrease, from 26.4 students per class in 1997-98 to 26.0 and 25.5 in 1998-99 and 1999-00, respectively (MEC, 2010b). At the same time, there is no evidence of increases in high school teacher numbers, either in official data MEC (2010a) or in the rep-

[3]Specifically the "*Ley de Ordenación General del Sistema Educativo , 1990 (LOGSE)*" (General Regulation of the Education System of 1990).

[4]Although students can stay in school until they are 18 (or 21 in the case of pupils with special education needs).

resentative sample of high school teachers we use. This suggests that at the time of the reform there was excess teaching capacity in the Spanish Higher Education System.

The data we use is drawn from the quarterly Spanish Labor Force Survey (SLFS). We select a sample of full-time employees in the period spanning 1^{st} quarter of 1996 to 4^{th} quarter of 2004. Self-employed workers are excluded. The full sample consists of about 988,329 workers, 2.57% of them are high school teachers.[5] In Spain, secondary education teachers must have a university degree, only teach subjects of their field of specialization and are primarily civil servants who attained their post through state or regionally competitive exams. In all estimates we control for both public sector and temporary contracts, 85% of the teachers work in the public sector and 64% are on permanent contracts.

To test the robustness of our results we use a number of sub-samples. This includes dropping the vacation period (third quarter of the year surveys) as teachers have more summer holidays than many other workers. Furthermore, to ensure that the timing of other holidays are not generating our results, we estimate our models on two successively more restrictive samples. The first is workers in the education industry only and in the second we include only primary and secondary school teachers. These latter two groups have essentially identical holiday schedules and provisions. The second sample contains 63,062 workers in the education sector, and the third sample is comprised of 49,106 primary and secondary school teachers. Importantly our key results are robust to the choice of these samples.

(Insert Table 1)

[5]We are able to identify high school teachers in our data as we have available three digit dissagregation of occupations (ISCO).

We use information on the hours of absence per week reported as being due to sickness to generate our dependent variable.[6] We calculate this variable as the difference between usual hours and actual hours for those that report the reason of any difference between them as due to sickness.[7] Generally, paid sick leave is very generous in Spain. Whilst coverage may vary slightly by sector or firm level agreement, the norm is 1 month of absence leave fully paid per year worked in Spain up to a maximum of 18 months leave. If the worker reaches their maximum leave entitlement they have to attend a special panel which assesses their sickness. We appreciate that using sickness absence only may be quite restrictive. In unreported estimates our main results are robust to using more broad definitions where we include differences in usual and actual hours due to other forms of absence including personal/family responsibilities, bad weather, summer schedule/flexible hours and 'other reasons'.

(Insert Figure 1)

A range of control variables are available in the SLFS. We use gender, age, age squared, marital status, education, public sector, type of contract, industry dummies, occupation dummies and size of the firm/establishment. We also control for year, quarter and Regional (CCAA) fixed effects so as to take regional differences into account.[8]

[6]The Spanish Labour Force Survey has been demonstrated to have an internationally consistent definition of absence (Barmby, Ercolani, and Treble, 2002).

[7]We consider usual hours as synonymous with contractual hours. This is similar in spirit to the approach used in previous research such as Hamermesh, Myers, and Pocock (2008) and Lozano (2010).

[8]Such as wage differences and unemployment rates due to different industrial

III. Methodology

In our baseline model, workers' minutes of absence per week can be specified as follows:

$$\begin{aligned} \text{Absm}_{it} &= \phi + \delta \text{RoSLA}_{it} + \gamma\beta \text{HST}_i + \beta \text{RoSLA}_{it} \times \text{HST}_i + \alpha \text{X}_i + \varepsilon_i, \quad (1) \\ & i = 1, \ldots, 988,329 \quad \text{and} \quad t = 1996\text{Q1}, \ldots, 2004\text{Q4} \end{aligned}$$

where Absm_{it} corresponds to the minutes of absence of worker i in the period t. RoSLA_{it} is an indicator that takes value of unity if the worker is observed during the reform period. HST_i is a dummy variable that equals one if the worker is a high school teacher and 0 otherwise. And the interaction term $\text{RoSLA}_{it} \times \text{HST}_i$ equals one for treated individuals (HSTeachers) in the posttreatment period (after the RoSLA was implemented). The OLS estimate of β is equivalent to the Differences-in-Differences (DID) estimator and thus provides the absence caused by the reform for the treated group (i.e. the absence caused by the RoSLA for secondary school teachers) (Cameron and Trivedi, 2005, pp. 890-891).

