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EDUCATE GIRLS GLOBALLY

Girls' Education in Latin America

Final Report

Part I

Girls' Education in Rural Areas of Latin America

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Lead

The challenge of educating girls is part of the larger issue of women's empowerment, which is an important and pressing issue in many if not most parts of the world. The issue is important for women and girls, opening to them opportunities fully to contribute to economic and social progress and also to be "all they can be". Apart from the opportunities education offers to the girls, educating girls is widely regarded as the most powerful instrument available to promote economic and social change in developing countries. The education of mothers is the most powerful indicator of the health of families—more important than medicine and nutrition—because if a girl is illiterate, she will often stay away from the local health clinic, and she will not take medicine. The education of both boys and girls is much more a function of the mother's education than the father's. And a mother's education is the most powerful factor influencing fertility.

Educated mothers, in short, will have less, healthier and better-educated children—with enormous benefits to society as a whole.

All Latin American governments are committed to educating girls and empowering women. "Education", however, must be taken to include both formal schooling systems and other socializing influences, especially including family and local cultural influences. Therefore, it is important, in exploring issues related to girls' education, to look at a wider range of things than are normally considered in studies of education. These should include how formal education influences women's and girls' views of their roles in society, of their future opportunities and possibilities. It should also include consideration of how governments' educational reforms encourage girls to pursue their education and their life after school with a full sense of the expanding possibilities available to them.

Geography is the most powerful influence on differences in school indicators in Bolivia, Guatemala and Peru. Average schooling in urban areas—measured by years of education—exceeds by more than four years education in rural areas. The gaps in education between urban and rural areas are parallel to continuing gaps in education between indigenous and non-indigenous populations because most indigenous people live in rural regions.

Although gender differences were in the past very large in Latin American countries, these gaps have been closing by continuing public commitments to end gender discrimination. Enrollments of boys and girls show basically no difference in Peru and Bolivia, and very little difference in Guatemala. One possible problem with this conclusion might exist in the data having to do with the difference between enrollment—the number of children who show up the first day and sign up—and actual attendance—the number who actually attend school. In many countries, for instance in South Asia, there are substantial differences between these numbers, with attendance sometimes as little as one-half enrollment; and general differences often show up more strongly in attendance figures than enrollment figures. The differences between these numbers reflect, at least in part, the incentives of government school officials in favor of high enrollment figures as well as the lack of incentives of some families to let their children attend school

regularly; and the differences can have important implications for assessing real problems of gender.

The studies in this report have made a special effort to assess possible differences between data on enrollments and attendance. We wanted to be sure that the virtual disappearance of differences in schooling between boys and girls as reflected in enrollment statistics also showed up in attendance, which is a more accurate measure of schooling than enrollment.

Although enrollment figures in these three countries show almost no gender differences, in Bolivia and Guatemala differences do show up in attendance of boys versus girls in rural primary schools. In fact, the Guatemalan data show that among the indigenous children the differences in attendance by gender are larger than among the non-indigenous. The Bolivian data, on the other hand, reveal that two thirds of the children who do not attend school on a random day are girls. Since actual attendance in school matters more than formal enrollment, we believe this issue needs further study to be certain in judgments about the state of schooling in these and other countries.

In terms of the larger school experiences of boys versus girls—experiences that play powerful roles in influencing how girls view their roles in society and their professional opportunities—all three studies found classroom influences that holds girls back and limits their vision of opportunities. The study from Peru includes an analysis of the images presented in the textbooks used by children. Some of the books showed more male figures involved in school and labor activities and female figures involved in leisure activities, and many times women appear doing activities considered as stereotyped. Regarding the number of male and female characters that appear in the textbooks, the researchers found that there are more men than women in the figures, portraying a more masculine world. Regarding the attitudes expressed by men and women in the textbooks' pictures, some of them show more men with aggressive attitudes and more women expressing pleasant or sad attitudes. In others, however, men and women are expressing neutral attitudes.

Just as important as these formal educational influences promoting traditional roles for girls, in all three countries families also promote those traditional roles and implicitly (sometimes explicitly) discourage girls from going into professions traditionally reserved for boys. The papers in this book show that all families, urban or rural, poor or not, invest less on average in their teenage girls' education compared to the boys'. While this differential investment worsens with poverty, the study from Guatemala shows that even the wealthiest families invest close to 10% more in boys' than in girls' education and boys are more likely to attend private schools. This coincides with the findings of the Peruvian paper revealing that parents in general have higher expectations for boys than for girls, in the sense that they are more prepared—at least hypothetically—to send a boy to college than a girl. This reveals the persistence of gender stereotypes that should be a concern to policy makers as they implicitly help define the roles of boys and girls in society—especially in limiting the role of girls.

Although little formal evidence of gender disparities remains in primary and secondary education in Latin American countries, pockets of such disparity inevitably remain especially in poor rural areas. In the Guatemalan smallest rural schools boys attend more to school than girls. Experiences from a variety of countries suggest that the problems of pockets of gender disparity (including those revealed by differences between enrollment and attendance), the continuing discrepancy between urban and rural education, perhaps important parts of the overage problem, and even the cultural problem of family and community expectations of boys versus girls may all be mitigated by a single reform.

The background for this reform should begin with the observation that traditional, rural life in many developing countries is communal, connected life. School experiments in many countries show that strong parental involvement and “ownership” of schools can therefore play a powerful role in promoting commitment to education for girls and for all children, when schools are “connected” to communities. When they are not, as unhappily many are not, many children stay home, especially girls. Government schools in many countries, including developed countries, are often less than friendly to parents.

Governments cannot make strong parental involvement in schools happen by fiat. It must happen organically, from the grass roots; governments can encourage it by creating spaces for it in the schools and by providing leadership encouraging schools to recruit parents and communities as partners in making schools work. Empowerment of families and communities has been shown in different societies to play an important role in promoting profound cultural change in schools and communities. In Upper Egypt, around the city of Asyut, the “epicenter” of Islamic terrorism in Egypt, many fathers would not let their girls out of their homes before the launching of the community-based UNICEF girls’ community schools. The schools have opened fathers’ sense of possibility for their girls so much that many of them will today let them to go Cairo to college¹.

By opening spaces for real self-governance, in which parents and especially fathers gain real authority and a sense of “ownership”, working with teachers, traditional people move away from the traditional, habitual spaces that keep women and girls down. They become “conscious” and can gain a sense of responsibility for educating girls even in one village meeting when the girls stand, speak to them and appeal to them to be heard.²

Government school reform, promoting strong community ownership, can have consequences far beyond reform of individual schools. The conscious, active commitment to help girls can also be used to solve other economic and social problems, thus helping correct the differences in living standards between urban/rural and indigenous/non indigenous populations and the remaining gender biases that contribute to the existing inequities in Latin American societies.

These factors need seriously to be addressed in the public agenda, supported by serious commitment to research and experimentation. The possibilities are very great. Only by

¹ Interview with Malak Zaalouk, founder and director of the UNICEF project, January 2001.

² Interview with Anjula Tyagi, director of project in Uttaranchal, conducted by SBMA for EGG. See also evaluation on the project done for the International Center for Research on Women, New Delhi, 2005.

addressing issues such as these will it be possible to reach the MDG of universal primary education and women's empowerment.

The Project on Girls' Education in Latin America

The Project on Girls' Education in Latin America was financed by the IABD through the specialized institution Educate Girls Globally (EGG). EGG hired research teams to carry out six studies in the following countries: Argentina, Bolivia, Guatemala and Peru.³ The project was designed to understand better the qualitative differences in the education of boys and girls, with special attention to the role of ethnicity, and how those differences contribute to labor-market biases in the Region. In order to do this, two main studies were conducted: i) an analysis of rural girls' primary education and ii) an analysis of urban female employment and its links with secondary education.

The first study focused in the primary education in the rural areas, as secondary education is still very limited in rural areas of the Region. It was executed in Bolivia, Peru and Guatemala and it is the matter of this volume.

The second study focuses in secondary education in urban areas and its links with female employment and earnings. It was carried out in Bolivia, Peru and Argentina and its results are included in a separate volume.

Contents of the Final Report

The final report of the Project on Girls' Education in Latin America has two parts. The first part contains an introductory chapter and the final versions of the studies on Rural Girls' Education carried out in Bolivia, Peru and Guatemala. The second part contains an introductory chapter and the final versions of the studies on Urban Female Employment conducted in Bolivia, Peru and Argentina.

This volume corresponds to the first part of the report. Its contents are:

- I. Introduction
- II. Rural Girl's Primary Education in Bolivia
- III. Rural Girl's Primary Education in Peru
- IV. Rural Girl's Primary Education in Guatemala

Apart from the introduction, each chapter corresponds to the final draft report submitted by each research team to EGG, revised and edited by EGG. Each chapter has a brief introduction that serves as a framework for the studies performed by the research teams, the main results and conclusions and policy recommendations.

³ The respective research teams were from CEDLAS, Universidad Católica de Bolivia, CIEN and GRADE.

I. Introduction

This introductory chapter has three parts. In the first one we present a state of the art in girls' education that motivates the analysis. In the second one we explain briefly the methodology followed in the research. The last part includes a summary of the results found by the studies that constitute this volume.

I.1 Background

At the 1990 World Summit for children world leaders committed that boys and girls should have access to quality education and that disparities in rates of enrollment would vanish. The Heads of State and Government at the Second Summit of the Americas in Santiago, Chile in 1998 committed, by signing of the Plan of Action, to ensure access to and improve the quality of education and to eliminate "all forms of discrimination against women". In the Millennium Declaration of September 2000, Member States of the United Nations committed to achieve by 2015 universal education and gender equality through empowering women. (UNICEF, 2003)

It is very well documented that the social returns to educating women are high and that there is a positive relationship between female schooling and a country's social and economic development indicators. The returns of educating women are measurable not only in terms of higher female earnings and labor force participation, but also in terms of reduction in total and adolescent fertility, child mortality rates and STDs and HIV/AIDS, improvements in family health and nutrition, superior educational performance of future generations and increases in overall earning potential and household incomes (Schultz, 1995b; UNICEF, 2003). More subtle empirical results have pointed out that more educated women are less prone to domestic violence against their children, and are more likely to live with a spouse that does not abuse them.

Even in countries that exhibit near universal enrollment at the primary level and good levels of participation at the secondary level like Peru and Argentina, differences in gender and socio-economic status greatly influence overall educational achievement. Youth in lower income quartiles show greater dropout and repetition rates and lower completion rates with the most pronounced differences for indigenous girls and those living in rural areas.

Schooling of the children, seen as a family outcome, has been shown to depend mostly on the education of the mother (King and Lillard, 1983; Rosenzweig and Evenson, 1977), but it may well depend also on local school facilities, public policies, parental assets and wage opportunities (Schultz, 1988; King and Lillard, 1987). As shown in Lavy (1992), Tansel (1993) and Deolalikar (1993), the household income elasticity of the school enrollment rate is higher for daughters than for sons, and distance from residence to school is a greater deterrent to enrollment for girls than for boys. As seen in other countries and regions (like northwest Pakistan, Baluchistan, Upper Egypt), even in the most traditional, Islamic communities, when parents and communities participate in schools, girls' attendance increases up to 90% and higher. (UNICEF, 2003)

The figures of enrollment show that many advances have been made and overall educational coverage is high in Latin America. On average school enrollment rates of children between 6 and 12 years of age in Latin America are close to 95%. However, for poorer families the levels are still low, particularly in some countries, as observed in Graph 1. These figures are lower when looking only at rural regions of the countries, where most of the indigenous populations are located.

The lack of schools, the lack of pertinence of the curricula, and many times the lack of bilingual professors are barriers that prevent children from attending to the schools and parents from sending them, as shown in the papers in this book. Other “barriers” to girls’ schooling that have been identified in the literature on girls’ education are: absence of female teachers, lack of toilets and opportunity costs (child labor is needed at home). This study tried to identify what types of barriers prevent schooling in Latin America, specifically for rural and indigenous girls. In Guatemala’s case it was found that in fact general cleanliness of the bathrooms at the schools is correlated with girls’ attendance, in particular first graders’. It was also identified that many times indigenous children do not like to go to school simply because they do not understand the language in which they are taught (Spanish).

The figures of schooling for adult populations still show differences by gender, as seen in Figure 2. Adult women have on average half year of schooling less than men, but this difference is higher in countries with higher indigenous populations, like Peru, Bolivia Mexico and Guatemala (in these countries the average difference is 1.5 years). This trend has been recently reversing, up to the point that in many cases girls’ enrollment rates are higher than boys’, particularly in urban areas. In fact, for the average population between 10 and 20 years old the mean schooling of girls is 0.3 years higher than for boys.⁴

However, variations between and within each country could be masking existing differences in educational achievement between boys and girls, between rural and urban populations and between indigenous and non-indigenous populations. The papers in this book show that there are still many challenges for assuring gender equity and geographic and cultural inclusion in the Region’s educational systems. In order to face these challenges, governments and policy makers need to adopt mechanisms that will retain girls in school, improve education quality, guarantee gender equity and increase post-educational opportunities for women.

The studies in this volume include a description of school attendance, retention, performance and parental involvement by gender and ethnicity at the school level in rural areas of Bolivia, Peru and Guatemala. At the household level the researchers have analyzed the reasons for gender discrimination in school attendance, household chores, child labor, and parental perspectives about the education of girls and boys, and by ethnic origin in rural areas. In each country, the research teams have analyzed quantitative and qualitative data in order to derive specific and practical policy recommendations that can

⁴ Average figures in this paragraph correspond to the countries of Figure 2, for years between 1998 and 2001. Source: CEDLAS data in De Ferranti et al. World Bank (2003).

help in the reduction of inequality in education and increase educational opportunities for girls in rural areas, especially for indigenous girls.

The papers in this book did not find evidence of quantitative differences in the education that is given to boys versus girls in their countries. However, a more subtle analysis of textbooks figures (see Benavides and Nopo) indicates that textbooks still show to children a world where there are more men than women. It is expected that these differences contribute to the persistence of biases observed in the labor-market.

Another aspect analyzed in Benavides and Nopo's paper was the issue of the expectations that parents have on their children's future. They find evidence that these expectations differ between boys and girls. This problem of gender based expectations calls for interventions that are definitely harder to define, that most likely are linked to cultural inheritances, but also should be taken into account.

In addition to the general objectives of the project, this study tried to shed light on two specific issues. The first one is related to a variable called "actual school attendance", which differs from the usual school attendance and enrollment in that it measured at each school the number of girls and boys that actually went on a specific day. Enrollment figures not necessarily reflect how many children actually attend school. The issue of attendance as opposed to enrollment is extremely important to know the reality at any school.

The second issue specifically addressed was parental participation in the schools and in the educational process as a whole. Both at the school level and at the household level, the degree of parental involvement with their children's education was measured. This issue is very important for EGG, since it has been proved that in regions where the parents "own" the schools and are more involved in the entire education process, children's outcomes are much better, not only in terms of standardized test scores, but also in terms of attendance, retention and promotion. This is particularly true for girls. Examples of this can be found in the UNICEF Girls' Community School Program in Upper Egypt, in the "Escuelas Nuevas" in Colombia, Guyana, the Philippines and other countries⁵ and in other experiences around the globe. Experience shows that when parental participation is weak, its effects can be weak; but when it is strong it can result in very high rates of enrollment and girls' attendance, regardless of income.

⁵ The "Escuela Nueva" is a rural school program based on developing active and participative learning,, allowing each student to advance at his/her own pace, ensuring that the teacher operates as a facilitator and not as an information transmitter, promoting leadership and cooperation between the administrative body and the teachers and the school, and involving the community and parents in the schooling process. Evaluations of the program have shown that drop out rates are reduced and learning has improved, at the same time that community organization and participation are being positively affected.

Figure 1.

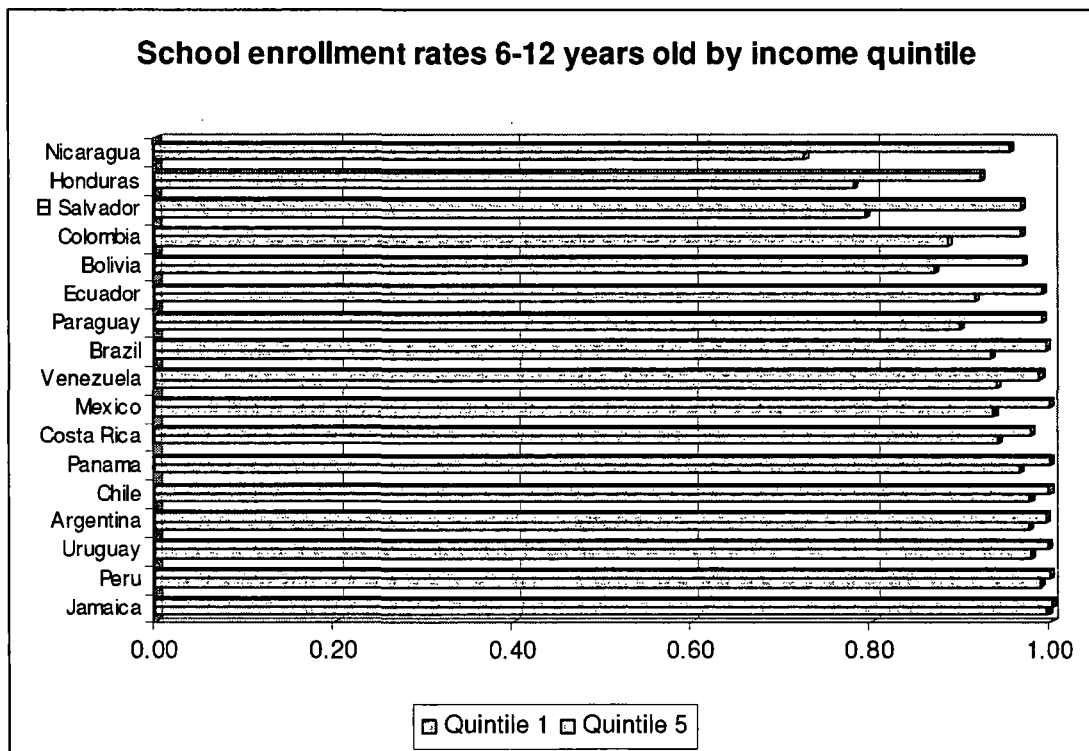
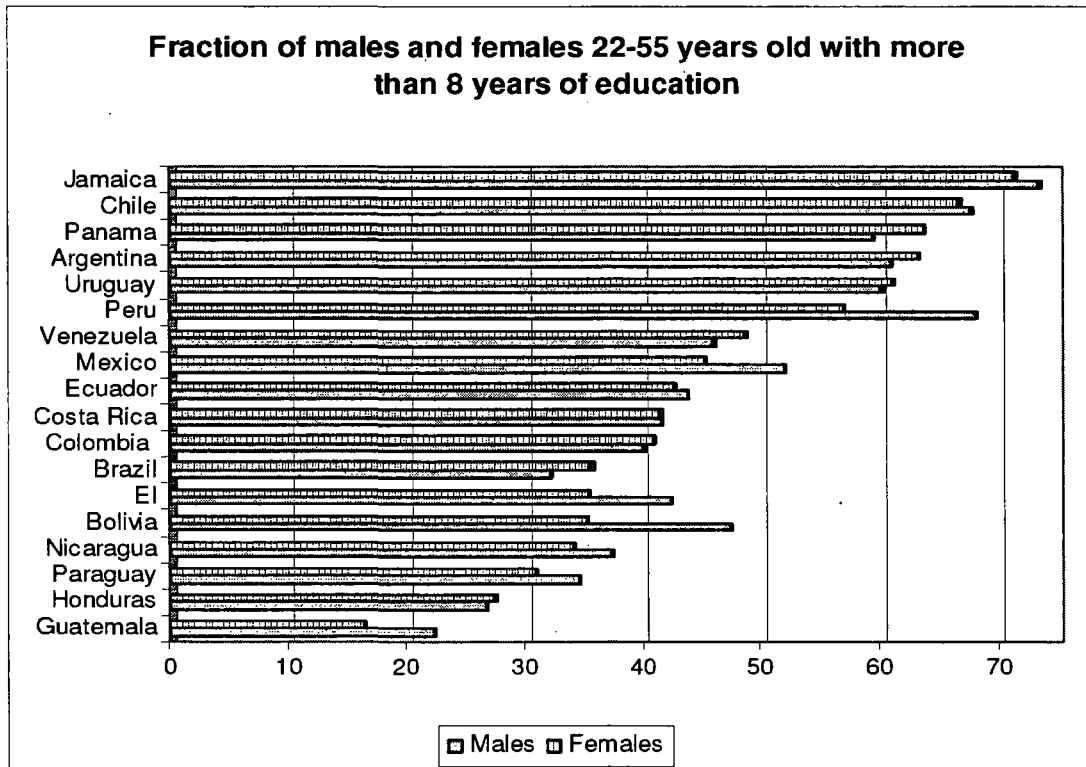


Figure 2.



Source: CEDLAS- De Ferranti et al. World Bank (2003). All figures correspond to years 1998 - 2001

I.2 Methodology

To study girls' rural primary education the research teams used official data when available. In Guatemala the main source of data was the Census. It provides, by gender and by ethnic origin, official statistics of enrollment and grade by age, constituting a very rich set of data for this study. In addition, other surveys were also used, such as the Encuesta Nacional de Condiciones de Vida [ENCOVI] and official statistics from the Ministry of Education [MOE]. In Bolivia the information from the Census also proved useful, and in Peru, the researchers used the Encuesta Nacional de Hogares [ENAHOG] and the School Censuses to develop descriptive statistics of the educational system.⁶

In the three countries additional surveys were designed and applied under the context of this study. A household survey investigated the demographics and socioeconomics of households with school age children (7-15 years old). Apart from collecting relevant socio-demographic characteristics of the household, the main purpose of this survey was to reveal educational patterns, whether the children attend school or not, what is their level of education achievement given the age, what other duties they have to perform in the household (farm) apart from studying, how much time they devote to these activities, and others.⁷ The surveys tried to go deeper into the reasons for not attending school, not being enrolled, or dropping out of the system, particularly for girls. They directly inquired about the issue of parental involvement in the schools⁸ and included questions about general parental attitudes and expectations towards education of boys and girls.

In addition to the household survey, a school survey was applied in the three countries. Its purpose was to examine in each school the actual (daily) attendance (when the interviewers went to schools to apply the survey to the principal, they collected information from school records of the number of girls and boys that attended school at specific dates), retention (how many of the children enrolled in one grade graduate and move on to the following grade), performance by gender and by ethnic origin in two key subjects in specific grades, degree of parental participation in schools, availability of free meals and size of classes, attitudes toward girls from principals and teachers and school costs.

In Guatemala and Peru the sample of analysis for the household surveys was based on selecting a random sample of schools and going to the households of randomly selected

⁶ In these two countries, since the rural population is basically indigenous, the data were not manipulated by ethnicity but only by area.

⁷ A specific request from EGG was to inquire not only about children living in the households, but also about sons or daughters from the couple that no longer lived in the household, in order to take into account the possible selectivity bias that can occur when looking only at children who are currently living in the household (Holmes (2003)). It was found, however, that the fraction of the children 6-11 that do not reside in their households was negligible.

⁸ Are the parents involved in the schools in any way? How are they involved? Do they attend school meetings? How often do they go to the schools to meet with teachers or with the principal? What functions do parents have in the school? Do they have any formal authority to participate in the school's activities or manage any part of its affairs? Does the school encourage parents to be involved in any way? Etc.

children from the schools and a neighboring household. The sample of analysis for the household survey in Bolivia was based on the maps used by the National Institute of Statistics for the MECOVI household survey for La Paz and El Alto. The samples are not representative at the national level but they were concentrated in specific locations selected by the research teams according to special considerations. In the case of Peru, for instance, the sample of states for the survey was selected after a detailed analysis of which states exhibit the worst educational outcomes for girls (in access to schools and performance).

In the school surveys the actual (daily) attendance of girls and boys at different grades was collected in order to find out not only how many children are enrolled, but how much of the actual education gets to them through school attendance. These data were collected during various days of different months prior to the school visit, as not to bias the answers using only a single day observation.

The surveys designed by the research teams were carried out by specific firms hired separately by IADB. Each country team designed its own survey to cover their own information needs; therefore, although all the studies are oriented in the same direction, the surveys are different by countries. The questionnaires of the surveys that were applied as well as the details of the sample design are not included.⁹

⁹ This information has been submitted separately by the firms in charge of the surveys to IADB. It is available upon request.

I.3 Main Results

This section summarizes the main results found by the research teams in each study. It is based on the final reports included in parts II, III and IV of this report. It is structured by topics in the following order. Section 1 describes the main results of the studies in terms of educational outcomes. Enrollment, attendance and overage rates are compared in the three countries. Models that determine some of these outcomes are discussed in section 2. The third section describes the findings regarding schooling costs, a factor to which non enrollment or non attendance are many times attributed to. The fourth section summarizes the results of the studies about school performance. The 5th section describes the results of the textbooks analysis that was made in Peru. The issue of parental participation in schools is outlined in Section 6. Section 7 deals with parental expectations and gender equity. The final section includes a description of the geographical considerations that were accounted for in the studies.

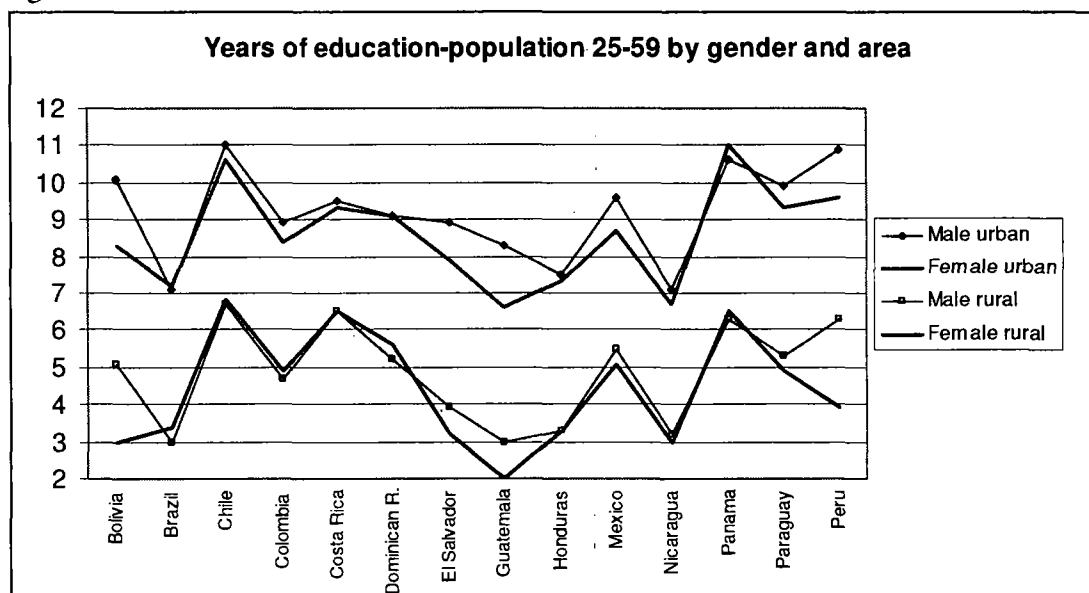
I.3.1 An overview of educational outcomes: enrollment, attendance and overage

The issue of rural primary education in Bolivia, Peru and Guatemala is highly correlated with the dichotomy between urban and rural areas, by far the most important structural feature of developing economies. The gap in earnings between the two areas has been increasing, making migration to urban settings very attractive for rural people. The investment in education yields higher returns in urban areas than in rural areas, and this is reflected in the fact that the average schooling in urban areas exceeds by more than four years that of rural areas (see Figure 3). This is an indicator that the demand for labor in rural areas is mainly oriented toward low skilled workers, that will mainly be devoted to agricultural or cattle raising activities. However, the proportion of rural population devoted to these two activities seems to be decreasing, at the same time that average levels of schooling increase gradually in rural areas.

Average education levels for children in rural regions of Bolivia are low (close to 3 years for children aged 6-13), reflecting the scarcity of schools, mainly secondary, in the rural settings. However, average education levels for children in rural regions do not show disparities by gender. The gender gap in education that previously existed, and that was reflected by the different levels in schooling and literacy of adults by gender, has been gradually closing. In fact current average school achievement by age does not show significant differences between boys and girls younger than 15. Not only has the gap closed, but in the upper secondary level there are now more girls than boys (in Guatemala). The gap in average education between rural and urban regions, and consequently between indigenous and non indigenous populations, on the contrary, has not decreased but it tends to grow.

The data show that close to 90% of rural children in Bolivia and Guatemala are actually enrolled (the figure is 92% in Peru). In Bolivia and Peru there are no significant differences in enrollment by gender, but in Guatemala enrollment for boys is 3 percentage points higher than for girls. Since enrollment depends on the offer of schools in the region, it is lower in rural areas (and for indigenous children) than in urban areas (and for non indigenous children).

Figure 3.



Source: CEPAL- Panorama Social de AL 2002-2003. All figures correspond to years 1999 – 2002.

The proportion of children 6-11 that attend to the proper level and grade for their age is only close to 42% in rural Peru. While these indicators did not show either significant difference by gender in Peru and Bolivia, there are marked differences between urban and rural areas: in urban areas of Peru the proportion of children 6-11 that attend to the proper level and grade for their age was around 54% and in rural areas is less than 30%.

Of the three countries the only one where disparities in attendance persist is Guatemala. At all ages boys attend¹⁰ more to school than girls and the gap is larger among the indigenous population than the non indigenous. Comparing by ethnicity, indigenous children attend less to school than non indigenous. However, among the non indigenous population, attendance rates are higher for girls than for boys.

The largest differences between urban and rural regions are found for the over-age rate. This is defined as the proportion of children enrolled in a given grade who are older than the age considered appropriate for that grade. While 47% of children in rural areas of Peru are over-aged, in urban areas only 25% are older than the age considered appropriate for their grade. This coincides with the fact that approval rates¹¹ are higher in urban areas, and drop-out rates¹² are higher in rural areas. The gender differences appear in rural settings, with boys having higher over-age rates than girls.

¹⁰ Gross attendance of all children school aged to any school level.

¹¹ Proportion of children in given grade that passes the grade.

¹² Proportion of children in given grade that drop out of school without finishing the grade.

Apart from the children that are not enrolled in rural settings of these countries because are too young to go to school in their parents' opinion, the second major reason for non-enrollment is schooling costs, and this reason is given more commonly for girls than for boys (the issue of costs will be explored later on). The third reason in Bolivia is work, and this reason is twice as frequently cited for girls than for boys. In Guatemala, after costs, the second major reason is that the students do not like or do not want to go to school and the third reason for absenteeism is parental reluctance, which is also more frequently cited for girls than for boys. For girls it is more common that she has to do household chores that impede her to go to school, and in the case of boys it is more common that he has to work.

In Guatemala the survey revealed larger actual (daily) attendance of boys only in the small rural schools. In the other types of schools boys' and girls' actual attendance is similar and in several cases girls' is higher than boys'. At the descriptive level this variable appeared to be related to school characteristics (such as playground, bathrooms or latrines in acceptable condition, general cleanliness of the school), but when these characteristics were used as explanatory variables in a model to explain attendance, they lost significance. The variables that explain attendance are mainly related to parental education, household wealth and parental participation (this will be explored ahead).

I.3.2 Models to explain educational outcomes

The papers in this volume include an estimation of the determinants of attendance for children in the age range 7-12. A number of child characteristics, household socio-demographic characteristics, schools characteristics and geographical context variables were taken into account for these estimations.

In general younger children attend more frequently, a result that has already been documented in rural areas of Latin America (for example in Alcázar et al (2002)). Gender was not a significant variable in the determination of attendance or attendance to the proper grade (given the age) in Peru, but in Guatemala girls have a 8% lower chance to attend school than boys. This confirms the trend observed in girl's attendance at the descriptive level in that country.

While mothers' education explains significantly the children attendance to the proper grade (given the age) in Peru (this is the expected sign of this variable), in Guatemala mother's education was not significant but father's education had a higher impact on children attendance to schools.

In general better characteristics of the schools tend to be positively correlated with attendance: existence of playground, school vehicle accessibility, and general cleanliness had all positive and significant coefficients in the model of attendance estimated in Guatemala. The same happens with better economic conditions in the children's homes such as access to electricity, which explains positively attendance, attendance on the proper age and approval rates in Peru.

The paper from Guatemala includes an estimation of the joint decision of children between school and work, defining work in a broad sense that includes non remunerated work for children. The analysis was performed for three ranges of children age. They found that children 7-12 in female headed households are less likely to be attending school and more likely to be working than children in male headed households. Regarding gender, boys are more likely to attend to school and not work, whereas girls are more likely to work and not attend. These effects tend to be more pronounced for older children.

I.3.3 School costs

School costs are one of the most cited reasons for children not to attend school. These costs can be of two types: direct or indirect. Direct costs include school fees (if any, in all three countries public schools are suppose to be free), costs of uniforms, books and other materials, transportation, meals or other costs directly related to the fact of going to school. Indirect costs include the opportunity costs of having the children go to school and therefore losing their help at home or in the farm. These latter costs can be more important than the former ones, particularly in rural contexts, and can be perceived differently for boys or girls, depending on the type of help that is needed from each of them.¹³

A hint of possible gender inequality was found in the study from Bolivia. When parents were questioned about why their children were not enrolled in school, schooling costs was more commonly responded for girls in 35% of cases and for boys in 24% of cases. Is education actually more costly for girls than for boys? Is parents' willingness to pay for girls' education lower? Do girls have a higher opportunity cost considering their role in chores at home? This issue is most likely correlated with the different expectations that parents have for their children conditional on their gender, as analyzed in depth in Benavides and Nopo's paper.

In fact, the Guatemala's paper shows that for children 13-18 years old all families, urban or rural, poor or not, invest less on average in their girls' education compared to the boys'. The difference was higher among the poorest families, but even the wealthier families invest almost 11% less in girls' than in boys' education. Likewise, fewer girls than boys are enrolled in private primary or secondary schools.

I.3.4 School performance

The papers tried to assess school performance of children in their countries by using existing data sources and by looking at the grades given to children in their schools by the teachers. In Peru girls achieve on average better results on the standardized Language and Communication test, while boys achieve better results on the standardized Math test, independently of the schools being public or private.

¹³ Having to work in the household chores not only reduces study time, but also leisure time, for both boys and girls. In Guatemala it was found that girls with domestic responsibilities have less available time for playing or for watching TV or listening music.

In Guatemala, regarding gender, no differences by gender were found in teacher given grades, either in mathematics or Spanish languages, for any of the explored grades. However, indigenous students do receive lower grades by their teachers than their non indigenous peers, independent of the school size, the linguistic region and sector¹⁴.

By looking at the results of standardized tests in language and mathematics taken by PRONERE in 2000, it is found that girls in rural schools have a performance significantly lower than boys in both tests, especially in mathematics. With the exception of reading in urban settings, girls consistently receive lower scores than boys.

Spanish speaking students' reading scores were about one full standard deviation higher than the Mayan speaking students' scores. As for mathematics, Spanish speaking students significantly outperformed Mayan speaking students, although the differences were less dramatic than for reading.

I.3.5 Textbooks analysis

In order to further analyze whether the observed gender differences in performance and access are related to hidden cultural messages that define gender roles, the research team from Peru has performed an analysis of school materials. They have coded the images included as examples in the textbooks for grades 4 and 6 in Language and Communication and Social-Personnel in three areas: demography (number of males and females in image), attitudes (body language of men and women or boys and girls in image), and segregation (activities being performed by men and women or boys and girls in image).

Although in terms of attitudes and segregation they do not find consistent differences between males and females in the pictures, in terms of demography they document a strong gender bias (77% of the images show more men than women, 13% show more women than men, and only 10% show the same number of both). According to the authors, this bias tends to increase with grade.

I.3.6 Parental participation in schools

The surveys designed in this study tried to measure whether the schools offer opportunities for parents to be able to participate, and, assuming this is the case, how parents participate in the children schooling. Three approaches were considered. The first one is supporting the school, either economically or by providing their labor force. The second one is getting involved in the school management. The third one is actively supporting their children learning, either at the household or at the school. (MEDIR, 1999)

While on one hand active support for learning can be considered as an indicator of parents' recognition of the importance of the education (reinforcing the demand for

¹⁴ Private or public.

education), on the other hand, parents' material, economical, managerial and in-kind support reinforces the capacity of the local school to continue offering education.

In Guatemala, material and economic support to the school is the most common form of parental participation in the schools. In general the capability of parents to intervene in managing the schools seems quite low, as revealed by the parents' ignorance of the PA responsibilities.

Regarding help with school responsibilities, close to two thirds of children in school receive some type of help, with no difference by gender. The mother is the most frequent supporter (59%), followed by the father (32%) and by older siblings (8%). Help is more common in urban areas and for students in private schools and is less common in the linguistic indigenous regions. The key variable related to giving support is parental education, especially mothers': when mothers have an educational attainment beyond the primary level almost all students receive help with their school chores.

Parental support for learning and material support to schools were not related with children performance, but they had a positive incidence on attendance.

I.3.7 Parental expectations

The chapter from Peru analyzes parental expectations by addressing the parents with a hypothetical situation, where they have to establish, assuming they had the means to do that, whether they would prefer to send to college a boy or a girl. The evidence shows that all parents are gender stereotyped (in the case they have to decide to send someone to higher education the majority of them would send a boy) and this pattern is clearer for the less educated parents.

It is not possible to know how those parental perceptions and culture around gender could affect girls, whether children will contest, ignore or reproduce those perceptions. What is clear from the analysis is that girls and boys are not educated in values of equality. This dimension of the gender problem goes beyond attendance and performance indicators, and it presents a puzzle still unsolved.

