EDUCATION ACHIEVEMENTS IN URBAN SCHOOLS IN PERU

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Education achievements in urban schools in Peru

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Declaration

I, Patricia Soto Quiroga, hereby declare that the work presented in this dissertation is my own original work. Where information has been derived from other sources, I confirm that this has been clearly and fully identified and acknowledged. No part of this dissertation contains material previously submitted to the examiners of this or any other University, or any material previously submitted for any other assessment.

Signature

Date

Classification

This piece of research is primarily:

- □ an empirical/econometric study
- □ the examination of a theoretical problem
- □ a critical analysis of a policy issue
- □ an analytical survey of empirical and/or theoretical literature

Abstract

This dissertation, primarily, evaluates the extent at which some family characteristics and school characteristics affect students' achievement in Peru. For this purpose, the data used in this study is based on a survey conducted in Peru in 2009, to 3,438 students of 60 schools in 17 urban cities in the country. Moreover, the production function of cognitive achievement of Todd and Wolpin (2003) is used, with school and location fixed effects modelling; however, with the purpose of doing an original piece of research about education in Peru with recent information, this study faces the limitations of the data used and it cannot develop thoroughly the production function of Todd and Wolpin.

The findings show that girls report better achievement than boys by 0.12 of a standard deviation. It is interesting to see how home environment matters: it is found that students who live with both parents have 0.178 more points than the ones who do not live with both parents, which represents 0.10 standard deviations, and that the students who have close supervision from their parents in their studies, in the use of their free time and in the use of video games and internet, have from 0.407 to 0.897 more points, which means that for one standard deviation increase in average supervision of parents raises average student achievement by 0.22 – 0.48 standard deviation of the total student achievement distribution. Also, it is confirmed that students who dedicate more than 8 hours to self-study do better, than the ones who do not dedicate such time during a week by 0.38 standard deviations.

Also, it is found that schools are a source of inequality gap in Peru, as a better socio economic level is a determinant for better achievement in school. Surely, there is more behind the socio-economic level of families; for example, better education of parents, parents with more family networks and parents with more money to pay for better schools; but, all of these are driven by the socio economic level of the family. Furthermore, students that have to work while studying to improve family income have 0.34 points less, which is 1.7% less points, than the ones who do not need to study to cover family expenses. When the type of school is analysed, students from private schools turns out to achieve better than students from public schools.

Finally, as we can see, the role of the government to close the inequality gaps in schools is decisive, as those gaps have a multiplicative effect in the wage gap when students from poorer backgrounds enter the labour market.

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Introduction

Peru is one of the countries in Latin America with sustainable rates of growth of Gross Domestic Product from the last 10 years (Central Reserve Bank of Peru, BCRP, 2011). Even during the years of the international financial crisis, 2008-2009, Peru grew more than the average of other countries in Latin America (Central Reserve Bank of Peru). Furthermore, total poverty in the country has decreased from 54.8% in average in 2001 to 31.3% in average in 2010 (National Institute of Statistics and Information (INEI, 2011).

By contrast, not all the population benefit to the same extent from this economic growth. This fact is shown in the CIA Ghini coefficient, which measures the degree of inequality in the distribution of family income. For the case of Peru, the Ghini coefficient remained almost similar between 1996 and 2009. In fact, it was 46.2 in 1996 and 49.6 in 2009 (CIA, 2009). Moreover, Peru is ranked 25 in level of inequality from 136 countries. The most inequality country according to this index is Namibia with 70.7 and the more equal country is Sweden with an index of 23. It is interesting to highlight that in comparison to other countries of Latin America, Peru is a more equal country than Colombia, Bolivia, Brazil and Chile.

Another important achievement of Peru in the last years is the field of Education; specifically, the growth of school enrolment in Primary and Secondary education. In 2010, the primary schooling gross rate of enrolment was 97.7 % (population between 6 and 11 years old who attend any grade) from 94.7% in 2004. Also, the secondary gross rate of enrolment was 90.7% (population between 12 and 16 years old who attend any grade) from 86.3% in 2004. In addition, the illiteracy rate has decreased to 7.2 in average in 2010, from 9.7 in 2004 (INEI, 2011).

As a contrast to the decreasing of illiteracy and the increasing of schooling enrolment rates, which measures quantity of schooling, the quality of those years of education is less than the average of other countries in Latin America. This fact is shown in the marks of 15 years old children in the Program for International Students Assessment, PISA, 2009. This test evaluated the following subjects: Reading, Mathematics and Science; but the focus was mainly Reading. In 2009, Peru was ranked 62 of 65 countries, in each of the subjects (OECD, 2010).

In this international test, Peru is ranked in the lowest level. In the Reading area, this level means that students are only able to recognize the main idea in the text when it is explicitly stated and it is a familiar topic. In Peru, one in three students does not attain this basic level. In Mathematics, this level means that students can only solve problems that involve routine procedures following direct instructions in familiar contexts. In Science means a very little general scientific knowledge (OECD, 2010). This test also shows that the marks are higher for the higher economic levels and the opposite holds. Moreover, this difference is the biggest of all the countries that participated in the test.

School performance and type of school matters since it explains to a certain extent higher adult wages Dearden, Ferri, and Meghir (2002). Indeed, it matters as labour force quality, measured by Mathematics tests achievement, has a strong positive relationship with economic growth (Hanushek, and Kimko, 2000).

This dissertation aims to give a better understanding of the key variables that explain school achievement in 13 to 17 years old students from urban schools in Peru. It is important to identify which variable is significant and which one it is not, as it is necessary to acquire a higher level of educational achievement, as the actual average level is still very low. The first chapter shows some relevant literature review about Economics of Education in the world and then include some relevant literature about this field specifically in Peru. The second chapter explains the data used and the methodology applied. Finally, the conclusions and economic policies implications are presented in the third chapter.

Chapter 1: Literature review Economics of Education

In the field of Economics of Education, there is a vast literature of the main concerns in this discipline. For example: quality and quantity of schooling, peer effects, teacher performance, incentives mechanism, inequality gap, gender gap, parental background, type of schools: private or public, among others. Moreover, it is very interesting to find that across countries and schools there is no a unique response in some of the main variables of interest.