Our dependent variable, minutes of absence, is a count variable. Moreover, there is an excess of zero outcomes. This could occur during the reference week both if (i) the worker/teacher never gets sick and doesn't skip work during the reference week but could have been absent in the case of illness (sampling zeros); (ii) The worker/teacher always goes to work due to commitment and motivation despite illness (structural zeros). As a result we estimate zero-inflated models that allow for these excessive number of zeroes in addition to overdispersion in the ZINB case. Importantly, zero-inflated models permit the zero absence of teachers

structures within regions and patterns of morbidity.

to be explained in a different manner than that of those workers that are absent for more than zero hours. It combines a count density with a binary process in such a way that a binary model is estimated to predict, with probability ψ_i, whether a worker will always have a zero count (i.e. type ii above). Then, a count model (Poisson or negative binomial) chosen with probability $1-\psi_i$ is generated to predict the counts for those who will not always have a zero count (type i).

Then Absm_i has a zero-inflated distribution given by Long (1997, pp. 242-250). We estimate both Zero Inflated Poisson (ZIP) and Zero Inflated Negative Binomial(ZINB) models:

$$\Pr(\text{Absm}_i = k|x_i, z_i) = \begin{cases} f_1(0) + (1 - f_1(0))f_2(0) & \text{if k=0} \\ (1 - f_1(0))f_2(k) & \text{if } k \geqslant 1 \end{cases} \tag{2}$$

Zero Inflated Poisson:

$$\begin{aligned} \Pr(\text{Absm}_i = 0|x_i, z_i) &= \psi_i + (1 - \psi_i)e^{-\mu_i} \\ \Pr(\text{Absm}_i = k|x_i) &= (1 - \psi_i)\frac{e^{-\mu_i}\mu_i^k}{k!} \end{aligned} \tag{3}$$

Zero Inflated Negative Binomial:

$$\begin{aligned} \Pr(\text{Absm}_i = 0|x_i, z_i) &= \psi_i + (1 - \psi_i)(\frac{\alpha^{-1}}{\alpha^{-1} + \mu_i})^{\alpha^{-1}} \\ \Pr(\text{Absm}_i = k|x_i) &= (1 - \psi_i)\frac{\Gamma(\alpha^{-1} + k)}{\Gamma(\alpha^{-1})k!}(\frac{\alpha^{-1}}{\alpha^{-1} + \mu_i})^{\alpha^{-1}}(\frac{\mu_i}{\mu_i + \alpha^{-1}})^k \end{aligned} \tag{4}$$

IV. Results

Table 2 presents estimates of the effect of RoSLA on high school teacher absence behavior. Two sets of estimates are reported for the ZIP and ZINB models, respectively. The Vuong test (reported in each of the tables) suggests that our zero-inflated models are a significant improvement over standard Poisson or Negative Binomial models. The Likelihood-ratio test in all cases rejects the null hypothesis of no overdispersion (p-value=0.000). It indicates that due to overdispersion the ZINB can improve goodness-of-fit over the ZIP. Nonetheless, we report both sets of estimates to demonstrate that our results are not being driven by choice of model. For both models the policy effect dummy (RoSLA $\times$ HSTeacher) demonstrates a statistically significant increase in high school teacher absenteeism as a result of the RoSLA. Coefficient estimates from count data models can be difficult to interpret so we also present the incident rate ratio (IRR) or exponentiated coefficient $e^{\hat{\beta}}$. Thus, an IRR greater than one indicates that the expected count in the exposed group is greater than the expected count in the unexposed group. These demonstrate that the effect of the policy was to increase the count of absence of teachers by 15% (IRR=1.15).