Is it possible to change parents? According to Benavides and Nopo, given that education is an experience that generates less stereotyped perceptions, one possibility to reduce stereotypes is by increasing the adult population's education. This could be made via non formal educational programs for fathers and mothers that would eventually produce a change in perceptions, attitudes and therefore expectations towards gender equity.

I.3.8 Geographical considerations

All the studies in this book took into account regional considerations within each country. In Guatemala all linguistic regions were considered and the survey was designed in order to cover them. In Bolivia and in Peru part of the research was focused to determine the regions that exhibited worst outcomes for girls. In Bolivia the analysis was made at the municipality level and in Peru at the department level.

In Peru the researchers designed two indices to determine the states where access to schools or performance was considerably worse for girls than for boys. The analysis of such indices shows that those states with larger gaps against girls in access and performance are precisely those states where poverty is more acute (Apurímac, Ayacucho, Huancavelica and Puno). This analysis served as a first step to determine the sample of analysis for the household rural survey. The objective of this survey is to uncover, at the individual level, the cause of these observed trends.

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IISEC – UCB SP
Educate Girls Globally EGG - Inter American Development Bank

**Project: RURAL GIRLS' EDUCATION AND URBAN
FEMALE EMPLOYMENT IN BOLIVIA**

**PRIMARY SCHOOL ENROLLMENT AND ATTENDANCE
OF BOLIVIAN RURAL GIRLS**

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Girls schooling in Bolivian rural areas should be analyzed taking into account that it is supposed that the demand for education have a goal related to the children's future. Under the assumption that households have a rational strategy whenever they demand education then the question is: Education for girls, what for? There are two main choices, to continue living in rural areas or to go to the urban ones. In each case, the demand for education could be different. Perhaps education is not really needed if the choice is to continue living in the rural area, but clearly there is a demand if education is just a requirement for a future switch to the urban area. This is an important question because the average of years of education is low in Bolivia, both urban but mainly rural context. On the other hand, there is a very important well-being gap between urban and rural area, which is rising in time. So, it is almost unlikely that households would prefer the rural area.

Still, there is another important question. Given a demand for education, how is the quality of Bolivian rural educative system? There are two different types of education. If a girl has access to a better education level, she will achieve an important educative output, which is knowledge; but if she has access to a poor education level, she will achieve just a modest educative output. Despite which was her school experience, it is supposed that she will be included in the labor market, where, as a rural person, she could face limited opportunities.

Motivated by the previous perceptions, this paper is oriented to answer three questions related to rural Bolivian children education. The first one is related to enrollment, the second one is concerned with attendance and finally it is studied spatial distribution of children who face abnormal enrollment.

The first question was answered by analyzing official statistics, based on household surveys, but also performing a discriminate model in order to find potential predictors for enrollment and non-enrollment in rural context. Six different Logit models for the same number of samples were performed. It was found that gender is not a very important predictor for enrollment or non-enrollment, and also that there is no significant difference in the probability of being enrolled by gender when looking preformed models for boys and girls. Both of them, boys and girls, face a common significant obstacle that is assumed hinds a deep economic ruin, which affects severely to Bolivian peasant economy.

The second question was answered in the same way but it was found that the 99% of enrolled boys and girls attend primary school normally. It is a very important issue that should be considered in order to analyze attendance econometric outcomes, which are not different than other previously found related to enrollment.

The third question was answered by firstly defining as rural municipalities all of them that have less than 15 thousand habitants and next building symmetry index of enrollment by gender. Such a symmetry index was useful in order to define a typology of rural municipalities. The 85% of rural children at primary school age face a normal enrollment, around 8% of them face an abnormal female enrollment and 7% face an abnormal male enrollment. Econometric outcomes suggest that there are no specific features of municipalities that could explain the low probability of normal enrollment.

Finally, based on specific surveys to students, teachers and households in three rural municipalities of La Paz and Oruro, a detailed description of surveyed household's preferences is presented in order to show factors that usually are not considered in official surveys. This analysis is presented by socio-economic level.

The most important findings of the new surveys can be summarized in two points. First, the enrollment of the child is associated with father working, having at least primary education, living in the same house, the family living near the school that allows them to walk to it and student's mother language when is Spanish. Second, school attendance of student is mainly associated with mother and father working, having at least primary education, having a school near the house and having the student zero absenteeism.

The next section discusses some relevant features of Bolivian rural context; section three summarizes empirical evidence including some econometric models. Section four is related to the analysis of rural surveys in order to achieve a detailed analysis about rural household's decisions. Finally, section five present our main conclusive remarks.

I BOLIVIAN RURAL CONTEXT

I.1 Bolivian rural area

Bolivia is a country with under-utilized land frontier, but the number of landlessness and near landlessness is increasing as long population is growing. Clearly, this is a result of an unequal land distribution. According to Jazairi et al estimation,¹ in 1952, just before of agrarian reform of 1953, the Gini coefficient of land tenure was 0.79, but it was 0.55 in 1988; which was still high. The true problem is that most arable land that belongs to large landholders are not cultivated, while land allocated to small holders and near landless are exhausted, as a result of long time over exploited.²

Fifty years after the ambitious process of agrarian reform, which has eliminated big farms based in forced work of indigenous people and have increased arable land frontier, political pressure has managed to disfigure this process.

Apart from land concentration, two important features describe the Bolivian agricultural sector. First, there is a big difference between agriculture in highlands³ and in lowlands. Second, most of highland agriculture is performed by smallholders, it is a subsistence activity and it is internal market oriented, while in lowlands there are big landholders, whose plantations of sugar cane, cotton and other oleaginous seeds like soy been, are mainly oriented to export rather than to the internal market, but also other farmers and immigrants from highlands, called settlers, reproduces the same sort of agriculture.

Despite the big difference between these two different kinds of agriculture activities, both of them are dependent from climate whims. Just about 10% of total arable land is benefited with irrigation; most of them have precarious small irrigation systems.

¹Jazairi et al (1992).

² A new law recently approved permits to have unproductive land while owner pay taxes for it, otherwise land would be expropriate in favour of the State. But this is a very slow process that has not changed land concentration.

³ Highlands comprehend both Altiplano and Valleys.

As a consequence of climate dependency, natural calamities like droughts and floods cyclically cause great losses. For example, during 1999 the whole Bolivian agriculture was affected by two climate disasters; El niño and La niña.⁴

Apart from climate dependence, traditional small agriculture is far to be homogenous. On the contrary, several factors produce different results and economic outcomes. The Geographical location, the access to irrigated, fertile land and access to roads are important factors that make a difference between peasants' (smallholders) economic situation.

As it was mentioned before, irrigated land is very scarce, so fertile land is also limited because fertility is related to irrigation and altitude over the sea level. Clearly, the valley area has better climate conditions as a result of its geographical location, mainly with less altitude over the sea level rather than Altiplano.

Lack of physical infrastructure, like roads, irrigation and other productive facilities is another reason of traditional agriculture's low productivity levels. For example, precarious roads, frequently seasonally impassable, are a very important constraint for smallholders⁵. Poor infrastructure has negative effect on prices, diffusion of technology and improves inputs.

In 1996, Bolivia had 52 thousand kilometer of roads,⁶ most of them rubble feeder roads (74%). Total feeder roads distance was about 39 thousand kilometers,⁷ but in Bolivia exist about 12 thousand small peasant villages. So, clearly there is an isolation problem that can be seen as a deficit of roads, but also as a low quality of existent roads.

Dispersion of rural population in very small villages, distant each other and frequently linked just by precarious trails, is one of the most important causes of lack of social services. It is impossible to achieve a full attendance of public services, as education and health, because such dispersion is a formidable obstacle.

Rural education and health have low quality levels, which inhibits the rural people from taking advantage of them. There is also a lack of training and marketable skills, which is a significant constraint.

In summary, peasant's economic vulnerability and low productivity are the most important features of the whole Bolivian agriculture. Modern agriculture faced the vulnerability by borrowing resources from commercial banks, and asking to government for aid. Land Smallholders faced the vulnerability by selling animals that means reducing their savings and assets. This is the context of taking decisions under severe constraints. One of them is rural household's decision on demand for education, which could not be a sustainable decision as a logical result of extreme volatility of household's welfare.

I.2 Entitlement and risk

Bolivian rural economic activities are developed under uncertainty. Different economists have formalized this kind of economic vulnerability that affects rural productive activities.

⁴ Both El niño and La niña will cyclically affect Bolivia again.

⁵ Smallholder have permanent contact with market mainly trough the so called fairs, most of them are weekly. But peasants who cannot arrive to trade during rains season are in a disadvantaged situation, they have to sell and buy when they can do but no when it is better for them.

⁶ INE (1996).

⁷ 77% of feeder roads were rubble roads; most of them are seasonally impassable.

According to A. Sen (1981), the concept of entitlement is related to the people's ability to command food through legal means available in the society by using production possibilities and trade opportunities.

In relation to Sen, a person starves either because she does not have the ability to command enough food or because she does not use this ability to avoid starvation. The entitlement approach ignores the latter.

An endowment of a person could be transformed in a set of alternative commodity bundles either by producing or trading them. For example, a peasant's endowment is expressed by land possessions, labor skills, and a small set of other resources. Up to this endowment a peasant could: 1) produce a bundle of food; 2) sell her labor skills and earn a wage which can be transformed in a bundle of commodities which includes food; 3) to farm cash crops and sell them to buy food and other commodities. There are another choices with several mixed possibilities. Then, the exchange entitlement of each endowment is represented by a set of all such available commodity bundles in a given situation.

Thereafter, the entitlement exchange mapping (E-mapping) specifies the exchange entitlement set of alternative commodity bundles respectively for each endowment bundle. The E-mapping will depend on legal, political, economic and social characteristics of a specific society and the person's position in it.

Clearly the economic behaviour of a representative agent (average peasant household) could be complex and principally variable, according to her unstable environment. What is now important is to define that a person will starve if, and only if, she is unable to access to a commodity bundle, which will avoid a starvation process. This is possible if outcomes of her economic activities are less profitable or if her E-mapping has dropped out as a result of changes in her inter trade activities.

In turn, Dercon (2002) discuss risk factors that affect poor households in developing countries and, most important, how these poor households face and cope risk. Both approaches are useful and compatible. Our interest in this theoretical approach is that it allows us to take into account a very important aspect of rural households' decision making; most of the time peasants have to make choices that are different of their main preferences and even could be opposite to their aims. Decisions on demand for education should be analyzed under this view. In this context demand for education could be affected by the income volatility but also by some arrangements that households manage to do in order to face economic problems. It is very important to take into account that rural demand for education in this extremely hard environment certainly could not be a permanent decision; it will be as volatile as household's welfare is.

1.3 Previous studies

In Bolivia, children's education has been a goal for public policy. For example, some studies carried out by the Commission of Educative Reform (1953-1954) pointed out that the education supply couldn't only fulfil increasing enrollment rates as an isolated objective. On the contrary, education has an implication for children's human formation and it should include elements according to characteristics around the households structure, labor conditions, customs, religion and others aspects that are transmitted through generations. It is not good enough to access obligatorily to formal primary education, it is needed that education

be rooted in the real living conditions and based on the country's economic and social structure, otherwise education impact could be contrary to the foreseen purpose. Therefore, public educational policies will be compatible with the society's socio-economic needs, supplying primary education but also technical training with continuity at secondary level toward a humanistic formation or industrial one including agricultural skills, among others.

For example, the Bolivian Code of Education, which was put in place by a public act in 1955 said⁸: "... therefore, it is indispensable to find the links between educational system and its socio-economic environment." Inside that statement, the Code was a claim for an educative system democratization, including school-farms, experimental centers and scientific institutes that should be implemented in favor of farmers' technical education towards qualified peasants. In this sense, it was expected that rural school should have been playing two roles "... to educate the boy in function of the means and to cooperate in the improvement of the community", and into its objectives it should "... teach him to be a good agricultural worker exercising it in the use of renovated production systems and animal rearing... ". Unfortunately most of these purposes were just declarative; expansion of public educative system was just oriented to humanist education, neglecting other forms of education (Villa Gomez, 1954). About female education, the Bolivian Code of Education include a very clear criteria: "... the State assigns to women technical education, the importance that corresponds to women in the total structure of the educational system, and is considered to be at the same importance level compared to male teaching." Some specific goals were: "a) to prepare women, in a practical way, in order to be able to achieve an effective improvement of their economic and social situation; b) to qualify women, so that they could be incorporated in the process of industrial transformation, trade, administration and household's improvement; c) to persuade women to help the community, providing means of life and social and economic independence; d) to impart and to enlarge the hard-working woman's general culture," (Villa Gomez, 1954).

As it was mentioned before, the Bolivian rural reality is very different from the above mentioned purposes, but also from universal claims approved in several international conferences. The reality of the family as a productive unit, distant and dispersed from the communities and abandoned by the State, as well as the existence of mechanisms of social regulation and cultural patterns that rules children's socialization process and the allocation of children's responsibilities into the rural family, configures a very complex scenario that is hard to understand with scarce information.

Besides these limitations, Bolivia has achieved high enrollment rates in basic school, mainly in urban areas, but also in rural ones; perhaps with the exception of some remote rural places. Since 1994 the effort has been focused principally in rising female education enrollment rates, the Bolivian government has supported a gender program as a component of a comprehensive educative reform. In turn, this program, funded by the World Bank, has supported a couple of recent studies in two different rural areas. The first was oriented to rural municipalities of Oruro, Potosí and Chuquisaca; and the second was oriented to rural municipalities of La Paz. Both of them were ruled by the same terms of reference, which basically were oriented to identify specific determinants that reduce female enrollment in basic and secondary school.

⁸ The translation from Spanish to English is responsibility of the authors.

Economía y Sociedad srl. (2001) has also analyzed determinants of primary school for 13 rural municipalities of Oruro, Potosí and Chuquisaca.⁹ The author has combined two methodologies: an economic approach, which implied an econometric analysis, and a sociological approach based on focus T-groups and interviews. Basically, they have found an equal household's demand for education between boys and girls. On one hand, they have found that there was a common important problem, which is the very low rural education quality that affects both boys and girls. On the other hand, Economía y Sociedad srl has found that rural population faces very complex choices about their economic situation related to entitlement difficulties and risk as it was discussed before.

CIDES-UMSA (2001) has performed a socio-cultural study in rural municipalities of La Paz. Based on interviews, the authors have found that rural households' demand for education should be understood in a more general context, which involve the whole peasant economy difficulties, and rural households' intertemporal strategies. They concluded that aside the effective demand for education, rural communities have several problems of social exclusion which do not fit into a real gender bias in favor of male education, but the demand for education belongs to a strategy in order to get representation. Such strategy is also associated to another one that is clearly dominant: the migration of rural population to urban areas. Therefore, the demand for education is oriented not exactly to a gender bias against girls, but adult male and boys are the first migrants, both temporal and permanent, so households' strategy is oriented to the male education.

Distance to school was identified as a barrier for regular school attendance; some solutions were assessed, for example common or familiar hospitability for children who belong to a community where school is partial. According to Fundación Pueblo (2003), in North Potosí, distance is a relevant problem as it is a cause of schooling drop out. It is observed that the school attendance rate falls severely if boys and girls have to walk for an hour or more. Apparently North Potosí is a well-supported zone because there are 790 schools, organized in 92 "núcleos"¹⁰; but most of them are partially supplied because almost 60% of rural schools have just three basic grades, which means that boys and girls should walk to another place where a completed basic school exist¹¹. Approximately 70% of new students registered at first basic grade in North Potosí belong to an incomplete school that has just first grade or till third grade. In this case children have to walk after first or after third grade of education to another village with a complete school. The average distance between a peripheral school and a central one is 11 kilometers, which means approximately two hours walking in a one way trip from home to school and another two hours in opposite direction. According to Fundación Pueblo (2003), distance is a relevant problem both for boys and girls but mainly for the latter because it is a risk factor. Apparently there is not a gender bias in school enrollment rates, due to 54% of students are boys and 46% are girls. The ratio of the number of students per teacher is 28, which means that 15 boys and 13 girls belong to every average group of 28 students and one teacher.

CIDES (2000) did a statistical study about rural school attendance, matching male and female school enrollment rates at municipal level. As averages of school enrollment rates controlled

⁹ Supported by a specific survey, focus groups and interviews

¹⁰ A núcleo is a central school, which has at least five grades and it is relate to several peripheral schools that are incomplete.

¹¹ Indeed, children need to look for a school with all primary education grades (i.e. 8th grade)

by gender at departmental level were very similar, the hypothesis was that the municipal level hind important asymmetries in enrollment by gender. This hypothesis was rejected because every department is a set of municipalities and, every department's average of rate of enrollment by gender has a dispersion by municipalities, which has in fact two tails: first, where the male school enrollment rate is less than the female's rate; second, where the opposite is true.

In different countries some studies show a sign of enthusiasm concerning the importance of increasing women schooling rates, or discuss specific issues about households' demand for education. According to the United Nations (2004) there is no tool for development more effective than girls education. In this way it is clear that raising female school enrollment rates in basic education could be really helpful in order to achieve better living conditions.

Other relevant evidence could be found in the literature for other countries. King and Lillkard (1987), for example, studying Malaysia and Philippines, found that government policies, mainly fiscal tools (like subsidies) and legislative power (passing budget's public act), can effective raising educational outcomes by schooling cost reductions. Even though it is a very important issue, Bolivian public education is free. Additionally, some specific programs were analyzing how to pay some subsidies to households if children get enrolled into basic education¹². However, private cost of education was not estimated yet, as public cost was not calculated accurately.

Another study that discusses the importance of women schooling has been done by Behrman Jere et al (1999), and the binding hypothesis assessed was that, increases in women years of schooling enhance human capital accumulation of the next generation and thus make a unique contribution to economic growth. The authors found a positive and significant relationship between maternal literacy and children schooling in India at the moment that a green revolution were starting. On the other hand, it is clear that the intergenerational link between maternal education and human capital of the next generation should also be considered.

Furthermore, Holmes (2003) has tried to measure the determinants of school completion in Pakistan. This study finds evidence that demand for education could be affected by bias in two different ways. Censoring bias could be possible if studies do not distinguish between currently school enrolled children and those who have completed their schooling. On the other hand, studies that exclude from their samples children who have left their household may introduce sample selection bias if the decisions to leave home and to attend school are related. This is a very important insight because boys usually have to leave their households seasonally or permanently.

II EMPIRICAL EVIDENCE

This part is oriented to discuss the empirical evidence trying to answer the main sets of questions of this study. The first one is related to the clear well-being gap between urban and rural areas and on the requirements of educated workers in the Bolivian economy, mainly in rural areas. The second set of questions is related to actual school enrollment rate by gender.

¹² OIT _ The Bolivian Labour Ministry have a commission responsible for studying how to avoid the worst children's jobs by paying their parents if children were moved from this kind of risky jobs. It is a program oriented to El Alto city and some mining towns like north Potosi (Llallagua, Siglo XX. Catavi etc)

The third set evolves attendance to primary school, given that children were already enrolled. Finally, the fourth set of questions is related to the spatial distribution of children, who face an abnormal school enrollment, which is an analysis within rural municipalities. Each set of questions is empirically analyzed based on evidence from surveys and the National Bolivian Census.

II.1 Remain living in rural areas, is it a good idea?

Certainly Bolivian rural area is affected by a rising well-being gap compared with the urban area. A good example is the income gap as it could be seen in Table 1.

Table 1. Income per hour differences by geographical area, 1999 and 2002
Index: rural income per hour = 1

Average worker	1999	2002
Rural indigenous people non-salary income	1.00	1.00
Urban non indigenous people salary income	5.87	7.62
Urban indigenous worker	2.98	4.25

Source: Own elaboration based on Mecovi 1999 and Mecovi 2002.

In terms of income, Table 1 shows, without any doubt, that there is a widening gap. In fact, urban salary income per hour of non-indigenous people was 5.8 times the non-salary income per hour of indigenous workers in 1999, while in 2002 the widened gap was 7.6 times in favor of urban non-indigenous people. Another question is if Bolivian rural education is able to close this raising gap. If there is an affirmative answer, the demand for education is a rational choice, but if it is not, perhaps the answer relies on a demand for education that corresponds to a different rationality. The reason why Table 1 compares extreme situations is because there is an intention to summarize what could be the 'dream' for a representative rural person (average rural person): to be a successful migrant, while leaving a rural non waged job and finding another urban waged job, having also achieved a "non-indigenous" status¹³, which is obviously unlikely but it could be also an attractiveness factor. In other words, perhaps such a raising gap shows what is the dominant strategy for rural people to jump to the cities. In fact, an indigenous worker who has an urban job, earns an income per hour which is 2.98 times the income per hour of an indigenous in rural area in 1999, while this difference has raised in 2002 until 4.25 times.

Another relevant question is, given that an average rural household has a revealed demand for education, how many years of education are needed for future employment? In order to answer this question we have measured the average of years of people's education related to different economic activities. If economic activities have requirements in terms of educated workers, it is supposed that rural households have noticed it and, their demand for education is adequate to the economic activities' profiles. It is also possible that households have built expectations about future requirements for educated labor force, and perhaps such expectations are formed by observing the requirements of educated workers along time.

¹³ Indigenous is defined by mother's language.

Table 2 shows the average years of employees' education by geographical area in 1992 and 2001. Education rural requirements are very low both in 1992 and 2001, while urban requirements are also modest, as it is the whole country's average. Certainly, the Bolivian production function is not intensive in high educated labor, mainly in the rural area, which is a relevant outcome in order to have an idea about the average rural household's demand for education.

Table 2. Average of employee's education by area (years of education)

	1992	2001	Variation
Urban	7.8	9.3	1.6
Rural	3.4	4.7	1.3
Total	5.6	7.6	2.0

Source: National census of 1992 and 2001

Under the assumption that people's expectations are adjusted by looking the evidence, we could imagine that rural people have noticed the slow variation in the average requirements for educated workers between 1992 and 2001, and perhaps they are expecting the same variation for the next 9 years, it is by 2010. If so, urban requirements could be expected to be around 11 years of schooling, whereas the expected future rural requirements would be just up to 6 years of schooling.

Staying in the rural context means that, with high probability, future employment would be principally within agricultural activities. In fact, 72% of rural employment belongs to agriculture and cattle raising. However, it is the same with occupational group related directly with this activity, which certainly is the most important occupation in rural areas. 75% of rural employment belongs to agricultural workers.

Table 3 shows a diminishing percentage of employees in time within the agricultural sector and the directly related occupational group.¹⁴ Also it is shown an almost constant average years of schooling, which means that the most important rural economic activity's requirements of educated workers have not increased.

Table 3. Employment and average of education in agriculture and related occupational group; Percentages of the total

	1992		2001	
	Emp	Edu	Emp	Edu
Agriculture and Cattle raising	83	3.0	72	4.0
Workers of agriculture and cattle raising unqualified	85	3.9	75	4.0

Source: National census of 1992 and 2002.

Emp = Employment; Edu = Average of years of education of employees

How educated are Bolivian children? By looking at Bolivian rural children at primary school age (6 to 13 years old) we see that the average of years of education is 2.8, both for girls and boys. As rural economic activities have a requirement of 4.7 years of education, our target group would need further years of education to be able to work in the rural area.

¹⁴ Occupational group is a set of workers with similar duties, in this case, workers in agriculture and cattle raising.

**Table 4. Years of education of rural children
(6 to 13 years old)**

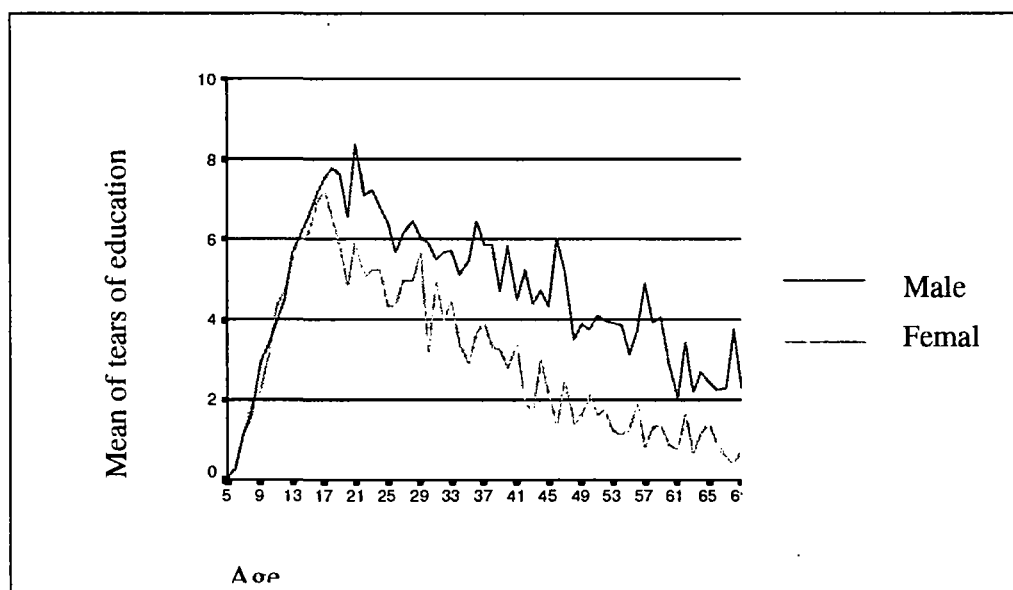
Gender	Average
Male	2.87
Female	2.80
Total	2.84

Source: Own elaboration based on Mecovi 2002.

Therefore, three more years of education would allow them to be able to work in the rural area in the future if, as it has happened, physical capital is not increased and technology is not improved. Who have achieved the maximum number of years of schooling could be considered overqualified for rural areas. Approximately 5% of rural children have more than 6 years of schooling, but most of children are still studying.

The next question is how different is education by gender? As we can see, rural young people do not show a clear difference between boys and girls in average education, as it did in the past. The education gap is higher for adults: among those over 18 years old, the average schooling for men is 5 and for women is 3.

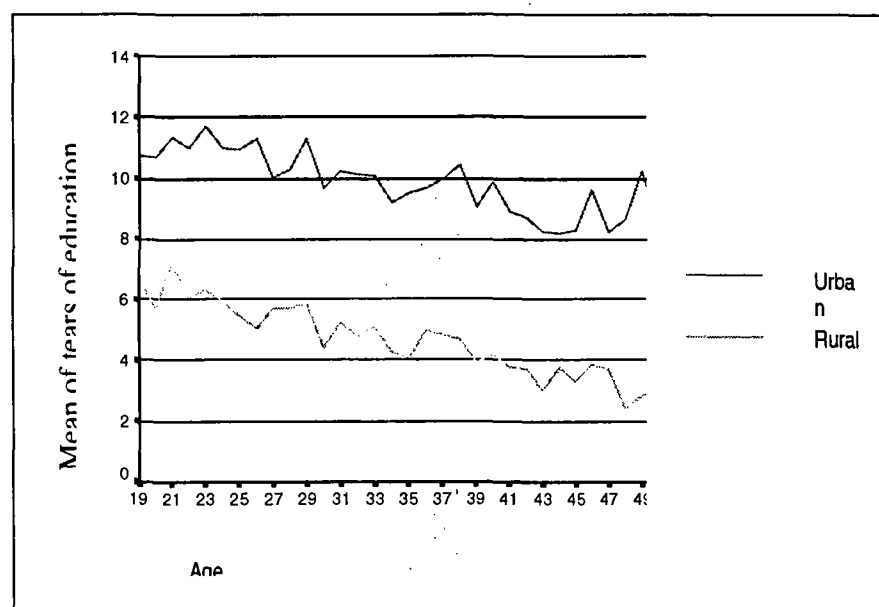
Figure 1. Average years of schooling by gender and single ages, 2002



Source: Own elaboration based on Mecovi 2002

When we compare urban with rural areas, the gap in years of schooling is higher than by gender, as seen in Figure 2.

Figure 2. Average years of schooling by area (2002) and single adult ages



Source: Own elaboration based on Mecovi 2002

The next question we analyzed is how many Bolivian children belong to our target population. According to Mecovi-2002¹⁵ data, Bolivia has 1.85 million of children, most of them living in urban areas (1.1 million) and just 0.75 million in rural villages (see Table 5). The latter group is our target population.

Table 5. Bolivian children between 6 and 13 years old, 2002
In millions

	Male	Female	Total
Urban	0.57	0.50	1.10
Rural	0.37	0.37	0.75
Total	0.94	0.88	1.85

Source: Mecovi 2002

In order to see how much did rural households spent in education, the data show that an average rural household was spending Bs. 57 in educative expenditures per month¹⁶, which represents approximately 41% of their total per capita consumption per month (Bs. 140.7). This is less than urban household's average per capita consumption, whose educative spending was Bs. 248.9. Following that, an urban household was investing approximately 75% of their per capita consumption (Bs. 336.6). It means that a rural household invests less in education per month than an urban household does, and also, investing a minor proportion of average consumption expenditures as can be seen in Table 6.

¹⁵ Bolivian National Statistics Institute, MECOVI-2002. MECOVI is a Spanish acronym of a households survey of living standards measuring.

¹⁶ Bolivianos (Bs.) is the domestic currency

Table 6. Consumption and educative expenditure monthly

	Per capita consumption expenditures	Educative expenditure
Urban	333.59	248.85
Rural	140.66	57.64
Total	253.95	169.91

Source: Own elaboration based on Mecovi 2002

II.2 Enrollment¹⁷

II.2.1 Were rural children enrolled in 2002?

Table 7 shows that about 90% of rural children at primary school age were enrolled in 2002, with no statistically significant gender difference: 91% for males and 89% for female children. This enrollment rate was lower than in urban areas, where it was 96% for boys and girls.

Table 7. Have you been enrolled this year?

	Total			Urban			Rural		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Yes	94%	93%	94%	96%	96%	96%	91%	89%	90%
Not	6%	7%	6%	4%	4%	4%	9%	11%	10%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: Own elaboration based on Mecovi 2002

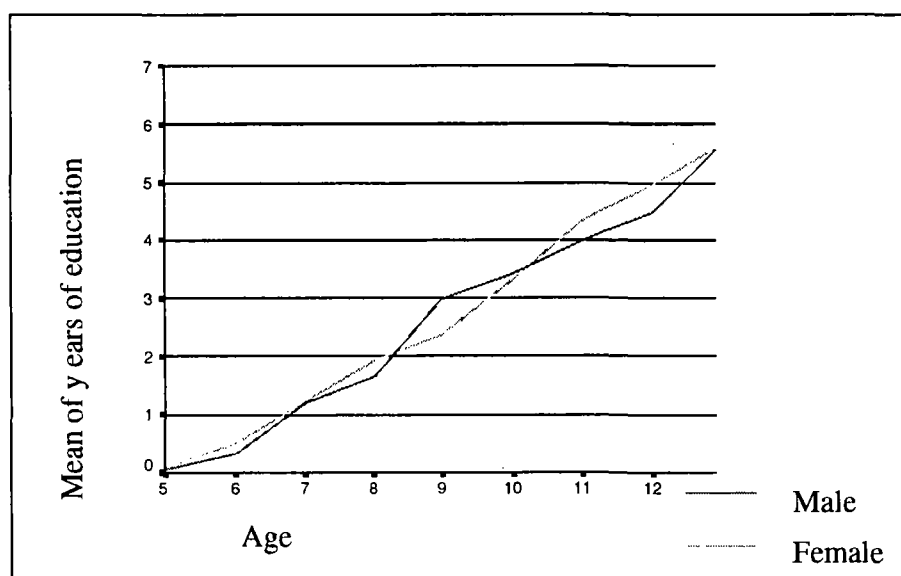
Figure 3 shows that average years of education are a raising function of age with a small gap in terms of gender. Within children up to nine years old, an average enrolled rural child achieve 3 years of education, but they need more than four additional years to achieve six years of education.

The next question was why there are rural children who are not enrolled in school. Early age¹⁸ became the first reason for existence of rural children out of school (see Table 8), which affects to 33% of children who were not enrolled with a gap by gender. In opinion of their parents, 43% of boys who were not school enrolled have less than the required school age, and by 23% of girls was in the same situation. Non enrollment can be a consequence of an irregular demand for education along time, dropping out and then going back to school, as it was found in previous studies like Evia et al. (2001) and Economía y Sociedad srl (2001). Money scarcity became the second obstacle to school enrollment rates, that is 30% of non enrolled children face this kind of constraint, again with gender gap; 35% of girls who do not were enrolled had budget problems, as it happened to 24% of boys in the same situation.

¹⁷ Enrollment was defined directly from mecovi survey. Question is Have you been enrolled this year?

¹⁸ It means that parents consider that, for specific grade, a child has not adequate age yet.

Figure 3. Years of education by age



Source: Mecovi 2002

The third main reason of non-enrollment was economic activity, which affects to 11% of non-enrolled children, one more time with a gender gap. While 14% of non-enrolled girls were working constituting an obstacle to school enrollment rates, only 7% of boys were in the same situation. Finally, distance from home to school was the fourth main reason for non enrollment. This reason was declared by 10% of non-enrolled children and it did not show any gender gap.

Table 8. Reasons for non enrollment

	Male	Female	Total
Scarcity of money	24%	35%	30%
Job	7%	14%	11%
Illness or handicapped	0%	2%	1%
Distance to school	9%	10%	10%
Do not want	6%	9%	7%
Take care of children	0%	0%	0%
Early age	43%	23%	33%
Familiar troubles	4%	2%	3%
Another	6%	4%	5%
Total	100%	100%	100%

Source: Mecovi 2002

Distance is a relevant problem as it means that many small villages do not have access to school infrastructure, or perhaps some of them have but only to the first or third grade, which means that children who want to continue studying, have to commute to other villages, which could be risky mainly for girls and bear more costs.

II.2.2 Models of school enrollment

In order to find predictors for school enrollment we have performed two types of models. First, a canonical discriminatory linear function that explores if there is a statistical distance between school enrolled and non-enrolled children, and, if so, finds some suitable predictors. Then, some logistic regressions have been performed in order to find marginal effects for each main predictor, which were previously identified. Both of them are useful when there is a binary dependent variable, as it happens in this case.

Discriminatory analysis

The canonical discriminatory linear function should be evaluated taking into account some main statistics. The canonical correlation measures the correlation between variables and an optimal linear combination of them, which means that it measures the strength of the relationship between the predictors and the two groups (enrolled and non-enrolled). If canonical correlation were lower than 60% the discriminatory model could be less useful, perhaps only helpful to identify predictors, what is exactly it was used for.

Table 9 shows some descriptive statistics of the variables included in the discriminant analysis and in the logistic regression. In turn, Table 10 shows a matrix structure and other statistics related to goodness of fit. There are 14 variables that could be potential predictors of enrollment, all of them are ordered by their correlation with the canonical discriminatory linear function.

Some variables are individual predictors: overage, total worked hours, age, dummy employed, dummy gender, member's number in household, father's years of education and mother's years of education. Other are predictors related to household: poverty by income, educative expenditures, total household's purchases, family's average of employees, household's food expenditures, household's per capita income, household's size and dummy Spanish as mother's language.

The matrix structure included in Table 10 shows all independent variables in the model ordered by correlation. The most important variable is total worked hours, and the less important is total household's purchases. Gender is a relevant variable for the study, but it is a variable in 8th place. It means that there are other seven more important predictors for school enrollment.

Table 9. Descriptive statistics for some variables

Variable	Mean	Median	S. Deviation
Overage	2.9	2.00	0.99
Total worked hours	28.44	24.00	18.66
Age	10.74	10.00	3.37
Dummy employed = 1	0.34		
Dummy gender male = 1	0.51		
Member's number in the household	4.47	4.00	1.60
Father's years of education	4.36	4.00	3.23
Mother's years of education	2.56	2.00	2.83
Poverty by income	0.89	1.00	0.31
Educative expenditures (Monthly)	53.37	31.16	84.70
Total household's purchases (Monthly)	832.07	673.31	673.36

Family's average of employees	2.46	2.46	0.00
Household's expenditure (Food – monthly)	570.02	455.39	534.09
Household's per capita income (Monthly)	179.50	123.78	193.29
Household's size	6.50	6.00	2.12
Dummy Spanish as mother's language = 1	0.49		

Source: Mecovi 2002

Table 10. Table 10.Discriminatory analysis (enrollment)

	Function
	1
Total worked hours	0.538
Age	0,535
Overage	0,499
Educative expenditures (monthly)	-0,233
Household's per capita income (monthly)	0,175
Father's years of education	-0,137
Member's number in the household	-0,134
Gender female = 1	-0,094
Household's size	-0,078
Dummy Spanish as mother's language	0.066
Mother's years of education	-0,064
Household's expenditures (food - monthly)	0.054
Total household's purchases (monthly)	-0,022
Eigen value	3.277
Canonical correlation	0,875
Wilk's lambda	0,234
Chi square	24.202,7
D. of freedom	13
Sig.	0.000
Classification	97,2

Source: Own elaboration based on Mecovi 2002

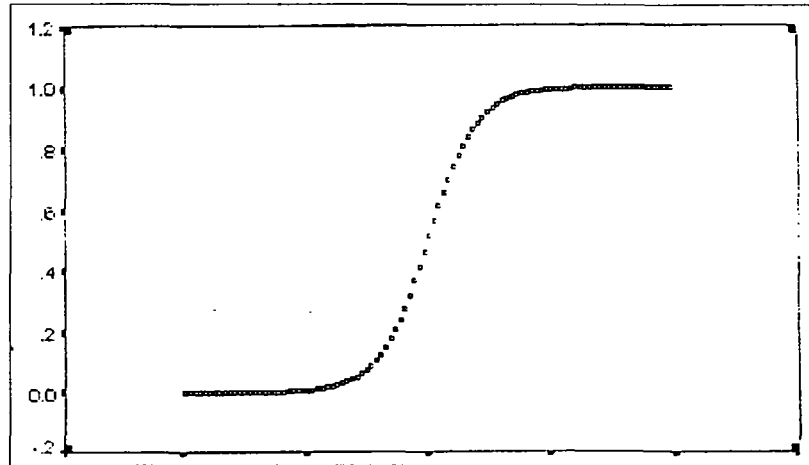
Logistic model

Once the model of discriminatory analysis has been performed and predictors for the dependent variable were identified, the Logistic model is estimated. It was not possible to include gender as a predictor for school enrollment for two different reasons. First, as the matrix structure shows, gender is the 8th important variable. Not all predictors identified through a discriminatory analysis should be included in a logistic regression, only the most important. Second, the Logistic regression was performed using a forward stepwise method, which includes in every iteration important variables, but it was not the case of gender. So, different models for males and females have been performed, both active and inactive.