1.1 Quantity or Quality of schooling?

Quantity of schooling is a basic and straightforward concept that sets the sight on schooling as a factor of economic growth (Barro, 1991); but as education policies are different across countries and there are also other important variables that determine performance in school, Hanushek and Kimko (2000) shows that the real driver of economic growth is the quality of the workers and this is a consequence of quality of schooling. Moreover, Hernandez-Zavala (2006) states that quality of schooling has two main components: the first one is how much students learn in their years of schooling, measured by test scores; and the other one directly refers to the quality of the school: management, infrastructure and teachers.

This depth in the concept of quality of schooling is not trivial and can help policy makers to take different actions according to specific objectives. Indeed, in Pisa 2009, there were countries that performed well above the mean of the OECD countries in despite of the backgrounds of the families or schools. Moreover, they have very few students in the lowest scale of the test, but large quantity of students who perform at the top level. However, this is not a reality in all countries. PISA 2009 showed that socio economic background explained on average 14%, of the differences in students Reading performance within each country, and in the case of Hungry, Peru, Bulgaria and Uruguay, it was 20%. (OECD, 2010)

1.2 Private and Public schools

As it can be seen, the distinction in the concept of quality of schooling is even more significant as schools can be run not only by governments but also by privates. Moreover, the return of those years of schooling are different among both, mainly because students from private schools achieve better scores than students from public schools (Green, Machin, Murphy and Zhu, 2010)

Green, Machin, Murphy and Zhu (2010), studying the evolution of education differentials between public and private schools and the subsequent wage gap from both, in Britain, state "In this paper we provide a striking set of findings showing that earnings and education differentials have raised significantly over time for privately educated versus state educated individuals"[1]. Indeed, they argue that the existence of private schooling gives parents the possibility to choose

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where their children are going to study, according to their preferences and resources (Also, (Rivkin, Hanushek and Kain, 2005). Furthermore, the return of those years of schooling is higher than the ones of state schools.

One of the questions that arise in this piece of research from Green, Machin, Murphy and Zhu (2010) is why private schools are preferred by some parents. One of their answers is that private schools are more capable at adapting their teaching to the requirements of the market and that parents are not only looking for better achievement but also other soft skills in their children. As a consequence, the authors conclude that if the returns of private schools are higher because of the better academic achievements of their students, policy makers could consider replicating them into public schools.

Following the same point of view, Rivkin, Hanushek and Kain (2005) states that in public schools quality of schools and teachers matters. Moreover, he says that education policy should be oriented to improve achievement of less income students through improving quality of teachers and schools; and Neal (2011) argues that the real role of the government is to delineate an incentive system which leads to the education quality desired.

For the case of Chile, Tokman (2002) evaluates the impact of the voucher system in private and public schools. The voucher system permits parents of low socio economical level to choose the school of their children, but not only between the public schools. Indeed, as parents receive vouchers from the government to pay school fees, they can choose also, among private schools. Tokman (2002) finds that for the case of Chile private schools are not systematically better or worse than public schools. Moreover, she finds that public schools are more efficient for students that come from poor families.

1.3 Inequality gap

The different achievements in public and private schools could be explained to some extent, not only by the type of schools themselves, but also by the different economic situation of the students. It is widely recognize that children from poorer families have less educational achievements than children from more prosperous families, but it is unclear if this is a consequence of the family characteristics or the family income and which of these two is the

predominant one (Chevalier and Lanot, 2001). They find that family characteristics, mainly parental education, eclipse the effect of family income. Even though Chevalier recognizes that due to the methodology used, the effect of parent income could be underestimated. However, other authors arrive at the same conclusion.

It is very important to understand the impact of home environment, specifically family background of students, as it is the main driver to their development, as Freeman, Machin and Viarengo (2010) argue. Furthermore, the impact of greater income in families also has different consequences according to the sex of their children as Glick and Sahn (2000) find studying gender differences in achievement, rate of enrolling and withdrawal from school in West Africa. In their study, they find that when family income increases, parents decide to provide more schooling for girls, without any significant impact on boys. However, when this increase in income is permanent, there is also a better achievement on girls and a higher probability that girls finish school.

In addition, Glick and Sahn (2000) recognize the importance of the structure of families which influences the schooling of boys and girls. For example, with the presence of little children in the family, it is more likely that girls take care of them than boys. This fact has as an immediate consequence the worst achievement of girls and the probability of an early living of school. In this respect, Glick and Sahn (2000) suggest that having policies oriented to subsidize child care will increase schooling of girls.

Another suggestion which he makes about this topic is that education policy should go directly towards girls, because the effects of more and better years of schooling for girls have immediate and intergenerational effects. For example, more education of the mother conduces to more schooling of their daughters in families.

Hernandez Zavala (2006) in his study of Latino America indigenous people, find that native people receive lower returns to schooling for different reasons: they come from less advantage home environment, study with less qualified teachers in lower quality schools and lastly, they may suffer discrimination in their work place. He finds that in Guatemala, 24% of indigenous students work while studying and only 16% of non-indigenous students usually work. In Mexico,

indigenous students are 12% more likely to work than non-indigenous students. Indigenous students' need to work is explained by the poorer background of their families.

Also, Hernandez Zavala (2006) finds that some variables are more significant than others in explaining school achievement between indigenous people in Latin America. In Mexico, it is determinant for indigenous student attainment that mothers have basic education. For the case of non-indigenous students, they have better achievement as mothers have more education. Moreover, he finds that family characteristics influence the most in explaining the gap in achievement between indigenous and non-indigenous students.

McEwan (2003) analyses Mathematics and Spanish test scores of eight grade students in Chile. He finds that parental education mainly education of the mother, has a positive and significant effect in students achievement. The education of the father has also a positive and significant effect, but with a less magnitude than education of the mother.

1.4 Differences in achievement in school between boys and girls

The better performance of girls in school is widely recognized by the literature. Indeed, Machin and McNally (2006) consider that girls are ahead of boys, in almost all subjects and in all levels of education. They found that in England, when students finish mandatory school, 10% fewer boys achieve 5 or more General Certificate Secondary Education of English students. However, PISA shows that on average across OECD countries, there are similarities in top performers between boys and girls: 4.4% of girls and 3.8% of boys are top performers in the three subjects. The differences increase in Reading and Mathematics tests: In Reading 2.8 girls and 0.5% boys are top performers and in Mathematics, 3.4% of girls and 6.6% of boys are top performers (OECD, 2010).