(Insert Table 2)

Comparing high school teacher absence behavior and that of all other workers may be too broad. For instance, there may be unobserved changes to the incentives for worker absence occurring for other occupations / industries during the same period. Alternatively, there may be some unobserved shock to teachers absence that coincides with the policy change. These may serve to bias our estimates of the policy effect in some unknown way. To mitigate this problem we examine our two successively more restrictive sub-samples of workers, education workers and

teachers (high school and primary school). As previously mentioned, focusing on the education sector aims to eliminate the possibility of bias originating from unobserved changes in absence incentives in other industries. While comparing primary and high school teachers only has the added advantage that these workers face a very similar holiday structure and leave timing. The cost of these robustness checks are decreased sample size and potentially less precise estimates.

(Insert Table 3)

Table 3 reports the estimates for these two sub-samples, where for brevity we only report the key policy variable estimates. Again these estimates reveal that the change in compulsory schooling laws lead to an increase in teacher absence. Moreover, restricting our sample leads to an increase in the magnitude of this effect to 20%, suggesting that our earlier estimates were biased downwards.

(Insert Table 4)

An additional issue is that we do not possess a non-policy control group (i.e. schools or regions where there is no RoSLA). Hence, there is the potential that our policy effect is in actuality due to some contemporaneous exogenous shock. To examine this, we conduct robustness checks exploiting the regional variation in pre-RoSLA high school participation rates. The intuition is that schools in regions where participation rates were lower should be more affected by RoSLA, that is, a larger proportion of students in these schools are treated by the policy reform. Hence, if it is this policy that is actually causing the change in teacher absence, teachers in lower participation areas should respond more. We re-estimate our absence models split according to whether the school was in a region with greater than or less than 20% post-compulsory participation rates prior to RoSLA,

and report these estimates in Table 4.[9] The results demonstrate that the policy caused teacher's absence to increase by more than 50% in those regions with lower post-compulsory high school education participation before the reform was implemented. This result increases our confidence that the rise in absence we observe is caused by the policy reform.

We conduct three final sets of robustness checks. First, we investigate the longevity of the policy effect by introducing a one year lead of the reform (RoSLA_{t+1}) and the corresponding interactions. Our main results are maintained, but the absence effect one year on is roughly a half. This suggests that the RoSLA effect on teachers absence is concentrated in the short term. Introducing further leads suggests that the policy effect disappears from 2 years on. In addition, no policy effect was evident when we investigated a placebo reform for the year prior to the actual RoSLA.

(Insert Table 5)

Second, we re-estimate our models excluding the summer quarter of the SLFS. This is done for two reasons, first the bulk of school holidays occur in the summer quarter hence the opportunity (or need) for teachers to take sickness absence in this quarter are diminished. Second, it has been suggested that increases in temperature are generally associated with increases in absence (Connolly, 2008). Estimates of these further restricted models are reported in Table 5. The pattern of these estimates largely follow those reported in Tables 2 and 3. Together the

[9]We estimate this for the education sector sample as there are insufficient observations if we use the teachers only sample. These results are robust to alternative splits of the regions such as greater or less than 25% of students attending post-compulsory prior to the reform.

results in Tables 3, 4 and 5 suggest that our estimated impact of RoSLA on teacher absence is not being driven by unobserved variations in holiday availability/timing or unobserved shocks to the absenteeism of teachers.

Bertrand, Duflo, and Mullainathan (2004) demonstrate that standard errors in Difference-in-Difference estimators are inconsistent [10] when panels with longer time periods are used and the dependent variable is serially correlated. We examine this by collapsing the time dimension of our data into two periods, pre and post RoSLA. We then re-estimated (1) across these two periods. Our resulting estimate of the RoSLA effect remained statistically significant at standard levels, and suggest a larger policy effect of at least 50%. This suggests that the statistical significance of our RoSLA estimates are not a result of serial correlation in absenteeism.