Usually a Logistic regression is recommended after using a discriminatory analysis; it is useful if the relation between predictors with the dependent variable is not linear and when

errors are non normal distributed but Logistic. As Figure 4 shows, the mentioned relation is not linear.

Figure 4. Logistic model for probability of enrollment



The logistic equation is:

$$\text{Prob (not been enrolled)} = \frac{e^{\alpha \cdot \text{age} + \beta \cdot \text{education} + \delta \cdot \text{poverty}}}{1 + e^{\alpha \cdot \text{age} + \beta \cdot \text{education} + \delta \cdot \text{poverty}}}$$

The Cox's and Snell's R^2 and the Nagelkerke's R^2 are suitable R^2 s equations for Logistic regressions. Classification depends on P , the proportion of cases = 1 (enrolled) in the sample. Six different models have been performed for equal number of samples; all of them are significant according to the Chi-Square criteria. Table 11 shows that all the models are significant, which means that all predictors included in every model are different from zero. As it is well known, Chi-Square criteria is an statistic that is build with proportion of cases that are equal to 1 in the dependent variable. According to the Wald test, every predictor included in the six models is significant at 1%. Proportion of correct classification of cases (between 87 and 97%) is very high in every model, so it could be another indicator of goodness of fit.

Some variables have been identified as predictors of enrollment. The coefficient of overage shows that, once having dropped out from school, it is very hard to go back, mainly keeping in mind severe economic troubles in Bolivian rural area that were discussed previously.

As it was expected, mother's education is a good predictor of enrollment for girls, both active or inactive¹⁹, but also to be younger than other members of household is a good predictor of enrollment as well as monthly educative expenditures of household. On the contrary, overage, as it was mentioned before, and Spanish mother's language are predictors of non-enrollment for girls.

¹⁹ An active person is who participate in labor market. Inactive person is who does not participate in it.

Table 11. Logit models. Dependent variable is enrollment of young people between 6 and 18 years old, all of them have less than 8 years of schooling (enrolled = 1 and not enrolled = 0)

Predictor	Female	Male	Active female	Active Male	Inactive Female	Inactive Male
Overage	-0.782	-0.706	-0.901	-0.776	-0.720	-0.180
Wald test	46129,8	33791,9	18487,1	27245,0	15015,9	154,6
Mother's years of education	0,053	-0,100	0.164			-0.206
Wald test	252,2	985,9	760,5			349,4
Father's years of education			-0.121			0.253
Wald test			636,1			470,2
Educative expenditures (monthly)	0.017	0.017	0,036	0,013	0,007	0.052
Wald test	5065,5	7571,1	7643,0	4140,4	898,9	1685,5
Household's size		-0.072		-0,102	-0,268	0,328
Wald test		335,2		528,8	1542,5	466,9
Member's number in the household	0,276	0,129		0,241	0,699	-0,325
Wald test	1767,8	476,8		1240,9	2843,3	258,6
Household's per capita income (monthly)			-0,004		-0,002	0,005
Wald test			687,9		1634,1	148,5
Total worked hours			-0,047	-0,046		
Wald test			5441,9	8790,4		
Dummy Spanish as mother's language	-0,633	-0,543		-0,567	-1,123	-2,342
Wald test	1557,9	1219,9		1082,1	2106,1	1187,6
Poverty by income			-2,593			2,138
Wald test			1811,4			279,0
Constant	3,104	4,520	6,462	4,003	3,584	0,445
Wald test	9133,8	20676,6	6557,6	11335,8	4655,9	7,9
Chi 2	179.032,0	169.268,8	81.477,5	91.560,184	37.636,662	6.873.300
Degrees of freedom	7	7	7	6	6	9
Sig	0	0	0,000	0,000	0,000	0,000
Log likelihood	137.818,0	141.367,4	62.109,6	97.448,434	52.733,904	16.609,620
R2 Cox and Snell	0,388	0,360	0,525	0,459	0,296	0,072
R2 Nagelkerke	0,668	0,644	0,719	0,639	0,520	0,319
Classification	93,3	93,7	90,4	86,8	91,5	97,2

Source: Own elaboration based on Mecovi 2002

Table 12. Exponential coefficients, Exp(B)

Exp(B)	Female	Male	Active female	Active male	Inactive female	Inactive
Overage	0,458	0,494	0,406	0,460	0,487	0,835
Mother's years of education		0,905	1,178			0,814
Father's years of education	1,055		0,886			1,288
Educative expenditures (monthly)	1,017	1,017	1,036	1,014	1,007	1,053
Total household's purchases (monthly)	1,000					
Household's size		0,931		0,903	0,765	1,388
Member's number in household	1,318	1,138		1,272	2,011	0,722
Household's per capita income (monthly)			0,996		0,998	1,005
Total worked hours	0,950	0,944	0,954	0,955		
Dummy Spanish as mother's language = 1	0,531	0,581		0,567	0,325	0,096
Poverty by income			0,075			8,486
Constant	22,279	91,796	640,191	54,758	36,009	1,561

Source: Own elaboration based on Mecovi 2002

An interesting outcome is that two predictors for enrollment or for non-enrollment seem to have different meaning depending from economic activity of boys. Active boys have less probability of being enrolled while bigger is the household's size; but it is the opposite for inactive boys. As younger is an active boy, he has greater probability of being enrolled, but an inactive boy has less probability. Perhaps these differences are related to household's strategies in order to send all their children to school, but sometimes not all of them simultaneously.

In turn, for all boys – active or not active - there are some common predictors for the dependent variable. Overage and Spanish as mother's language are associated with a lower probability of being enrolled. Monthly educative expenditures are positively associated with the probability of being enrolled.

Active boys and girls have less probability of being enrolled as they work more hours. It is very important outcome because being active apparently is not an obstacle for being enrolled, but clearly allocating more time to work is.

In the rural area, Spanish mother's language is a negative predictor for being enrolled, both for boys and girls. In turn, households size is harmful for enrollment for active boys as it happens for inactive girls. On the contrary, household's size is positively associated with enrollment of inactive girls.

As overage was several times mentioned as an obstacle for enrollment, it is important to keep in mind that this variable could reflect the average rural household's income variability. Such uncertainty is assumed as a result of economic troubles that were discussed before. In this case, policy implications should not be related to education simply as a public service, but should be also oriented to resolve the very complex economic situation of average rural household.

In general, being younger than other members of the household is an important determinant of being enrolled; so policy implications could be oriented toward initial or pre-scholar education, which seems to be an important factor associated with better educative performance, as it will be discussed in other section. In turn, there are no important differences by gender.

II.3 Attendance²⁰: is it really a problem?

The percentage of children enrolled in school that attend primary school is close to 99% for both boys and girls. Among those that do not attend, the main cause is budget constraint, which affects 46% of boys and 35% of girls (Table 13). The second reason is familiar troubles, which affects around 21% of both, boys and girls. It is very important to mention that households' difficulties are causing drop out, but certainly it is not a households' free choice, because it could be a forced decision by a hostile environment of crisis and other troubles related with volatile income. It is more common among girls that they do not want to continue studying (this affects 13% of boys and 24% of girls).

Table 13. Why do you not attend to school?

	Male	Female	Total
Scarcity of money	46%	35%	41%
Illness or handicapped	5%	0%	2%
Has finished studies	0%	3%	2%
Do not want	13%	24%	18%
Familiar troubles	21%	21%	21%
Another reason	15%	17%	16%
Total	100%	100%	100%

Source: Mecovi 2002

A Logistic regression (see Table 14) was performed in order to find predictors of normal attendance. It was found that attendance is negatively related to overage, mother's years of education, total worked hours, being woman and Spanish as a mother's language. In contrast, school attendance probability is positively related with cost of education and being younger than other members in the household (member's number in the family according to the Mecovi).

Even though mother's education was expected as a predictor of greater probability of attendance, amazingly it is a variable negatively associated with the probability of attendance. Perhaps this is not exactly an odd outcome because it is possible that a more educated mother could have a clear preference for urban education instead of a rural one. It could explain also the signal of another predictor related to the mother, the dummy that is equal one if the mother's language is Spanish, which in rural area is negatively associated with the probability of attendance. The selected predictors allow a correct classification in 93% of cases.

²⁰ Attendance was defined as a kid who has answered to Mecovi survey that assists to school or is enjoying a vacation. First question is, Do you assist to school? Second question is, Why do you do not assist? An answer "yes" to first question and an answer ""because I am in vacation" to the second, were considered normal attendance.

Lastly it is important to notice that there are no important differences between enrollment and attendance. It is useful to remind that 99% of enrolled in primary school also attend.

Table 14. Logistic models. Dependent variable is attendance
Assist = 1 and do not assist = 0.

Step 6(f)	B	Wald	Sig.	Exp(B)
Overage	-0.731	87397.36	0.000	0.481
Mother's years of education	-0.063	887.68	0.000	0.939
Cost of education (Monthly)	0.015	12498.48	0.000	1.015
Member's number in family	0.173	2027.73	0.000	1.188
Total worked hours	-0.050	39062.75	0.000	0.951
Dummy female = 1	-0.307	956.26	0.000	0.736
Dummy Spanish mother's language	-0.556	2889.92	0.000	0.574
Constant	3.549	26695.87	0.000	34.777
Chi2	338072.19			
Df	7			
Sig	0.0000			
2 log likelihood	309292.98			
R2 Cox and Snell	0.365			
R2 Nagelkerke	0.628			
Classification	92.9			

II.4 Non-school enrolled children. Where are they?

This section is oriented to find where are girls who face an abnormal enrollment, consequently we now discuss some empirical evidence through the construction of a municipal database. Because we are analyzing the demand for primary education in the Bolivian rural context, we have defined rural municipalities as those that have less than 15 thousand inhabitants. Despite this is a debatable criteria, it could be also a useful one because all of these municipalities have rural features. We have a database for 314 municipalities of which 207 are 'rural' according our criteria. It means two thirds of all municipalities (66%) that include 17% of Bolivian population and 18% of children at primary scholar age (6 to 13 years old). See Table 15.

Table 15. Municipalities: typology and some indicators

	Municipalities	Total households (2001)	Total population (2001)	Children at scholar age 6 to 13 years (2001)	Local taxes income 2000	Governmental transfers 2000
Total	100	100	100	100	100	100
15000 or more	34	83	83	82	97	81
Less than 15000	66	17	17	18	3	19

Source: Municipal data base

The symmetry index (*SI*) was built by dividing male rate of school enrollment by female rate of school enrollment, that is:

$$SI = (Me/Ma)/(Fe/Fa)$$

Where:

Me = Male enrolled

Ma = Male at scholar age

Fe = Female enrolled

Fa = Female at scholar age

If *SI* is equal to 1 it means perfect symmetry, if it is included in a band that was defined by the *SI* average minus one standard deviation and the average plus one standard deviation, it is considered a normal or symmetric enrollment by gender. If *SI* is greater than the average plus one standard deviation, it is considered an abnormal (too low) female school enrollment. Finally, if *SI* is less than the average minus one standard deviation, it is considered an abnormal (too low) male school enrollment.

Average *SI* is 1.03, which shows almost a perfect symmetry because it is close enough to 1. The standard deviation is 0.0992, which means that our band that is considered as a normal school enrollment places between 0.93 and 1.13. Maximum *SI* was found in the municipality of Bolpebra (Department of Pando) where *SI* gets a value of 1.46 and the Minimum *SI* was found in Yunguyo del Litoral (Department of Oruro) where it is 0.2. Hence, clearly there is a school enrollment symmetry controlling by gender but, there are also two statistical tails, one of them shows abnormal female enrollment but another shows the opposite. Municipalities whose *SI* were greater than 1.13 are considered to belong the type 1, which means an abnormal female school enrollment. In turn municipalities whose *SI* were included in the above mentioned band are considered within type 2, which means symmetric school enrollment by gender. Finally, municipalities whose *SI* were less than 0.93 are considered to belong to type 3, which means abnormal male enrollment.

Explained typology of municipalities could be summarized in Table 16. It is very interesting to see that just 15% of total rural children at school age live in a municipality where there is abnormal enrollment either for males or females. Municipalities where female school enrollment is abnormal include 8% of children at primary school age, while municipalities where male school enrollment is abnormal include 7% of children at primary school age. It means that 85% of children of primary school age live in a municipality where *SI* shows a symmetric access to school by gender.

Taking into account that 18% of Bolivian children at primary school age live in a rural municipality, our findings achieved by using the *SI* shows a very important outcome, that is, less than 3% of total Bolivian children at primary school age live in a rural municipality where *SI* shows abnormality for girls or boys. In fact 1.4% of children at primary age live in a municipality where female enrollment is abnormal, but 1.3% live in municipalities where happens the opposite. If public policies were oriented toward a greater rural enrollment rate for girls and also for boys, such policies would be referred to a proportion of total Bolivian

children at primary school age by 3%; but actually the above mentioned public policies are oriented toward the increase of female school enrollment rates, which means just 1.4% of total Bolivian children, according to municipal data.

Table 16. Typology of Bolivian rural municipalities by type of symmetry (in percentages)

	Municipalities	Total households	Total population	Children at scholar age 2001 (6 to 13 years old)	Local taxes income 2000	Governmental transfers 2000
Total rural municipalities	100	100	100	100	100	100
Type 1	10	9	8	8	3	8
Type 2	77	83	84	85	82	83
Type 3	13	8	7	7	14	9

Source: Municipal database

Type 1 Abnormal female enrollment. $S/\text{greater than } 1.13$

Type 2 Symmetric enrollment by gender. $S/\text{between } 0.93 \text{ and } 1.13$

Type 3 Abnormal male enrollment. $S/\text{less than } 0.93$

II.4.1 Discriminatory analysis

A canonical discriminatory linear function was estimated in order to find predictors for the subsets of municipalities with abnormal school enrollment rates. Both, for abnormal female school enrollment and less male school enrollment, it was performed for municipalities type 1 (with less female school enrollment) and type 3 (less male school enrollment) excluding the bulk of normal school enrollment by municipalities (type 2).

Table 17 shows descriptive statistics for variables included in the discriminatory analysis and the Logistic regression. Table 18 shows that the municipality's total number of years of education is positively related with the probability of belonging to a municipality type 1. The same applies with a successful high rate in terms of finishing the 8th primary grade, but also with a high average monthly consumption per person and with more municipal own income. All of them are indicators associated to development, as they are desirable. Unfortunately, as type 1 means abnormal female enrollment, our linear discriminatory function seems as if it were linking these indicators with abnormal female enrollment at primary school. However, a linear function is not a definitive criterion, as it will be discussed in this section.

On the other hand, according with our discriminatory function, overage at primary level, labor supply, total municipal investment, governmental transfers and expected investment by final design projects are associated to less male school enrollment. All of them are also related to development, but now, directly or indirectly, these variables are related to labor supply, which in Bolivia is mainly a male responsibility.

Table 17. Some municipal characteristics

Variables	Mean	Median	Std. Deviation
Total years of education 2001	4.97	5.08	1.39
Overage primary 2003	0.25	0.23	0.11
Successful finishing rate primary (8 ^o grade)	0.54	0.56	0.28
Per capita consumption (Bs per month)	147.15	141.00	47.74
Municipal own income 2000 (000 Bs.)	28.90	5.71	75.29
Labour supply 2001 (000 personas)	2.54	2.31	1.62
Total municipal investment 2000 (000 Bs.)	80.27	38.31	123.73
Governmental transfer 2000 (000 Bs.)	172.96	149.99	127.50
Final investment projects (000.Bs.)	70.35	35.74	83.63

Source: Municipal data base

Table 18. Discriminatory analysis between municipalities where enrollment is abnormal (type 1 and 3)

Total years of education 2001	0.619
Overage primary 2003	-0.569
Successful finishing rate primary (8 ^o grade)	0.378
Per capita consumption (Bs per month)	0.318
Municipal own income 2000	0.192
Labour supply 2001	-0.185
Total municipal investment 2000	-0.082
Governmental transfer 2000	-0.022
Final investment projects	-0.017
Eigenvalue	1.045517
Canonical correlation	0.714931
Wilk's Lambda	0.488874
Chi 2	28.98385
Df	9
Sig.	0.000652

II.4.2 Logistic model

As it was mentioned, a linear discriminatory function is not exactly a definitive criterion, but it is useful in order to find predictors for a Logistic regression, as it was used here. See Table 19.

As it can be seen, the Logistic regression has confirmed just two variables as useful predictors for our dependent variable (type 1 = 1 or type 3 = 0). Higher levels of total years of education in a municipality increases the probability of abnormal female enrollment, whereas, more years of students overage, increases the probability of male abnormal enrollment. Both predictor variables are related to the educative system, it suggests that there could be a limited demand for education, with a specific limit for girls and a non-continuous demand for boys. Both predictor variables seem to be coherent with risk and vagueness of economic activities in Bolivian rural context.

Table 19. Logistic regression between municipalities type 1 and type 3

	B	Sig.	Exp(B)
Total years of education 2001	0.779053	0.014047	2.179408
Wald test	6.032207		
Overage primary 2003	-7.80733	0.026867	0.000407
Wald test	4.899345		
Constant	-1.56048	0.420296	0.210036
Wald test	0.649488		
2 log likelihood	42.50176		
R2 of Cox and Snell	0.375412		
R2 of Nagelkerke	0.502459		
Classification	80.85106		

II.5 Quality of Education

The information produced by the System of Measurement and Evaluation of the Quality of Education (SIMECAL) is used in order to analyze the quality of education in Bolivia. Since 1997, the SIMECAL has applied tests as well as questionnaires to the scholars that have allowed analyzing the factors that impact the students' performance. The information collected from 3rd, 6th and 8th grades of primary school is the base line of the school system, which precedes the application of the Educative Reform.

Because the Educative Reform implementation has been a gradual process, first having 300 rural schools, called "núcleos", from all over the country beginning in 1995, the SIMECAL evaluated its progress at the conclusion of the 1st cycle of primary that corresponds to the 3rd of primary in the monolingual Spanish mode.²¹ Besides, the rural school in bilingual Aymara, Quechua and Guaraní modes were evaluated. This information has not been published yet, which is why it is showed only the preliminary results.

Table 20 shows that in both language and mathematics, students of the rural area have lower evaluation than the students in the urban area. The higher difference is present in language. Also in language girls are better assessed than boys, but this situation is reversed in the mathematics curricular area. The gaps between urban and rural areas are around 5 points in language and lower than 3 points in mathematics.

Various factors have been analyzed in order to determine the students' performance, by using the Education Production Function. It is interesting to note that the native mother tongue has no incidence in the evaluation of 6th grade of primary school. This result contrasts the literature findings at 3rd grade of primary, where the students are better assessed if they receive school education in their native tongue. Additionally, if the student lives with her parents and brothers she has better performance, but this factor is more important in the urban area compared to the rural area. Lastly, with regards to the teacher's characteristics, in the rural area of Bolivia it is found that teacher's gender is important; students that have male teachers have higher evaluation than those who have female teachers.

²¹ Primary has three cycles.

Table 20. Average grades according to geographic area by curricular area and gender, 6th of primary without Educative Reform.

Geographic Area		Language			Mathematics		
		Male	Female	Total	Male	Female	Total
Rural	Average	45,73	46,52	46,09	48,40	47,60	48,03
	Standard Deviation	9,45	9,26	9,37	9,99	9,92	9,97
Urban	Average	51,12	51,43	51,28	51,10	50,23	50,66
	Standard Deviation	9,77	9,93	9,85	9,93	9,88	9,91

Source: Own elaboration, based on the testing of 6th grade of primary school, 1997.

Table 21. Average grades according to geographical area by curricular area and gender, 8th of primary without Educative Reform.

Geographic Area		Language			Mathematics		
		Male	Female	Total	Male	Female	Total
Rural	Average	43,57	46,61	45,21	45,78	47,09	46,49
	Standard Deviation	9,30	9,73	9,66	8,85	8,72	8,81
Urban	Average	52,08	52,22	52,16	51,94	51,29	51,58
	Standard Deviation	9,14	9,56	9,38	10,01	10,16	10,09

Source: Own elaboration, based on the testing of 8th grade of primary school, 1998.

As seen in Table 21, the gap of assessment between students of the urban and rural areas is higher for 8th grade of primary school than for 6th grade: in language, the gap is around 6 points and for mathematics 5 points. The gaps by gender in the rural area have similar characteristics between the two grades. Lastly, in both curricular areas girls are better assessed than boys, however, it is noted that this difference is minimal in the urban area.

For 8th grade, a Logit model was estimated²² in order to analyze the factors that increase the probability of having assessment at risk.²³ The results show that for language: 1) children older than 15 years are more likely to obtain an evaluation at risk; 2) initial education is one of the variables that decreases the probability of assessment at risk; 3) students that always work are more vulnerable to have an evaluation at risk than those that never worked; and 4) as the mother is more educated, the probability of assessment at risk decreases. For mathematics, the sex of the students becomes a significant variable: girls have more probability of getting an evaluation at risk. Lastly, failing and repeating are more frequent in mathematics than in language, meaning that in the former more children have evaluations at risk.

With regards to the results related with school characteristics, students of non-professional teachers (without bachelor degree) explain part of the assessments at risk. It does not happen with teachers that are professionals (maestros normalistas). Additionally, as teachers have more years of experience, the probability of having an assessment at risk decreases. Lastly,

²² Results are not included but they are available upon request.

²³ According to the typification of assessment at school, 'assessment at risk' are the grades less than or equal to 45 points, regular assessment between 45.01 points and satisfactory assessment for grades over 55.01.

continuous evaluation and frequent homework contribute favorably to the assessment of the students.

Analyzing now the evaluation of the Educative Reform progress it can be seen in Table 22 that the assessment of the students has improved in language but it has not improved in mathematics. The gap that existed between the urban and rural areas diminished, being the education more equitable. Moreover, the gap between boys and girls were also reduced, in both curricular areas.

Table 22. Average grades according to geographic area by curricular area and gender, 3rd of primary with Educative Reform.

Geographic Area		Language			Math		
		Male	Female	Total	Male	Female	Total
Rural	Average	52,14	52,30	52,21	46,73	46,79	46,76
	Standard Deviation	9,63	9,71	9,67	8,52	8,75	8,63
Urban	Average	53,99	54,01	54,00	46,59	46,52	46,56
	Standard Deviation	8,75	8,84	8,80	8,22	8,43	8,33

Source: Own elaboration, based on the testing of 3rd grade of primary school with Educative Reform, 1999.

In this case, through the Education Production Function, we found that the significant associated factors related to a higher evaluation are: if the student has received initial education, if he (or she) has received two or more years of schooling with the program of the Educative Reform, if he (or she) has good reading habits and if he (or she) likes attending to school. With regards to the family's characteristics that impact positively on students' assessment are: parents' education, specially the mother. Participation of parents in school meetings also increases the performance of their children. Lastly, teachers that have good evaluations of their students use the texts of the Educative Reform, apply techniques of curricular evaluation, return evaluations and correct them with the students. Besides, they give homework and check it with every student.

Finally, Table 23 shows the children evaluation with bilingual mode in the rural area. In language, the Guaraní students in 3rd of primary perform better than Aymaras and Quechuas. On the other hand, in mathematics, Quechua students have the higher scores compared to the Aymaras and Guaranies students. In 5th of primary, the Aymaras students have higher evaluations in both language and mathematics.

Table 23. Assessment of the children in rural schools with bilingual mode, according to language of teaching and curricular area.

Language of teaching	3th primary		5th primary	
	Language	Mathematics	Language	Mathematics
Guaraní	50.00	50.00	47.90	49.84
Aymara	49.39	49.74	54.30	53.40
Quechua	48.14	53.37	52.03	51.30

Source: Own elaboration, based on the testing of 3th and 5th grade of primary school , 1997.

III NEW EMPIRICAL EVIDENCE: RURAL AREA SURVEY RESULTS ANALYSIS

Three surveys have been carried out: a student surveys, a principal and teachers' survey and a household survey. Students survey's objective was to find new empirical evidence, related to time allocation, activities within school, any kind of discrimination within scholars activities, pupil's perceptions on educative performance by gender and reasons of non-promotion in some grade.

Principal and teachers survey was applied with the following objectives. Principals and teachers perceptions about student's performance and their scholar's activities; their perceptions on the reason for non-enrollment and non-attendance in order to check if there is any kind of bias by gender; and their suggestions and proposals for improving educative quality.

Finally, household survey had two specific goals. The first one was to analyze the reasons why some children had dropped out the school. The second one was to find the determinants of non-attendance. However, in both cases there were found few cases that limited the econometric analysis.

III.1 Survey's sample

In order to obtain information about the rural area, three municipalities from the *departments* of La Paz and Oruro were selected by considering the higher rate of school abandonment in the Bolivian Altiplano's municipalities. Under this criterion, the municipalities of Sica Sica and Pampa Aullagas were selected. In order to analyze some particularities of the scholarship in the Afro Bolivian population it has been selected certain communities of the Coroico municipality (located in the tropical region of La Paz).

The three selected municipalities have a high level of poverty (see Table 24.). Sica Sica is the only municipality that has a native language as the predominant; in the others municipalities Spanish is the predominant language.

Table 24. Information of the municipalities of the rural schools survey

	Main language	Human Development Index (HDI)	Incidence of poverty (NBI) CNPV 2001	Population 6-18 years of age CNPV 2001		Net coverage in primary level		Rate of finish Eighth of primary		Rate of drop out 2003	
				Male	Female	Male	Female	Male	Female	5th	8th
Sica Sica	Aimara 51.8%	0.5353	99.1%	3309	3296	77.5%	79.4 %	74.2%	51.4%	5.4%	9.9%
Coroico	Spanish 57.0%	0.5908	75.6%	1539	1436	99.3%	98.8 %	64.1%	75.4%	4.2%	11.5 %
Pampa Aullagas	Spanish 44.4%	0.4922	97.1%	266	279	60.3%	60.5 %	69.4%	31.0%	14.1%	9.8%

Source: Education in Bolivia: municipal statistics, 2004.

The regions studied have a very low net coverage rate and a high overage problem, mainly in this last municipality. Sica Sica and Pampas Aullagas are the municipalities with low rates of

completion of eighth grade, mainly for girls. Only in Coroico this last rate favors girls, but in contrast it is the municipality that has the highest rate of school abandonment in the first eight grades (however, the highest rate of abandonment of the fifth grade is in Pampa Aullagas).

Once the municipality was selected, nine schools were chosen. Several surveys of male and female students of the third, fifth and eighth grade of primary school were conducted. 106 homes in the vicinity of the schools were surveyed and a total of 582 people were interviewed.

Table 25. Detail of the sample of the rural schools survey

Department	Municipality	Community	Students	Teachers and Principals	Homes	Members of the home
La Paz	Sica Sica	Konani	59	5	12	62
La Paz	Sica Sica	Belén	44	4	12	52
La Paz	Sica Sica	Khulluma	10	2	12	60
La Paz	Coroico	Pacallo	36	5	12	57
La Paz	Coroico	Mururata	34	4	12	49
La Paz	Coroico	Tocaña	10	1	12	68
Oruro	Pampa Aullagas	Pampa Aullagas	74	6	24	126
Oruro	Pampa Aullagas	Bengal Vinto	16	9	10	50
Total			283	36	106	524

Source: EGG, Rural Schools Survey: Schoolchildren²⁴.

III.2 Profile of the schools

From a total of the nine schools selected, six offer pre-school education. None of them offer bilingual education. The school at Mururata has only one teacher that takes care of the students from first to fourth years of primary school, the school at Khulluma has two teachers and the school at Bengal Pinto has three. The rest of the schools have between eight and thirteen teachers.

The time that the teachers dedicate to teaching in the classroom varies, in five schools children have more than four hours of class a day, in the rest it varies from three to three and a half hours. Nevertheless, in all the schools the break lasts thirty minutes.

The school assemblies work in all the schools, and it can be observed that fathers have more representation than mothers, because thirty out of the thirty-five members in the schools selected are men.

The infrastructure of the schools is similar, all of them have calamine roofs and cement floors, bathrooms are separate for boys and girls. As far as what services availability concerns, seven schools have electric energy supply and two do not have it. Five schools have running water and four do not have this service.

From the nine schools studied, seven receive support from the NGOs, principally in building schools, teaching materials and in building housing for teachers. Six of them have school

²⁴ The term "schoolchildren" is used to note that the survey was taken to both boys and girls that attend elementary school, even if they are teenagers. In Bolivia, the elementary school corresponds to the first eight years of education.

farms in which they grow lettuce, carrots, chards, tomatoes and cucumbers. Both boys and girls participate in these chores preparing the land for the sowing.

In five schools, teachers organize excursions with the parents every three months; in three schools they do it monthly, and once a semester in one of them. Both fathers and mothers participate in these reunions. Other activities in which parents participate are: building classrooms, civic acts, school breakfast and classroom cleaning.

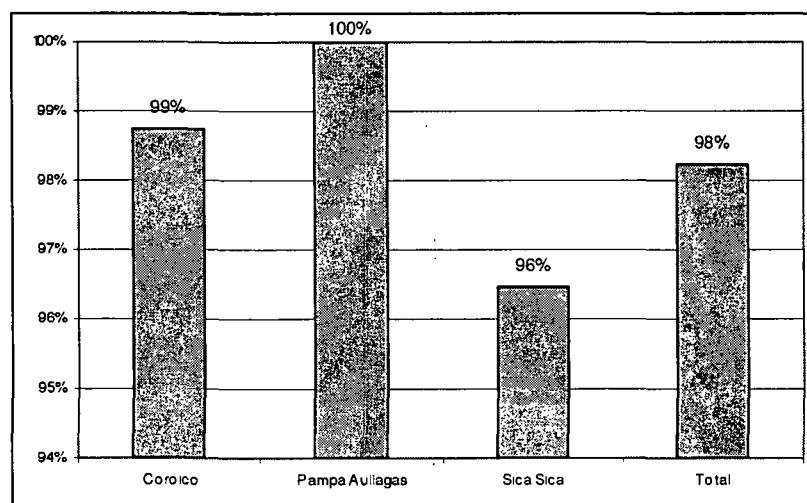
III.2.1 School practices

Some questions have been asked about the practices that are developed in rural schools, this analysis is only done by gender, because it is independent of the socioeconomic level of the homes.

Regarding the school farms there is a modest participation: only 60% of students stated that they work in the school farm. 61% of boys participate in most of the farming chores such as preparing the land, sowing and harvesting. Yet, only 39% of girls do so. However, concerning maintenance of the crops, the difference is reduced from 55% to 45%, respectively.

The Educational Reform proposes that teachers should not give homework. It can be observed that this proposal is not taken into account, because ninety eight percent (98%) of the students answered that they do take schoolwork to their homes. This is more evident in Pampa Aullagas and Coroico than in Sica Sica (see Figure 5.).

Figure 5. Schoolchildren by municipality level according to homework



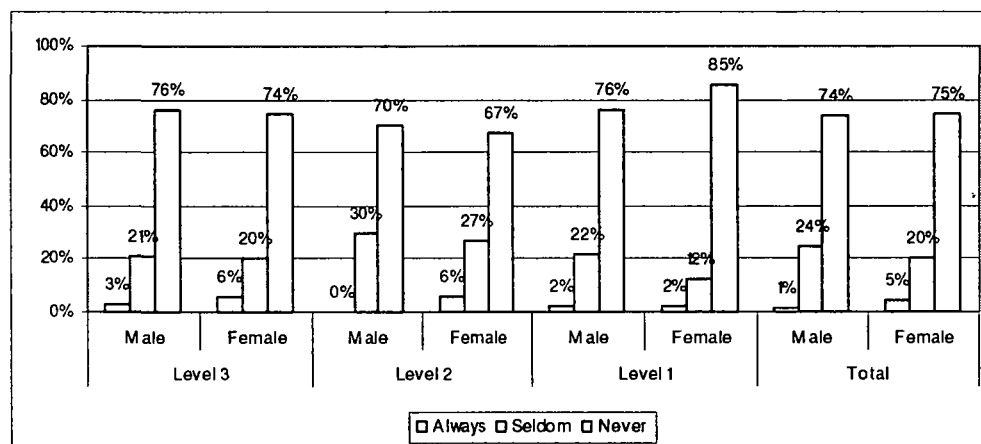
Source: EGG, Rural School Survey: Schoolchildren

Most of the students do their homework without anyone's help, this happens mainly in the eighth grade, but also happens in the third and fifth grades. However, the students of both third and fifth grades get help from their older brothers and from their fathers more than from their mothers.

Lastly, two years ago, the school breakfast program was carried out in the schools of Bolivia, that is why it can be seen that 75% of the student never take food to school, 22.5% of them

state that they do it sometimes. These students belong to the level 2 and are mainly boys (see Figure 6).

Figure 6. Schoolchildren by socioeconomic level depending on if they take food to school or not.



Source: EGG, Rural school Survey: Schoolchildren

III.2.2 Teaching manner

Even if all the schools selected are classified in the monolingual manner – Spanish; it must be noted that eight teachers state that they conduct their classes in native language (Aymara or Quechua).

It is pertinent to mention that bilingual inter-cultural education has not accomplished to be an effective answer to strengthening the identity of the cultures with more importance in Bolivia. A high percentage of the families of Aymara or Quechua origins reject bilingual education and are not motivated to strengthening their native or original tongue and consider that “castellanización” is a mean of overcoming poverty. This must be a reason why in the municipalities where the predominant language is a native one, parents make their children education to be conducted in Spanish.

III.3 Profile of the surveyed students

In this part, the profile of the surveyed students of the nine rural schools is analyzed. In the three communities and in a total of nine schools, 283 students were surveyed. Fifty three percent (53%) of them are boys and the remaining forty three percent (43%) are girls. The municipality in which more students were surveyed is Sica Sica, in Oruro (see Table 26).

Regarding the age of the students in each grade it is observed that a high proportion has the normal age for the grade attended, however the children percentage with overage is also important. In the third grade, for example, more students (56%) are eight years old or younger, and the remaining forty four percent (44%) of the students are over aged (see Figure 7).

In fifth grade, the normative age is ten. Fifty nine percent (59%) of the boys and girls have that age, in Figure 7 it can be observed that there are more boys than girls with ten years old, the overage extends until thirteen and there is no a notable difference by gender. In eighth

grade, the normative age is thirteen. Also, it can be observed how the girls are left behind in their education, which is why most of them are fourteen or older.

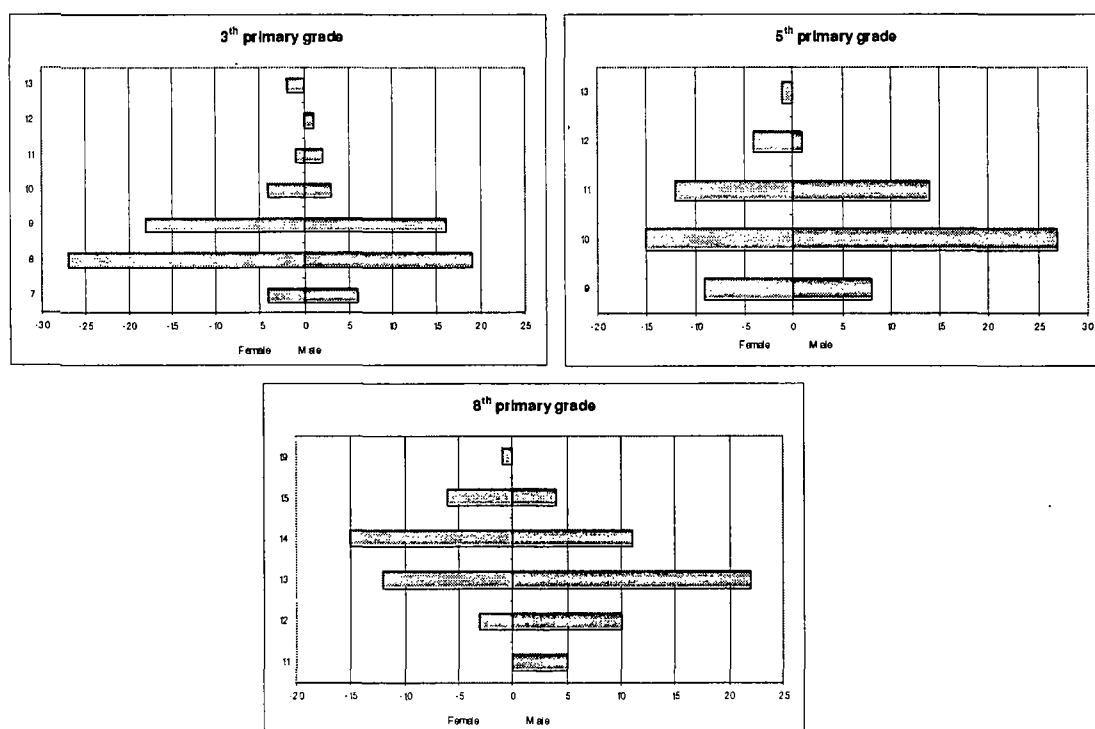
Table 26. Distribution of the students by municipality and according to their gender.