Also, in PISA test scores some countries show the largest gap between boys and girls, in favour of boys in about 20 points as Belgium, Chile, United Kingdom and the United States. However, in Qatar, Kyrgyzstan, Lithuania, Trinidad Tobago and Albania, girls perform better than boys in about 5 to 11 points (OECD, 2010)

It is somewhat surprising to find in the literature, that the differences in achievement between boys and girls have different explanations across countries. Burgess (2004) analysing the results

of the General Certificate Secondary Education of English students of age 16, in Mathematics, English and Science finds that in English girls do better, but in Mathematics and Science the results have some particularities. The media in Mathematics and Science scores is the same in both subjects for boys and girls; but in the top decile, boys do better than girls.

Burgess (2004) shows that these differences in achievement between English boys and English girls, are not due to differences in school performance, class size or other school characteristics; as a consequence, no educational policy in schools can be taken to reduce this gap in achievement, because the reasons of the gap are beyond observable school characteristics.

In addition, Bailey and Dynarsky (2011) who analyse the gap in income, race and sex in the United States, highlight the fact that for the case of college entry and completion rates, the educational achievement of women has outperformed men in every demographic group and this difference has been increasing for the last thirty years.

Lai (2010), analysing data from students in Beijing, finds that girls have better scores in Chinese and Mathematics than boys, in secondary education. In addition, he finds that girls receive more parental support than boys, and more parental involvement is positively related with school attainment. Also, he finds that girls have other important characteristics, for example: studying more hours than boys, enjoying school and being more involved in committees in school. However, those findings are a driver to better performance, he states that this gap in achievement between boys and girls in Beijing is explained solely by primary school performance. As a consequence, he suggests that policy intervention to reduce the attainment gap between boys and girls should be done in the first years of education instead of secondary school.

Al-Samarrai and Peasgood (1998) find out that the level of education of parents is the main driver for children schooling in his study of household and family characteristics in 16 villages in rural Tanzania. Unsurprisingly, he finds that father's primary education increases in a higher extent the likelihood of boys enrolment than girls; the opposite also holds. Moreover, if both parents have attended secondary education, it improves the probability that children attend secondary school. Also, he finds that coming from a divorced family has a higher negative impact in boys than in girls.

1.5 Literature review: Peru.

In Peru the education system has three mandatory levels: one year of pre-school, six years of Primary education and five years of Secondary education. The literature of Economics of Education about Peru covers various aspects of differences between achievement in rural areas, urban areas, causes of drop out or abandonment of school between areas, achievements in monolingual schools, Spanish, in comparison to bilingual schools with Spanish and Quechua or Aymara as the second language. Quechua and Aymara are native languages of the highlands and the jungle respectively. Also, another aspect analysed is the economic differences between schools and between students and achievement in students who migrate to the cities. Sanchez (2008) provides a rich literature of what is written in Peru about these topics.

To understand better the situation of Education in Peru, it is analysed briefly how students of 15 years old in Peru were assessed in PISA evaluation in 2009. This exam has three areas: Reading, Mathematics and Science and the main focus of the 2009 exam was Reading. The main objective of this exam is to evaluate if students understand thoroughly what they read and apply this new knowledge to unknown situations which requires integration with previous knowledge and reflection (OECD, 2010). Peru was ranked 63 of 65 countries in Reading and Mathematics tests and 64 on the Science test, as it is shown in Table 1.

In Reading, Peru is in level 1a from 7 levels, being the 1b the lowest and level 6 the highest. In this level, students are able to recognize the main idea in the text when it is explicitly stated and it is a familiar topic. In Peru, one in three students does not attain this basic level. In Mathematics, Peru is ranked in level 1 from 6 levels. This means that students can solve problems that involve routine procedures following direct instructions only in familiar contexts. Also, in Science test Peru is ranked in level 1, which means a very little scientific knowledge (OECD, 2010)

OECD (2010) finds that the gap between students from the urban schools and students from rural schools is around 45 score points, after controlling by family characteristics. Also, they find that 27% of the student attainment in reading test is explained by the student socio economic status, one unit increase in the PISA index of economic, social and cultural status leads to an increase of 40 points in test scores.

Table I

PISA 2009 Results: What Students Know and Can Do: Student Performance in Reading, Mathematics and Science (Volume I) © OECD 2010
Comparing countries' and economies' performance

		On the overall reading scale	On the mathematics scale	On the science scale
1	Shanghai-China	556	600	575
2	Korea	539	546	538
3	Finland	536	541	554
4	Hong Kong-China	533	555	549
5	Singapore	526	562	542
6	Canada	524	527	529
7	New Zealand	521	519	532
8	Japan	520	529	539
9	Australia	515	514	527
10	Netherlands	508	526	522
17	United States	500	487	502
18	Liechtenstein	499	536	520
19	Sweden	497	494	495
20	Germany	497	513	520
21	Ireland	496	487	508
22	France	496	497	498
23	Chinese Taipei	495	543	520
24	Denmark	495	503	499
25	United Kingdom	494	492	514
	…			
55	Jordan	405	387	415
56	Tunisia	404	371	401
57	Indonesia	402	371	383
58	Argentina	398	388	401
59	Kazakhstan	390	405	400
60	Albania	385	377	391
61	Qatar	372	368	379
62	Panama	371	360	376
63	**Peru**	**370**	**365**	**369**
64	Azerbaijan	362	431	373
65	Kyrgyzstan	314	331	330

Statistically significantly above the OECD average

Not statistically significantly different from the OECD average

Statistically significantly below the OECD average

Source: OECD PISA 2009 database.

Within this context it is analysed concisely what it is written about Education in Peru.

1.6 Public schools vs. Private schools: Which is better?

In Peru, it is important to distinguish between both types of schools. Public schools are run and mainly financed by the government. On the contrary, private schools are run privately and they are totally financed by parents. The distinction is important because 85% of students go to public schools and 10% to private schools in Peru (Sanchez, 2008). As a consequence, the papers written about Peru are mainly focus on the need of closing inequality gaps in Education.

For example, Hernandez Zavala (2006) analysing test scores for 3rd and 4th year of primary schools, suggests that indigenous students are 14% more likely to work while studying that non indigenous students. This fact can be explained because indigenous students usually come from poorer families. Moreover, Hernandez Zavala (2006) states that students who attend private schools have higher scores than the ones who attend public schools.