V. Conclusions

Raising the compulsory school leaving age is seen as a key instrument for increasing basic education levels within society. At the same time, it has been relied upon by many researchers as a source of exogenous variation in educational attainment in econometric studies of the returns to education. In this paper we asked the question, how do teachers react to the changes in teaching environment implicitly created by retaining students at school who would have otherwise left? Specifically, we focus on one potential response, changes in teacher absence behavior.

We examined changes in high school teacher absence behavior due to an increase in the school leaving age in Spain in the academic year 1998-1999. Using

[10] Specifically they are biased downwards causing overestimation of significance levels.

representative labor force data we demonstrated that teachers affected by this reform increased their absenteeism by 15%, rising to 50% in regions that traditionally had lower post-compulsory school participation. Our interpretation of this result is that more onerous teacher environments lead to decreases in effort by high school teachers. This result is of importance for two related reasons. Given previous research that establishes a link between teacher absence and lower student performance, our results demonstrate that increasing the compulsory school leaving age has the potential to reduce educational quality. Second, our results suggest that researchers using RoSLA or other policy changes that may affect teaching conditions as an instrumental variable should consider their possible effects on educational 'quality'.

This paper has considered the effect of RoSLA on absence, future research should consider the range of other potential reactions of teachers (i.e. turnover, job satisfaction) and the subsequent effect these have on childrens' outcomes. Finally, a policy recommendation that is derived from our work is that education authorities should consider the need for increased compensation or improved working conditions for teachers adversely affected by increasing the compulsory school leaving age.

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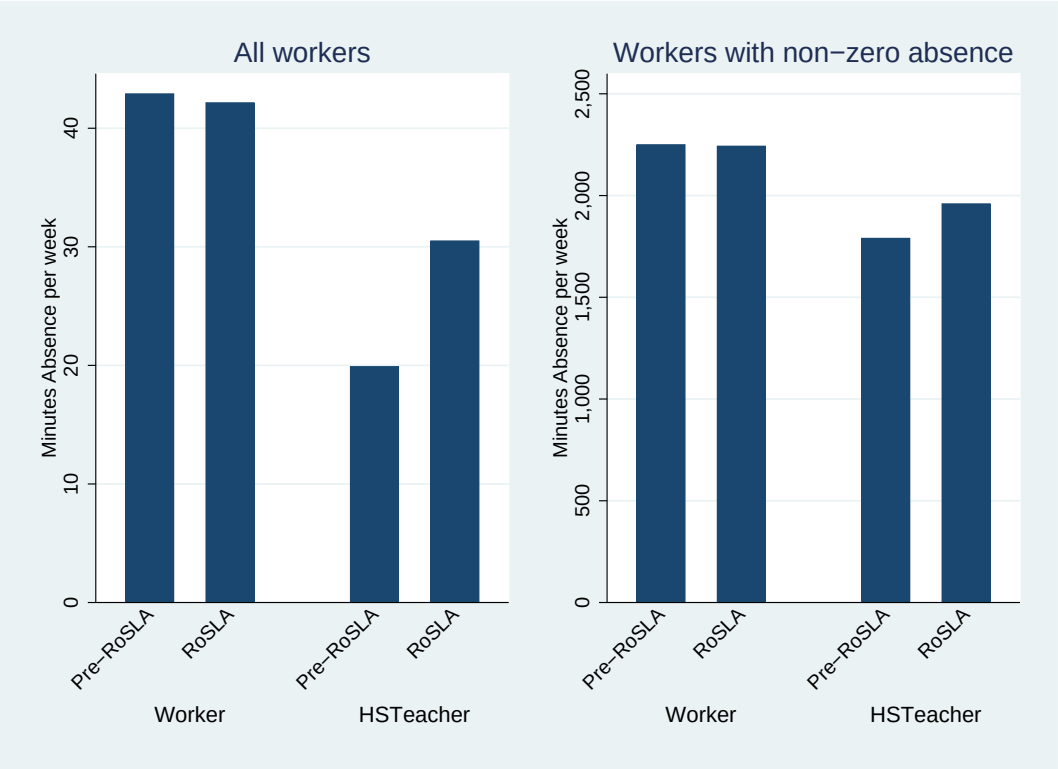