Municipality	Boys		Girls		Total	
	N	%	N	%	N	%
Coroico	41	28%	39	29%	80	28%
Pampa Aullagas	53	36%	37	28%	90	32%
Sica Sica	55	37%	58	43%	113	40%
Total	149	100%	134	100%	283	100%

Source: EGG, Rural School Survey: Schoolchildren.

There is no an important lag in eighth grade of elementary education. This could be explained by the fact that the students that were left behind have already abandoned school and do not reach the eighth grade of elementary education and those who reach it do it with one or two year of lateness at most.

Figure 7. Pyramid of ages by grade



Source: EGG, Rural School Survey: Schoolchildren

III.3.1 Place of birth

A little bit more than half (51%) of the surveyed students were born in the same community where they attend school, only sixteen percent (16%) of them were born in a capital city and are in third grade. This demonstrates that parents that migrate from the urban area to the rural area prefer their younger children attend to school in the rural area. From a certain grade and

on they prefer their children going to study in schools from urban areas, not only because of the quality of the rural education, but also because the offer in the rural area is small. In some cases, it only reaches till fifth grade of primary.

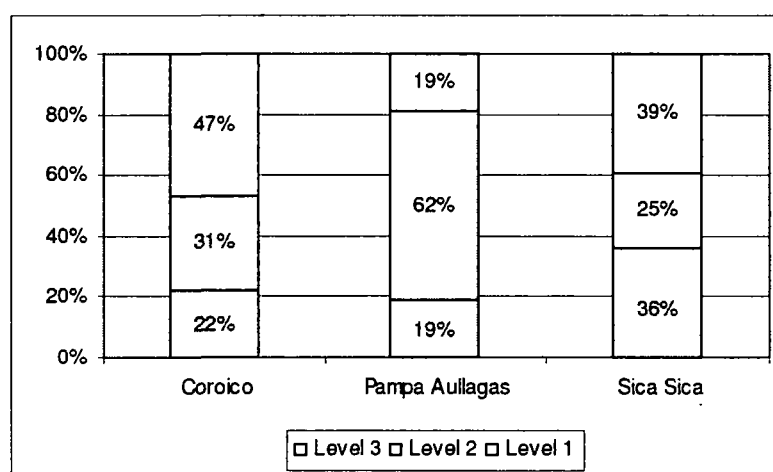
III.3.2 Socioeconomic level

It has been built an index as a proxy variable of the socioeconomic level with the method of Principal Component Analysis. It must be noted that this is a really changeable situation in the rural area of Bolivia, because it depends on many factors that cannot be controlled, such as climatic factors that determine the amount and quality of the harvest, the possession of the land and its characteristics, the migratory situation of the members of the home, among others, as it was discussed in Bolivian rural context.

However, for this study, the socioeconomic level has been built by considering the following variables: availability of running water in the house, electricity supply in the house, literacy of the father, literacy of the mother, if they have a radio and if they have a television in their house.

After building this index, it has been transformed in order to work with a categorical variable as control variable for the rest of the analysis. The classification of this variable is as follows: Level 1 are the homes that would have better socioeconomic level because they have electricity and water services and also both parents are able to read and write. Level 2 are the homes that have just one of the services and one of the parents is able to read and write. Level 3 are the homes that would have the lowest socioeconomic level because they have one of the services; none of the parents is literate and have only radio.

Figure 8. Socioeconomic level by municipality



Source: EGG, Rural School Survey: Schoolchildren.

Comparing with the Human Development Report by municipality, the municipality of Sica Sica has an HDI²⁵ of 0.5353 and this study shows that 36% of the Schoolchildren would pertain to the socioeconomic stratum of level 3, as can be seen in Figure 8. The municipality of Coroico presents an HDI of 0.5908; most 22% of the students of this municipality belong to

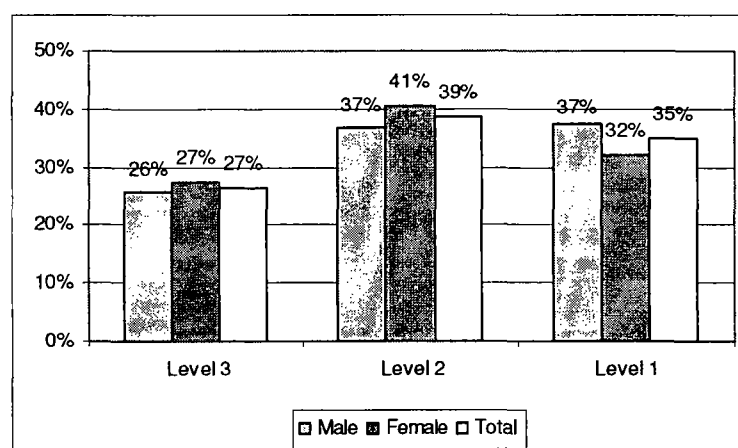
²⁵ Human Development Index. Source: Municipalities Human Development Report, 2004.

the level 3. The same happens in the municipality of Pampa Aullagas, one of the most impoverished of the country, which has an HDI of 0.4922 were the schoolchildren of this study belong principally to the socioeconomic stratum of level 2.

III.3.3 Personal and home characteristics

In this part the results about schoolchildren are presented according to their particular characteristics and the particular characteristics of their homes. Figure 9 shows that, in general, twenty seven percent (27%) of the students belong to the level 3 stratum, thirty nine percent (39%) belongs to the level two stratum and thirty five percent (35%) to the level 1 stratum. In the literature, the issue of the feminization of poverty (mainly in the rural area) is discussed. In this study can be observed that the 41% percent of the girls belong to the level 2 stratum, and 27% belong to the level 3.

Figure 9. Socioeconomic Level by Gender



Source: EGG, Rural School Survey: Schoolchildren.

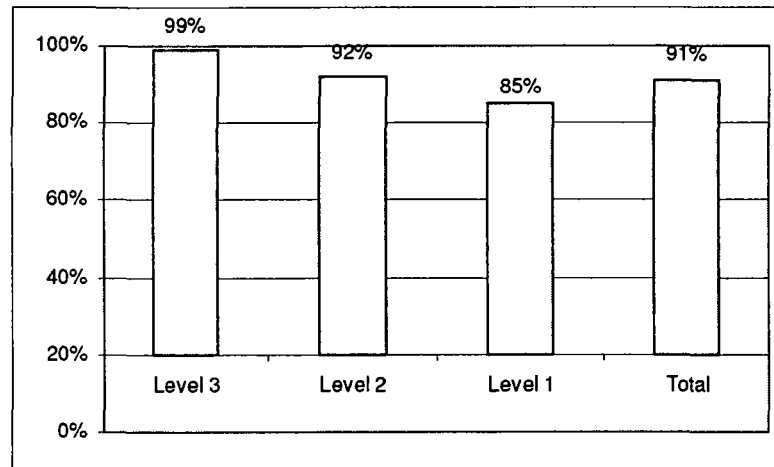
As mentioned before, another variable that could help to improve the quality of the socioeconomic stratum index is the ownership of farm land(s). As can be seen in Figure 10, ninety one percent (91%) of the surveyed children answered that their families own some land, in the level 3, ninety nine percent (99%) answered that they do own. It is remarkable that only eighty five percent (85%) of the students of level 1 say that their families own land. That is the reason why this variable did not become part of the calculus of the index, because it is a variable that does not discriminate adequately.

Finally, the profile of the students will be analyzed by taking into account the socioeconomic stratum en the gender, wherever applicable (see Figure 11). About seventy percent (70%) of the children attending elementary school live with both parents and (13%) only with the mother. There is no significant difference by gender; this distribution is similar for boys and girls.

This analysis by socioeconomic level is interesting because the percentage of schoolchildren of level 2 and 3 that live with both parents is considerably lower than the percentage of level 1 schoolchildren. This shows that rural homes that are in poverty choose for the father to

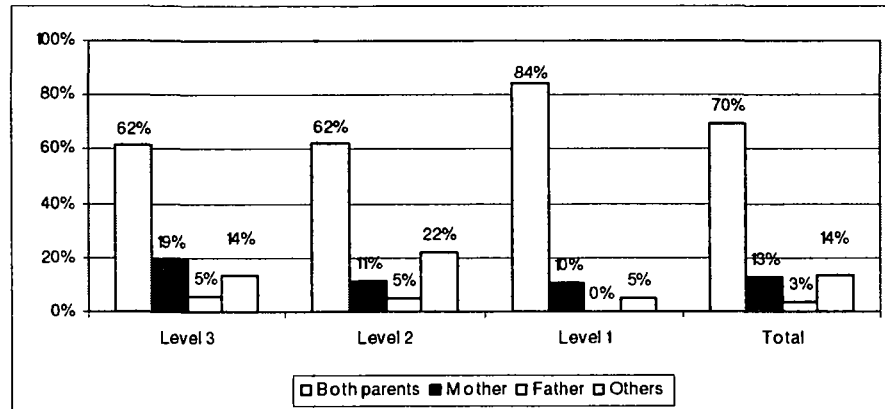
migrate to the urban area, decision that in most cases could not solve the situation, principally because the labor opportunities of the peasants that migrate to the city are scarce. Consequently, in these strata, there are a higher percentage of schoolchildren that live with the mother, or, when both parents have migrated to the city, with other relatives.

Figure 10. Schoolchildren by socioeconomic level, according to the ownership of farmlands.



Source: EGG, Rural School Survey: Schoolchildren.

Figure 11. Schoolchildren by socioeconomic level according to whom they live with.



Source: EGG, Rural School Survey: Schoolchildren

III.3.4 Pre-school education

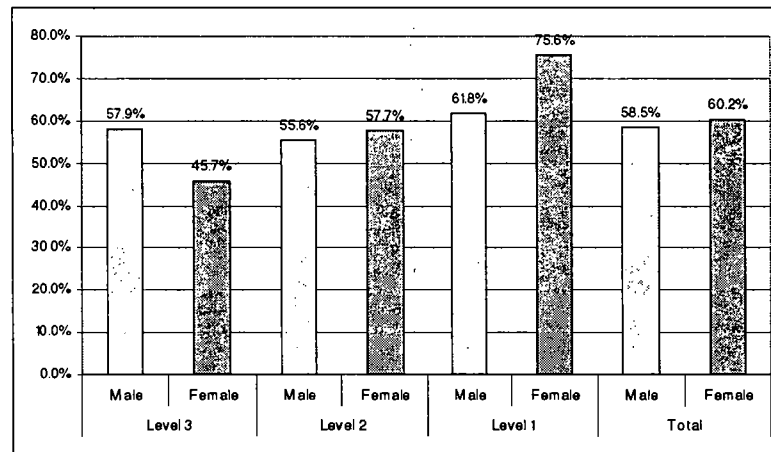
The literature says that another variable that allows analyzing the quality of rural education is the attendance to the nursery or pre-school. In this study fifty nine percent (59%) of the schoolchildren attended to pre-school education. As can be expected, in higher proportion are schoolchildren of the level 1 socioeconomic stratum and the majority are girls.

III.3.5 Use of time

One important contribution of this study to the literature is the analysis of the students' use of time, since it is a feature that has not been studied up to now in the literature. The analysis by stratum allows to observe that boys and girls of Level 1 have more time for studying, playing and having fun than the boys and girls of the low and very low stratum. On the other hand, boys and girls of the lower stratum dedicate more time to work and help with household tasks. However, there are more girls than boys that do so.

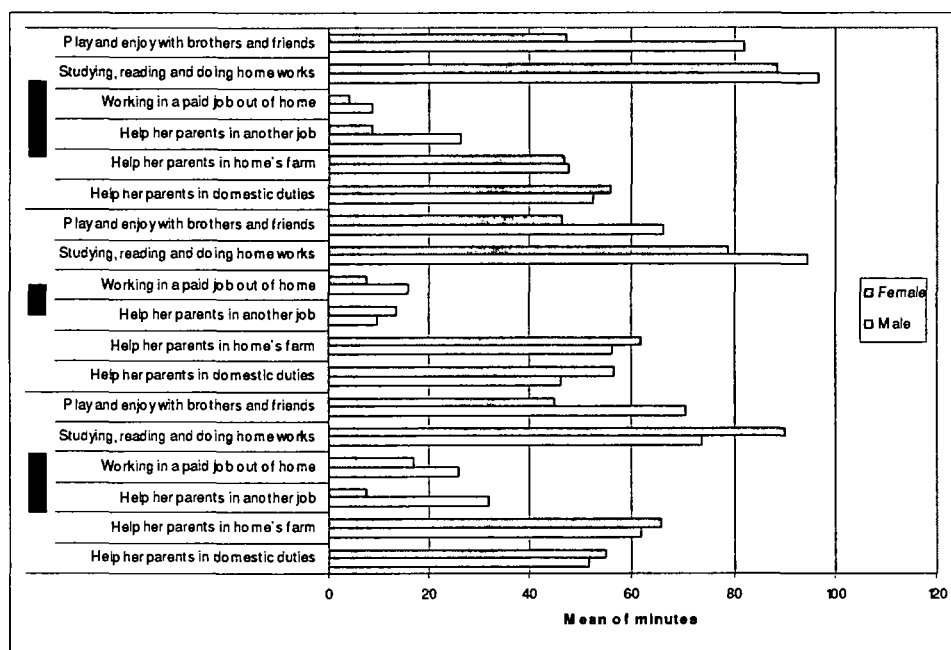
About the activities at home, both boys and girls help in taking care of the animals, however, boys help more in the farms. In the municipality of Coroico a distinct difference can be observed: children help more in the farming than in other municipalities. During their job in the farming activities, girls declare to have had more accidents that have affected mostly their feet and hands.

Figure 12. Schoolchildren by socioeconomic level according to their attendance to pre-school



Source: EGG, Rural School Survey: Schoolchildren.

Figure 13. Schoolchildren by socioeconomic level and gender according to the use of time



Source: EGG, Rural School Survey: Schoolchildren

III.3.6 Health

Without socioeconomic stratum and gender distinction, schoolchildren mention that they get sick more frequently to their nose, throat, and they get the flu due to the low temperatures of El Altiplano. The other disease that they mention is stomachache, which is more frequent among younger children.

III.4 School enrollment

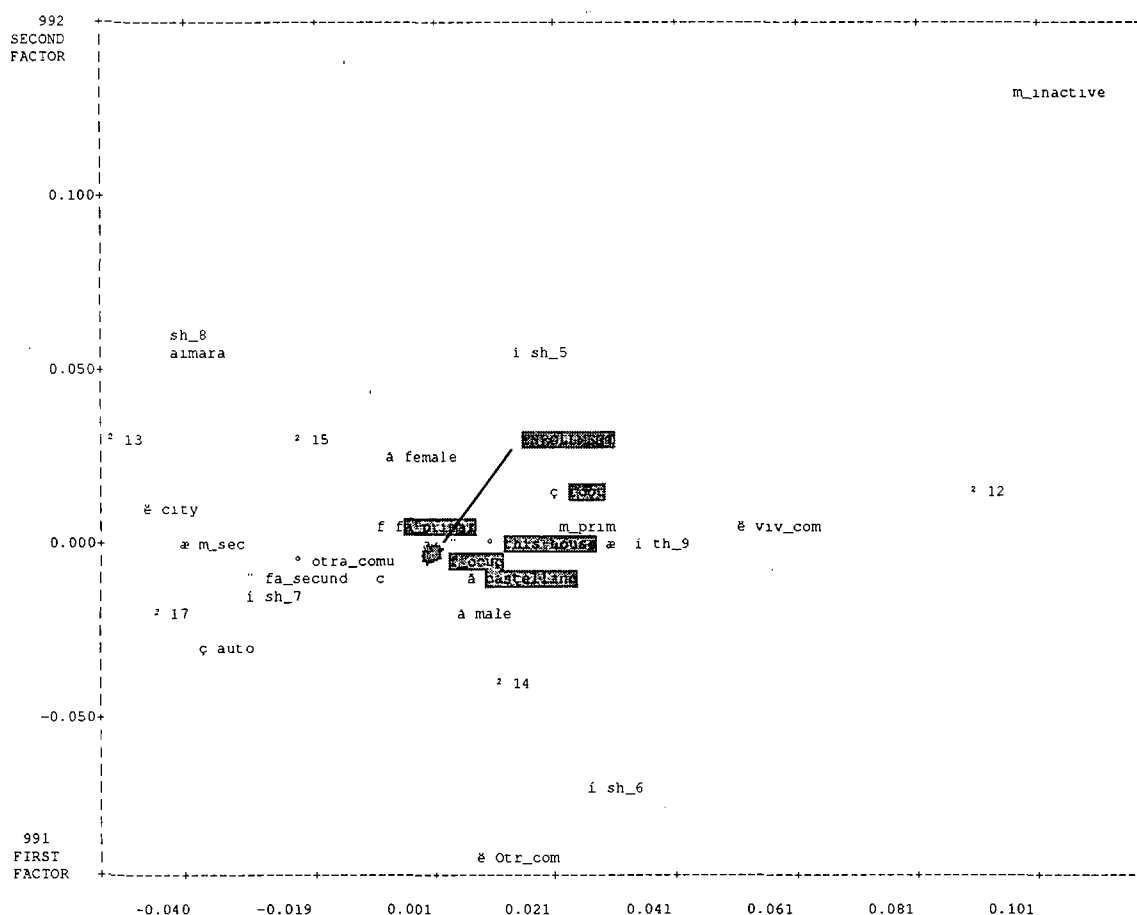
The enrollment registration and attendance book show a difference between the enrollment of boys and girls. There are five percent (5%) more boys than girls enrolled. Teachers explain this situation as follows: parents do not take their daughters to school because the girls help more their parents in working the lands, and because parents do not think education is important.

With the information of the survey at home level, a deeper analysis has been made over enrollment and attendance. In this case the factors associated to enrollment are studied through the Multiple Correspondences Analysis, whose graphic representation is presented in Figure 14.

The symbol that is in color indicates the position of the enrollment variable, which is associated: if the father works (f_ocup), if the father has at least primary education (f_primary), if he lives in the same house (this house), near the school that allows them to walk to it (foot) and if the student's mother language is Spanish. The sex is not a variable that

discriminates against being enrolled; also the size of the home (Sh_ #) is not associated with enrollment as well as other categories (from the variables) non-marked.²⁶

Figure 14. Principal plane of enrollment



Source: EGG, Rural School Survey: Schoolchildren

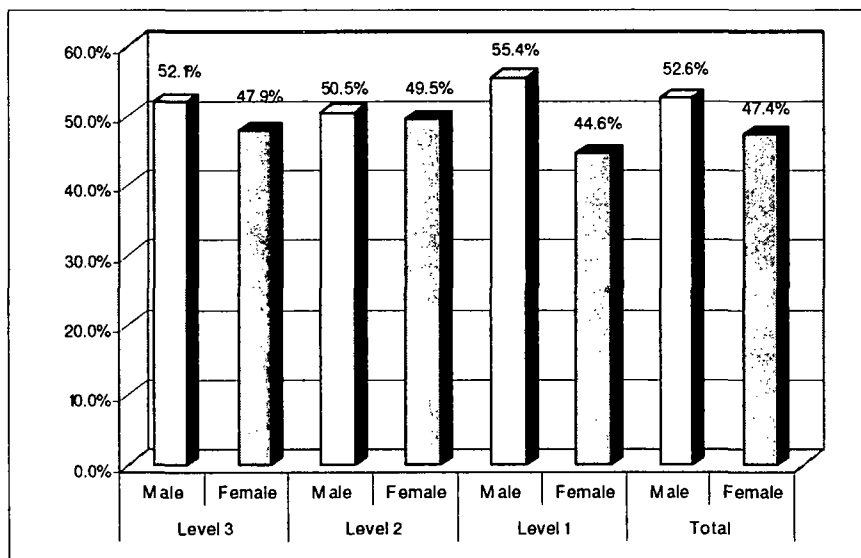
III.5 School Attendance

Next attendance is analyzed considering two points of view: the school and the home. Regarding the perceptions that schoolchildren have over if students like attending school or not, most of them - ninety eight percent (98 %) - state their satisfaction with it. The girls are the most satisfied with the school. The remaining two percent (2%) are children of the socioeconomic levels 2 and 3 (see Figure 15).

Figure 16 present the main plane of the Multiple Correspondences Analysis for the categories of the variables associated to the school attendance.

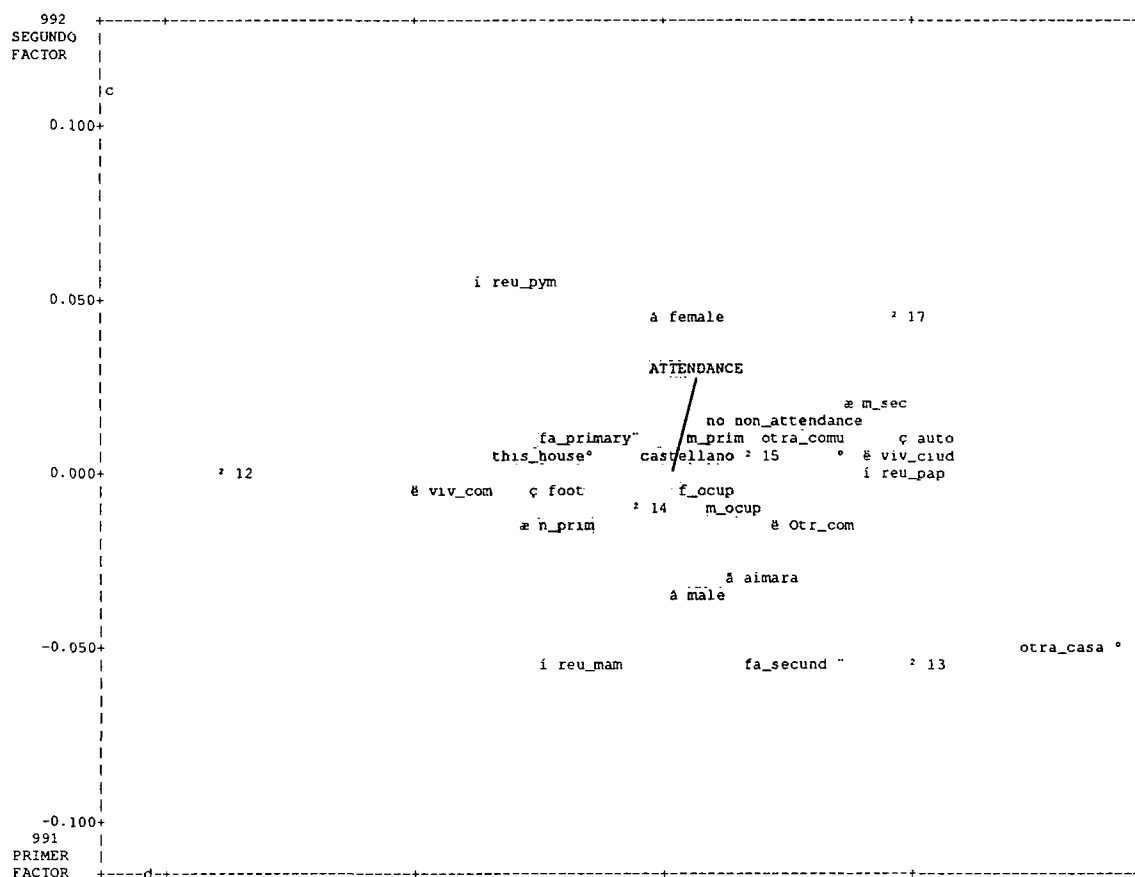
²⁶ The other variables are the age of the student, the mother occupation.

Figure 15. Schoolchildren by socioeconomic level and gender according to like attending school



Source: EGG, Rural School Survey: Schoolchildren

Figure 16. Principal plane of enrollment



Source: EGG, Rural School Survey: Schoolchildren.

The associated categories of variables of school attendance are mainly: if the mother and the father are working (m_ocup, f_ocup), if the parents have at least primary education (f_primary, m_primary) if the school is near the house (foot), if the scholars have zero absenteeism (Non non_attendance). In this case it is observed that boys are more associated than girls to attendance. On the other hand, the participation of the parents in the school meetings is not a variable that is associated to attendance as well as the age of the student.

Next, to analyze the factors that impact school attendance it is presented the results of a Logistic model, which has as dependent variable a dummy that equals 1 if the child attends to school (see Table 28).

Table 27. Logistic model, dependent variable is attendance

Variable	Coefficient	Significance
Age 5 years	-2,73	0.0375
Socioeconomic level	0,46	0,0631
Human Development Index (HDI)	-13,41	0.0301
Live in the city	-1,72	0,0468
Father assistance at meeting school	0,44	0,0889

Source: EGG, Rural School Survey: Schoolchildren.

The fact that 5 years old impacts negatively over attendance corroborates the premise said before that the parents are not taking advantage of pre-school education when the offer exists. In other cases, like in the rural communities, it may be that this service is not found available. Also, the socioeconomic level and father assistance at school meetings increase the probability of attendance.

An important finding is that the children that migrated to the city have smaller possibilities to continue attending to school. Lastly, the Human Development index of the communities decreases the probability of attending, which could be related to factors like attendance promotion policies focus in the poorest communities.

III.6 Non-attendance

This is an important variable for analysis; it is necessary to make some considerations, though. This variable has been obtained from the attendance book of the school and there were only 73 cases of non-attendance registered. This information does not allow making a deeper statistical analysis in order to determine the causes and characteristics of the students that miss classes. Any way, it can be observed that boys miss more classes than girls. Analyzing the reasons of the absences, it is observed that they are mainly due to diseases or the winter weather that makes them too difficult to get to school. Seventy five percent (75%) of the students that miss class argument those two reasons. Six percent of the students missed classes due to work reasons.

According to teachers' opinions, both men and women say that the main reason why girls miss class is work, as secondary reasons they mention family issues and the distance from

home to school. About the boys, teachers say that the main reason is work, too. As secondary reasons they mention family issues and diseases.

An element that appeared several times is that “there is no parental control” and another one is “lack of motivation”.

The actions teachers take when students miss class regularly are: “curricular support” bringing the student up to date”, “talking with the student and his parents”, requesting the presence of the parents by a “citation” that asks for the parents’ attention, and “visiting his or her parents for finding out the reasons”.

III.7 School abandonment

In teachers’ opinion, the main cause for both boys and girls to abandon school is “lack of money”, this leads to think that the poverty in which these communities live forces or induces the students to abandon school and migrate possibly to the cities in search of a job.

Actions taken by teachers in order to keep students at school are: making parents aware of the importance of education, making a comparison with the level of educations they reached and the future their children can have if they finish their studies. Another action is the provision of studying materials, which is donated by NGOs, this incentive aims to have the parents pay just for the registration fee and the study materials are for free. Finally, the provision of school breakfast or lunch, which is partially financed by the NGOs, also helps keeping students at school.

Teachers were also inquired about the actions they take in order to have the students continuing their education, most of them aims of making them aware that education improves quality of life and allows them to have a better future. Teachers also said that one way of motivating their students to keep studying is by teaching in a more entertaining and dynamic way, using creative methods for keeping the students interested and that the class does not get boring.

III.8 Repetition

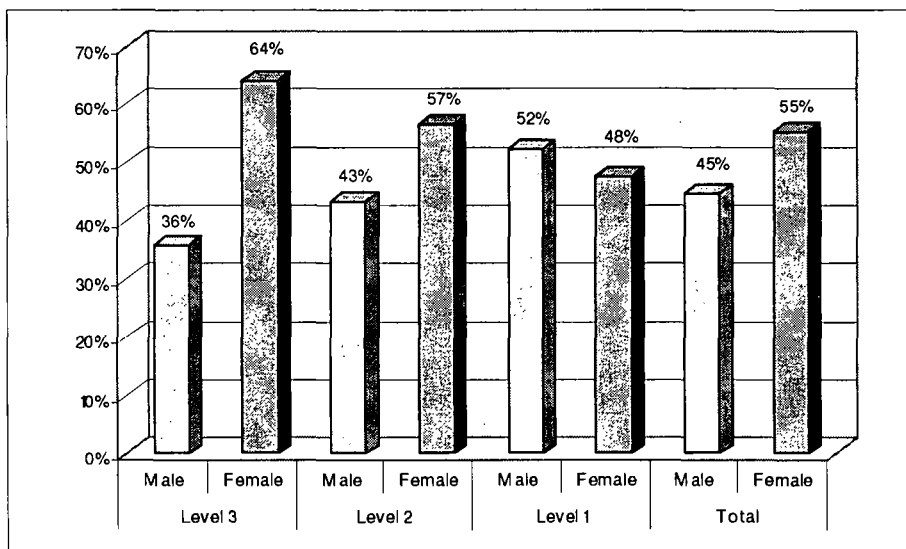
According to the information about the number of times that the schoolchildren have repeated, nineteen percent (19%) has repeated one course and this is represented mostly in the girls of the level 1 stratum. The main reason that they argument is sickness and there are more girls, the second reason in the same proportion by gender is because of the will of their parents. On the other hand, because of bad grades and due to travel are more the boys than the girls.

Even though the Law of Educational Reform in force proposes the automatic promotion in elementary school, it can be observed that twenty one point one percent (21.1%) of the schoolchildren has repeated at least once. Fifty five percent (55%) of repeaters are girls and forty five percent (45%) of them are boys.

The repetition is not an educational problem in Bolivia, however, in the teachers’ opinions the main cause for repetition of both boys and girls are family issues, the second cause for boys is work and for girls is lack of interest or for not paying attention in class.

Other explanations are “the change of system”, it means the changes due to the Educational Reform, “carelessness of the parents, “poverty and low economical resources”. Some mention that children get poor nutrition, too.

Figure 17. Students by socioeconomic level according of repeaters



Source: EGG, Rural School Survey: Schoolchildren.

III.9 Quality of education

In this study we tried to obtain information about the students performance in mathematics and Spanish. However, this information was not completed, because in most of the primary schools students do not receive grades with point but according to their accomplishments and competences acquired. Any way, sixty nine percent (69%) of the teachers interviewed think that the students' achievement is the same in both boys and girls, twenty eight percent (28%) state that girls have better performance than boys.

III.10 Parental participation in schools

In the survey at home level, the topic of parents' participation in the school was studied deeply. Eighty eight percent (88%) of the homes answered that they attend the meetings at school, and in forty percent (40%) of the homes just the father goes, in thirty percent (30%) of them only the mother and in twenty one percent both attend.

The main reason why the father goes to the school is to find out about the grades or for cultural activities. Some are required to be at school because their children misbehaved. Mothers state that they attend the community work sessions that have to be done at school such as classroom building, building houses for teachers, school breakfast and feeding.

Parents give importance to primary education because it is necessary that their children “learn to read and write”, others expect that their children “improve themselves and be better than

their parents”, they also would want that their children could be admitted in secondary education somewhere else.

When they were asked about the damage that means the fact that their children do not study they say “there is no time for helping in working the land”, even if this answer was pretty infrequent, it shows how the rural parents feel.

Specifically, they state that the loss that implies sending their daughters to school is that “there is no one to help in working the land”, “the teacher gives homework”, “they reach a certain age and they get married or have children”, “they do not seize the opportunity”. On the other hand, they state that the loss that implies sending their (male) sons to school is that “they have no time for helping in working the land”.

IV CONCLUSIVE REMARKS AND RECOMMENDATIONS

This paper analyzed three questions related to rural children primary education: enrollment, attendance and spatial distribution of children who face abnormal enrollment.

It has found that the probability of enrollment is less for children that have overage in a specific grade. It was interpreted as an indicator of recurrent economic troubles that force to households to send all their children to school but not all of them simultaneously. It could be the result of economic cycles that make hard to return to study after some time out of school. In this sense, overage would be an indicator of the average rural household’s income variability. In this case, policy implications should not focus only on education as a public service, but should be oriented also to resolve the economic problems of rural household.

Despite the economic difficulties that face most of the rural households, educative expenditures are a good predictor for enrollment, both for boys and girls. It could be interpreted as a rural household’s clear preference for primary education for all their children. Certainly private cost of education is not an obstacle. Another related outcome is that poverty by income is not a significant variable in most of models performed, but it is a barrier just in case of inactive girls.

Per capita income becomes a significant predictor for non-enrollment in case of girls, both active and inactive. It could be an indicator of a phenomenon that was also found in other studies. In fact, Economía y Sociedad srl (2001) has found that both more prosperous and less prosperous Bolivian rural households show less enrollment rates, in the first case because they have more economic activity for household’s members; for example taking care of animals, which is usually a girl’s responsibility; so as higher per capita income is less probability of female enrollment. Because having animals also implies a kind of savings, they should be looked after. A relevant policy implication in this point is related to coverage of financial system, which is almost urban.

In general, to be younger than other members of household is an important determinant of enrollment, so in this way policy implications could be oriented toward initial or pre-scholar education, which is also an important factor associated with better educative performance.

As labor participation is usually high in Bolivian rural context, even for children at primary school age, to be employed seems that are not an obstacle for enrollment, but for sure a barrier is the total worked hours. In fact, both active boys and girls have less probability of being

enrolled as long as they work day. But children's work day perhaps is also as volatile as household's income is.

As it was expected, mother's education is a good predictor for female enrollment. Empirical evidence shows that bias by gender is not actually a problem at the moment, but it was a problem before. So, today less educated rural mothers have less ability for supporting their children's studies, but it is a result of observed bias in the past. Perhaps a policy implication is to keep enrollment to school without any bias by gender.

The second question that was answered is related to attendance given that a child had been enrolled. It was found that 99% of enrolled boys and girls attend also primary school normally. The younger is a person higher is her probabilities of attend primary school. It is the same as high is household's educative expenditure. On the contrary, overage is again a predictor of non-attend as it happens with worked hours and a dummy for girls. Even though this last result is a bias against girls, it is useful to keep in mind that almost all enrolled children in primary school also attend it. There is no really any important difference between enrollment and attendance.

Even though mother's education was expected as a predictor of greater probability of attendance, amazingly it is a variable negatively associated with the probability of attendance. Perhaps this is not exactly an odd outcome because it is possible that a more educated mother could have a clear preference for urban education and not a rural one. It could happen the same with another predictor related to the mother, in this case a dummy that is equal one if mother's language is Spanish, which in rural area is negatively associated with the probability of attendance.

Certainly there is no serious problem of enrollment or attendance in Bolivian rural area, but it was found a problem that is rural education's extremely low quality. Educative quality is usually measured by standardized exams, as the Educative Quality Assessment System (SIMECAL) has done several times. According to empirical evidence provided by SIMECAL, rural education's quality is clearly lower than urban one. It is considered one of the most important problems, much more important than a numeric approach in terms of enrollment and attendance. This is a problem both for monolingual and bilingual rural education. The former is a Spanish education that shows outcomes assessed by a standardized exam with an average of correct answers less than urban average in approximately 5 or 8 points over 100. The last is a bilingual education in an indigenous language and Spanish. In turn, another SIMECAL standardized test has shown that 42% of students that had been educated in Aymara and Spanish has not be able to write absolutely nothing in their own language, in this case Aymara. It also has happened with the 27% of students who were educated in Quechua and Spanish and with the 38% of students previously educated in Guaraní and Spanish.

The empirical evidence about rural education showing that the core of rural education's problems is low quality, means a serious trouble taking into account that an ambitious educative reform was put in place in 1994, which has become a very expensive program whose benefits are not as clear as increased public educative budget. Obviously policy implication here is to increase rural education's quality, which is supposed was the main goal of Educative Reform.

The policies should consider the associated factors that improve educative quality. For example, mother's years of education, bilingual education and access to pre-school education, seem to be very important in order to achieve better educational outcomes.

About spatial distribution of abnormal enrollment, according to the municipal database that was constructed, less than 3% of Bolivian children at primary scholar age live in municipalities where an abnormal enrollment exist, having abnormal school enrollment rate for both boys and girls. Certainly, empirical evidence shows that at primary education level there is not any relevant gender gap, but it is clear that it is a problem as people are older than 20 years old, because a relevant gender gap emerge.

Finally, our main conclusive remark is oriented to redefine some policies' targets, mainly trying to take into account a huge and increasing welfare gap between urban and rural contexts in Bolivia, but also, keeping in mind that the true problem of Bolivian rural education is quality.

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Gender and Education in Rural Primary Education: Attendance, Performance and Parental Perceptions.

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Gender and Education in Rural Primary Education: Attendance, Performance and Parental Perceptions.

**Martín Benavides and Hugo Ñopo
GRADE**

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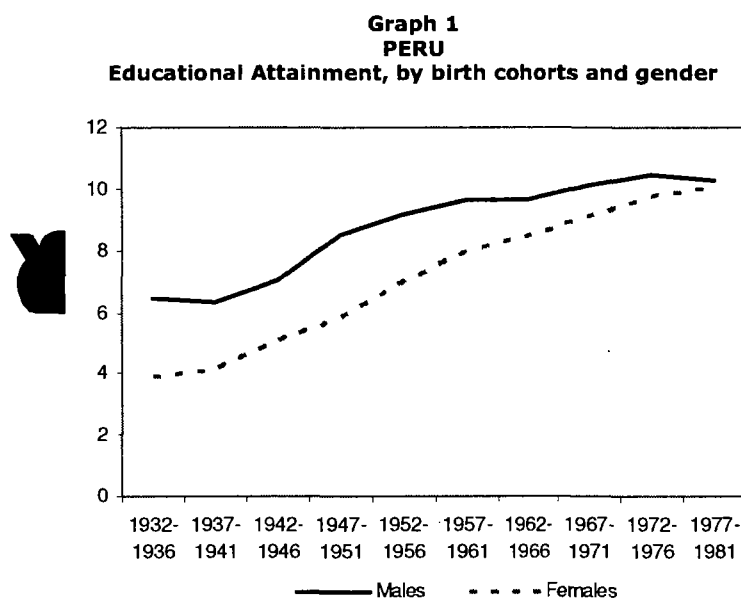
1. Gender and primary education: assistance, performance and beyond

1.1 Some quantitative indicators

The Peruvian society has made important progress lately in expanding education, especially at the primary level. For example, while half of the persons who were born in the 30's did not have education at all or only incomplete primary, only 20% of those who were born in 1970 have that condition (Valdivia, M. and Saavedra, J, 2000). Years of education for the population 15 years old or more changed from an average of 2 in 1940, to 6 in 1981, to 8 in 1996 and to 8.7 in 1999 (Escobal, Saavedra and Torero, 1998)

As a result, gender inequalities have been decreasing for the recent generations. According to Guadalupe, gender parity in enrollment has been achieved in primary education, in contrast to secondary education (Guadalupe, 2002). Gender differences in years of education are almost inexistent for the younger, despite that illiteracy is still a problem among adult women (17.6% in comparison to 6% of men).