Another piece of research about inequality gaps was done by Luque (2008). He finds that schools in Peru have important differences in educational achievement: the best student in the worst school can have worse scores than the worst students in the top schools. On the one hand, Luque (2008) explains these differences in achievements between students from private and public schools on the families' socioeconomic level, school characteristics and other non-observable characteristics; for example, parents pre-dispositions towards better education; on the other hand, Cueto (2007) explains these differences by the better quality of education delivered in private schools.

Those findings are consistent with Navarro (2002), who suggests that in the last years there are more private schools in Peru for both, primary and secondary levels and the differences from the public ones are mainly better infrastructure, better classroom equipment, and better prepared and motivated teachers.

Saavedra and Suarez (2002) provide information about how much families finance the education of their children in public schools. Surprisingly, they find that families spend more than 30% of the total expenditure of primary and secondary education in public schools. This amount of money is for registration and other payments that schools request from the parents, even though

public schools should be mainly free of payments. This was because of the low expenditure in education from the government in those years studied. Therefore, public schools are not reducing inequality gap of education in the country.

But, these gaps even increase when students finish school and begin working. In fact, Saavedra and Maruyama (1999) using a 1997 household survey, find that those who attend private schools have higher wages than the ones who attends public schools. These findings are supported by a later piece of research made by Calónico and Ñopo (2007) who used household surveys from years 1997 and 2000. This survey has detailed information about each of the households of urban and rural areas of Peru. Their findings confirm the existence of wage gaps between those who study in private schools and those who study in public schools; furthermore, the gaps from secondary schooling are similar to primary schooling. However, they remark that this gap could be upward bias, because families that send their children to private schools also have better economic situation; mostly better education and as a consequence, better networks that enable their offspring to find better jobs and as a result have higher wages. It is somewhat surprising that studying in a private or public school is such a strong source of inequality that even the returns of studying in a private university are higher when the student has attended a private school than a public one.

In addition, it is necessary to mention that more schools are needed in the country. Evidence of the lack of public schools was found by Gertler and Glewwe (1989). They find that even poor families of rural areas, are willing to pay fees to reduce the travel time of their offspring in secondary education, when this travel time is more than two hours.

1.7 Do girls perform better than boys in Peru?

Academically, there is almost nothing written about the differences in achievement between girls and boys during school years. There is more written about wage gender gap in Peru. For example, Ñopo (2009) analysing the period from 1986 to 2000, finds a wage gender gap of 45% in favour of males. In fact, this wage gender gap is almost 100% when the lowest part of the distributions of wages is analysed; this means, between the poorest.

About gender gap during school years, Duryea (2007), analysing the 2003 households survey, finds that between the poorest, there is an important difference in attendance at school between

boys and girls, in favour of boys. Parents prioritize the education of their male children. Nevertheless, girls have more number of years of school approved, due to higher repetition rates among boys in comparison to girls. Indeed, there is a gender gap in the number of years of schooling, but not in school achievement between girls and boys.

Chapter 2: Data analysis and Fixed Effects Models of Education Achievements.

Our descriptive analysis will be based on a survey of 3,438 students from the third to the fifth year of high school, from 60 randomly selected urban schools in Peru in 17 cities. This survey was made by Navarre University from Spain, Piura University from Peru and Intermedia Consulting from Italy, in 2009. The goal of this survey was to study the lifestyle of teenager students in Peru. The variables used, in this piece of research, are classified into two main categories: family characteristics and school characteristics as it is required by the contemporaneous specification of the production function for cognitive achievement of Todd and Wolpin (2003).

$$T_{ija} = T_a\left(F_{ija}, S_{ija}\right) + \mathcal{E}_{ija}$$

With the data available, T_{ija} is the reported usual average score that the student i said to have in school j at time a, F_{ija} is the vector of individual and family characteristics (inputs), S_{ija} is the vector of school characteristics (inputs) and $\mathcal{E}_{ija}$ includes not only the measurement errors but all the past history of the student i. The vector of individual and family characteristics includes variables as age, sex, composition of the family, information about the parents: if they are divorced or separated; self-declared socio economic level and building materials –as a proxy of socio-economic level-. Also, it includes information about the supervision of the parents on their studies and the time students dedicate to TV, computer and video games, and others. The vector of school characteristics includes variables such as: location, type of school: private or public, single sex or mixed, and if the school has internet access. Table 2 shows a description of some variables used and Appendix 1 shows the variables as they were asked in the survey. The looking of originality and the used of recent data of students in Peru limited the depth of the analysis and the exhaustive use of the Todd and Wolpin equation in this piece of research.

Table 2

Description of some variables used

Variable		Obs	Mean	Std. Dev	Min	Max
Score minimum		3377	13.9793	1.7815	0	17
Score maximum		3377	15.2307	2.11778	10	20
Sex	0=boy, 1=girl	3399	0.54604	0.49795	0	1
Live with parents	yes=1,no=0	3399	0.60194	0.48957	0	1
Divorced	yes=1, no=2	3007	1.74061	0.43838	1	2
Economic level	Low=1, medium=2, high=3	3334	2.0243	0.51414	1	3
Supervision of parents	0=lower level, 5=maximum level	3315	3.0911	1.49193	0	5
Internet at shool	no=0, yes=1	3368	0.47328	0.61551	0	2
PC at home	no=0, yes=1	3369	0.63164	0.48243	0	1
Study more than 8 hours a week	no=0, yes=1	3333	0.25473	0.43577	0	1
Study and work	yes=1,no=0	3373	0.16217	0.36866	0	1
School		3399	113.277	90.1201	1	226
Location		3399	23/51486	8.8448	11	37
If public or private school	public=1, private=2	3399	1.53722	0.49869	1	2
if single sex or mixed	diff=1, mixed=2	3399	1.72698	0.44558	1	2

One consideration that has to be done is that students are not assigned into schools randomly; indeed, the choice of what school to attend is a parental decision, mainly according to their level of education, economic characteristics, distance of their house to school, among others. The methodological way to deal with this not random assignment is Fixed Effects models. As average test score, individual and family characteristics are at the individual level and school

characteristics are at the school level, the regressions of the production function are made according to fixed effects models; in this case, school fixed effects. In other words, students of a school are of a specific type and not a random draw from some underlying population (Verbeek, 2008), as opposite to random effects.