Figure 1: Minutes of absence for full-time workers before and after the reform

Table 1: Descriptive statistics

	All Workers	Education Workers	High/Primary School Teachers
Total Observations	988,329	63,062	49,106
Absence due to illness	18,349	922	785
	Excluding Summer Quarter		
Total Observations	742,458	47,876	37,321
Absence due to illness	14,012	800	690

Source: SLFS

Table 2: Changes in Compulsory Schooling Laws and Teacher Absenteeism, All workers, Spanish Labour Force Survey 1996-2004

	ZIP[a]	ZINB[b]
RoSLA × HSTeacher	0.140** (0.068)	0.141** (0.069)
	[1.150**]	[1.151**]
HSTeacher	-0.203*** (0.068)	-0.203*** (0.068)
	[0.817***]	[0.816***]
RoSLA	-0.047 (0.058)	-0.056 (0.061)
	[0.954]	[0.945]
Age	0.001 (0.001)	0.001 (0.001)
	[1.001]	[1.001]
Age^2	0.000 (0.001)	0.000 (0.001)
	[1.000]	[1.000]
Female	0.003 (0.003)	0.003 (0.004)
	[1.003]	[1.003]
Married	0.004 (0.003)	0.004 (0.003)
	[1.004]	[1.004]
Secondary Education	-0.009** (0.004)	-0.009** (0.004)
	[0.991**]	[0.991**]
Higher Education	-0.004 (0.005)	-0.004 (0.005)
	[0.996]	[0.996]
Public Sector	-0.027*** (0.004)	-0.027*** (0.004)
	[0.974***]	[0.974***]
Temporary Contract	-0.006 (0.004)	-0.006 (0.004)
	[0.994]	[0.994]
Establishment size: workers 0-5	-0.019*** (0.007)	-0.019*** (0.007)
	[0.981***]	[0.982***]
workers 6-10	0.001 (0.006)	0.002 (0.006)
	[1.001]	[1.002]
workers 11-19	0.007 (0.005)	0.008* (0.005)
	[1.007]	[1.008*]
workers $\geqslant$ 50	0.003 (0.004)	0.004 (0.004)
	[1.003]	[1.004]
Observations	988329	988329
Vuong test	1221.66	-2.59
p-value	0.0000	0.9952
Likelihood-ratio test	$1.6 \cdot 10^6$	
p-value	0.0000	

Note: *, ** and *** indicate statistical significance at the 10%, the 5 % and the 1% levels, respectively. Controls for industry, workers' occupation, region, year and quarter are included but not reported. [a] Zero Inflated Poisson. [b] Zero Inflated Negative Binomial. Robust standard errors are in parentheses. IRR are in brackets.

Table 3: Changes in Compulsory Schooling Laws and Teacher Absenteeism, Alternative Sub-Samples

	ZIP[a]		ZINB[b]	
	Education Workers	High / Primary School Teachers	Education Workers	High / Primary School Teachers
RoSLA × HSTeacher	0.184** (0.073)	0.184* (0.109)	0.193** (0.077)	0.193* (0.108)
	[1.203**]	[1.202*]	[1.212**]	[1.213*]
HSTeacher	-0.184** (0.072)	-0.166 (0.108)	-0.191** (0.076)	-0.171 (0.107)
	[0.832**]	[0.847]	[0.827**]	[0.842]
RoSLA	-0.157** (0.072)	-0.164 (0.137)	-0.162** (0.078)	-0.171 (0.137)
	[0.855**]	[0.849]	[0.850**]	[0.843]
Observations	63023	49075	63023	49075
Vuong test	327.93	285.71	3.05	2.89
p-value	0.0000	0.0000	0.0012	0.0019
Likelihood-ratio test			$8.0 \cdot 10^4$	$6.5 \cdot 10^4$
p-value			0.0000	0.0000

Note: *, ** and *** indicate statistical significance at the 10%, the 5 % and the 1% levels, respectively. All other controls as in Table 2. [a] Zero Inflated Poisson. [b] Zero Inflated Negative Binomial. Robust standard errors are in parentheses. IRR are in brackets.