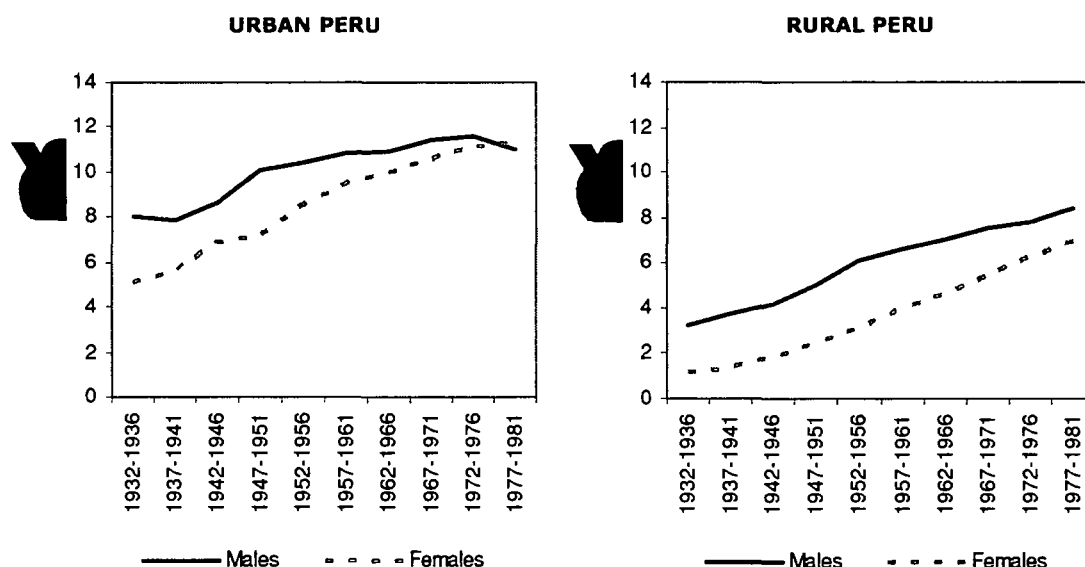
Our own analysis confirms these previous findings. As it can be seen in Graph 1 the gap between males and females in years of education has been reducing over time, especially for the cohorts born after the fifties.



Source: National Household Survey (2002 iv)

However, that change over time seems to be more prevalent in urban settings than in rural ones. It seems that in rural areas the attitudes toward gender are still limiting the achievement of equality. Only for the younger cohorts (born between 1972 and 1976) the gap in rural settings has begun to close (see next graphs).

Graphs 2a and 2b
URBAN AND RURAL PERU
Educational Attainment, by birth cohorts and gender



Source: National Household Survey (2002 iv)

At the same time, in terms of educational indicators (see Appendix 1 for a detailed description of these indicators) only small gender differences appear in primary education (the focus of our analysis). However there are clear differences for all the indicators when comparing urban and rural settings. In general gender differences are smaller than their urban-rural counterparts (see Table 1). The pattern of gender differences within rural population follows the national trend.

Table 1
URBAN AND RURAL PERU 2001 – 2002 - PRIMARY EDUCATION
Enrollment, Attendance, Overage and Approval Rates

	Net Enrollment Rate	Net Attendance Rate	Overage Rate	4th grade Approval Rate	6th grade Approval Rate
Primary Education	92.07	49.00	34.79	90.38	96.75
Urban	92.41	54.37	24.77	93.31	97.98
Rural	91.61	41.97	46.79	86.89	95.02
Boys	92.46	49.16	35.20	90.20	96.63
Girls	91.67	48.82	34.37	90.57	96.88
Rural boys	91.90	42.26	47.88	87.00	94.98
Rural girls	91.34	41.69	45.69	86.77	95.07

Source: National Household Survey (2001iv and 2002iv) and School Census (2002)

Gender differences in primary educational achievement have also been studied. In despite of not being comparable, the results of the three national evaluations (1996, 1998, 2001) show consistently that boys do better than girls in Mathematics, but the differences are small. Only the differences between the average performance of boys and girls in 1998 and 2001 have been reported as statistically significant. For the year 1996 we do not have that information. In two of the evaluations (1998 and 2001), the results show also that boys do better in Mathematics and girls in Communication.¹ Those differences continue to hold even after controlling by other family and school characteristics (World Bank, 1999; Benavides, 2002; Caro et al. 2003). Also the pattern of differences between boys and girls in 1998 and in 2001 (in mathematics and communication) is the same in public and non-public schools. Boys do better in Mathematics and girls in Communication and language in both types of schools.

1.2 Beyond quantities: school materials, teachers and family dynamics

The link between gender and education does not involve only issues of access and school performance. We believe that the problem of gender goes beyond that. Recently, the literature has stated that the reproduction of gender inequalities is related to the social construction of expectations, for instance through school materials. The images presented in materials and school notebooks may have an impact on the self-esteem of girls (Anderson, 1983; Espinosa, 2004). In order to analyze that problem, we did an analysis of the contents of school materials. Our purpose was to identify the hidden, implicit and latent gendered messages in the school textbooks of Language and Communication and Social Personal of fourth and sixth grade. Such messages are understood as symbolic and ideological dimensions involved in the reproduction of gender roles in our society. The specific questions that this study addressed were: how boys and girls are demographically represented in the images of the books; are they doing the same activities and expressing the same attitudes or it is possible to find some kind of segregation/specialization²?

Table 2 presents the results; we found that there is a gender bias in the representation of men and women. For example, in the Communication textbook of 4th grade, we found that men appear in 63% of the images and in 6th grade they appear in 75% of the images. This analysis shows that gender biases in the books appear explicitly in the demographic dimension.

¹ In 2001 evaluation the differences were bigger in Mathematics than in Communication.

² In appendix 2 we describe our categories of analysis.

Table 2
Gender Participation in the Images of 4th and 6th Grade Textbooks

	4th grade		6th grade	
	Language Text Book	Social-Personal Text Book	Language Text Book	Social-Personal Text Book
Men	63.10	57.25	75.80	68.70
Women	36.90	42.75	24.20	31.30
Total	100	100	100	100

Another component of our analysis explores the activities segregation of boys and girls showed in the images. In Language and Communication there is segregation in both grades especially in the school related category. This reinforces the idea that knowledge is privative of men in that kind of activities (men are more represented than women). It is also important to notice that domestic activities are less represented in the textbook and that women are proportionally more involved in leisure activities in the images than men.

As can be observed in the next tables, there are differences between fourth and sixth grade, especially in the Social-Personal textbook. Also, is important to note that in two of the categories ("Leisure" and "Family") there is not segregation. However in both grades there are strong differences in the labor activities, more in sixth than in fourth grade.

Table 3
Language Textbook – 4th Grade of Primary Education
Distribution of Males' and Females' Images in Different Activities

Kind of activity	Males		Females	
	(N)	(Percentage)	(N)	(Percentage)
Domestic	1	0.65	1	1.75
School Related	49	31.82	12	21.05
Familiar-Affective	6	3.90	3	5.26
Labor	6	3.90	2	3.51
Leisure	74	48.05	31	54.39
Other	18	11.69	8	14.04
Total	154	100.00	57	100.00

Table 4
Language Textbook – 6th Grade of Primary Education
Distribution of Males' and Females' Images in Different Activities

Kind of activity	Males		Females	
	(N)	(Percentage)	(N)	(Percentage)
Domestic	0	0.00	1	4.35
School Related	31	44.29	3	13.04
Familiar-Affective	1	1.43	2	8.70
Labor	5	7.14	3	13.04
Leisure	26	37.14	12	52.17
Other	7	10.00	2	8.70
Total	70	100.00	23	100.00

Table 5
Social-Personal Textbook – 4th Grade of Primary Education
Distribution of Males' and Females' Images in Different Activities

Kind of activity	Males		Females	
	(N)	(Percentage)	(N)	(Percentage)
Domestic	3	6.82	5	15.15
School Related	10	22.73	5	15.15
Familiar-Affective	11	25.00	9	27.27
Labor	9	20.45	1	3.03
Leisure	10	22.73	11	33.33
Other	1	2.27	2	6.06
Total	44	100.00	33	100.00

Table 6
Social-Personal Textbook – 6th Grade of Primary Education
Distribution of Males' and Females' Images in Different Activities

Kind of activity	Males		Females	
	(N)	(Percentage)	(N)	(Percentage)
Domestic	0	0.00	1	2.78
School Related	3	4.05	1	2.78
Familiar-Affective	4	5.41	2	5.56
Labor	28	37.84	9	25.00
Leisure	22	29.73	11	30.56
Other	17	22.97	12	33.33
Total	74	100.00	36	100.00

Our results are consistent with previous analysis (Anderson, 1983). School materials continue to present a world where more men exist than women, and this biased representation increases for the advanced grades. This could be related to the progressive elimination of the domestic activities in the textbooks at the same time that the labor activities where men are over represented are more prevalent in advanced grades. One positive trend, however, is the representation of men expressing attitudes normally related to girls. There is more equality in the attitudinal dimension. The reproduction of gender stereotypes is more related to segregation of activities than segregation of attitudes, but this is not as accentuated as the demographic representation. Gender roles are represented in a stereotyped manner, but not in the magnitude they were before³.

Another perspective states that teachers and families also play a role in the reproduction of gender inequalities. For teachers, some scholars agree that school practices, stereotyped rituals, and teachers' lower expectations towards girls can also play a role in the future reproduction of gender inequalities (Anderson, 1982, Espinosa, 2004). According to Ames (2004), this is particularly problematic in rural settings, because teachers do not see the value of investing energies in stimulating girls' learning, due to their lower expectations

³ An extended version of the qualitative analysis of school textbooks can be found in Appendix 2.

toward girl's performance. Other studies affirm, however, that the gender of the teacher is also important. If the teachers are females those bias against girls can diminish (Rose and Al-Samarrai 2001).

On the other hand, there is evidence that familiar cultural practices play a role on gender inequality. Parents make decisions toward school based on perceptions about sons' and daughters' opportunities to have good jobs in the future. For this reason, based on their values and perceptions, they are more likely to educate sons than daughters (Buchmann, 2000). Those family decisions are not only related to labor market constraints but also to perceptions about innate characteristics of sexes. For example parents can believe that men are more intelligent than women and they have more ability. Those decisions, however, are mediated with the educational experience of fathers and mothers. According to Al-Samarrai, girls have more probabilities to assist to schools if mothers know how to read and write. In general, educated parents give more value to education and therefore they want both sons and daughters to assist to schools (Buchmann, 2000).

There are other demographic characteristics that can also play a role in those decisions. These kind of decisions can also be influenced by the resources the families and the number of children they have to distribute those resources.. Those who have more probabilities to drop out schools are the older brothers (Rose and Al-Samarrai , 2001) or sisters. In rural Perú it has been studied that the age of a girl and the position in the family, as well as the absence of one of the parents has negative influence over girls' school experience. (Ames, 2004)

2. The purpose of this paper

Gender inequalities exist not only for assistance and performance but also, as the literature suggests, for school and family dynamics. Even though in Peru we have macro level data on attendance and performance, we still have doubts about how gender is related to those variables in rural settings. As we mentioned before, gender inequalities have been reducing at a slower rate in rural places. One of the purposes of this paper is then to analyze if gender still plays a role in attendance and performance in rural primary education.

We also address the issue of parental perceptions related to gender. This is a topic that has not been studied in the country. How stereotyped are parental perceptions about gender issues? How rooted they are in the culture of parents? How homogeneous are mothers and fathers in those perceptions?

In this paper we explore hypothetical parental decision-making. For example, decisions related to the access to higher education. Our working hypothesis is that whenever families have binding constraints, they tend to make decisions on a gender-biased way.

In order to analyze attendance and performance in primary education, parental perceptions hypothetical decision making, we have collected data in rural households. The issues of assistance, performance and drop out are addressed with information of students in our

sample and their families. Our survey was previously tested in other rural settings. The survey has four parts: one general to be answered by the person who knows more about the children, one for the mother (or women in charge), one for the father (or men in charge) with the same questions, and finally one for children

The issue of perceptions is addressed by analyzing parental responses to questions related to a stereotyped image that is part of a primary textbook (see Appendix 3 for the image and coding we use). Finally, the issue of hypothetical decision-making is addressed by looking at parental responses to the following question: "Let's assume that you have two children, a boy and a girl, who have finished school and who want to study at an institute or at a college. If you had enough money to send only one of them to study, who would you send?"

3. Our approach to understand the gender dynamics in the school world

3.1 The sample design

Our units of analysis are the households. Since we had no sample framework from which extract the households to visit, we took a two-step sample design. The first step in the sampling procedure involved choosing schools. In a second step, we selected random samples of children whose households were then surveyed⁴.

A previous step in our approach required us to identify the departments with the widest education gender gaps. It is important to notice the way in which gender gaps were computed. For the attendance, enrollment and approval rates (where having a larger rate is "better" than having a small one), the gender gap is defined as the difference between the males' rate from the females' one. Thus, a larger gap can be associated to situations in which boys performed better than girls. The case of the over-age and annual drop-out rates is different. Since a larger over-age or annual drop-out rate does not denote a better situation than having a small one, the gender gap was defined in the opposite way than in the previous case. Thus, a larger gap in these two rates can also be associated to situations where boys performed better than girls. The following table shows those gaps between departments:

⁴ For this reason our analysis is not concentrated in indicators of enrollment. Approximately 4% of children in rural Perú are not enrolled in primary education. Not significant differences seem to exist between boys and girls, at least following national data. (See Appendix 4)

Table 7
RURAL PERU 2001-2002 – PRIMARY EDUCATION
Enrollment , Attendance and Overage Rates, by Department

Department	COVERAGE														
	Net Enrollment Rate					Net Attendance Rate					Overage Rate				
	Boys	Girls	(B-G)	Partial Index	n	Boys	Girls	(B-G)	Partial Index	n	Boys	Girls	(G-B)	Partial Index	n
Amazonas	86.9	81.0	5.9	0.29	23	35.3	45.1	-9.8	-0.33	4	56.7	39.2	-17.5	-0.38	4
Ancash	92.0	93.1	-1.1	-0.05	8	34.2	38.6	-4.5	-0.15	6	61.8	56.5	-5.3	-0.12	11
Apurimac	93.7	94.2	-0.6	-0.03	10	41.6	40.0	1.5	0.05	16	47.3	48.8	1.4	0.03	15
Arequipa	97.1	97.0	0.1	0.00	12	61.0	53.9	7.1	0.24	20	29.8	35.5	5.7	0.12	18
Ayacucho	93.5	89.9	3.6	0.18	19	50.5	39.1	11.4	0.38	24	44.7	49.6	4.9	0.11	17
Cajamarca	93.4	93.3	0.1	0.01	13	39.7	44.2	-4.5	-0.15	7	49.8	49.7	-0.1	0.00	14
Cusco	91.2	87.9	3.3	0.17	18	42.0	32.8	9.2	0.31	22	53.7	52.0	-1.7	-0.04	12
Huancavelica	94.8	89.5	5.3	0.26	22	37.8	39.6	-1.8	-0.06	11	52.1	46.7	-5.4	-0.12	10
Huánuco	87.8	91.5	-3.7	-0.18	2	32.0	35.4	-3.4	-0.11	9	58.2	51.4	-6.9	-0.15	8
Ica	95.8	95.8	0.0	0.00	11	40.5	44.5	-4.0	-0.13	8	43.3	31.6	-11.7	-0.25	5
Junín	91.1	90.4	0.7	0.04	15	49.7	44.7	5.0	0.17	19	33.6	41.6	8.0	0.17	21
La Libertad	84.4	86.2	-1.8	-0.09	5	42.5	44.3	-1.8	-0.06	12	55.1	49.2	-5.9	-0.13	9
Lambayeque	91.1	84.9	6.2	0.31	24	52.1	41.3	10.8	0.36	23	24.4	37.1	12.7	0.28	22
Lima	94.6	90.1	4.6	0.23	20	44.5	43.4	1.1	0.04	15	24.5	38.0	13.4	0.29	24
Loreto	95.6	94.2	1.3	0.07	17	41.7	42.2	-0.5	-0.02	13	57.3	49.5	-7.7	-0.17	7
Madre de Dios	90.8	93.8	-3.0	-0.15	4	35.3	48.4	-13.1	-0.44	3	47.1	18.2	-28.9	-0.63	2
Moquegua	88.0	91.2	-3.2	-0.16	3	46.1	61.1	-15.0	-0.50	2	25.4	24.1	-1.3	-0.03	13
Pasco	92.2	91.1	1.1	0.05	16	40.0	45.2	-5.3	-0.18	5	45.5	49.2	3.7	0.08	16
Piura	93.6	93.3	0.3	0.02	14	45.0	46.9	-1.9	-0.06	10	56.8	45.9	-10.9	-0.24	6
Puno	91.0	92.6	-1.6	-0.08	6	42.7	42.4	0.3	0.01	14	35.8	43.6	7.8	0.17	20
San Martín	92.3	93.1	-0.8	-0.04	9	51.2	43.8	7.4	0.25	21	31.2	44.1	13.0	0.28	23
Tacna	98.0	93.1	4.9	0.25	21	69.0	64.4	4.6	0.16	18	28.3	7.3	-21.0	-0.46	3
Tumbes	86.1	100.0	-13.9	-0.69	1	49.3	67.9	-18.6	-0.62	1	55.6	23.1	-32.5	-0.71	1
Ucayali	94.3	95.5	-1.2	-0.06	7	38.8	36.0	2.8	0.09	17	42.3	48.3	5.9	0.13	19
	Min Gap -13.9 Max Gap 6.2 Range 20.0					Min Gap -18.6 Max Gap 11.4 Range 30.0					Min Gap -32.5 Max Gap 13.4 Range 45.9				

Source: National Household Survey (2001iv and 2002 iv)

Table 8
RURAL PERU 2001-2002 – PRIMARY EDUCATION
Approval Rates, by department

Department	PERFORMANCE									
	4th grade Approval Rate					6th grade Approval Rate				
	Boys	Girls	(B-G)	Partial Index	n	Boys	Girls	(B-G)	Partial Index	n
Amazonas	81.6	81.8	-0.2	-0.02	12	93.9	94.7	-0.8	-0.07	8
Ancash	73.0	72.0	1.0	0.07	18	81.7	81.6	0.0	0.00	14
Apurímac	72.6	70.3	2.3	0.17	22	82.2	80.3	1.9	0.17	21
Arequipa	81.1	82.6	-1.5	-0.11	6	90.4	90.3	0.1	0.01	15
Ayacucho	77.1	74.6	2.5	0.18	23	87.0	84.4	2.5	0.22	23
Cajamarca	84.2	84.6	-0.4	-0.03	10	94.0	94.2	-0.2	-0.02	12
Cusco	72.2	71.5	0.7	0.05	17	85.1	85.3	-0.2	-0.02	13
Huancavelica	79.9	76.2	3.7	0.26	24	89.3	87.6	1.8	0.16	20
Huánuco	79.8	78.0	1.8	0.13	20	90.4	90.1	0.3	0.03	16
Ica	80.2	86.6	-6.3	-0.46	3	94.2	93.4	0.7	0.06	18
Junín	78.0	78.3	-0.3	-0.02	11	88.9	90.1	-1.1	-0.10	6
La Libertad	84.4	84.4	0.0	0.00	13	92.7	93.1	-0.4	-0.04	10
Lambayeque	79.6	79.6	0.0	0.00	14	88.6	90.1	-1.5	-0.14	5
Lima	84.5	88.1	-3.7	-0.26	4	88.8	90.5	-1.7	-0.15	4
Loreto	74.4	75.7	-1.3	-0.09	7	89.2	89.5	-0.4	-0.03	11
Madre de Dios	76.3	76.0	0.4	0.03	16	83.7	86.7	-3.0	-0.27	2
Moquegua	85.2	83.6	1.7	0.12	19	95.1	91.7	3.4	0.30	24
Pasco	84.1	85.2	-1.1	-0.08	8	92.3	95.1	-2.8	-0.25	3
Piura	83.1	84.8	-1.7	-0.12	5	95.9	96.8	-0.8	-0.07	7
Puno	83.0	81.0	2.0	0.14	21	91.7	90.1	1.6	0.15	19
San Martín	81.0	80.9	0.1	0.00	15	92.6	93.3	-0.7	-0.07	9
Tacna	73.5	80.3	-6.8	-0.49	2	77.2	85.1	-7.9	-0.70	1
Tumbes	81.3	91.5	-10.2	-0.74	1	94.5	92.1	2.4	0.21	22
Ucayali	79.0	79.5	-0.5	-0.03	9	92.5	91.9	0.6	0.06	17
	Min Gap -10.2					Min Gap -7.9				
	Max Gap 3.7					Max Gap 3.4				
	Range 13.9					Range 11.2				

Source: School Census (2002)

As the previous tables show, there are important differences across departments. In order to determine which departments have the largest gender gaps in access and performance indicators we constructed an index. This index was defined considering not only the gender differences in terms of access to the system, but also in terms of the performance of the students. The indicators utilized to evaluate the gender gap in terms of access were the net enrollment, attendance and overage rates. The indicators utilized to evaluate the gender gap in terms of performance were the approval rates for the fourth and the sixth grade of primary education. The selection of these indicators was made considering the analysis of the Reliability Coefficient Alfa (see Appendix 5 for details).

Once we determined which indicators will define the index and estimated the gender gaps for all of them and for each one of the departments, we then calculated for each department the ratio between its gender gap and the range (the difference between the maximum and minimum value) for all the indicators. This ratio is what we call partial indexes for each department. Thus, these partial indexes permit us not only to rank the departments according to their gender gap, but also to let us know about the differences in the size of the gender gap between departments. Table 2 shows the gender gaps and partial indexes.

After we constructed the partial indexes for each department, we aggregated the information in two indexes. The Access Index is the addition of the overage rate, net enrollment and attendance rates partial indexes. In the same way, the Performance Index is the addition of the partial indexes estimated for the approval rates for the fourth and sixth grades. Since the gender gaps are constructed in order to obtain a bigger (positive) gap when boys' situation is better than the one for girls, the access and performance indexes will also have larger values when the boys' situation is better than the one for the girls. Access and performance indexes for each department are displayed in Table 3.

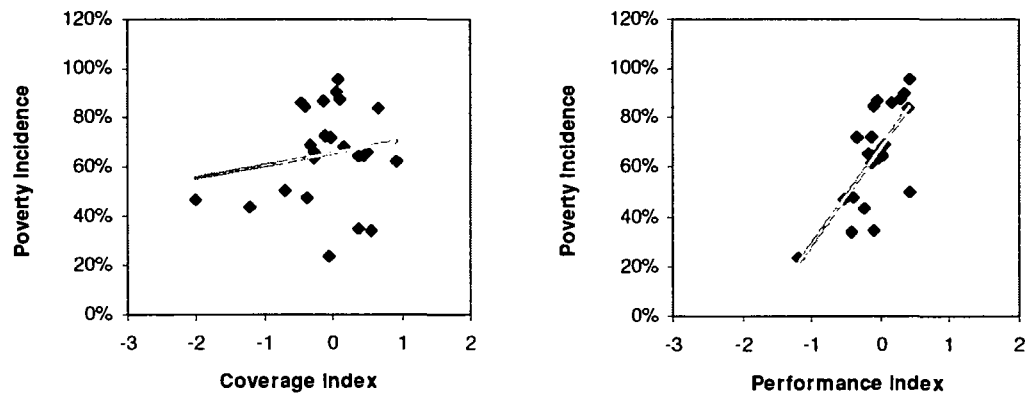
Table 9
RURAL PERU 2001-2002 – PRIMARY EDUCATION
Coverage and Performance Index, by Department

Department	Net enrollment rate Index	Net attendance rate Index	Overage rate Index	COVERAGE INDEX	4th grade Approval Rate Index	6th grade Approval Rate Index	PERFORM. INDEX
Amazonas	0.29	-0.33	-0.38	-0.41	-0.02	-0.07	-0.09
Ancash	-0.05	-0.15	-0.12	-0.32	0.07	0	0.07
Apurímac	-0.03	0.05	0.03	0.05	0.17	0.17	0.34
Arequipa	0	0.24	0.12	0.37	-0.11	0.01	-0.1
Ayacucho	0.18	0.38	-0.11	0.66	0.18	0.22	0.4
Cajamarca	0.01	-0.15	0	-0.15	-0.03	-0.02	-0.05
Cusco	0.17	0.31	-0.04	0.44	0.05	-0.02	0.04
Huancavelica	0.26	-0.06	-0.12	0.08	0.26	0.16	0.42
Huánuco	-0.18	-0.11	-0.15	-0.45	0.13	0.03	0.16
Ica	0	-0.13	-0.25	-0.39	-0.46	0.06	-0.39
Junín	0.04	0.17	0.17	0.38	-0.02	-0.1	-0.12
La Libertad	-0.09	-0.06	-0.13	-0.28	0	-0.04	-0.03
Lambayeque	0.31	0.36	0.28	0.94	0	-0.14	-0.13
Lima	0.23	0.04	0.29	0.56	-0.26	-0.15	-0.41
Loreto	0.07	-0.02	-0.17	-0.12	-0.09	-0.03	-0.13
Madre de Dios	-0.15	-0.44	-0.63	-1.22	0.03	-0.27	-0.24
Moquegua	-0.16	-0.5	-0.03	-0.69	0.12	0.3	0.42
Pasco	0.05	-0.18	0.08	-0.04	-0.08	-0.25	-0.33
Piura	0.02	-0.06	-0.24	-0.28	-0.12	-0.07	-0.19
Puno	-0.08	0.01	-0.17	0.1	0.14	0.15	0.29
San Martín	-0.04	0.25	0.28	0.49	0	-0.07	-0.06
Tacna	0.25	0.16	-0.46	-0.06	-0.49	-0.7	-1.19
Tumbes	-0.69	-0.62	-0.71	-2.02	-0.74	0.21	-0.52
Ucayali	-0.06	0.09	0.13	0.16	-0.03	0.06	0.02

Source: National Household Survey (2001iv and 2002 iv) and School Census (2002)

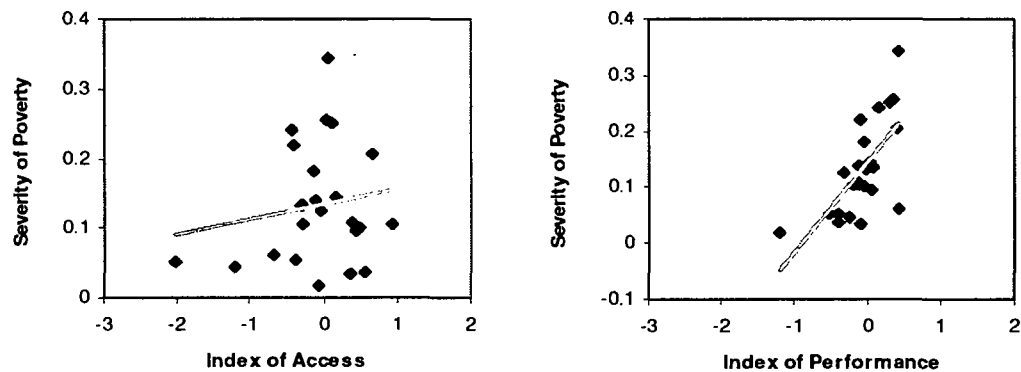
In the first part of the paper we reported that gender gaps were small, even within the rural sector. This analysis tells us that it is also important to consider differences across departments in gender gaps in rural Perú. For instance regional differences in gender gaps can be accounted by poverty indicators. The following graphs show that departments with more proportion of poor or more severity of poverty are at the same time those that have the bigger gaps according to the index of access and performance.

Graphs 3a and 3b
RURAL PERU 2001-2002 – PRIMARY EDUCATION
Relation between the Indexes and departmental poverty incidence



Source: National Household Survey (2001iv and 2002 iv), School Census (2002) and Poverty Map – MEF (2001)

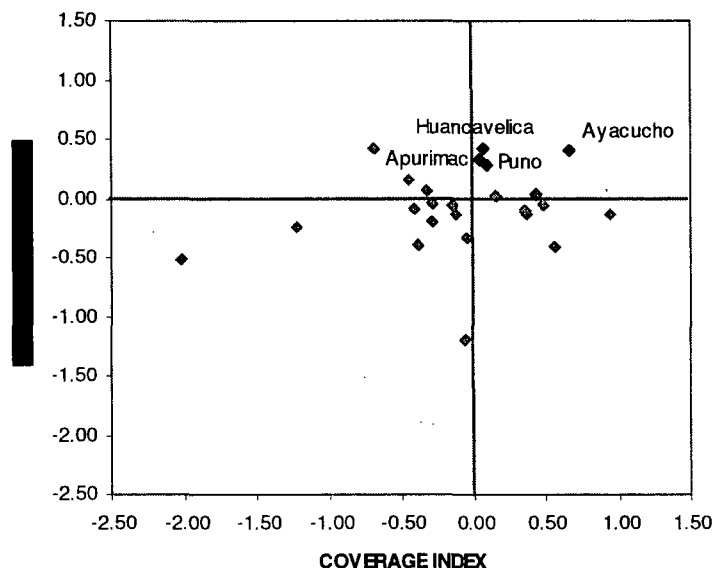
Graphs 4a and 4b
RURAL PERU 2001-2002 – PRIMARY EDUCATION
Relation between the Indexes and Severity of Poverty



Source: National Household Survey (2001iv and 2002 iv), School Census (2002) and Poverty Map – MEF (2001)

The next step to determine the sample was to identify which departments have the worst situation in both indexes. We can see these departments by means of a plot. In Graph 5 it can be observed that Apurímac, Ayacucho, Huancavelica and Puno have the largest positive indexes, since their distances from the origin (0,0) are the largest. Then, following our indexes, the survey was carried out in these cities.

Graph 5
Coverage Index and Performance Index, by department



Source: National Household Survey (2001 iv and 2002 iv) and School Census (2002)

The second step was to select the schools from which to choose the children whose households would compose the sample. The universe from which we selected the sample was composed of public and parochial primary schools with at least one student enrolled in third grade in 2003 (schools devoted to primary education for adults were not part of the universe). We planned to visit approximately 500 households on each department, so the total sample would have approximately 2000 households. The procedure began with the random selection of districts where 15% of the schools were also randomly chosen, with rounding to the next integer. This means that even if a district had only one school, this one is part of the sample.

The next step was to randomly select up to twelve children (six boys and six girls) enrolled in fourth grade within each selected school. The number of students we expected to find in fourth grade was determined by the number of students enrolled in third grade in 2003, according to the information given by the Ministry of Education⁵.

However, it was very likely to find fewer children than the number reported by the Department. Three factors can explain this fact: over-declared enrollment (in the census), repetition, and drop-out. Once we consider these three factors, the over-sampling turns out necessary. Thus, in each department we extended the sample of schools by 20% (10% due to the over-declared enrollment, 3% due to the difference between the repetition rates in third and fourth grade, and 7% due to the drop out rate). The extension of the sample was randomly determined among the selected districts.

⁵ The data set can be found in the Ministry of Education web page. www.minedu.gob.pe

At the schools we selected six boys and six girls, whenever possible. If there were less than six boys (or less than six girls) we selected as many boys (or girls) as possible.

3.2 The resulting sample: some characteristics

As it can be seen in Table 4, we could not afford to get all the districts that were sampled, due to contingencies such as logistics problems or strikes in the schools. Approximately 70% of the planned sample was actually covered. (Appendix 6 shows maps for each state, with the coverage per district of the sample).

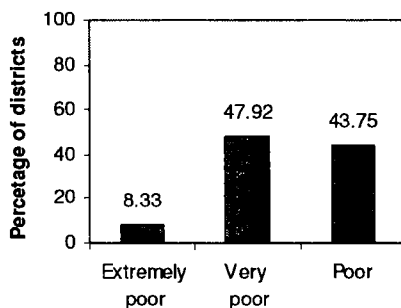
Table 10
RURAL PERU 2004
Resulting Sample: Coverage of districts, schools and households of the sample

	Apurímac	Ayacucho	Huancavelica	Puno	Total
Districts visited	19	17	15	19	70
Districts in sample	25	20	28	25	98
Percentage of districts covered	76.0	85.0	53.6	76.0	71.4
Schools visited	36	50	39	53	178
Schools in sample	64	71	77	76	288
Percentage of schools covered	56.3	70.4	50.6	69.7	61.8
Households visited	304	298	293	438	1333
Households in sample	500	500	500	500	2000
Percentage of households covered	60.8	59.6	58.6	87.6	66.7

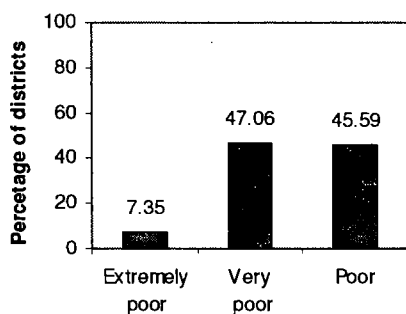
Given that problem we proceeded to check for the possible bias that these attrition problems may introduce. We analyzed whether the difference between the districts surveyed and those not surveyed could be accounted by poverty. At least according to poverty indicators, there was not strong evidence of biases, although the non-visited districts are poorer than those visited.

Graphs 6a, 6b and 6c
RURAL PERU 2004
Distribution of poverty incidence among sampled districts

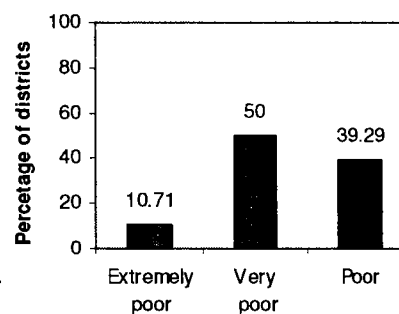
Total Sample



Visited Districts



Not visited districts



Source: Poverty Map – FONCODES (2000) , National Household Survey (2001 iv and 2002 iv) , School Census (2002) and resulting sample

In the following paragraphs we describe some characteristics of our sample. First, the sample has proportionally more multi-grade schools with two or more teachers than full grade or multi-grade with one teacher. Schools are also medium sized, with mode between 51 and 100 students⁶.

Table 11
RURAL PERU 2004
Type of school

	n	Percentage
Multigrade (one teacher)	41	23.16
Multigrade (two or more teachers)	97	54.80
Full grade	39	22.03
Total	177	100

⁶ In Appendix 7 it is possible to see a comparison with the statistics coming from the Department of Education for the same schools. The data from school came from a survey to the principals.

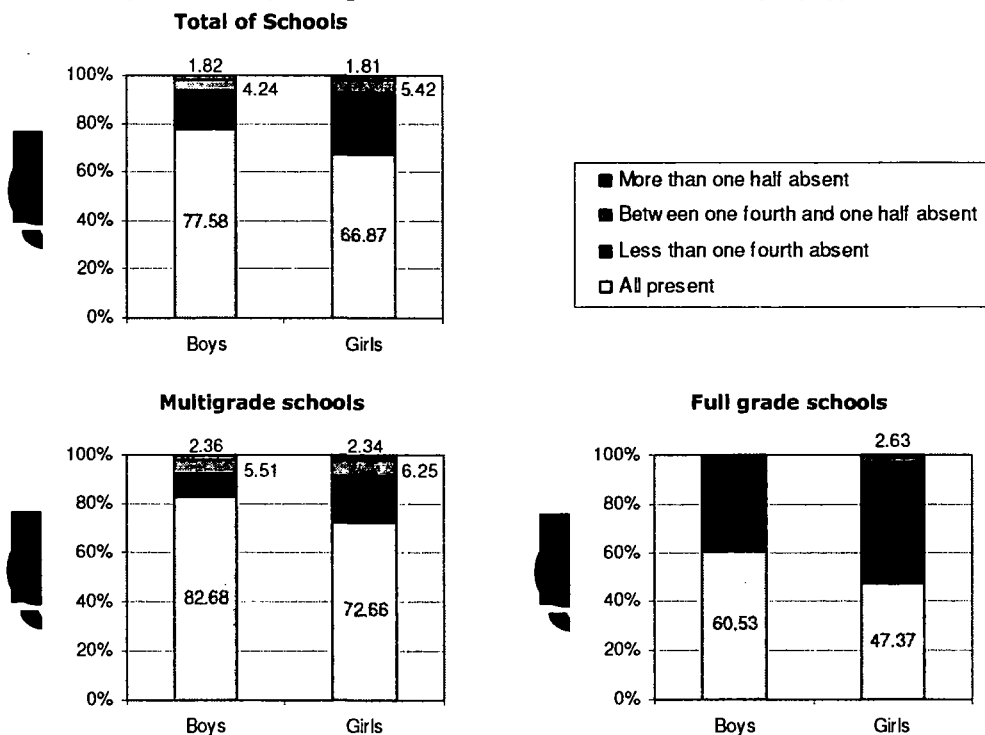
Table 12
RURAL PERU 2004
Number of primary students in the schools

	n	Percentage
Between 1 y 20	19	10.73
Between 21 y 50	56	31.64
Between 51 y 100	64	36.16
Between 101 y 200	21	11.86
More than 200	17	9.6
Total	177	100

In those schools, on average 7% of children enrolled in the fourth grade were absent on the Wednesday previous to the visit (5.94% of boys and 7.62% of girls). Regular assistance seems to be a problem in those schools, and girls are more absent than boys. Also in multigrade schools there are more students absent (approximately 7%) than in full grade ones (approximately 5%). The magnitude of the gender differences is the same within those kinds of schools.