In the linear specification and dropping a, the production function becomes:

$$T_{ij} = \beta_0 + \beta_1 F_{ij} + \beta_2 S_{ij} + \mathcal{E}_{ij}$$

And with the fixed effect model, it becomes:

$$T_i = \beta_1 F_i + \alpha_i + \mathcal{E}_{ij}$$

Where $\alpha_i = \beta_0 + \beta_2 S_j$ and this could be identified as the fixed effects of being in school j. My analysis will be based on individuals across schools. It is assumed $\mathcal{E}_{ij}$ has mean zero, a constant variance and it is only dependant on T_i. In this type of framework it is allow α_i to be correlated with S_j. In other words, observations are independent across schools but not within schools. To explain this, Luque (2008) argues that the traditional sampling approach is based on observable characteristics but not by unobservable school differences in scores: the school effects. He found important school effects in Peru. Indeed, Hernandez-Zavala (2006) explains some concerns about school selection: first, parents choose schools according to the income disposable for education of the children and location. Then, parents choose schools for other characteristics which are not observable to the econometricians. Lastly, parents evaluate the resources per student disposable at school.

The dependant variable, self-reported scores were answered in the survey as intervals. The dependent variable has 5 intervals: scores from 0 to 10, from 11 to 12, from 13 to 14, from 15 to 16, from 17 to 20. In Peru, the scale of scores is from 0 to 20. This means that the data does not have the exact self-reported scores; it shows an interval where the score is; but what it is known is that the scores are within a threshold and this information is enough for the parameters' estimation (Wooldridge, 2009). In the literature this type of outcome is called double censoring data. As it is explained by Davidson and Mackinnon (1993):

$$y_t^* = x_{t+} u_t \quad where\ u_t \sim NID(0, \sigma^2)$$

$$y_t = y_t^* \; if \; y_t^l \leq y_t^* \leq y_t^u; \; y_t = y_t^l \; if \; y_t^* < y_t^l; \; y_t = y_t^u \; if \; y_t^* > y_t^u$$

The Loglikelihood function is:

$$\sum_{y_t^l \leq y_t^* \leq y_t^u} \log(\frac{1}{\sigma}\emptyset(\frac{1}{\sigma}(y_t - X_t\beta))) + \sum_{y_t^* < y_t^l} \log(\emptyset(\frac{1}{\sigma}(y_t^l - X_t\beta))) + \sum_{y_t^* > y_t^u} \log(\emptyset(\frac{1}{\sigma}(y_t^u - X_t\beta))$$

2.1 School Fixed effects

First, I estimate a double censored regression or interval regression, with clustered standard errors to identify the dispersion in scores and to know if they are caused because of differences across schools, then, I estimate a double censored regression with school fixed effects to know if the differences are because of the within school components. The results are shown in table 3. There are 60 schools in the data analysed. As it can be seen, analysing between schools, girls do 0.185 more points than boys, which represents 0.10 standard deviations, and within schools girls do 0.217 points better than boys, conditional upon all the other variables, which means 0.12 standard deviations.

When evaluated the data by school fixed effects, living with parents becomes a significant variable and students who live with both parents have in average within schools 0.178 points more, 1% more, than the ones who do not live with them. This confirms the findings of Astone and McLanahan (1991), who find that being an offspring from single parental family has negative consequences in school achievement. To get to know how many students are in this situation and as a consequence, understand the significance of it, Corcuera (2010) mentions that from the students surveyed, 2 from 10 students live only with their mother and 2 from 10 students do not live with their parents.

In both regressions, if students are not poor – are in the medium scale of economic level–, they have 0.215, with clustered standard errors; and 0.174 with school fixed effects, more points than poor students, or 0.12 and 0.09 standard deviations.

The variable summary supervision of parents is a composition of a set of questions given to the students asking if their parents supervise their free time, set the time that they should go back

home on weekends, know and see when they go back home, follow the time dedicated to watch TV, play on video games or to internet and finally if theie parents talk to them about the use of internet and videogames. As a confirmation that parents are important agents in the education process, it is shown clearly that with more supervision from parents, students do much better than the ones that do not have parents that dedicate their time to supervise them in different aspects of the use of their time. This variable has five levels and the fourth level has more positive impact than the fifth one. For the students who answered that they received a level of supervision of their parents as 4, they have 0.897 more points than the students who have no supervision or, in other words, it explains 0.48 standard deviations. The students that answered that they received a level 5 of supervision have 0.857 more points than the ones who do not have supervision of their parents or 4.3% more points.

Not surprisingly, another result found is that students that study more than eight hours a week do better with 0.719 more points than the ones who do not study this amount of time weekly. Also, the ones who do not work outside home have 0.341 more points than the ones who work. It is important to highlight that 20% of the students' surveyed work outside home; but also, it is necessary to mention that in Peru, there is no practice of working while studying; the usual practice is that parents pay for all the education and other needs of their sons and daughters even the university expenditures. Clearly, working while studying is a consequence of the students' necessity to help in the improvement of their family income, in other words those students have a less advantageous economic situation. It is important to mention that Sanchez (2008) reports that 25% of boys and girls between 6 to 17 years old work in Peru, but Corcuera, 2010 argues that this percentage varies between location.

Lastly, students who have a computer at home do better by 0.21 more points, or 1% more points that the ones who do not have; but having internet at school is a not significant variable.

2.2 Location Fixed effects

Luque (2008) finds that the specific areas where children study are another source of variance of test results. Moreover, a large and populated city can offer more cultural resources than a little city in a less populated area; as a consequence and to show this effect in my piece of work, I run a double censored regression with area fixed effects.

Table 3

Regression results with Clustered Standard Errors and School Fixed Effects

Variables	Clustered Standard Errors	School Fixed Effects
Sex	0.185*	0.217***
	(0.102)	(0.0737)
Do you live with father and mother?	0.117	0.178**
	(0.0913)	(0.0803)
Economic level - Medium	0.215**	0.174*
	(0.101)	(0.0997)
Supervision of parents - level 1	0.333**	0.407***
	(0.139)	(0.156)
Supervision of parents - level 2	0.363***	0.459***
	(0.125)	(0.144)
Supervision of parents - level 3	0.537***	0.626***
	(0.123)	(0.14)
Supervision of parents - level 4	0.834***	0.897***
	(0.12)	(0.139)
Supervision of parents - level 5	0.777***	0.857***
	(0.115)	(0.141)
Do you have internet in school?	-0.0381	0.0455
	(0.0939)	(0.0724)
Do you have computer at home?	0.241***	0.210***
	(0.0794)	(0.0773)
Do you study (outside school) more than 8 hour a week?	0.753***	0.719***
	(0.0842)	(0.0708)
Besides studying at school do you work outside home?	-0.235**	-0.341***
	(0.106)	(0.0938)
Constant	13.54***	13.49***
	(0.153)	(0.301)
Observations	2,829	2,829
Pseudo R-squared(*)	0.089	0.192

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
(*) Mc Kelvey & Zavoina's R^2

In the data used there are 17 urban cities analysed in Peru. The within area effects are described with this regression and I called it, the location effect. In addition, this location fixed effects permit us to evaluate other variables of schools which cannot be analysed in the school fixed effects model. These variables are: the differences in achievement of being in a private or public school or if there is any significance to study in a single sex school with reference to a mixed sex school. Furthermore, it is also important to identify the effects of the area because some characteristics of the students may come from their specific location, as some of them are in the coast, others in the mountains and others in the forest area of the country.