Table 4: Changes in Compulsory Schooling Laws and Teacher Absenteeism, by previous RoSLA participation rates in secondary education

	ZIP[a]		ZINB[b]	
	$< 20\%$	$\geqslant 20\%$	$< 20\%$	$\geqslant 20\%$
RoSLA $\times$ HSTeacher	0.418(0.142)***	0.084(0.090)	0.454(0.158)***	0.092(0.093)
	[1.519***]	[1.088]	[1.575***]	[1.096]
HSTeacher	-0.399(0.138)***	-0.095(0.089)	-0.430(0.151)***	-0.100(0.094)
	[0.671***]	[0.909]	[0.650***]	[0.905]
RoSLA	-0.326(0.158)**	-0.121(0.088)	-0.357(0.172)**	-0.131(0.093)
	[0.722**]	[0.886]	[0.700**]	[0.878]
Observations	20176	42886	20176	42886
Vuong test	156.04	267.13	1.91	2.43
p-value	0.0000	0.0000	0.0280	0.0074

Note: *, ** and *** indicate statistical significance at the 10%, the 5 % and the 1% levels, respectively. All other controls as in Table 2. [a] Zero Inflated Poisson. [b] Zero Inflated Negative Binomial. Robust standard errors are in parentheses. IRR are in brackets. $< 20\%$ and $\geqslant 20\%$ columns comprise 6 and 12 regions, respectively.

Table 5: Changes in Compulsory Schooling Laws and Teacher Absenteeism, Excluding Summer Quarter

	ZIP[a]		ZINB[b]	
	Education Workers	High / Primary School Teachers	Education Workers	High / Primary School Teachers
RRoSLA × HSTeacher	0.168** (0.079)	0.184* (0.110)	0.173** (0.083)	0.190* (0.114)
	[1.182**]	[1.201*]	[1.189**]	[1.209*]
HSTeacher	-0.161** (0.078)	-0.164 (0.110)	-0.165** (0.081)	-0.167 (0.113)
	[0.851**]	[0.849]	[0.848**]	[0.846]
RoSLA	-0.157* (0.089)	-0.174 (0.143)	-0.163* (0.095)	-0.179 (0.147)
	[0.855*]	[0.841]	[0.850*]	[0.836]
Observations	47848	37299	47848	37299
Vuong test	311.49	285.63	3.10	3.06
p-value	0.0000	0.0000	0.0010	0.0011
Likelihood-ratio test			$7.5 \cdot 10^4$	$6.1 \cdot 10^4$
p-value			0.0000	0.0000

Note: *, ** and *** indicate statistical significance at the 10%, the 5 % and the 1% levels, respectively. All other controls as in Table 2. [a] Zero Inflated Poisson. [b] Zero Inflated Negative Binomial. Robust standard errors are in parentheses. IRR are in brackets.

Table 6: Changes in Compulsory Schooling Laws and Teacher Absenteeism Collapsed, Excluding Summer Quarter

	ZIP[a] Education Workers	ZINB[b] Education Workers
RoSLA × HSTeacher	0.414* (0.247)	0.604*** (0.228)
	[1.513*]	[1.829***]
HSTeacher	-0.099 (0.236)	-0.265 (0.216)
	[0.906]	[0.767]
RoSLA	-0.322 (0.230)	-0.295 (0.205)
	[0.725]	[0.745]
Observations	12349	12349
Vuong test	117.24	6.09
p-value	0.0000	0.0000
Likelihood-ratio test	$2.0 \cdot 10^5$	
p-value	0.0000	

Note: *, ** and *** indicate statistical significance at the 10%, the 5 % and the 1% levels, respectively. All other controls as in Table 2. [a] Zero Inflated Poisson. [b] Zero Inflated Negative Binomial. Robust standard errors are in parentheses. IRR are in brackets.