On the other hand, in approximately 8% of multi-grade schools almost 75% of the students were absent on the previous Wednesday.

Graphs 7a, 7b and 7c
RURAL PERU 2004
Proportion of boys and girls who were absent last Wednesday, by type of school



Our sample of households has the following characteristics. We have 1331 “link” children (we use this term to refer to those kids that we found at schools), 2807 individuals enrolled in primary, 2458 between 7 and 12 and 1062 between 13 and 17. The proportion of boys and girls is almost the same in all the samples.

Table 13
Total number of children in resulting sample

	Apurimac	Ayacucho	Huancavelica	Puno	Total
Children enrolled in primary	647	629	648	883	2807
Boys	337	327	327	426	1417
	[52.09]	[51.99]	[50.46]	[48.24]	[50.48]
Girls	310	302	321	457	1390
	[47.91]	[48.01]	[49.54]	[51.76]	[49.52]
Children between 7 and 12 years old	566	538	545	809	2458
Boys	288	281	285	405	1259
	[50.88]	[52.23]	[52.29]	[50.06]	[51.22]
Girls	278	257	260	404	1199
	[49.12]	[47.77]	[47.71]	[49.94]	[48.78]
Children between 13 and 17 years old	253	185	235	389	1062
Boys	116	106	112	190	524
	[45.85]	[57.30]	[47.66]	[48.84]	[49.34]
Girls	137	79	123	199	538
	[54.15]	[42.70]	[52.34]	[51.16]	[50.66]
Link children	303	298	293	437	1331
Boys	153	155	147	218	673
	[50.50]	[52.01]	[50.17]	[49.89]	[50.56]
Girls	150	143	146	219	658
	[49.50]	[47.99]	[49.83]	[50.11]	[49.44]

Source: Resulting sample

In most of the cases both parents are present at the household (70.47%) and in charge of the child's education (67.99%). Additionally, it is more common to find a single-mother than a single-father present at the household (19% vs 3%) as well as in charge of the education of the children (20% vs 4%).

Table 14
RURAL PERU 2004
¿Do the parents live at the household?

Father	Mother		Total
	Yes	No	
Yes	938	45	983
	[70.47]	[3.38]	[73.85]
No	252	96	348
	[18.93]	[7.21]	[26.15]
Total	1,190	141	1,331
	[88.20]	[11.80]	[100]

Proportions in brackets

Table 15
RURAL PERU 2004
¿Are the parents in charge of the link child?

Father	Mother		Total
	Yes	No	
Yes	905 [67.99]	53 [3.98]	958 [71.98]
No	269 [20.21]	104 [7.81]	373 [28.02]
Total	1,174 [88.2]	157 [11.8]	1,331 [100]

Proportions in brackets

In most of the households, mothers and fathers have only primary education. Proportionally more fathers have secondary and higher education, and more mothers have no education (24% vs 7%). In these households 1 out of 4 mothers did not go to school and approximately 6 out 10 mothers and fathers got only primary education. It can also be seen that educated mothers have partners with similar educational level in most of the cases.

Graph 8
Educational Attainment of the parents

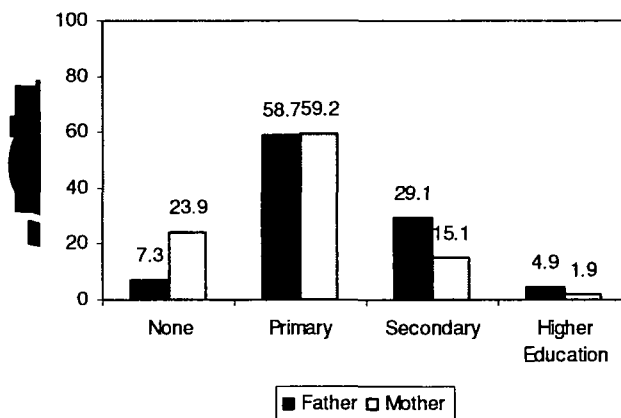


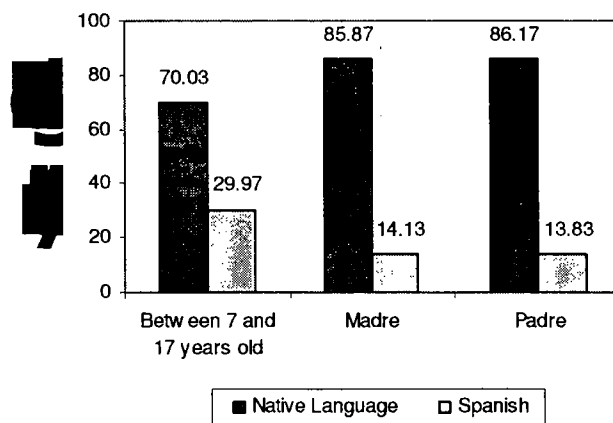
Table 16
RURAL PERU 2004
Educational Attainment of the parents
(only for households where both parents are present)

Father	Mother				Total
	None	Primary	Secondary	Higher	
None	51 [23.94]	13 [2.34]	1 [0.79]	0 [0.00]	65 [7.13]
Primary	142 [66.67]	378 [68.11]	18 [14.29]	1 [5.56]	539 [59.1]
Secondary	19 [8.92]	156 [28.11]	88 [69.84]	2 [11.11]	265 [29.06]
Higher	1 [0.47]	8 [1.44]	19 [15.08]	15 [83.33]	43 [4.71]
Total	213 [100]	555 [100]	126 [100]	18 [100]	912 [100]

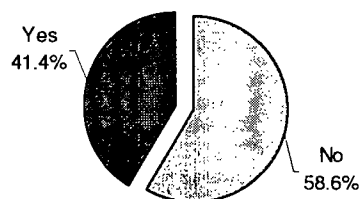
Proportions in brackets

Most of the households also have predominance of native mother tongue, not only for mothers and fathers, but also among individuals between 7 and 17 years old. At the same time 41 % of the households have access to electricity.

Graph 9
RURAL PERU 2004
Mother tongue of the household members

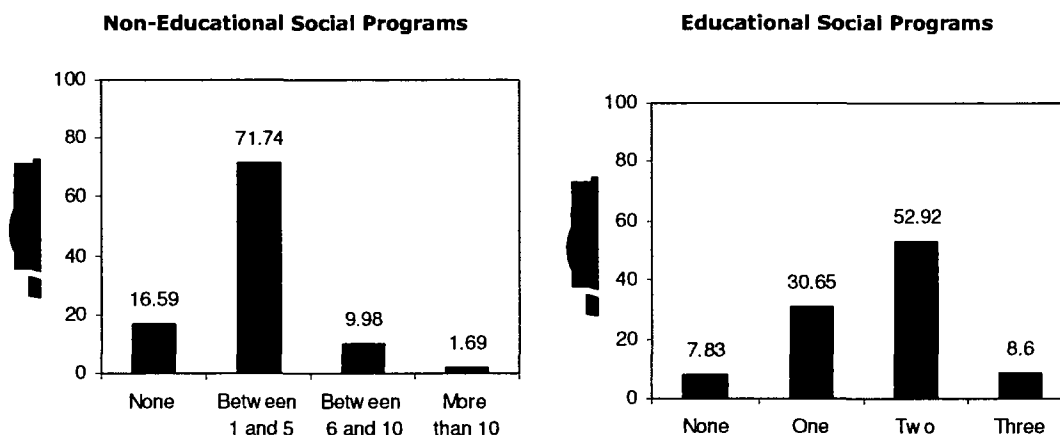


Graph 10
RURAL PERU 2004
Is there electricity at the household?



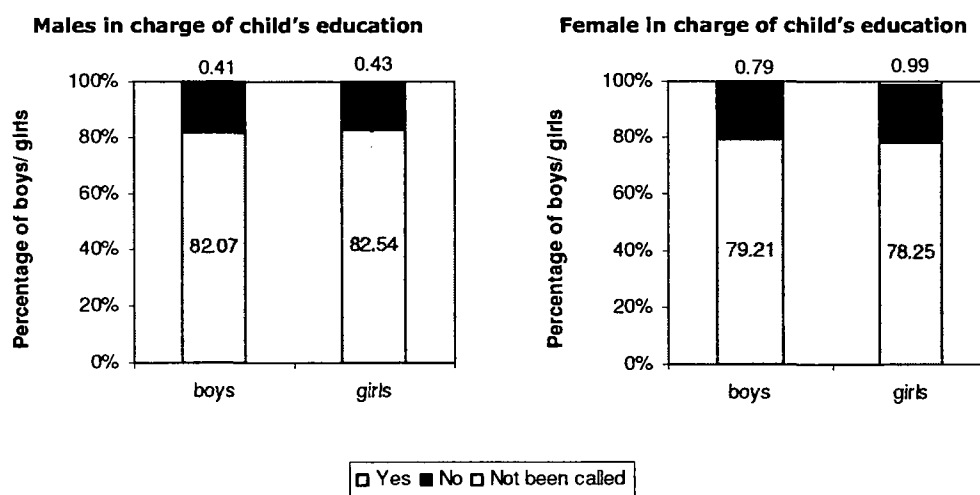
A majority of the households have at least one of its members with access to “social” or “educational programs”. In only 17% and 8% of the households no members have access to social and educational programs, respectively. More households have access to between 1 and 5 social programs and to 2 educational programs.

Graph 11a and 11b
Access to Social Programs



On the other hand, we don't find strong differences between males and females in charge in participation in the APAFA meetings⁷. Also there are no differences in participation according to the gender of the child.

Graphs 12a and 12b
Have you participated in APAFA meetings?
(Only for children enrolled in primary education)



⁷ APAFA= Asociacion de Padres de Familia is the acronym for the parents' association.

We followed Holmes (2003) in taking into consideration that some family members live out of the households. For that purpose we designed the appropriate questions, asking the households about their kids living out of home. We found almost 7% of the children living outside households, with some differences by age-group. While almost 20% of the individuals between 13 and 17 live outside, only 2% of 7 and 12 years old are in the same condition.

Table 17
¿Where do the children live?

	Between 7 and 12 years old	Between 13 and 17 years old	Between 7 and 17 years old
Inside the household	98.54	81.73	93.47
Outside the household	1.46	18.27	6.53

Our households then are low educated, indigenous, poor, with some access to social programs and important participation in APAFA's. Mothers and fathers are predominantly in charge of child education, but 1 out of 5 kids have only a mother taking care of them.

4. Results

4.1 Gender differences in attendance and performance

We will present our results for the following indicators: attends regularly, was not absent in the last two weeks, has not repeated, and attends on time (over-age). See Appendix 8 for definition and Appendix 9 for descriptive statistics. Attendance indicators are relatively good for this population, but over-age is a problem, even considering only our 4th grade population (link children). This result is consistent with the proportion of students that has repeated at least once in his educational experience.

Being gender our focus of analysis we will now turn to describe the differences along those lines. In the three samples we are considering (all enrolled in primary education, children between 7 and 12 and our link children) we only find slight differences in attendance for the last two weeks and some very small differences in repetition.

Table 18
RURAL PERU 2004
Results of attendance, repetition and overage rates

	Children enrolled in primary education			Between 7 and 12 years old			Link children		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Attends regularly	97.86	97.8	97.83	98.43	98.19	98.31	97.86	97.66	97.76
Was not absent in the last two weeks	87.54	85.89	86.73	88.29	87.53	87.92	85.78	84.43	85.12
Has not repeated	67.31	66.93	67.12	70.55	70.29	70.42	61.49	62.87	62.17
Attends on time	69.85	68.8	69.33	76.4	76.75	76.57	67.67	67.75	67.71

Those results were confirmed by our multivariate analysis (see Appendix 8 for a description of variables included in the regression). We model our dependent variable using variables related to individual, demographic and socioeconomic characteristics of the household, distance to school, access to social programs, and the geographical location of the school.⁸

As it can be seen in the following table, there are not significant gender differences in any of those variables for any of the three samples. Looking at all the models, the model that explains less the differences is the one for “was not absent in the last two weeks”. It seems that this variable cannot be explained in any systematic way. People are absent for different reasons, reasons that are not apparently systematic, or at least not captured by the data we collected.

Other variables different than gender explain better our four variables. In other words the problems in education related to attendance, repetition and over-age exist (especially for the last two variables) but the role of gender is not statistically significant. There are other variables doing a better job in explaining them. To be the youngest child in the family decreases the odds to attend regularly (only in the sample of primary). The effects of female education and electricity in the household are more important. More education of the woman in charge and availability of electricity increase the odds of regular attendance at least for the primary and the 7-12 years old samples.

In the case of repetition, older individuals are more likely to repeat, with a parabolic effect, but the contrary happens with those who are the oldest child. To have electricity in the household decreases the odds to repeat. For attendance on time, mother tongue of the children seems to have the more consistent effects across samples. Children that have Spanish language have more probabilities to attend on time. More education of the mother and being the oldest child also increase the odds to attend on time. Being the youngest child, on the contrary, diminishes the odds to attend on time.

⁸ The model is a logistic regression. We use the cluster option in order to correct the problem of information nested in households.

Finally differences across departments are not consistent between variables. We can say that Ayacucho and Huancavelica show the more systematic worst situations in our dependent variables in comparison to Apurimac⁹.

⁹ We also checked the results on gender including other variables such as the interaction between households where there is at least one boy and one girl enrolled in primary and our gender variable.

Table 19
Logistic regression to explain attendance, repetition and overage rates

		Children enrolled in primary				Children between 7 and 12 years old				Only link children		
		Regular attendance	Att. last two weeks	Not repeated	Att on age	Regular attendance	Att. last two weeks	Not repeated	Att on age	Regular attendance	Att. last two weeks	Not repeated
Characteristics of the child	Sex (1 = male, 0 = female)	0.17 [0.51]	0.23 [0.84]	0.62 [0.19]	29.42 [0.51]	0.00 [0.60]	0.00 [1.32]	1.04 [0.01]	96.05 [0.32]	1.0001 [0.00]	1.09 [0.52]	0.91 [0.77]
	Age	1.40 [0.64]	1.04 [0.17]	0.15 [5.86] ***	2.30 [0.94]	0.21 [1.19]	0.32 [1.54]	0.13 [2.73] ***	0.05 [1.66] *			
	Squared age	0.98 [0.91]	0.99 [0.74]	1.06 [4.06] ***	0.88 [2.83] ***	1.08 [1.16]	1.05 [1.40]	1.07 [1.88] *	1.08 [0.91]			
	Interaction: gender and age	1.44 [0.54]	1.34 [0.85]	1.11 [0.22]	0.48 [0.59]	3.49 [0.53]	3.73 [1.31]	0.97 [0.03]	0.38 [0.36]			
	Interaction: gender and squared age	0.98 [0.60]	0.99 [0.77]	0.99 [0.25]	1.04 [0.67]	0.94 [0.46]	0.94 [1.28]	1.00 [0.07]	1.05 [0.41]			
	Mother tongue (1 = native, 0 = spanish)	0.60 [1.13]	1.16 [0.94]	0.82 [1.57]	0.73 [1.72] *	0.68 [0.85]	1.19 [1.03]	0.86 [1.10]	0.71 [2.13] **	0.7559 [0.61]	1.15 [0.80]	0.74 [2.19] **
	Oldest child	0.60 [1.58]	1.15 [0.91]	1.52 [3.21] ***	1.61 [2.45] **	0.95 [0.12]	1.30 [1.44]	1.73 [3.91] ***	1.74 [3.19] ***	0.4636 [1.22]	1.02 [0.10]	1.06 [0.32]
	Youngest child	0.42 [2.58] ***	0.88 [0.87]	0.95 [0.42]	0.57 [3.25] ***	0.57 [1.58]	0.94 [0.36]	0.93 [0.50]	0.57 [3.32] ***	0.5927 [1.13]	0.93 [0.32]	1.15 [0.86]
Demographic characteristics	Number of children at household	0.98 [0.11]	1.21 [2.72] ***	1.09 [1.43]	1.03 [0.36]	0.94 [0.41]	1.18 [2.18] **	1.10 [1.64]	1.11 [1.34]	0.8137 [0.87]	1.0293 [0.34]	0.93913 [0.93]
	Members per room	1.03 [0.32]	0.92 [1.65] *	1.03 [0.63]	0.91 [1.70] *	1.28 [2.28] **	0.93 [1.40]	1.00 [0.04]	0.91 [1.87] *	1.1416 [0.72]	0.93 [1.37]	1.01 [0.28]
	Father in charge of child's education	0.79 [0.47]	1.11 [0.56]	0.81 [1.48]	1.07 [0.40]	0.92 [0.17]	1.09 [0.48]	0.84 [1.21]	1.05 [0.31]	0.9821 [0.04]	1.14 [0.65]	0.88 [0.87]
	Mother in charge of child's education	2.84 [1.78] *	1.73 [1.88] *	0.95 [0.20]	0.73 [1.15]	3.12 [1.79] *	1.81 [1.86] *	0.81 [0.78]	0.84 [0.74]	4.9333 [2.70] ***	1.68 [1.75] *	1.08 [0.28]
Socioeconomic characteristics	Education of female in charge of child's education	0.59 [1.10]	0.84 [0.98]	1.11 [0.76]	1.62 [2.71] ***	0.56 [1.08]	0.83 [0.96]	1.15 [1.04]	1.71 [3.32] ***	1.0128 [0.03]	0.99 [0.04]	1.75 [3.78] ***
	Electricity	2.38 [2.03] **	1.18 [0.90]	1.82 [4.66] ***	1.34 [1.59]	3.13 [2.27] **	1.19 [0.93]	2.10 [5.65] ***	1.52 [2.57] **	1.6845 [1.08]	1.18 [0.88]	1.94 [4.81] ***
Access to social programs	Acces to no-educative social programs	0.64 [0.83]	0.7304 [1.33]	1.00597 [0.04]	0.8237 [0.86]	0.7561 [0.41]	0.664 [1.67] *	1.03855 [0.24]	0.865 [0.73]	1.0321 [0.05]	0.8763 [0.57]	1.09387 [0.50]
	Acces to educative social programs	1.35 [0.51]	0.69 [1.28]	0.80 [0.92]	0.51 [1.71] *	1.05 [0.05]	0.53 [2.03] **	0.68 [1.49]	0.50 [2.12] **	2.5801 [1.61]	0.67 [1.06]	0.63 [1.62]
Schools characteristics	Distance to school (in minutes)	0.99 [0.98]	0.99 [2.28] **	1.00 [0.44]	1.00 [1.49]	0.99 [0.80]	1.00 [1.24]	1.00 [0.65]	1.00 [1.31]	0.9914 [0.88]	1.00 [1.45]	1.00 [0.59]
Geographical context	Ayacucho ^{1/}	0.99 [0.03]	0.77 [1.12]	0.53 [3.69] ***	0.51 [2.69] ***	0.39 [1.09]	0.70 [1.49]	0.49 [4.17] ***	0.54 [2.88] ***	1.0336 [0.04]	0.64 [1.73] *	0.55 [3.15] ***
	Huancavelica ^{1/}	0.27 [2.05] **	1.00 [0.02]	1.21 [1.15]	0.44 [3.40] ***	0.10 [2.90] ***	0.79 [0.92]	1.19 [0.99]	0.48 [3.39] ***	0.2365 [2.15] **	0.76 [1.05]	0.73 [1.71] *
	Puno ^{1/}	0.82 [0.36]	1.32 [1.21]	2.03 [4.23] ***	0.62 [1.87] *	0.48 [0.88]	1.18 [0.70]	2.03 [4.21] ***	0.84 [0.76] *	1.1205 [0.16]	1.18 [0.65]	1.61 [2.54] **
	Observations	2594	2588	2607	2610	2226	2221	2239	2239	1212	1207	1216
Pseudo R2		0.11	0.04	0.26	0.58	0.12	0.03	0.17	0.37	0.12	0.02	0.07

1/ Apurímac is the reference category

Robust z-statistics in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

The variable about attendance of parents to the APAFA meetings was not included in the final models because it reduces the number of observations. However, it is important to mention that we ran a reduced model with it. The variable resulted non-significant and the patterns of gender did not change.

An interesting analysis of gender is obtained when we cut the sample in two: a sample of girls and a sample of boys. We found that the dynamics of attendance, repetition and overage are somewhat different between boys and girls. We found that for the sample of primary, regular attendance is related to age for boys (older boys attend more regularly but until certain age only) but in the case of the girls attendance decreases if the child is the youngest in the household (see Appendix 10 for the regressions for only boys and only girls).

4.2 Gender differences in drop out¹⁰

There are more differences in drop out for those who are between 13 and 17 than for those who are 7 to 12 years old (only a few cases). It is interesting to see that drop out happens more in primary than in secondary education for the 13 to 17 years old group, especially in sixth grade. But gender differences begin to appear strongly after the third grade. This data is also consistent with the one reported by the principals of the schools of our sample.

If we bring together the results from both samples we could hypothesize that age has to do with the probabilities to drop out. But, besides age, it could be also an over-age problem. Those who drop in primary education could be the ones that are in over-age due to repetition or other factors. We can hypothesize that those who quit are over aged (students that repeated and continue in the school) and that over age women in primary education have more probabilities to quit than over age men.

¹⁰ The data that comes from households refers to individual that attended school and at the moment of the survey they are not attending anymore. We don't know if they have come back to school. The data from schools (principals) is related to students that leave the school in the 2004, after being enrolled for that year.

Table 20
RURAL PERU 2004
Drop out rates

	Between 7 and 12 years old			Between 13 and 17 years old			Between 18 and 24 years old		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Number of Children who dropped out	7	5	12	40	57	97	47	62	109
Percentage of children who drop out	0.6	0.4	0.5	8.3	11.4	9.8	2.7	3.7	3.2
Percentage of children who dropped out in primary education	100.0	100.0	100.0	62.5	70.9	67.4	68.1	72.9	70.8
First grade	14.3	25.0	18.2	0.0	0.0	0.0	3.1	2.4	2.7
Second grade	0.0	50.0	18.2	0.0	2.6	1.6	0.0	7.1	4.1
Third grade	28.6	25.0	27.3	8.0	15.8	12.7	12.5	16.7	14.9
Fourth grade	28.6	0.0	18.2	8.0	15.8	12.7	12.5	14.3	13.5
Fifth grade	0.0	0.0	0.0	16.0	13.2	14.3	12.5	11.9	12.2
Sixth grade	28.6	0.0	18.2	68.0	52.6	58.7	59.4	47.6	52.7
Percentage of children who dropped out in secondary education	0.0	0.0	0.0	37.5	29.1	32.6	31.9	27.1	29.3
First year	-	-	-	20.0	31.3	25.8	20.0	31.3	25.8
Second year	-	-	-	46.7	37.5	41.9	46.7	37.5	41.9
Third year	-	-	-	20.0	18.8	19.4	20.0	18.8	19.4
Fourth year	-	-	-	13.3	12.5	12.9	13.3	12.5	12.9

Table 21
RURAL PERU 2004
Annual drop out rates
according to the principal of the school

	Boys	Girls	Total
Primary Education	5.7	7.4	6.7
First grade	7.7	6.2	7.4
Second grade	4.5	6.5	5.2
Third grade	5.9	7.8	6.9
Fourth grade	4.6	8.8	6.7
Fifth grade	6.3	5.8	6.7
Sixth grade	8.3	8.2	6.9

We don't find evidence that drop out is related to other socio economic characteristics, such as mother tongue and education, but some interesting results are found for the comparison between those who live in the households and those who don't live there anymore. This second group has dropped proportionally more. But we don't know if they dropped before or after moving.

Table 22
Drop out, by mother tongue

	Dropped out	Did not dropped out	Total
Native language	103 [79.84] [3.99]	2481 [69.07] [96.01]	2584 [69.44] [100]
Spanish	26 [20.16] [2.27]	1111 [30.93] [97.71]	1137 [30.56] [100]
Total	129 [100]	3592 [100]	3721 [100]

Table 23
Drop out, by where do the child lives

	Dropped out	Did not dropped out	Total
Inside the household	99 [74.44] [2.77]	3470 [96.15] [97.23]	3569 [95.38] [100]
Out of the household	34 [25.56] [19.65]	139 [3.85] [80.35]	173 [4.62] [100]
Total	133 [100]	3609 [100]	3742 [100]

Table 24
Drop out, by educational attainment of the individual in charge of link child's education

	Dropped out	Did not dropped out	Total
Primary or less	70 [73.68] [3.52]	1918 [66.41] [96.48]	1988 [66.64] [100]
Secondary or higher	25 [26.32] [2.51]	970 [33.59] [97.49]	995 [33.36] [100]
Total	95 [100]	2888 [100]	2983 [100]

Table 25
Drop out, by educational attainment of
the individual in charge of link child's education

	Dropped out	Did not dropped out	Total
Primary or less	108 [87.8] [3.61]	2881 [83.87] [96.39]	2989 [84.01] [100]
Secondary or higher	15 [12.2] [2.64]	554 [16.13] [97.36]	569 [15.99] [100]
Total	123 [100]	3435 [100]	3558 [100]

Table 26
Drop out, by availability of electricity

	Dropped out	Did not dropped out	Total
Electricity	51 [38.35] [3.38]	1456 [40.52] [96.62]	1507 [40.45] [100]
No electricity	82 [61.65] [3.70]	2137 [59.48] [96.30]	2219 [59.55] [100]
Total	133 [100]	3593 [100]	3726 [100]

Therefore, why over age women could have more probabilities to drop out than men? As we stated in our introduction, parental perceptions also play a role, especially when they have to decide. How do they decide? We explore one possible explanation: parental perceptions towards gender.

4.3 Parental Perceptions

As it was described in our annex, we coded parental responses to questions related to a stereotyped image¹¹. We first prepared the codes looking at a group of questionnaires, we discussed them in our team group and then we register the responses (see Appendix 3 for details). We were very conservative in the coding and registration in the sense that we looked for enough evidence in order to register one response as being part of one category. This is why we also created intermediate categories such as “ambiguous” and “neutral”. The coding and registration was made by the same person in order to reduce possible misunderstandings.¹²

¹¹ We performed that analysis only for two departments: Ayacucho and Puno.

¹² As it was already mentioned this population is basically non-Spanish speaking. We utilized translators in the field in order to capture the responses. Therefore we don't have direct answers in the cases where the respondent does not speak Spanish. In those cases a translator mediated the responses.

As it can be seen, both in Ayacucho and Puno the majority of responses have been qualified as “conservative”¹³. This proportion of people can increase if we consider the responses that were coded as “neutral”¹⁴. The second category is the “critical”,¹⁵ with mothers and fathers of Puno being more critical. In third place we also have those with ambiguous responses. Those are individuals who are critical and conservative at the same time. According to these data, we can infer that gender roles could also been sustained through parental beliefs.

Table 27
RURAL PERU 2004
Perception about gender roles

	Puno	Ayacucho	Total
Critical perspective	172 [28.43]	48 [11.59]	220 [21.59]
Neutrality	15 [2.48]	19 [4.59]	34 [3.34]
Conservative opinion	278 [45.95]	218 [52.66]	496 [48.68]
Ambiguous opinion	47 [7.77]	35 [8.45]	82 [8.05]
No opinion / Blank	10 [1.65]	23 [5.56]	33 [3.24]
Does not know / does not understand the question	40 [6.61]	24 [5.8]	64 [6.28]
Does not answer the question	21 [3.47]	11 [2.66]	32 [3.14]
Other	22 [3.64]	36 [8.7]	58 [5.69]
Total	605	414	1019

Proportions in brackets

Then we restricted the number of observations, taking out the missing responses. As it can be seen in the following tables, the responses are pretty much homogeneous for different groups. Only mother tongue makes some difference. People with native mother tongue seem to be more conservative in terms of gender. No strong differences appear for gender, educational level, and the value of assets. To be or not conservative does not seem to be a problem of a particular gender or education but it is more related with the language characteristics of parents.

¹³ People who argue in favor of stereotyped roles.

¹⁴ People who say that things are as they are but they don't argue in favor.

¹⁵ People who are opposed to traditional gender biased stereotypes,

Table 28
RURAL PERU 2004
Perception about gender roles, by gender

	Male	Female	Total
Critical perspective	100 [23.70]	120 [25.64]	220 [24.72]
Neutrality	16 [3.79]	18 [3.85]	34 [3.82]
Conservative opinion	245 [58.06]	251 [53.63]	496 [55.73]
Ambiguous opinion	38 [9.00]	44 [9.40]	82 [9.21]
Other	23 [5.45]	35 [7.48]	58 [6.52]
Total	422 [100]	468 [100]	890 [100]

Proportions in brackets

Table 29
RURAL PERU 2004
Perception about gender roles, by educational attainment

	Primary or less	Secondary or higher	Total
Critical perspective	150 [24.15]	69 [25.84]	219 [24.66]
Neutrality	25 [4.03]	9 [3.37]	34 [3.83]
Conservative opinion	356 [57.33]	139 [52.06]	495 [55.74]
Ambiguous opinion	59 [9.50]	23 [8.61]	82 [9.23]
Other	31 [4.99]	27 [10.11]	58 [6.53]
Total	621 [100]	267 [100]	888 [100]

Proportions in brackets

Table 30
RURAL PERU 2004
Perception about gender roles, by mother tongue

	Spanish	Native language	Total
Critical perspective	35 [33.33]	183 [23.43]	218 [24.60]
Neutrality	4 [3.81]	30 [3.84]	34 [3.84]
Conservative opinion	44 [41.9]	450 [57.62]	494 [55.76]
Ambiguous opinion	7 [6.67]	75 [9.60]	82 [9.26]
Other	15 [14.29]	43 [5.51]	58 [6.55]
Total	105 [100]	781 [100]	886 [100]

Proportions in brackets

Table 31
RURAL PERU 2004
Perception about gender roles, by total value of assets
(by terciles)

	1 (more poor)	2	3 (more rich)	Total
Critical perspective	40 [20.94]	66 [23.57]	94 [28.06]	200 [24.81]
Neutrality	10 [5.24]	9 [3.21]	8 [2.39]	27 [3.35]
Conservative opinion	106 [55.50]	167 [59.64]	175 [52.24]	448 [55.58]
Ambiguous opinion	20 [10.47]	25 [8.93]	32 [9.55]	77 [9.55]
Other	15 [7.85]	13 [4.64]	26 [7.76]	54 [6.7]
Total	191 [100]	280 [100]	335 [100]	806 [100]

Proportions in brackets

These findings are opening another dimension of the gender problem. One could imagine that parents eventually take decisions based on those perceptions. Most importantly, we can think about possible impacts for the socialization of children of the conservative parental perception about gender roles¹⁶.

¹⁶ Although some preliminary exploration of children use of time shows that boys practice more sport than girls (but the differences is not strong), and girls play more other games (See Appendix 11), Future analysis should explore more the connection between parental values and ideas and actual trajectories of children.

4.4 Parental hypothetical decision making

We have data on hypothetical decision-making, exploring the role of gender on it. In the following tables we see that the majority of parents would prefer to send a boy to higher education as we expected it will happen in a binding situation. But, in this case, the responses are more heterogeneous within this population. Less educated persons, men, those who have mother native tongue and poorer individuals prefer more to send a boy. There are however some differences between those variables and the effect of education seems to be bigger in comparison to the other variables.

Table 32
RURAL PERU 2004
¿Who would you send to college?
Hipothetical decision, by gender

	Male	Female	Total
The boy	492 [59.85]	528 [52.96]	1020 [56.07]
The girl	99 [12.04]	173 [17.35]	272 [14.95]
Anyone	231 [28.10]	296 [29.69]	527 [28.97]
Total	822 [100]	997 [100]	1819 [100]

Proportions in brackets

Table 33
RURAL PERU 2004
¿Who would you send to college?
Hipothetical decision, by educational attainment

	Primary or less	Secondary or higher	Total
The boy	817 [60.43]	201 [43.23]	1018 [56.03]
The girl	205 [15.16]	67 [14.41]	272 [14.97]
Anyone	330 [24.41]	197 [42.37]	527 [29.00]
Total	1352 [100]	465 [100]	1817 [100]

Proportions in brackets

Table 34
RURAL PERU 2004
¿Who would you send to college?
Hipothetical decision, by mother tongue

	Spanish	Native language	Total
The boy	125 [48.08]	891 [57.52]	1016 [56.16]
The girl	44 [16.92]	227 [14.65]	271 [14.98]
Anyone	91 [35.00]	431 [27.82]	522 [28.86]
Total	260 [100]	1549 [100]	1809 [100]

Proportions in brackets

Table 35
RURAL PERU 2004
¿Who would you send to college?
Hipothetical decision, by mother tongue

	1 (more poor)	2	3 (more rich)	Total
The boy	343 [60.71]	322 [57.40]	240 [48.00]	905 [55.66]
The girl	93 [16.46]	87 [15.51]	69 [13.80]	249 [15.31]
Anyone	129 [22.83]	152 [27.09]	191 [38.20]	472 [29.03]
Total	565 [100]	561 [100]	500 [100]	1626 [100]

Proportions in brackets

Given those results, we estimated a multinomial logistic regression in order to analyze the process of hypothetical decision-making (see Appendix 8 for the definition of variables and Appendix 9 for descriptive statistics). As seen in the next table, the models do not explain very well the total differences in responses but some interesting effects can be detected. The gender of the individual who responds the question is a key variable to explain the hypothetical decision of who would be sent to college. In models 2 and 3, men usually prefer “the boy” to “anyone”. Age is also a variable that kept its significance through the three models. Older individuals tend to choose more anyone instead of a boy or a girl. According to model one, having a native mother tongue has a significant effect on the hypothetical decision. Spanish speaking individuals would tend to choose “anyone” instead of “the boy”. However, once we control for additional variables this effect disappears.

When we incorporate socioeconomic characteristics, education of the person seems to have a greater impact than the presence of electricity at the household (which is our *proxy* for economic factors). More educated individuals, especially those who attained secondary or higher education, would not support their decision on the gender of the

children, at least hypothetically. More educated individuals will then be less gender stereotyped. Finally the access to social programs increases the odds of choosing the boy or the girl instead of anyone of them.

Table 36
¿Who would you send to college?
Multinomial logit to model the hypothetical decision
(Base category: "Anyone")

	MODEL 1		MODEL 2		MODEL 3	
	The boy	The girl	The boy	The girl	The boy	The girl
Individual characteristics						
Sex (1 = male, 0 = female)	1.16 [1.32]	0.76 [1.75] *	1.53 [3.50] ***	0.90 [0.60]	1.48 [3.14] ***	0.89 [0.70]
Age	1.00 [0.32]	0.99 [1.78] *	0.98 [2.63] ***	0.98 [2.60] ***	0.98 [2.41] **	0.98 [2.44] **
Mother tongue (1 = native, 0 = spanish)	1.47 [2.53] **	1.11 [0.50]	1.13 [0.77]	0.93 [0.34]	1.21 [1.14]	0.94 [0.29]
Demographic characteristics						
Both parents in charge of child's education	1.18 [1.27]	1.30 [1.41]	1.17 [1.15]	1.26 [0.23]	1.26 [1.68] *	1.30 [1.36]
Number of children at household	1.07 [1.39]	0.92 [1.25]	1.05 [0.93]	0.90 [1.52]	1.03 [0.61]	0.95 [0.70]
Members per room	0.96 [1.08]	0.95 [1.12]	0.95 [1.44]	0.95 [1.00]	0.95 [1.54]	0.96 [0.90]
Socioeconomic characteristics						
Primary Education			0.63 [2.61] ***	0.90 [0.43]	0.67 [2.15] **	0.99 [0.05]
Secondary Education			0.25 [6.65] ***	0.43 [2.93] ***	0.30 [5.56] ***	0.50 [2.26] **
Electricity			0.93 [0.64]	1.27 [1.50]	0.90 [0.90]	1.00 [0.02]
Access to social programs						
Acces to no-educative social programs					1.39 [2.10] *	0.99 [0.04]
Acces to educative social programs					1.83 [2.86] ***	1.83 [1.70] *
Educative performance						
At least one child repeated					1.17 [1.26]	0.76 [1.58]
At least one child attends in overage					0.71 [1.68] *	0.57 [2.10] **
Geographical context						
Ayacucho ^{1/}					1.14 [0.71]	0.57 [2.38] **
Huancavelica ^{1/}					1.08 [0.43]	0.61 [2.16] **
Puno ^{1/}					0.86 [0.92]	0.32 [5.04] ***
Observations	1805		1801		1794	
Pseudo R2	0.01		0.03		0.05	

1/ Apurímac is the reference category

Robust z-statistics in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

5. Conclusions

Peruvian primary educational system has been expanding over time. As a result gender differences in enrollment have been diminishing, especially in urban settings and more slowly in rural ones. Differences in achievement exist but are small and in favor of boys for mathematics and girls for Language and Communication.

According to recent macro level data no important national gender differences exists in primary education for enrollment, over-age and approval. However within rural Peru we found differences between departments in the amount of their gender gaps in access and performance in primary education, differences that were associated with the level or severity of poverty, especially for performance. Poorer departments are the ones that seem to have the bigger gender gaps.

When we did our household analysis, we find no statistical evidence of gender differences in assistance, over-age and repetition for three samples: 7 to 12 years old, those enrolled in primary, and those in fourth grade (our link children). Age, as well as other socioeconomic characteristics such as education and access to electricity can explain problems of regular attendance. Education as well as other demographic variables related to age and birth order position in the household explains the performance variables.