In table 4, we find the results of the location fixed effect regressions. Within locations, students from private schools do better than students from public schools by 0.291 points, which means 16% of a standard deviation. This finding confirms the literature that in private schools students achieve better results than in public schools. This is also consistent and reinforce by the fact that students with better economic situation have 1% more points than poor students, in other words, the better economic situation explain 0.20 standard deviations. Another result within location is that girls do better than boys by 0.25 points.

Additionally, single sex schools do not have a significant coefficient, which is consistent with the review of literature that there is no a definite consensus that students in single sex schools perform better than mixed schools students; as Machin and McNally (2006) state. Having internet at school is another variable that does not have a significant coefficient in this study.

As in the previous regressions with school fixed effects, students that have more supervision from their parents do 4% better than the ones who do not, the ones who study more than 8 hours a week have 3.7% more points. Furthermore, students who have a computer at home have 1% more points. On average, within locations, students who do not work while studying have 1.7% more points that the ones who have to study and work at the same time.

It is interesting to see that when the same regressions are run only for girls and only for boys (Table 5) there are some differences: the average score for girls with school fixed effects is 14.39; while for boys, it is 13.12; but within locations the average score is 12.71 for girls while for boys 12.79, which means that boys do slightly better when analysing by location.

Table 4

Regression results with Location Fixed Effects

Variables	**Location Fixed Effects**
Sex	0.250***
	(0.0644)
Private school	0.291***
	(0.091)
Do you live with father and mother?	0.141*
	(0.0816)
Economic level - Medium	0.194*
	(0.102)
Supervision of parents - level 1	0.358**
	(0.16)
Supervision of parents - level 2	0.400***
	(0.148)
Supervision of parents - level 3	0.569***
	(0.144)
Supervision of parents - level 4	0.844***
	(0.143)
Supervision of parents - level 5	0.779***
	(0.145)
Do you have computer at home?	0.205***
	(0.0767)
Do you study (outside school) more than 8 hour a week?	0.739***
	(0.0717)
Besides studying at school do you work outside home?	-0.342***
	(0.0944)
Constant	12.51***
	(0.283)
Observations	2,829
Pseudo R-squared(*)	0.192

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

(*) Mc Kelvey & Zavoina's R^2

Table 5

Separate regressions for boys and girls

	Only girls		Only boys	
	Fixed schools	**Fixed location**	**Fixed schools**	**Fixed location**
Private school		0.384***		0.203
		(0.131)		(0.138)
Do you live with father and mother?	0.189*	0.104	0.181	0.212*
	(0.113)	(0.115)	(0.113)	(0.116)
Economic level - Medium	0.0128	0.0721	0.273*	0.293**
	(0.139)	(0.142)	(0.143)	(0.145)
Supervision of parents - level 1	0.238	0.151	0.520***	0.515***
	(0.268)	(0.272)	(0.192)	(0.196)
Supervision of parents - level 2	0.251	0.178	0.554***	0.557***
	(0.246)	(0.252)	(0.178)	(0.183)
Supervision of parents - level 3	0.619***	0.487**	0.573***	0.600***
	(0.24)	(0.245)	(0.176)	(0.18)
Supervision of parents - level 4	0.838***	0.697***	0.938***	0.946***
	(0.239)	(0.244)	(0.173)	(0.178)
Supervision of parents - level 5	0.875***	0.703***	0.752***	0.802***
	(0.241)	(0.246)	(0.179)	(0.183)
Do you have computer at home?	0.116	0.173	0.281**	0.235**
	(0.108)	(0.107)	(0.11)	(0.109)
Do you study (outside school) more than 8 hour a week?	0.734***	0.759***	0.625***	0.693***
	(0.094)	(0.0959)	(0.106)	(0.107)
Besides studying at school do you work outside home?	-0.234	-0.234	-0.432***	-0.473***
	(0.147)	(0.15)	(0.122)	(0.122)
Constant	14.39***	12.71***	13.12***	12.79***
	(0.355)	(0.423)	(0.337)	-0.4
Observations	1,560	1560	1,269	1,269
Pseudo R-sqaured (*)	0.213	0.142	0.211	0.148

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

A girl has 0.384 more points than the average, when studying in a private school than a public school, when controlling by location, but boys being in a private or public school is not significant. For the case of boys, the coefficients of supervision of the parents are significant from the lowest level of supervision to the upper one, while for girls it is only significant from the third level (of five levels).

Having a computer at home is significant and positive for boys but not for girls. Working outside home is highly negative significant for boys but not significant for girls. One possible reason for this insignificance for girls' results is that the question in the survey was if they work outside of their home. Of the students surveyed who work while studying, 63% were boys and 37% were girls and 80% of them study in public schools. The results could be downward bias, because usually girls from poor backgrounds have to work while they are at home, taking care of their younger siblings. In this sense, we are missing information about hours dedicated by girls to work at home because their mother is outside working to increase the family income. This confirms the findings of Sanchez (2008) that the working activities for children in urban areas for boys are retailing and the working activities of girls are working at home.

Having internet at school is not significant and this result is consistent with Luque (2008) who finds that school resources do not have an important explanatory effect for the case of Peru.

2.3 Supervision of parents

As it was already seen, home environment matters in student attainment. Indeed, appendix 2 shows in detail at what extent supervision of parents influences students' school achievement. In this regression the variable supervision of parents is decompose in other variables that correspond to the students' answers to the following questions: Do your parents know what do you do in your free time? Do you parents see you when you come back on weekends (At night)? Do your parents suggest you about the use of internet and video games? It is found that all of these variables are significant with school fixed effects and location fixed effects and the coefficients are higher for girls than for boys in almost all the variables. In fact, the variable with the higher coefficient is if their parents know what they do in their free time. This represents 0.26 of the standard deviation of the distribution of scores.

These results confirm the findings of Steinberg, Lamborn, Dornbusch, and Darling (1992), who state that parental supervision of students leads to better school performance among adolescent students.

2.4 Oaxaca Blinder decomposition

I use the Oaxaca blinder decomposition, as another tool of explanation of the gap in differences of scores between boys and girls (Appendix 3). This procedure decomposes the gap of marks in schools between boys and girls in three sources of differentials: Endowment effect, Coefficient Differences and Interaction Effect (Jann, 2008).

In our data, the **Endowments effect** would be:

$$E = (E\ (F_{boys}, S_{boys}) - \ E\ (F_{girls}, S_{girls}))' \beta_{girls}$$

This effect is the gap explained by observable characteristics of boys and girls. The next two components are the ones that cannot be explained by observable characteristics of boys and girls. The first of the two unexplained part is the **Coefficient Differences**, which in our case is:

$$C = (E\ (F_{girls}, S_{girls})'\ (\beta_{boys} - \beta_{girls}))$$

The last component of the Blinder Oaxaca decomposition is:

$$I = (E\ (F_{boys}, S_{boys}) - \ E\ (F_{girls}, S_{girls}))' (\beta_{boys} - \beta_{girls})$$

This last component takes into account the reality that differences in endowments and coefficients exist together: **Interaction Effect**.

The Oaxaca Blinder decomposition is often used analysing wage gap between male and female with wage as a continuous variable; however, in this study it is used to illustrate better the differences in scores, between boys and girls and the regressions are adjusted to use censored dependent variable, which gives a more efficient outcome than the traditional Oaxaca command in Stata.

In the case of our data, the Endowments Effect is the mean decrease in girls' school marks if they have the same observable variables as boys; or in other words, the mean increase in boys if they have the same observable variables as girls. These observable characteristics are mainly

type of school, supervision of parents and if they study more than 8 hours a week; this effect is around 29% of the gap. Moreover, more than 60% of the gap is due to coefficient differences. This means the decrease in girls' scores when using the men's coefficients to the women characteristics. These characteristics are mainly the ones of their own school, also the type of their school: public or private, and if they work. The third component, the interaction term of the both previous, does not have statistical significance.

Following the same methodology, the differences between public and private urban schools in Peru are analysed (Appendix 4). The endowment effect and the coefficient effect explain the entire gap between the two types of schools. It is very interesting to see in the coefficient effect that the mean scores of students in public schools would reverse sign if the socio economic level were higher, which confirms that the economic level is an important source of inequality gap in scores in Peru.

Analysing by age, the variable "live with both parents" becomes significant at the age of 17, by 0.82 points when the parents live together with the students, in comparison to not living together. Also, the variable "divorced" becomes significant by 0.845 points, which means that if the parents are not divorced students have 0.845 points more than the divorce ones.

The desire to do an original piece of work using recent data from students in urban schools in Peru, led to some limitations of information, which in the field of Economics of Education are important. For example, in the survey used, there is no information about education of parents and this is an important variable. It is important because it influences in the education achievement of their offspring; however, it is not clear yet, the extent of this influence (Luque 2008)

Another limitation of the data used is the area of study. This survey was done in urban schools in Peru and not rural ones. A comparison between schools of urban areas and rural areas is missing; indeed, Luque (2008) finds that urban schools perform better than rural schools. Furthermore, in PISA scores, the gap in performance between urban and rural schools is more than one year of school (OECD, 2010).

Another important set of variables missing in this dissertation are the ones that come from schools: effort devoted from different agents like teachers and managers of schools and the

incentives mechanisms which could change their behaviour to improve the objectives decided upon.

Chapter 3: Conclusions and Policy implications

Even though Peru has increased its rates of primary and secondary enrolment and decreased the illiteracy rates, in the last ten years; the average quality of education is still very poor. In fact, Peruvian students were assessed in the lowest level in Pisa test 2009. In this dissertation, an attempt was made to assess the variables that explain school achievement; as it is crucial to robust empirical evidence on what determines educational success in Peru as this is a very important economic subject to study in the country.

My dependent variable, self-report school achievement, is described in the data used as an interval, as a consequence, censored regressions were run with 60 school fixed effects and 17 location fixed effects to evaluate the importance of family characteristics and school characteristics, within schools and within locations. As a gap in school achievement between boys and girls and between public and private schools was found, the Oaxaca Blinder decomposition method was used to deepen in the explanation of those gaps.

In general, in almost all the different types of analysis done, girls report better marks than boys, which is widely consistent with the literature of Economics of Education. Other important variables that explain achievement in school are the ones related to home environment: living with both parents and having supervision of parents. Students who live with both parents do better by 0.10 standard deviations and students who have more supervision of their parents do better by 0.48 standard deviations. Moreover, for the case of boys, this supervision is significant even from the lowest level, which means that the parents who dedicate time to their sons help them greatly in the improvement of their school scores. In all cases, self-studying more than eight hours per week is a significant variable of school achievement, and it represents 0.38 standard deviations.

When the variable supervision of the parents is decomposed in its main components: supervision of free time, supervision of the use of video games and internet and supervision of the outing on weekends, all the components are positive and significant. Indeed, supervision of parents to their offspring' free time represents 0.26 of standard deviation of the distribution of scores.

In addition, the other variable that is important in this explanation of school achievement is the socio economic level: the students of better socio economic level do better by 0.48 standard deviations. I recognise that there is not only the family income variable the one which influences per se the scores, but all the variables related to this fact; for example, families with better income would have parents better educated and with better networks and as a consequence they would prefer that their children study in high quality schools.

Students, who work outside home while studying at school, mainly boys, do worse than the ones who do not work by 0.18 standard deviations. But, we are not analysing those girls who do work, but at home, cooking or helping their mothers to take care of with their siblings.

When analysing by type of school, we find that students from private schools do better, than students who study in public schools by 0.16 standard deviations. This fact reveals that the investments of the Peruvian government in education are not closing inequality gaps, on the contrary, it is deteriorating them.