Instead we find differences in the dynamics of boys' and girls' relationships with attendance, over age and repetition. That is, for primary education it seems to be more important to analyze why some girls are more likely to not attend regularly to school than other girls, instead of analyzing if boys and girls attend equally to school.

According to our data children between 7 and 12 years old did not drop out significantly. Children between 13 and 17 are those who dropped more, and they did that mostly while in primary education. Socioeconomic characteristics do not seem to explain who drops. For those who dropped in primary education we think there could be a combination of performance (over age) and gender, but no relation seems to exist with other characteristics, at least in this sample.

The other set of findings is related to perceptions and hypothetical decisions. We have enough evidence of how parents are gender stereotyped. In case they have to decide to send only one of their children to higher education, the majority would send a boy. We don't have data about how those parental perceptions and culture around gender could affect girls. We don't know if children will contest or reproduce those perceptions. But at least we can infer that they are not educated in values of equality, which is another dimension of the gender problem that goes beyond attendance and performance.

We have also found some evidence that the official culture about gender has changed. For example, there is advancement in terms of school materials. Despite that we found systematic over-representation of boys in the images, those are not always related to stereotyped situations, as least in the magnitude that they were in the past.

But it is possible to change parents? According to our data, education is an important element that reduces stereotyped perceptions. Our population is, on average, not well

educated, therefore non-formal educational (school for fathers) programs for fathers and mothers could produce a change.

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Appendix 1

Indicators of Educational Coverage and Performance

Table A1.1

Indicator	Description	Data Set	Source
Enrollment Gross Rate	Ratio of the number of students enrolled in a primary school (careless of their age) and the total number of children between six and eleven years old.	National Household Survey	Retrieved from Guadalupe, Cesar (2002) "La educación peruana a inicios del nuevo siglo".
Enrollment Net Rate	Porportion of children between six and eleven years old who are enrolled in a primary school.	National Household Survey	Retrieved from Guadalupe, Cesar (2002) "La educación peruana a inicios del nuevo siglo".
Attendance Gross Rate	Porportion of children between six and eleven years old who attend school (careless of the level they attend).	National Household Survey	Retrieved from Guadalupe, Cesar (2002) "La educación peruana a inicios del nuevo siglo".
Attendance Net Rate	Porportion of children between six and eleven years old who attend to the right level and grade according to their age.	National Household Survey	Retrieved from Guadalupe, Cesar (2002) "La educación peruana a inicios del nuevo siglo".
Overage Rate	Proportion of children enrolled in grade G, who are older than the age considered for that grade.	National Household Survey	Retrieved from Guadalupe, Cesar (2002) "La educación peruana a inicios del nuevo siglo".
Approval Rate	Proportion of the students who approved the school year	School Census	Retrieved from Guadalupe, Cesar (2002) "La educación peruana a inicios del nuevo siglo".
Annual Drop Out	Proportion of enrolled students who drop out school during the year	School Census	Retrieved from Guadalupe, Cesar (2002) "La educación peruana a inicios del nuevo siglo".

Appendix 2

A qualitative study of school materials

In the previous section related to gender differences in educational achievement, access and performance we reported that boys perform better than girls in mathematics but not in language and communication. Also we report that important differences exist between states. The question that arises directly from those results is if this has something to do with the cultural messages related to gender. In other words, if behind the fact that boys do better in mathematics and girls better in communication we can find hidden or implicit messages that define roles for each one of the genders.

How those messages are produced and reproduced in our society? What is the role of schools in that process?. We will try to approach that problem by doing a content analysis of school materials. The purpose is to identify the hidden, implicit and/or latent messages related to gender in the school texts as important symbolic and ideological dimensions involved in the reproduction of gender roles in our society. The specific questions that this study addresses are: how boys and girls are demographically represented in the images of the books; are they doing the same activities and expressing the same attitudes or it is possible to find some kind of segregation?

We privilege the analysis of images used as examples in the text materials. Images coming from 4th and 6th grade materials in language and communication and social-personnel were coded according to the following dimensions: demography, segregation and attitudes. The organization of the images for the analysis is detailed next.

Organization of the images for the analysis

In order to carry out the image analysis according to the three dimensions mentioned above we elaborated a matrix, which will be described next.

Within demography

- a. The number of women appearing per image
- b. The number of men appearing per image
- c. The total number of images of women in the book.
- d. The total number of images of men in the book

Spacial and labor segregation

- a. The space where the activity(ies) was(were) developed
- b. The kind of the principal activity¹⁷ developed in the image
- c. The sex of the individual that is carrying out the principal activity
- d. The kind of the secondary activity developed in the image, if there is one
- e. The sex of the individual that is carrying out the secondary activity

¹⁷ Later we will describe the determination of principal and secondary activities.

Gender stereotypes based on attitudes and values

- a. The attitude showed by the characters of the image

We defined categories to classify the spaces where the activities were developed, as well as the kind of activities, the sex of the individuals developing the activities and the attitudes and values of the characters of the images. From this classification we determined whether stereotypes were present or not in the images. The categories used were:

Categories and symbols used:

Spaces

- a. **Domestic:** A space is classified as a domestic one if it is a house space: room, kitchen, living room, dining room, etc.
- b. **School:** A space is classified as a school one if the activity of the image is developed in a school. For instance: the yard, a classroom, a laboratory, etc.
- c. **Labor:** This kind of space is determined by the kind of the activity developed in the image.
- d. **Leisure:** The leisure space is determined by the kind of activity showed in the image. For instance, in one image we find people sailing, an activity developed in the sea, the activity of this image was classified as leisure.
- e. **Other:** The classification of an space as "other" means that it does not correspond to any category previously defined.
- f. **Not identified:** This is an space that cannot be identified.

Activities

The classification of the activities had two stages. In the first stages we classified the activities as principal or secondary ones. A secondary activity is one developed simultaneously with principal activity; however its importance is less or equal compared to the principal one. In the cases where the activities developed are more than two, we tried to consider the two most representative ones; this discrimination was made based on the number of characters involved in the activity.

- a. **Domestic:** A domestic activity is an activity made at home, such as cleaning, cooking, put things in order, etc. independently of the space where the activity was developed. Many images present this kind of activity located in houses, but many others are located in schools, or non-identified spaces.
- b. **School:** These activities refer to school ones, just like the previous category, it does not depend on the space where the activity is developed. For instance, reading, writing are classified as school activities.
- c. **Familiar-affective:** These activities are determined by the presence of warm, emotive, contact between the characters of the images. For instance: hugs, an adult taking a boy or a girl, etc.
- d. **Labor:** labor activities are determined by the presence of characters working outside of the household: agricultural, handmaking, technicals, intellectual, etc.
- e. **Leisure:** The activities classified on this category are the ones that imply fun and recreation. Among them we find explicit games, sports, dance, singing, playing an instrument, etc.

- f. **Other:** The clasification of an acitivity as “other” means that it does not correspond to any category previously defined.

Sex of the individual developing the activity

- a. Male
- b. Female

Attitudes

- a. **Pleasant:** These attitudes are the ones that include individuals in a good mood,
- b. **Agressive:** Individuals that can be perceived as aggressive or violent ones.
- c. **Sad:** An attitude is classified as “sad” if the characters appearing on the image transmit loneliness, they are crying, etc.
- d. **Neutral:** This attitudes are the ones that do not transmit any kind of attitude
- e. **Other:** The clasification of an attitude as “other” means that it does not correspond to any category previously defined.

Demography: Number of boys and girls per image and in total

In the fourth grade language and communication textbook we have coded 151 images. In those images 63% were men and approximately 40% were women. In approximately half of them more men appeared than women per image, in 38% men and women appeared in the same number, and in 14% more women appeared than men. In the sixth grade 80 images were coded. In those 75% were men, and in almost 80% of them more men appeared than women.

In the other book analyzed (Social-Personnel), in 33 images coded for the fourth grade one, 57% were men, in 55% of them there were more men than women per image and in only 6% of them we had more women than men. In sixth grade, in 25 images, almost 70% were men, and in 76% of the images more men appeared than women. Only in one image more women appeared than men.

Segregation: Image of boys and girls according to different activities

In the case the activities in the images of the 4th grade language book and as it can be seen in the next table, the most important differences appeared in school activities (proportionally more men than women) and leisure (favorably to women). One additional point in this matter is that those leisure activities are in most of the cases classify as stereotyped. From the 16 images that we consider are stereotyped in all the text, nine of them are related to the leisure activities.

Table A2.1
Language Book – 4th grade of primary education
Distribution of gender in different activities in the images

Kind of activity	Males		Females	
	(N)	(Percentage)	(N)	(Percentage)
Domestic	1	0.65	1	1.75
School	49	31.82	12	21.05
Familiar-affective	6	3.90	3	5.26
Labor	6	3.90	2	3.51
Leisure	74	48.05	31	54.39
Other	18	11.69	8	14.04
Total	154	100.00	57	100.00

In sixth grade, again a bigger proportion of men are related to school activities and bigger percentage of women are related to leisure activities. In addition to this it needs to be said that more than a half of women are doing activities we consider as stereotyped. The same happens for the images where men are doing leisure activities. The only image showing a domestic activity involves a woman.

Table A2.2
Language Book – 6th grade of primary education
Distribution of gender in different activities in the images

Kind of activity	Males		Females	
	(N)	(Percentage)	(N)	(Percentage)
Domestic	0	0.00	1	4.35
School	31	44.29	3	13.04
Familiar-affective	1	1.43	2	8.70
Labor	5	7.14	3	13.04
Leisure	26	37.14	12	52.17
Other	7	10.00	2	8.70
Total	70	100.00	23	100.00

In the case of the social personnel book (4th grade), proportionally more men are related to school and labor activities and more women to domestic and leisure activities. Again some of those activities have been classify as stereotyped also.

Table A2.3
Social-Personal Book – 4th grade of primary education
Distribution of gender in different activities in the images

Kind of activity	Males		Females	
	(N)	(Percentage)	(N)	(Percentage)
Domestic	3	6.82	5	15.15
School	10	22.73	5	15.15
Familiar-affective	11	25.00	9	27.27
Labor	9	20.45	1	3.03
Leisure	10	22.73	11	33.33
Other	1	2.27	2	6.06
Total	44	100.00	33	100.00

In the case of sixth grade, differences favorable to men appeared in the school ones and in the labor ones. It is important to say in this last case that the kind of jobs men and women are doing have been classified as stereotyped.

Table A2.4
Social-Personal Book – 6th grade of primary education
Distribution of gender in different activities in the images

Kind of activity	Males		Females	
	(N)	(Percentage)	(N)	(Percentage)
Domestic	0	0.00	1	2.78
School	3	4.05	1	2.78
Familiar-affective	4	5.41	2	5.56
Labor	28	37.84	9	25.00
Leisure	22	29.73	11	30.56
Other	17	22.97	12	33.33
Total	74	100.00	36	100.00

Attitudes of boys and girls showed in the images and stereotypes

Most of the attitudes have been classified as neutral in the 4th grade language book. No important differences appeared, only proportionally more men express pleasant attitudes. It is important to say that only two images are considered as aggressive or sad, the first is a man the second is a woman.

Table A2.5
Language Book – 4th grade of primary education
Distribution of gender in different attitudes in the images

Kind of activity	Males		Females	
	(N)	(Percentage)	(N)	(Percentage)
Pleasant	55	27.78	25	21.55
Aggressive	1	0.51	0	0.00
Sad	0	0.00	1	0.86
Neutral	139	70.20	82	70.69
Other	3	1.52	8	6.90
Total	198	100.00	116	100.00

In sixth grade only in the case of the pleasant attitudes there is a difference between the proportion of women and men (more women). Most of the men and women are expressing in the images neutral attitudes.

Table A2.6
Language Book – 6th grade of primary education
Distribution of gender in different attitudes in the images

Kind of activity	Males		Females	
	(N)	(Percentage)	(N)	(Percentage)
Pleasant	19	20.21	12	40.00
Aggressive	2	2.13	1	3.33
Sad	0	0.00	0	0.00
Neutral	73	77.66	16	53.33
Other	0	0.00	1	3.33
Total	94	100.00	30	100.00

However in the case of the social-personal book in the 4th grade, women are more related to pleasant and sad attitudes, while men are more related to aggressive ones.

Table A2.7
Social-Personal Book – 4th grade of primary education
Distribution of gender in different attitudes in the images

Kind of activity	Males		Females	
	(N)	(Percentage)	(N)	(Percentage)
Pleasant	32	40.51	30	50.85
Aggressive	6	7.59	0	0.00
Sad	2	2.53	3	5.08
Neutral	38	48.10	25	42.37
Other	1	1.27	1	1.69
Total	79	100.00	59	100.00

In sixth grade, only the sad attitudes are expressing some kind of stereotype (proportionally more women than men).

Table A2.8
Social-Personal Book – 6th grade of primary education
Distribution of gender in different attitudes in the images

Kind of activity	Males		Females	
	(N)	(Percentage)	(N)	(Percentage)
Pleasant	32	35.96	15	36.59
Aggressive	0	0.00	0	0.00
Sad	7	7.87	6	14.63
Neutral	50	56.18	20	48.78
Others	0	0.00	0	0.00
Total	89	100.00	41	100.00

Conclusions of the analysis of school materials

This analysis shows that gender biases in the books appear explicitly in the demographic dimension. The reproduction of gender stereotypes is more related to segregation of activities than segregation of attitudes. More stereotypes appear in the social personnel books than in the Language and communication ones. In the first case 32% of the images are been coded as stereotyped, while in the second almost 20% of them. It is also important to notice than in two activities (familiar and leisure) there is some kind of equity, contrary to the labor and school ones.

In order to have more general conclusions we will compare each one the dimensions by grade and textbooks. It is interesting to see that the demographics of gender in the images increase from one grade to the other.

Table A2.9
Average proportion of male and female
characters appearing on Language and
Communication and in the Social Personnel
books' images, by grade

	Fourth Grade	Sixth Grade
Males	61 %	71 %
Females	39 %	29 %
Total	100 %	100 %

Table A2.10
Average proportion of pictures showing more
males than females; equal number of males
and females; and more females than males,
on Language and Communication and in the
Social Personnel books, by grade

	Fourth Grade	Sixth Grade
More Males	49 %	77 %
Equal number	38 %	10 %
More Females	13 %	13 %
Total	100 %	100 %

However there are not many differences when we compare proportion of men and women that appeared in the two textbooks but there are differences when we compare the number of men and women per image. It is important to notice that the social personal book where civic knowledge is transmitted has a more masculine representation than the other one.

Table A2.11
Average proportion of male and female
characters appearing on fourth and sixth
grade books, by book

	Language and Communication	Social Personnel
Males	66 %	63 %
Females	34 %	37 %
Total	100 %	100 %

Table A2.12
Average proportion of pictures showing more males than
females; equal number of males and females; and more
females than males, on fourth and sixth grade books, by book

	Language and Communication	Social Personnel
More Males	58 %	64 %
Equal number	27 %	31 %
More Females	15 %	5 %
Total	100 %	100 %

In the case of the segregation in activities in Language and Communication it has been found that there is segregation in all the categories in both grades especially in the school ones. This reinforces the idea that knowledge is privative of men in that kind of activities (men are more represented than women). It is also important to notice that domestic activities are the one less represented in the textbook.

In the case of the Social personal one, there are differences between one grade and the other. In fourth grade there are differences in all the categories, while in sixth grade only in three of them. Also, in two of the categories (leisure and family) neutrality is evident. However in both grades there are strong differences in the labor activities, more in sixth than in fourth.

The attitudinal dimension does not show consistent patterns between grades and textbooks. More segregation appears in sixth grade than in fourth grade, but differences are not important and only for some of the categories. It seems that this dimension has been more developed from a gender perspective.

Our results are consistent with previous analysis (Anderson, 1982). School materials continue to present a world where more men exist than women, and this representation increase for the advanced grades. This could be related to the progressive elimination of the domestic activities in the textbooks at the same time that the labor activities where men are over represented are more present in advanced grades. But one positive trend is the representation of men expressing attitudes normally related to girls. There is more equality in the attitudinal dimension.

Appendix 3

Categories used to classify the opinion about the difference on the activities developed by men and women

1) Critical Perspective: Opinions that do not support traditional gender roles. Examples:

- * There are no differences, they both work equally
- * Women also work at the field
- * Men and women work at the field or at the kitchen, there are no differences.

2) Neutrality: Responses that state that gender roles are as they are but they do not argue about this opinion. Examples:

- * I think that this is the way life goes on within my community.
- * It is a custom of the country, it will be difficult to change it
- * That is the way we live here

3) Conservative Opinions: Opinions that reinforce traditional gender roles. Examples

- * Men do the harder work; women do the less hard work
- * While men do the land work or any other hard activity, women work is still related to the house.

4) Ambivalent Opinions: The answer expresses conservative elements as well as critical ones.

5) Does not give an opinion / blank

6) Does not know / does not understand

- * The individual does not know what to answer, or does not answer.
- * The individual is illiterate and does not know how to express himself / herself, or he or she does not understand well the question.

7) Does not answer the question:

- * Boys expect to learn carpentry
- * If they do not work, there is no food

8) Other

Appendix 4

Situation of children who according to their age should be attending to primary or secondary education

Table A4.1
PERU 2002

	PERU			URBAN PERU			RURAL PERU		
	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls
Primary Education									
Inside the system	97.72	97.86	97.57	98.89	98.96	98.82	96.11	96.31	95.91
Out of the system	2.28	2.14	2.43	1.11	1.04	1.18	3.89	3.69	4.09
Secondary Education									
Inside the system	87.72	89.30	86.12	91.87	92.32	91.44	81.02	84.68	77.08
Out of the system	12.28	10.70	13.88	8.13	7.68	8.56	18.98	15.32	22.92

Source: National Household Survey (2002 iv)

Appendix 5

Selection of the variables included in the Indexes

The selection the indicators used in the construction of the index was made considering the analysis of the Reliability Coefficient Alfa¹⁸.

Table A5.1
Analysis of the Reliability Coefficient Alfa Including all the Gender Gaps

	Scale mean if item deleted	Scale Variance if item deleted	Corrected Item-Total correlation	Alfa if item deleted
Net Enrollment Rate	262.03	508.61	0.61	0.41
Gross Enrollment Rate	257.64	536.86	0.04	0.59
Net Attendance Rate	263.26	376.29	0.67	0.28
Gross Attendance Rate	261.32	644.85	-0.08	0.54
Overage Rate	265.65	301.06	0.43	0.43
4th gr Approval Rate	263.05	561.30	0.46	0.46
4th gr Annual Drop out Rate	261.63	626.70	0.18	0.52
6th gr Approval Rate	262.57	647.05	-0.10	0.54
6th gr Annual Drop out Rate	261.15	625.17	0.18	0.52
Reliability Coefficient Alfa				0.52

It is clear that the gross enrollment and attendance rates should be removed. Additionally, we can see that annual drop out rates do not contribute that much to our index. Once we remove them, the variables which would be considered for the index will be the net enrollment, attendance and overage rates, and the approval rates for the fourth and sixth grade. Table A5.2 shows this.

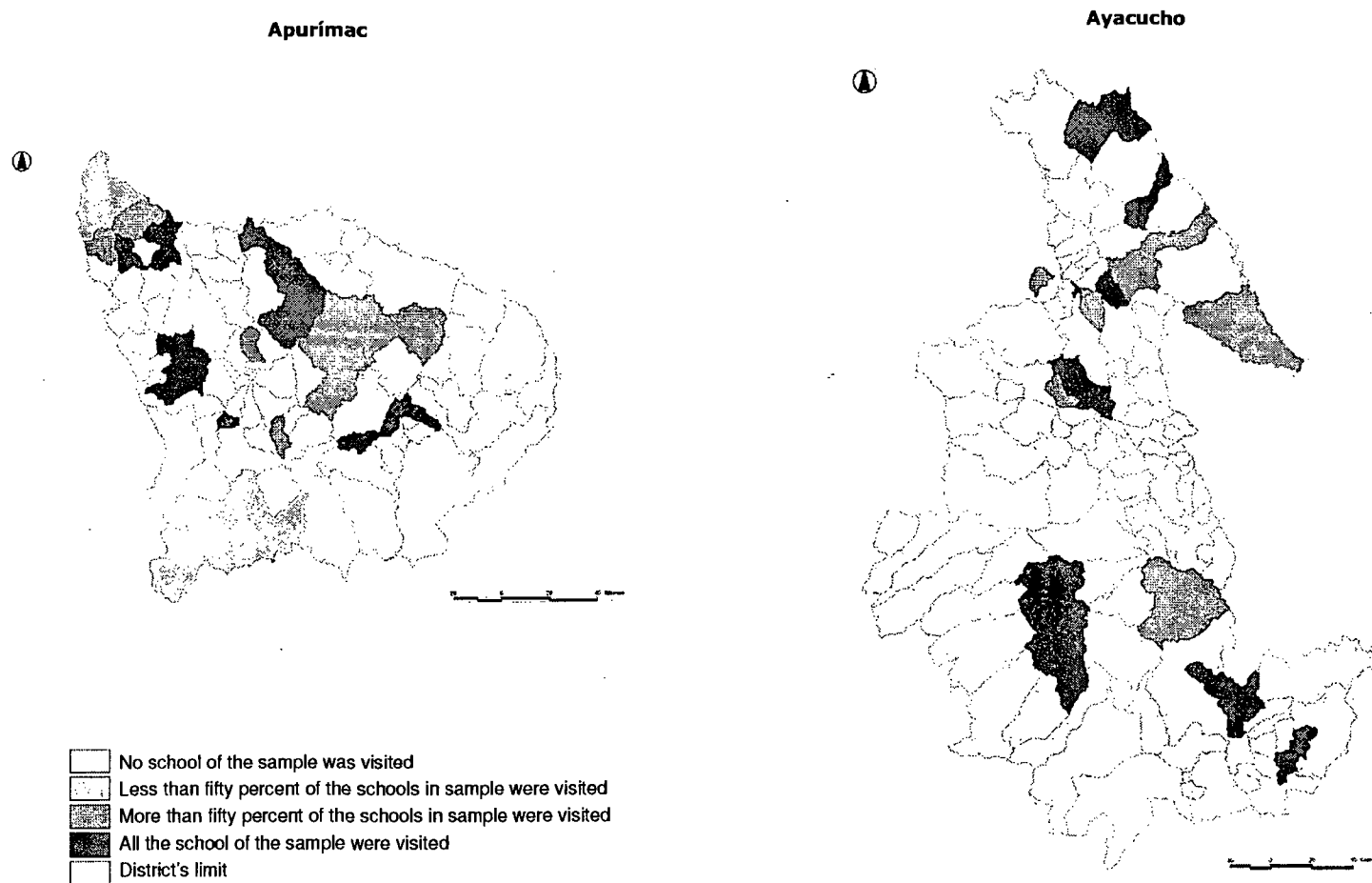
Table A5.2
Analysis of the Reliability Coefficient Alfa

	Scale mean if item deleted	Scale Variance if item deleted	Corrected Item-Total correlation	Alfa if item deleted
Net Enrollment Rate	124.62	423.42	0.48	0.60
Net Attendance Rate	125.85	284.93	0.67	0.45
Overage Rate 3	128.24	147.66	0.73	0.48
4th gr Approval Rate	125.64	449.07	0.48	0.62
6th gr Approval Rate	125.16	518.23	0.01	0.70
Reliability Coefficient Alfa				0.65

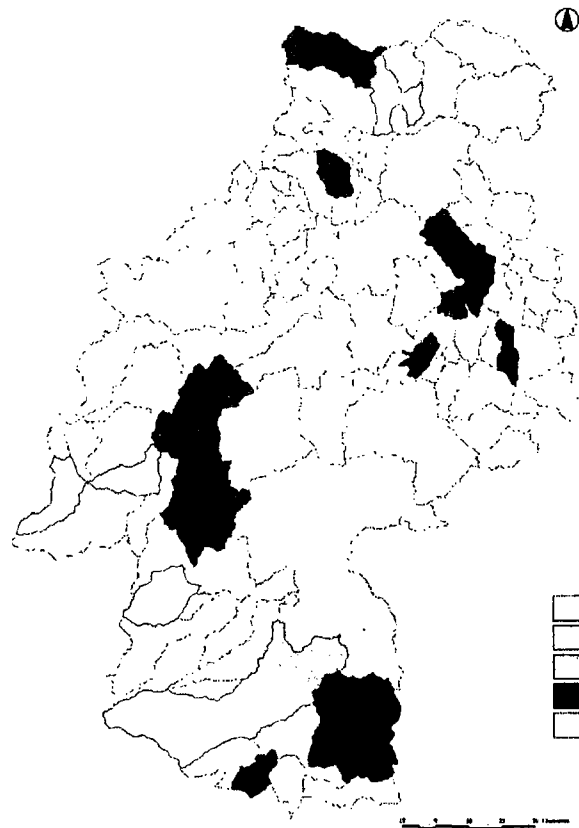
¹⁸ In order to calculate the Reliability Coefficient Alfa the values of the variables must be positive, then it was necessary to change the scale of the gaps.

Appendix 6

Districts visited in fieldwork, by department

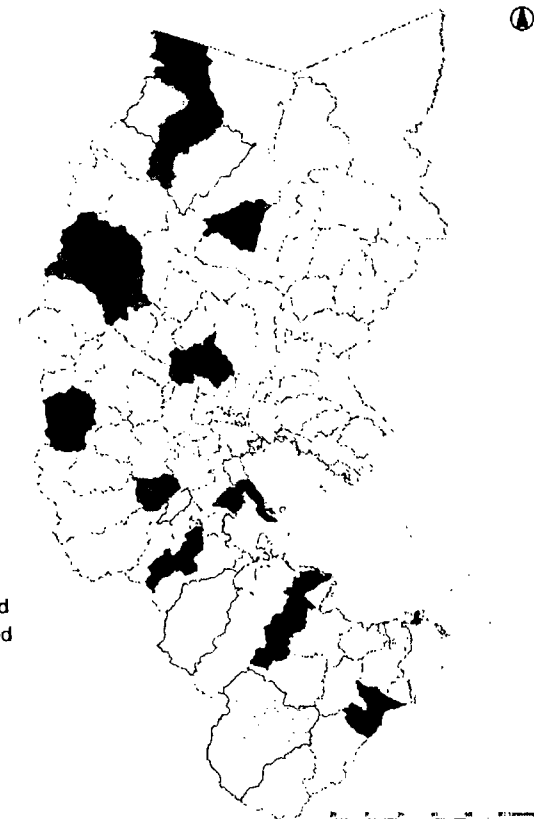


Huancavelica



- ☐ No school of the sample was visited
- ☐ Less than fifty percent of the schools in sample were visited
- ☐ More than fifty percent of the schools in sample were visited
- ☒ All the school of the sample were visited
- ☐ District's limit

Puno



Appendix 7

Comparison between of fieldwork and official data

Table A7.1
RURAL PERU 2004
Difference between the total number of students found in our visits
and the one reported by the Department of Education

	n	Percentage
No difference	88	49.72
Sub-report in official data: up to ten students	39	22.03
Sub-report in official data: more than ten students	6	3.39
Over-report in official data: up to ten students	39	22.03
Over-report in official data: more than ten students	5	2.82
Total	177	100

Table A7.2
RURAL PERU 2004
Difference between the total number of students found in our visits
and the one reported by the Department of Education

According to our survey	According to official data			Total
	Multigrade (one teacher)	Multigrade (two or more teachers)	Fullgrade	
Multigrade (only one teacher)	39 [92.86]	2 [2.00]	0 [0.00]	41 [23.16]
Multigrade (two or more teachers)	3 [7.14]	92 [92.00]	2 [5.71]	97 [54.80]
Fullgrade	0 [0.00]	6 [6.00]	33 [94.29]	39 [22.03]
Total	42 [100]	100 [100]	35 [100]	177 [100]

Proportions in brackets

Appendix 8

Codebook of the variables included in the multivariate analysis

Table A8.1
Only for children enrolled in primary education

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent variables					
Regular Attendance	2,766	0.98	0.15	0	1
Attendance last two weeks	2,758	0.87	0.34	0	1
Not retention	2,771	0.67	0.47	0	1
Attendance on age	2,801	0.69	0.46	0	1
Independent Variables					
<i>Individual Characteristics</i>					
Sex	2,807	0.50	0.50	0	1
Age	2,803	9.69	2.20	4	17
Squared age	2,803	98.71	44.63	16	289
Interaction: gender and age	2,803	4.87	5.07	0	17
Interaction: gender and squared age	2,803	49.43	57.92	0	289
Mother tongue	2,796	0.70	0.46	0	1
Oldest child	2,807	0.21	0.41	0	1
Youngest child	2,807	0.26	0.44	0	1
<i>Demographic characteristics</i>					
Number of children at household	2,807	3.01	1.22	1	7
Members per room	2,807	3.24	1.77	0.22	12
Father in charge of child's education	2,807	0.75	0.43	0	1
Mother in charge of child's education	2,807	0.90	0.31	0	1
<i>Socioeconomic characteristics</i>					
Education of female in charge of child's education	2,659	0.75	0.44	0	1
Electricity	2,793	0.39	0.49	0	1
<i>Access to Social Programs</i>					
Acces to no-educative social programs	2,789	0.85	0.35	0	1
Acces to educative social programs	2,789	0.93	0.25	0	1
<i>Characteristics of the school</i>					
Distance to school	2,772	21.80	26.01	1	240
<i>Geographical context</i>					
Apurimac	2,807	0.23	0.42	0	1
Ayacucho	2,807	0.22	0.42	0	1
Huancavelica	2,807	0.23	0.42	0	1
Puno	2,807	0.31	0.46	0	1

Table A8.1 (Continuation)
Codebook of the variables included in the regressions

<i>Socioeconomic characteristics</i>	
Father in charge of child's education	1 = The male in charge of the education of the link child is his or her father 0 = Other case (e.g. the grandfather, or no male is charge of the education of the link child)
Mother in charge of child's education	1 = The female in charge of the education of the link child is his or her mother 0 = Other case (e.g. the grandmother, or no female is charge of the education of the link child)
Both parents in charge of child's education	1 = The mother and father are the individuals in charge of the link child's education 0 = Other case
Education of female in charge of child's education	1 = Primary of higher education 0 = Other case
Electricity	1 = Yes 0 = No
<i>Access to social programs</i>	
Acces to no-educative social programs	1 = At least one member of the household access to a no-educative social program 0 = Other case
Acces to educative social programs	1 = At least one children of the household access to an educative social program 0 = Other case
<i>Characteristics of the school</i>	
Distance to school	In minutes
<i>Geographical context</i>	
Apurimac	1 = The household is located in Apurimac 0 = Other case
Ayacucho	1 = The household is located in Ayacucho 0 = Other case
Huancavelica	1 = The household is located in Huancavelica 0 = Other case
Puno	1 = The household is located in Puno 0 = Other case

Appendix 9

Descriptive Statistics of the variables included in the regressions

Table A9.1
Only for children enrolled in primary education

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent variables					
Regular Attendance	2,766	0.98	0.15	0	1
Attendance last two weeks	2,758	0.87	0.34	0	1
Not retention	2,771	0.67	0.47	0	1
Attendance on age	2,801	0.69	0.46	0	1
Independent Variables					
<i>Individual Characteristics</i>					
Sex	2,807	0.50	0.50	0	1
Age	2,803	9.69	2.20	4	17
Squared age	2,803	98.71	44.63	16	289
Interaction: gender and age	2,803	4.87	5.07	0	17
Interaction: gender and squared age	2,803	49.43	57.92	0	289
Mother tongue	2,796	0.70	0.46	0	1
Oldest child	2,807	0.21	0.41	0	1
Youngest child	2,807	0.26	0.44	0	1
<i>Demographic characteristics</i>					
Number of children at household	2,807	3.01	1.22	1	7
Members per room	2,807	3.24	1.77	0.22	12
Father in charge of child's education	2,807	0.75	0.43	0	1
Mother in charge of child's education	2,807	0.90	0.31	0	1
<i>Socioeconomic characteristics</i>					
Education of female in charge of child's education	2,659	0.75	0.44	0	1
Electricity	2,793	0.39	0.49	0	1
<i>Access to Social Programs</i>					
Acces to no-educative social programs	2,789	0.85	0.35	0	1
Acces to educative social programs	2,789	0.93	0.25	0	1
<i>Characteristics of the school</i>					
Distance to school	2,772	21.80	26.01	1	240
<i>Geographical context</i>					
Apurimac	2,807	0.23	0.42	0	1
Ayacucho	2,807	0.22	0.42	0	1
Huancavelica	2,807	0.23	0.42	0	1
Puno	2,807	0.31	0.46	0	1

Table A9.2
Only for children between 7 and 12 years old

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent variables					
Regular Attendance	2,367	0.98	0.13	0	1
Attendance last two weeks	2,359	0.88	0.33	0	1
Not retention	2,377	0.70	0.46	0	1
Attendance on age	2,390	0.77	0.42	0	1
Independent Variables					
Individual Characteristics					
Sex	2,458	0.51	0.50	0	1
Age	2,458	9.59	1.56	7	12
Squared age	2,458	94.35	30.01	49	144
Interaction: gender and age	2,458	4.93	4.94	0	12
Interaction: gender and squared age	2,458	48.76	52.32	0	144
Mother tongue	2,439	0.69	0.46	0	1
Oldest child	2,458	0.22	0.41	0	1
Youngest child	2,458	0.25	0.43	0	1
Demographic characteristics					
Number of children at household	2,458	3.02	1.22	1	7
Members per room	2,458	3.20	1.77	0.11	12
Father in charge of child's education	2,458	0.76	0.43	0	1
Mother in charge of child's education	2,458	0.90	0.31	0	1
Socioeconomic characteristics					
Education of female in charge of child's education	2,307	0.77	0.42	0	1
Electricity	2,420	0.41	0.49	0	1
Access to Social Programs					
Acces to no-educative social programs	2,419	0.85	0.36	0	1
Acces to educative social programs	2,419	0.92	0.27	0	1
Characteristics of the school					
Distance to school	2,377	21.90	25.80	1	240
Geographical context					
Apurimac	2,458	0.23	0.42	0	1
Ayacucho	2,458	0.22	0.41	0	1
Huancavelica	2,458	0.22	0.42	0	1
Puno	2,458	0.33	0.47	0	1

Table A9.3
Only for link children

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent variables					
Regular Attendance	1,297	0.98	0.15	0	1
Attendance last two weeks	1,290	0.85	0.36	0	1
Not retention	1,298	0.62	0.49	0	1
Attendance on age	1,310	0.68	0.47	0	1
Independent Variables					
Individual Characteristics					
Sex	1,331	0.51	0.50	0	1
Age	1,331	10.11	1.39	7	17
Squared age	1,331	104.08	30.24	49	289
Interaction: gender and age	1,331	5.12	5.14	0	14
Interaction: gender and squared age	1,331	52.61	55.60	0	196
Mother tongue	1,320	0.68	0.47	0	1
Oldest child	1,331	0.31	0.46	0	1
Youngest child	1,331	0.29	0.45	0	1
Demographic characteristics					
Number of children at household	1,331	2.64	1.22	1	7
Members per room	1,331	3.01	1.71	0.11	12
Father in charge of child's education	1,331	0.72	0.45	0	1
Mother in charge of child's education	1,331	0.88	0.32	0	1
Socioeconomic characteristics					
Education of female in charge of child's education	1,238	0.76	0.43	0	1
Electricity	1,303	0.41	0.49	0	1
Access to Social Programs					
Acces to no-educative social programs	1,302	0.83	0.37	0	1
Acces to educative social programs	1,302	0.92	0.27	0	1
Characteristics of the school					
Distance to school	1,298	21.93	26.28	1	240
Geographical context					
Apurimac	1,331	0.23	0.42	0	1
Ayacucho	1,331	0.22	0.42	0	1
Huancavelica	1,331	0.22	0.41	0	1
Puno	1,331	0.33	0.47	0	1

Table A9.4
Only for individuals who answered the question "Who would you send to school?"