With the results of students of urban schools in Peru, some suggestions can be made:

- With the data available, it was not possible to distinguish the components of quality of schools made by Hernandez Zavala (2006); but we confirm that students from private schools are doing better than the ones of public schools. As a consequence, policy makers have to recognise that positive actions are taking place in private schools that it is worthwhile to replicate in public schools. There are many variables that would be important to follow up in public schools: a minimum level of infrastructure, a minimum level of qualifications of teachers, with a level of salary that permits them to be motivated in their work and to work better and focus on students learning.
- Policy makers have to be creative enough to generate competition between private and public schools, which could improve public school quality (Dee, 1998). One way is introducing the voucher system (Horowitz, 2004). Since 2007, some boroughs in Peru are part of a program of decentralization of the education system from the Central Government. This means that public schools depend on their borough if they are part of the program. The boroughs are in charge of establishing, managing and controlling the education policy of their area. There is no research done yet about the results of the

implementation of this dependency; however, this new system does not create competition between private and public schools.

- Having internet in school was not significant in our analysis in private and public, urban schools. This is important to highlight as other type of investments in schools could be prioritize than having connection to internet.
- It was shown that parents are very important in the process of education; as a consequence, parents should know this fact. Involving parents in the education and supervision of their offspring is an important role that schools have. Indeed, it is not only involving but encouraging them to take an active behaviour in the supervision of the time of their children. This supervision covers how children use their free time during the week and on weekends.
- From our data, we do not know, what the impact of home work in girls is, but we can infer that girls from poor backgrounds have to dedicate time to help their mothers at home with their siblings. Some actions should be taken, to ensure that girls go to school, and while in school, do not work. It is confirmed in the literature that better education of girls has positive and multiplicative effect in their own families. It causes better health of their children and educated mothers promote better education to their children. As a result investing in education for girls have a strong impact for the present and future generations.

As the same type of survey used in this study, was done in Philippines and El Salvador, and both are developing countries as Peru, further research can be done analysing the same variables across these countries and with availability of data, longitudinal studies can be done to study the differences observed in students across time and across similar countries, to estimate a more sophisticated education production function.

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Appendix 1

Variables used in the model

personal data	Age	What is your age?
	sex	are you boy or girl?
family information	siblings	how many brothers and sisters do you have?
	live parents	Do you live with mother and father?
	divorced	do your parents are divorced or separated?
socio economic information	Socio economic level	how do you describe the socio economic level of your family?
	Floor house	which is the material of the floor of your house?
parents	Supervision free time	do your parents know where you are and what you do in your free time?
	Supervision: set time	do your parents set the time to go back home the weekends?
	Supervision:outing	Do your parents see you when you go back home after your outing on weekends?
	Supervision tics	do they control the time that you spend watching TV, playing video games, or in internet
	Summary supervision	Level of parents supervision - summary -
	c_progress school	do your parents follow your studies in school, closely?
data of school	School	school
	Location	location school
	Public or Private school	public school
	single sex or mixed	Is it differentiated or mixed school?
attainment	Scores	what is the usual average score that you have in school?
TICS	internet school	In school, do you have internet?
	pc at home	do you a computer at home?

Appendix 2

Detailed supervision of parents in only boys and girls

Variables	School Fixed Effect		Location Fixed Effect	
	boys	girls	boys	girls
Do your parents know what you do in your free time	0.239**	0.480***	0.292***	0.503***
	-0.0943	-0.0947	-0.0967	-0.0966
Do your parents see you when you come back on weekends (At night)?	0.284***	0.289***	0.303***	0.265***
	-0.0981	-0.1	-0.101	-0.102
Do your parent suggest you about the use of internet and video games	0.265***	0.302***	0.242**	0.285***
	-0.092	-0.0857	-0.0943	-0.0881
Constant	13.98***	14.47***	13.61***	13.28***
	-0.247	-0.228	-0.294	-0.27
Observations	1,493	1,786	1,493	1,786

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Appendix 3

Oaxaca Blinder decomposition (by Boys and girls)

VARIABLES	Overall	Endowments	Coefficients	Interaction
School		-0.00855	0.2023***	0.01477*
		(0.00512)	(0.074)	(0.00822)
Type of school (if public or private)		-0.00200	-0.5566***	0.00176
		(0.00724)	(0.1989)	(0.0064)
Type of school (if single sex or mixed)		0.01743*	-0.343	-0.0195
		(0.0092)	(0.245)	(0.01433)
Supervision of the parents		-0.07195***	-0.098	0.01192
		(0.01505)	(0.1323)	(0.0161)
If studies more than 8 hours a week, outside school		-0.03532***	0.00517	-0.000922
		(0.01196)	(0.038)	(0.006787)
If the student study and work		0.0002	-0.03758**	-0.0438**
		(0.0165)	(0.0186)	(0.0220)
group 1: Boys	14.37***			
	(0.0449)			
group 2: Girls	14.70***			
	(0.042)			
Difference	-0.328***			
	(0.0616)			
Endowments	-0.096***			
	(0.028)			
Coefficients	-0.197***			
	(0.062)			
Interaction	-0.0351			
	(0.0303)			
Constant			0.628	
			(0.4247)	
Observations	3,174	3,174	3,174	3,174

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Appendix 4

Oaxaca Blinder decomposition (by public school and private school)

VARIABLES	Overall	Endowments	Coefficients	Interaction
sex		-0.00164	-0.141*	0.00126
		(0.00596)	(0.0723)	(0.00461)
If the student live with both parents		-0.0290***	-0.161*	0.0229*
		(0.0102)	(0.0868)	(0.0131)
Socio economic level		0.00137	0.580**	-0.0591**
		(0.0202)	(0.272)	(0.0281)
Supervision of the parents		-0.0479***	0.0823	-0.00753
		(0.0126)	(0.14)	(0.0129)
If studies more than 8 hours a week, outside school		-0.0281**	-0.0231	0.00293
		(0.0132)	(0.0397)	(0.00521)
if the student study and work		-0.106**	0.0188	0.0755
		(0.0435)	(0.0125)	(0.0497)
Group 1: Public Schools	14.40***			
	-0.048			
Group 2: Private Schools	14.82***			
	-0.0454			
Difference	-0.422***			
	-0.066			
Endowments	-0.210***			
	-0.0516			
Coefficients	-0.269***			
	-0.0713			
Interaction	0.0573			
	-0.058			
Constant			-0.918**	
			-0.43	
Observations	3,174	3,174	3,174	3,174

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1