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent variables					
Who would you send to college?	1819	1.728972	0.8817247	1	3
Independent Variables					
Individual Characteristics					
Sex	1,819	0.45	0.50	0	1
Age	1,814	39.21	9.79	13	92
Mother tongue	1,809	0.86	0.35	0	1
Demographic characteristics					
Both parents in charge of child's education	1,819	0.78	0.42	0	1
Number of children at household	1,819	2.70	1.21	1	7
Members per room	1,819	3.07	1.67	0.4	12
Socioeconomic characteristics					
Primary Education	1,817	0.60	0.49	0	1
Secondary Education	1,817	0.26	0.44	0	1
Electricity	1,816	0.41	0.49	0	1
Access to Social Programs					
Acces to no-educative social programs	1,818	0.85	0.36	0	1
Acces to educative social programs	1,818	0.93	0.25	0	1
Educative performance					
At least one child repeated	1,816	0.55	0.50	0	1
At least one child attends in overage	1,812	0.89	0.32	0	1
Geographical context					
Apurimac	1,819	0.20	0.40	0	1
Ayacucho	1,819	0.22	0.41	0	1
Huancavelica	1,819	0.26	0.44	0	1
Puno	1,819	0.32	0.47	0	1

Appendix 10

Table A10.1
Boys: Logistic regression to explain attendance, repetition and overage rates

		Children enrolled in primary				Children between 7 and 12 years old				Only link children		
		Regular attendance	Att. last two weeks	Not repeated	Attendance on age	Regular attendance	Att. last two weeks	Not repeated	Attendance on age	Regular attendance	Att. last two weeks	Not repeated
Individual Characteristics	Age	2.49 [2.18] **	1.42 [1.28]	0.19 [4.61] ***	1.03 [0.04]	1.09 [0.05]	1.21 [0.29]	0.18 [2.38] **	0.02 [2.07] **			
	Squared age	0.95 [2.44] **	0.98 [1.62]	1.05 [2.76] ***	0.92 [1.87] *	1.00 [0.01]	0.99 [0.39]	1.06 [1.55]	1.14 [1.44]			
	Mother tongue (1 = native, 0 = spanish)	0.89 [0.25]	1.22 [0.98]	0.99 [0.06]	0.74 [1.31]	1.28 [0.47]	1.34 [1.38]	1.09 [0.53]	0.73 [1.52]	1.03 [0.04]	1.40 [1.37]	0.76 [1.47]
	Oldest child	0.53 [1.43]	1.04 [0.17]	1.91 [3.51] ***	1.45 [1.33]	1.22 [0.34]	1.66 [1.89] *	2.48 [4.54] ***	1.90 [2.54] **	0.31 [1.25]	1.10 [0.32]	1.20 [0.78]
	Youngest child	0.79 [0.52]	0.92 [0.43]	1.04 [0.21]	0.39 [4.14] ***	1.00 [0.00]	1.11 [0.45]	1.05 [0.28]	0.43 [3.86] ***	2.30 [1.04]	1.20 [0.63]	1.42 [1.65] *
Demographic characteristics	Number of children at household	1.00 [0.02]	1.22 [2.34] **	1.25 [3.02] ***	0.95 [0.49]	1.06 [0.37]	1.27 [2.47] **	1.31 [3.56] ***	1.06 [0.54]	0.89 [0.36]	1.01 [0.12]	1.07 [0.76]
	Members per room	1.06 [0.48]	0.87 [2.19] **	1.02 [0.48]	0.91 [1.24]	1.52 [3.35] ***	0.92 [1.47]	1.01 [0.21]	0.92 [1.15]	1.04 [0.20]	0.92 [1.10]	1.01 [0.09]
	Father in charge of child's education	0.44 [1.25]	1.00 [0.01]	0.93 [0.39]	1.03 [0.11]	0.59 [1.09]	0.95 [0.22]	1.00 [0.02]	1.05 [0.26]	0.49 [1.23]	0.93 [0.25]	0.94 [0.31]
	Mother in charge of child's education	3.47 [1.57]	2.47 [2.29] **	0.70 [1.15]	0.71 [0.96]	6.95 [2.92] ***	3.15 [2.77] ***	0.69 [1.14]	0.87 [0.46]	5.49 [2.12] **	3.30 [2.87] ***	1.13 [0.32]
Socioeconomic characteristics	Education of female in charge of child's education	0.46 [1.32]	0.98 [0.07]	0.91 [0.52]	1.17 [0.60]	0.39 [1.25]	1.04 [0.16]	1.05 [0.28]	1.38 [1.42]	0.88 [0.19]	1.21 [0.69]	1.48 [1.94] *
	Electricity	2.16 [1.41]	0.79 [1.09]	2.01 [4.23] ***	1.52 [1.84] *	2.05 [1.15]	0.82 [0.86]	2.28 [4.95] ***	1.67 [2.56] **	1.92 [0.90]	0.96 [0.15]	2.15 [4.10] ***
Access to social programs	Access to no-educative social programs	0.62 [0.76]	0.56 [1.71] *	0.88 [0.63]	0.56 [1.75] *	0.60 [0.62]	0.48 [2.06] **	0.96 [0.18]	0.64 [1.56]	1.11 [0.13]	0.57 [1.46]	0.98 [0.09]
	Access to educative social programs	0.52 [0.60]	0.47 [1.75] *	0.54 [1.86] *	0.47 [1.41]	0.61 [0.42]	0.42 [1.80] *	0.44 [2.34] **	0.49 [1.69] *		0.54 [1.11]	0.47 [1.89] *
School characteristics	Distancia Escuela (in minutes)	0.99 [1.94] *	0.99 [1.66] *	1.00 [1.01]	0.99 [1.91] *	0.99 [2.28] **	1.00 [0.59]	1.00 [1.22]	1.00 [1.07]	0.99 [1.55]	1.00 [0.55]	1.00 [0.38]
Observations		1309	1306	1310	1311	1130	1126	1132	1133	563	609	612
Pseudo R2		0.1	0.04	0.24	0.57	0.1	0.04	0.14	0.35	0.10	0.03	0.04

Robust z-statistics in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table A10.2
Girls: Logistic regression to explain attendance, repetition and overage rates

		Children enrolled in primary				Children between 7 and 12 years old				Only link children		
		Regular attendance	Att. last two weeks	Not repeated	Attendance on age	Regular attendance	Att. last two weeks	Not repeated	Attendance on age	Regular attendance	Att. last two weeks	Not repeated
Individual Characteristics	Age	1.20 [0.34]	1.04 [0.16]	0.15 [5.75]	2.46 [1.02] ***	0.29 [0.91]	0.37 [1.35]	0.16 [2.56]	0.06 [1.55]			
	Squared age	0.98 [0.76]	0.99 [0.73]	1.06 [4.08]	0.88 [2.89] ***	1.06 [0.78]	1.05 [1.21]	1.06 [1.74]	1.07 [0.81]			
	Mother tongue (1 = native, 0 = spanish)	0.57 [0.92]	1.17 [0.71]	0.70 [2.08]	0.86 [0.60] **	0.39 [1.42]	1.17 [0.67]	0.71 [1.89]	0.82 [0.87]	0.45 [1.08]	1.07 [0.25]	0.81 [1.06]
	Oldest child	0.65 [0.95]	1.12 [0.48]	1.07 [0.40]	1.85 [2.22] **	0.87 [0.24]	0.96 [0.16]	1.11 [0.57]	1.62 [1.99]	0.53 [0.71]	0.84 [0.53]	0.82 [0.81]
	Youngest child	0.25 [2.77]	0.86 [0.70]	0.92 [0.47]	0.94 [0.22]	0.37 [1.92]	0.79 [0.96]	0.90 [0.56]	0.88 [0.48]	0.24 [2.10]	0.74 [1.04]	0.94 [0.27]
Demographic characteristics	Number of children at household	0.87 [0.78]	1.20 [1.85]	0.98 [0.21]	1.17 [1.35]	0.80 [1.09]	1.10 [0.88]	0.97 [0.33]	1.21 [1.85]	0.54 [1.45]	1.05 [0.39]	0.84 [1.83]
	Members per room	1.12 [0.65]	0.96 [0.72]	0.97 [0.59]	0.94 [0.96]	1.29 [1.58]	0.93 [1.06]	0.94 [1.21]	0.92 [1.53]	1.95 [2.09]	0.93 [0.97]	1.00 [0.07]
	Father in charge of child's education	1.44 [0.68]	1.35 [1.30]	0.86 [0.76]	1.22 [0.74]	1.41 [0.67]	1.43 [1.50]	0.89 [0.57]	1.15 [0.57]	2.05 [1.13]	1.53 [1.58]	0.96 [0.19]
	Mother in charge of child's education	2.02 [1.32]	1.14 [0.39]	1.17 [0.48]	0.80 [0.59]	1.52 [0.62]	0.85 [0.38]	0.95 [0.13]	0.84 [0.50]	5.10 [2.38]	0.84 [0.41]	1.05 [0.13]
Socioeconomic characteristics	Education of female in charge of child's education	0.96 [0.08]	0.81 [0.95]	1.70 [3.18]	2.25 [3.69] ***	1.05 [0.09]	0.74 [1.18]	1.61 [2.68]	2.35 [4.20] ***	1.99 [1.17]	0.91 [0.33]	2.40 [4.40] ***
	Electricity	2.90 [1.92]	1.90 [2.81]	1.83 [3.57]	1.50 [1.61]	6.31 [2.75]	2.00 [2.83]	2.21 [4.36]	1.69 [2.34]	1.85 [0.84]	1.65 [1.87]	1.97 [3.50]
Access to social programs	Acces to no-educative social programs	0.45 [1.24]	0.78 [0.93]	1.01 [0.06]	0.96 [0.15]	0.51 [0.87]	0.74 [0.99]	0.95 [0.25]	0.93 [0.29]	0.47 [0.96]	0.98 [0.08]	0.97 [0.13]
	Acces to educative social programs	1.46 [0.68]	0.68 [1.14]	0.56 [1.83]	0.51 [1.35]	0.65 [0.46]	0.46 [1.85]	0.50 [1.98]	0.37 [2.27]	3.88 [1.99]	0.55 [1.21]	0.41 [2.33]
School characteristics	Distancia Escuela (in minutes)	1.04 [2.33]	1.00 [0.98]	1.01 [2.84]	1.00 [0.10]	1.04 [2.16]	1.00 [0.30]	1.01 [2.97]	1.00 [0.30]	1.03 [1.81]	1.00 [0.68]	1.01 [1.26]
	Observations	1285	1282	1297	1299	1096	1095	1107	1106	602	598	604
	Pseudo R2	0.14	0.04	0.24	0.59	0.13	0.04	0.15	0.38	0.24	0.03	0.06

Robust z-statistics in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Appendix 11

Children Distribution of time

Table A11.1
¿Have you played any sport last week?

	Between 7 and 12 years old			Between 13 and 17 years old		
	Boys	Girls	Total	Boys	Girls	Total
Yes	979	906	1885	327	323	650
<i>(proportion)</i>	[99.19]	[95.37]	[97.32]	[99.09]	[97.58]	[98.34]
No	8	44	52	3	8	11
<i>(proportion)</i>	[0.81]	[4.63]	[2.68]	[0.91]	[2.42]	[1.66]
Total	987	950	1937	330	331	661
<i>(proportion)</i>	[100]	[100]	[100]	[100]	[100]	[100]

Table A11.2
¿Have you played any other game last week?

	Between 7 and 12 years old			Between 13 and 17 years old		
	Boys	Girls	Total	Boys	Girls	Total
Yes	894	888	1782	241	252	493
<i>(proportion)</i>	[90.67]	[93.47]	[92.05]	[73.25]	[76.36]	[74.81]
No	92	62	154	88	78	166
<i>(proportion)</i>	[9.33]	[6.53]	[7.95]	[26.75]	[23.64]	[25.19]
Total	986	950	1936	329	330	659
<i>(proportion)</i>	[100]	[100]	[100]	[100]	[100]	[100]

Table A11.3
¿Have you read any book or magazine last week?

	Between 7 and 12 years old			Between 13 and 17 years old		
	Boys	Girls	Total	Boys	Girls	Total
Yes	639	623	1262	239	224	463
<i>(proportion)</i>	[64.94]	[65.86]	[65.39]	[73.09]	[68.50]	[70.80]
No	345	323	668	88	103	191
<i>(proportion)</i>	[35.06]	[34.14]	[34.61]	[26.91]	[31.50]	[29.20]
Total	984	946	1930	327	327	654
<i>(proportion)</i>	[100]	[100]	[100]	[100]	[100]	[100]



Rural Girls' Primary Education in Latin America: The case of Guatemala

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Final Report

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I. INTRODUCTION

At the beginning of the 1990s, as a result of the obvious gender difference evidenced by the fact that two thirds of the 100 million children in the world that did not receive basic education were girls, the United Nations Children's Fund held the World Summit for Children, during which emerged a Declaration on the Survival, Protection and Development of Children. The conference established that *"from birth, girls should receive the same treatment and the same opportunities"* and that *"strengthening women's position in general and with respect to equality of rights, will favor boys and girls throughout the world"* (UNICEF, 1996).

In most countries of Latin America, global indicators of schooling show that girls' access to education is in almost similar proportions, – and even slightly higher – than boys. Despite the above, the statistics also showed that: i) there existed inequalities in the access to education in countries with high illiteracy rates and/or a large presence of indigenous communities, ii) the level of repetition in Latin America and the Caribbean is one of the highest in the developing world, such that an average student invested almost seven years to finish the first four grades of primary school and iii) that the lower the income level, the higher the possibility of dropping out or repeating (McCulloch, 1998).

Like the rest of Latin America, the five Central American countries have been unable to resolve pervasive inequality problems that include inequalities in: (a) access to school, specifically for indigenous populations and girls; (b) school readiness; (c) quality of educational supply; and (d) learning outcomes (Alvarez, et al, 1999).

In the case of Guatemala, a girls' education diagnostic from 1992 showed: i) high drop out rates, such that in the rural areas, only one out of eight girls who started school completed sixth grade, ii) more than a quarter of a million girls did not even complete one year of school and iii) as in other parts of the world, economic barriers, infrastructure, physical constraints, cultures and nutrition and health were identified as factors which limited girls' education (Nieves, 1992). Following this initial diagnostic, the Guatemalan education community embarked itself in a series of actions to curb gender inequalities in the public educational system and to actively promote girls' participation in the school system. Through the 1990's into the 2000's a number of actions were taken and advanced, from school based to community based to nationwide campaigns. In what constitutes a primer in Guatemala, these actions were developed by an ample range of society members: the government, civil society organizations, the private sector, the church (of various denominations), and supported technically and financially by several international donors.

The present study is the result of the research effort promoted by Educate Girls Globally (EGG) and by the Interamerican Development Bank in Latin America to understand the qualitative differences between boys and girls' education in rural areas (especially for indigenous Guatemalan girls). It encompasses information organized around a number of critical indicators: enrollment, attendance, school retention and completion, student academic performance, parents' participation in schools and in their children's learning, attitudes towards girls and costs for parents associated with girls' education.

In the first section of this document, a review of the Guatemalan literature has been done, together with an analysis of the different policies, strategies and actions that have been taken to promote girls' education and gender equity in the country.

The second section of this report presents the results of the field study and from the various analyses performed on secondary data. It includes the analysis of a series of indicators that show that, despite girls' success as students and in spite of the system obvious advances, girls still face an unequal situation as compared to boys. Most of the indicators were analyzed not only by gender but also by ethnic origin, and, when the analyses that so called for, they were also conducted by urban and rural areas.

The last section summarizes the main findings. For those interested in a rapid glimpse at the main findings, this section presents the main conclusions of this study, always using the set of indicators as an organizing tool.

II. GIRLS' EDUCATION POLICIES IN GUATEMALA

During 1985 and 1988, the Agency for International Development -AID- impelled evaluations of the education deputy sector, its outcomes indicated as main problems of the basic education the following: i) poor quality and inefficiency of the system, ii) low coverage, and iii) a poor administration of the educational services¹.

In 1991, the Girl's Program was created with the main purpose of promoting the girl's education up to sixth grade in the basic level and to reduce the desertion and repetition indicators of girls in the rural areas; subsequently it was institutionalized at the *Sistema Nacional de Mejoramiento de los Recursos Humanos y Adecuación Curricular –SIMAC-* (Human Resources and Curricular Improvement National System), currently known as the *Dirección de Calidad y Desarrollo Educativo –DICADE-* (Educational Quality and Development Directorship), where it is located up to this moment.

In 1992, the *Comisión Eduquemos a la Niña* (Let's Educate the Girl Commission) carried out the Diagnose for the Girl's Education, which oriented the definition of the first action plan for the girl's education for 1992-1997. This plan included the execution of determined projects, which enabled the mobilization of different society sectors, such as the "*Eduque a la Niña*" (Educating the Girl) Project, "*Un Mundo Nuevo para la Niña* (A New World for the Girl)" y "*La Cocina en mi Escuela* (The Kitchen at my School)" among others. In 1994, with the purpose of increasing the retention and promotion rates for girls at the basic level, the Ministry of Education created the Scholarship Program for Girls in the Rural Area, which is still operational.

Between 2000-2003, the Information and Coordination Network was created as a means to support the Girl's Education, and it promotes the information and exchange of experiences, and the intra and inter-institutional coordination or organizations that hold up the girl's

¹ Núñez, G. (1997).

education². In 2003, with the support of the *Apoyo al Programa de la Niña* Project [PNUD-GUA/99/012] (Supporting the Girl's Program), the Information and Coordination Network in favor of the Girl's Education submitted the Strategic Plan for the Girl's Education for the 2003-2007 quinquennium; at the same time, the equity of gender was included as the transversal axis of the curriculum.

Studies to evaluate the actions taken in favor of girls' education began back in 1992 with the Diagnose of the Girl's Education and subsequently, evaluations related especially to the unit of Basic Educational Strengthening Project – BEST- were performed, which included among its activities the Girl's Program. The Indigenous Girls Scholarship Program was assessed as well, of which its last evaluation was in 1999. Certain outcomes of the evaluations indicated that the most successful methodology was *Nueva Escuela Unitaria* (New Unitarian School), which, in spite of not having a specific component of equity of gender, proved that the quality of the education inside the classroom is the key to improve the enrollment and performance of the girls (O'Gara, C. et al 1998). A later study confirmed this fact by indicating that such schools that applied the active multi-grade methodology had better results in retention and completion for basic education, particularly in the girls' case. (Nuñez, G. y Rubio, F. 2000).

According to O'Gara, C. et al (1998), the Girl's Program provided a new perspective to the girl's education and promoted a strong interest among the private and business sectors. However, its initiatives were stressed for not being able of making a substantial change at the Ministry of Education in connection to the equity of gender, besides achieving a weak integration and institutionalization of the Program regarding a sensitive-gender curriculum and training of teachers as part of the Ministry of Education's planning. Additionally, it has to be mentioned the limited promotion of the analysis of policies and the system's reform, which lack of participation from important members of the civil society in the girl's education effort, particularly, from Mayan women.

For Chesterfield and Rubio (1998), even though the Project had a positive impact in instructing teachers about techniques to improve the girls' and Mayan students' participation, achievements in changing concrete actions within the classroom, were still limited.

A study carried out by Chesterfield and Rubio (1997) demonstrated that scholarships improved the rate of girls who completed their studies and the promotion of one grade to the next one. The biggest impact was at the first and second grades, thus, it was stated that granting scholarships could be a useful incentive at a long-term.

Subsequently, the evaluation done by Delpino, M. (1999), confirmed the impact of scholarships as an incentive, besides having a direct influence in the perceptions and behavior of the girls who received them, by favoring a change regarding the importance towards education. The author found that among fathers and mothers, the scholarship constitutes a concurrent element comparing to other factors that influence most of their

² Information and Coordination Network. <http://www.mineduc.gob.gt/proyectos/progniña/red.htm> Visited on 2/06/2004.

disposition and conviction regarding the girl's education. The same results were obtained in the study done by the Ministry of Education, *Asociación Eduquemos a la Niña* (Educating the Girl Association), *Fundación para el Desarrollo Rural –FUNRURAL* [for its Spanish initials]- 2001 (Rural Development Foundation), which indicated that girls who received scholarships showed lower ratios of school repetition and wider goals, than the girls who didn't receive them.

Another study by Chesterfield and Enge (2002), suggested that scholarships programs might have a positive effect over the basic education completion rates, and noted that in rural primary schools of Guatemala, the problem was not only for girls, since rates of boys who didn't complete their education, were similar to those the girls'. Taking into consideration the inefficiency observed in first grade, authors suggested that Guatemala needed a strategy focused in assisting children of first enrollment of any gender, to increase their success possibilities in school. They also highlighted the importance of monitoring scholarship students at a personal-level, which has not been done up to date.

By considering the mentioned studies, it can be established that these are evidence of the importance of determining specific policies to favor the girls' education, as well as to emphasize the establishment of general policies to cover this part of the population. In the same way, these studies indicated the need to apply a focused strategy to assist boys and girls of first enrollment of any gender, and increase their success possibilities in school. Additionally, they also highlighted the benefit implications for the bilingual education for indigenous boys and girls who attend school for the first time. These aspects were taken into consideration by the current administration of the Ministry of Education, who developed the "*Salvemos primer grado*" (Let's save first grade) campaign.

Another aspect that was pointed out, was the incomplete coverage from teachers and their attitude towards the equity of gender, plus the lack of integration of actions for the girl's education and equity of gender, since these have not always been a key part of the policies, strategies, programs and working areas of the central and regional units of Education. Likewise, the disclosure of the established guidelines for the incorporation of gender in the preparation of educational material, has not been done in a standardized procedure and isolated efforts are reported in order to evaluate the equity of gender in texts, such as the one carried out in 1997 by the BEST Project's Girl's Program, when educational materials produced by the Project were assessed.

Although the Girl's Program was actually institutionalized in the Ministry of Education, it hasn't completely fulfilled its normative and coordination role of the girl's education and equity of gender actions related to the curricular and pedagogical aspects. It is necessary to recognize the activity's importance, by reflecting it in the quantity and quality of resources assigned, for in fact, during the last four years the Ministry of Education's Girl's Program has had only one person to carry out actions, has not had its own budget and according to *SEPREM* (2003) "the existence of the Program has had to be justified in one way or another, for every new government administration".

The revision of the policies taken in favor of education along the past decade indicates that coverage has been emphasized, focusing the generalization of the first three grades of primary education, especially in rural areas. Gradually, policy has been given integrality, by joining aspects such as gender criteria, culture, geographical location and language, which sets the basis, not only to access school, but also to facilitate the scholar attendance and promotion of the population.

III. GIRLS' EDUCATION IN GUATEMALA

This section presents an extensive review of educational indicators in Guatemala. This analysis is based on various sources: the 2002 National Census (INE, 2003), the field work conducted expressly for this study (EGG-BID-CIEN home survey), the 2000 Survey of National Living Conditions developed by the National Statistics Institute (INE) (ENCOVI 2000) and the most recent National Survey of Employment and Income (ENEL, Encuesta Nacional de Empleo e Ingreso 2003). The Ministry of Education (MOE) Education Management Information System (EMIS) and the MOE PRONERE 1999-2000 (National program for the evaluation of academic achievement) were also consulted to analyze education indicators of enrollment, internal efficiency indicators, progress through primary and secondary education and school completion. The different sources were selected in order to comply with the analysis needed to meet the goals of the study and to guarantee the consistency of the findings.

The section is divided in nine parts. The first part studies the statistics of enrollment. The second part analyzes attendance, daily attendance, the reasons for non attendance given by the families and the determinants of attendance. A specific model to determine jointly the decisions of study and/or work is estimated. The third part analyzes the indicators of retention, progress and completion of students. The fourth part is devoted to describe the students eating patterns and availability of meals at the schools. The fifth part analyzes performance of students in two subjects. The sixth part analyzes parental participation in schools and its relationship with children study outcomes. The seventh part specifically assesses the change in the attitudes towards girls. The eight part studies the issue of school costs, as it is highly related to the educational outcomes from the household perspective. The last part concludes this section with an analysis of the incorporation to the labor force and income generation. All analyses are performed by gender, area and ethnicity, as allowed by the data.

III.1 Enrollment

Preschool education covers the 5 and 6 years old children group. Primary or elementary education has six grade levels and the official enrollment age starts at age seven, through age 12. The first leg of secondary education - which in Guatemala is known as "Basic"- covers the school population aged 13 to 15, and has three grade levels (1st. to 3rd. Secondary grades). The upper secondary school level covers the school population aged 16 to 19, and has up to four grade levels.

According to the Ministry of Education (MOE) Informatics' Unit Statistics (IUS) 2003 Yearbook, net enrollment³ was the higher for girls in preschool and upper secondary school, and higher for boys in primary and in lower secondary school.

In the 2003 School Year (SY), the net enrollment in preprimary school level was 44.18%, with a net enrollment for girls of 44.51%, and for boys of 43.88%. The system served 97.3 girls for every 100 boys, and in the population there were 96.0 girls for every 100 boys for this particular age group. In preschool (pre-primary) the enrollment rates are slightly higher for girls than for boys.

At the primary school level, the situation is the opposite and gender differences are greater. The net enrollment was 89.20%, with a 90.52% enrollment for boys and 87.83% for girls. The system served 93.1 girls for every 100 boys, while in the population there were 95.9 girls for every 100 boys. This disparity in enrollment is explained by the lower retention rate of girls in primary school.

At the basic school level, net enrollment -which is very low-, was 28.95%, and a higher enrollment for boys (29.68%) is maintained over girls (28.19%). The system served 91.2 girls for every 100 boys, while in the population there were 96.0 girls for every 100 boys. The disparity in enrollment at the basic level is slightly higher than at the primary school level.

Lastly, at the upper secondary school level, the net enrollment -even lower than in the previous level-, was 17.35%, with net enrollment for boys at 16.29% and net enrollment for girls at 18.45%. The system served 109.0 girls for every 100 boys, while in the population there were 96.2 girls for every 100 boys. This school level has the largest gender gap, against boys. The possible causes for this situation may be found in an early involvement of males in the work force, the lack of pertinence of the educational system and a lower retention rate.

Table 1: Enrolled Girls as percentage of Boys in Public Schools 1993-2003 by School Level

School Level	1993	1995	1997	1999	2001	2003
Bilingual Preprimary	84.1%	87.6%	88.2%	90.3%	93.2%	95.2%
Preprimary	96.3%	97.2%	97.0%	96.8%	98.8%	99.2%
Primary	83.2%	83.1%	83.8%	85.4%	88.1%	89.6%
Lower Secondary	79.9%	81.8%	84.7%	82.2%	83.6%	81.8%
Upper Secondary	93.4%	95.0%	100.4%	104.5%	107.3%	111.9%

Source: Ministry of Education (MOE) Informatics' Unit Statistics (IUS) 2003 Yearbook.

Table 1 summarizes the evolution of the gender gap reduction in public schools over the last 10 years, from 1993 to 2003. It shows a steady, albeit slow, reduction of the gender gap over the last decade. With the exception of primary school, enrollment deficits are the main problem, whilst gender gaps, while current and enduring, are of less importance. On

³ See operational definitions of terms in Annex 1.

the contrary at the primary school level, the gender gap is of bigger significance than the enrollment deficit.

III.2 Attendance

The previous section examined the enrollment in the educational system, from preschool to secondary school. This section reviews school attendance. Attendance is different from enrollment (which does not ensure that enrolled students actually attend school) in that attendance indicates with greater precision who effectively has access on a regular basis to education services.

The exam for attendance in the country in function of gender is carried out using classification variables consisting of urban or rural location of the home and the ethnic origin for the school aged population, from 7 to 18 years of age,⁴ using data from the Population Census of 2002 (National Statistics Institute, INE 2002). Table 2 presents the attendance level for this population group, by gender and location.

Table 2: School Attendance of Boys and Girls by Age and Area*

Age	Total			Urban Area			Rural Area		
	Boys	Gils	Total	Boys	Girls	Total	Boys	Girls	Total
7	76.8%	76.2%	76.5%	85.9%	86.1%	86.0%	70.7%	69.6%	70.2%
8	84.8%	83.6%	84.2%	91.7%	91.0%	91.4%	80.1%	78.6%	79.4%
9	89.4%	87.9%	88.7%	94.3%	93.6%	94.0%	85.9%	83.9%	84.9%
10	90.3%	88.9%	89.6%	94.5%	94.0%	94.2%	87.4%	85.5%	86.5%
11	91.7%	89.9%	90.8%	95.2%	94.6%	94.9%	89.1%	86.5%	87.8%
12	91.0%	88.5%	89.6%	94.8%	93.6%	94.3%	88.2%	84.8%	86.5%
13	89.0%	85.6%	87.3%	93.7%	91.9%	92.8%	85.5%	80.9%	83.2%
14	86.5%	82.2%	84.4%	92.3%	89.9%	91.1%	82.0%	76.3%	79.2%
15	58.8%	50.7%	54.7%	71.7%	65.9%	68.7%	48.9%	38.5%	43.7%
16	50.6%	43.2%	46.9%	65.6%	59.1%	62.2%	38.8%	29.8%	34.3%
17	42.3%	35.8%	39.0%	57.1%	51.4%	54.1%	30.4%	22.5%	26.5%
18	34.9%	29.4%	32.1%	48.6%	43.3%	45.9%	23.3%	17.2%	20.2%
Total	75.7%	71.7%	73.7	83.1%	80.0%	81.5%	70.3%	65.5%	67.9%

* All differences are statistically significant, z test for proportions, p.0.0001 or less.

Source: Analyses conducted by the authors, using the NIS 2002 Population Census.

In general, according to this data, there is not universal attendance in Guatemala. Using this data to estimate the probability of ever getting enrolled before age fifteen, it was found that for the population age 7 during the year of the census, the probability of ever getting enrolled would be of 92%, with a gender gap against girls (94% for boys and 90% for girls).

The major attendance gaps were found as function of the location of the household (urban or rural) and as function of the ethnic origin (indigenous or non indigenous), followed by

⁴ This is the official age range for primary and secondary education in Guatemala.

gaps associated to gender. Urban attendance is 13.6% higher than in rural areas, and this urban-rural gap is smaller for boys than for girls (12.8% urban-rural gap for boys vs. a 14.5% urban-rural gap for girls). Table 3 presents the attendance level for this population group, by gender and ethnic origin. The non-indigenous–indigenous gap in attendance is 9.7%. As with home location, the gap associated with ethnic origin is smaller for boys than for girls (7.6% vs. 11.7%). Girls have lower attendance than boys, 75.7% for boys and 71.7% for girls. This gap in attendance is observed in the urban areas as well as rural areas, and between indigenous and non-indigenous and for all ages (except for the urban group at seven years of age).

Table 3: School Attendance of Boys and Girls by Ethnicity*

Age	Indigenous			Non Indigenous		
	Boys	Girls	Total	Boys	Girls	Total
7	71.6%	69.9%	70.8%	80.9%	81.3%	81.1%
8	80.3%	77.9%	79.1%	88.4%	88.3%	88.4%
9	85.9%	82.9%	84.4%	92.1%	91.8%	92.0%
10	87.4%	84.5%	86.0%	92.7%	92.5%	92.6%
11	89.1%	85.6%	87.4%	93.6%	93.1%	93.3%
12	88.6%	84.5%	86.6%	92.8%	91.6%	92.3%
13	86.0%	80.5%	83.3%	91.2%	89.4%	90.3%
14	83.4%	77.0%	80.2%	88.6%	86.1%	87.3%
15	51.3%	39.1%	45.1%	64.2%	59.3%	61.7%
16	42.3%	30.8%	36.5%	56.6%	52.0%	54.3%
17	33.9%	23.3%	28.5%	48.2%	44.9%	46.6%
18	27.4%	18.4%	22.7%	40.3%	37.5%	38.9%
Total	71.3%	65.1%	68.2%	78.9%	76.8%	77.9%

* All differences are statistically significant, z test for proportions, p.0.0001 or less.

Source: Analyses conducted by the authors, using the INE 2002 Population Census

III.2.1 Attendance by School Level

The previous section examined attendance independently of the school level the school age population was attending. This section will examine attendance for school level. For each school level, the specific school age population was selected, and it was determined whether each child attended or not the school during the SY 2002. As shown in Table 4, attendance is higher in primary with a bit more than seven out of every 10 boys and girls of primary school age attending at this level. Attendance is much lower in the lower secondary with only 23.4%, and attendance is barely 14.7% for the upper secondary level. In primary and basic school attendance of boys is slightly higher than girls, 1.5% higher in primary and 0.6% in basic. However, in the upper secondary schools, the attendance of girls is 0.6% higher than that of boys.

In analyzing attendance by area, we find that urban attendance is much higher than rural attendance. For primary school there is a gap of 15.4 percentage points (80.8% vs. 65.4%), while the gap in basic and upper secondary is much higher. In terms of gender, the

differences tend to be smaller in urban areas than in rural areas. Taken independently, the gaps associated with gender are much more modest than the gaps associated with area.

The non-indigenous population has a greater attendance than indigenous at all levels of education, independently of gender (See Table 5). The gap is clearly associated to the enrollment level: the lower the enrollment the greater the gap. Regarding gender and ethnicity, an opposite pattern of results in attendance is observed: within the indigenous population, boys have a higher attendance than girls, at all levels; on the contrary, among non-indigenous populations, girls have a higher attendance than boys. The gender gap (inverse by ethnicity as seen) is greater among indigenous boys. As with area, the associated gender gaps are much more modest than gaps associated with ethnicity.

Table 4: School Attendance by Level, Sex, and Area⁵*

Level	Area	Boys	Girls	Total
Primary	Urban	81.0%	80.5%	80.8%
	Rural	66.5%	64.3%	65.4%
	Total	72.5%	71.0%	71.7%
Lower Secondary	Urban	39.4%	39.7%	39.6%
	Rural	11.9%	10.2%	11.1%
	Total	23.7%	23.1%	23.4%
Upper secondary	Urban	25.7%	26.9%	26.3%
	Rural	5.2%	4.9%	5.0%
	Total	14.5%	15.1%	14.7%

* All differences are statistically significant, z test for proportions, p.0.0001 or less.
Source: Analyses conducted by the authors, using the INE 2002 Population Census.

Table 5: School Attendance by Level, Sex and Ethnicity

Level	Ethnicity	Boys	Girls	Total
Primary	Indigenous	65.8%	61.8%	63.9%
	Non-Indigenous	77.7%	78.2%	78.0%
Basic	Indigenous	12.3%	10.0%	11.2%
	Non-Indigenous	31.9%	32.8%	32.3%
Upper secondary	Indigenous	6.3%	5.2%	5.7%
	Non-Indigenous	20.2%	22.2%	21.2%

Source: Analyses conducted by the authors, using the INE 2002 Population Census.

Table 6 analyzes school attendance by level, gender, area and ethnicity. In general, for the primary level the non-indigenous have an attendance around 11% higher than indigenous, independent of area. Non-indigenous boys have an attendance between 10% and 11% higher than indigenous boys and non-indigenous girls have an attendance between 12% and 13% higher than indigenous girls. Examining the basic and upper secondary levels shows that the gap between non-indigenous girls and indigenous girls is clearly greater than the gap between non-indigenous boys and indigenous boys.

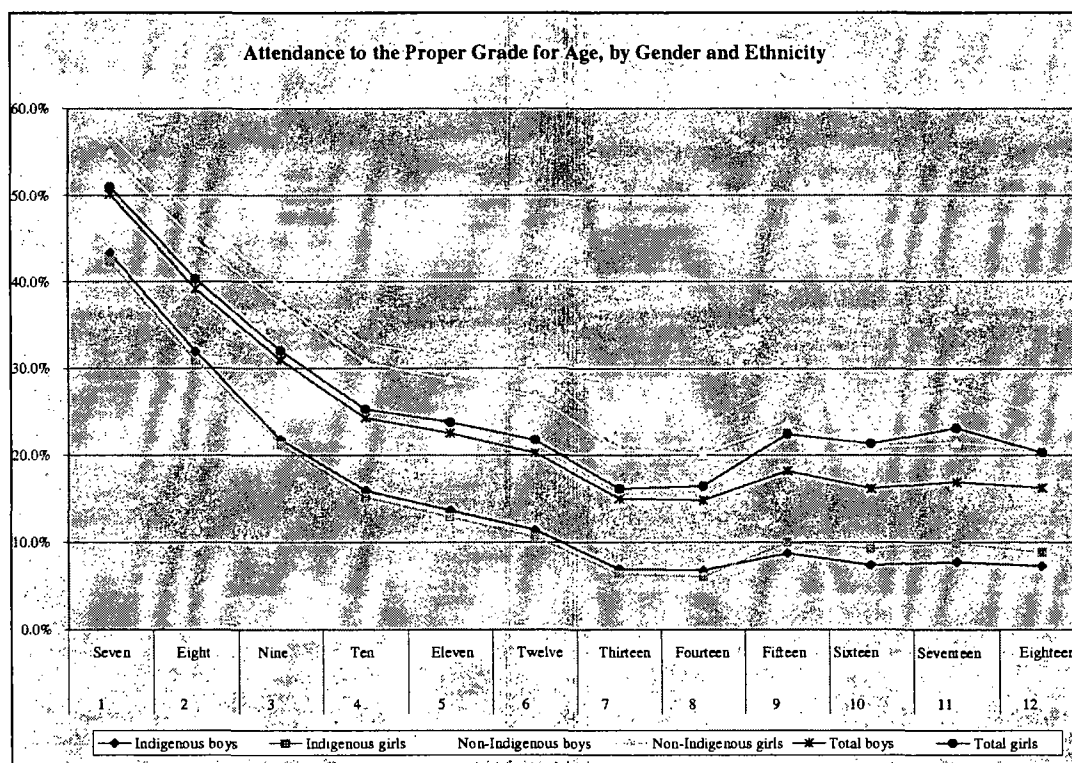
⁵ Given that a small percentage of the population at the age of each level is attending the level immediately higher, the net attendance rates presented here should be interpreted in the sense that this population currently attends the indicated level or attended this level in the past.

An equally important aspect is attendance to the proper grade according with age for those currently attending school. Figure 1 presents this relationship. The most striking finding is that most currently attending school students are not enrolled in the proper grade, and that this mismatch increases with age. Besides age, ethnic origin appears to be the most important variable to explain this mismatch. As for gender, more girls attend the grade they should be according with their age, as compared to boys, and the gender gap significantly increases over time.

Table 6: School Attendance by Level, Sex, Area and Ethnicity

Level	Area	Ethnicity	Boys	Girls	Total
Primary	Urban	Indigenous	74.4%	71.3%	72.9%
		Non-Indigenous	84.1%	84.8%	84.5%
	Rural	Indigenous	62.2%	58.0%	60.1%
		Non-Indigenous	71.2%	71.6%	71.4%
Basic	Urban	Indigenous	23.2%	20.5%	21.8%
		Non-Indigenous	46.5%	48.1%	47.3%
	Rural	Indigenous	7.5%	5.2%	6.3%
		Non-Indigenous	16.4%	15.6%	16.0%
Upper secondary	Urban	Indigenous	13.0%	11.2%	12.1%
		Non-Indigenous	31.2%	33.8%	32.5%
	Rural	Indigenous	3.1%	2.1%	2.6%
		Non-Indigenous	7.4%	7.8%	7.6%

Source: Analyses conducted by the authors, using the INE 2002 Population Census.

Figure 1

Source: Analyses conducted by the authors, using the INE 2002 Population Census.

In summary, this evidence suggests that gender, area and ethnicity interact in a complex way, implying that to be a girl of indigenous origin living in the rural area translates in the lowest assistance rate, independently of the educational level.

III.2.2 School Attendance in the Visited Communities

In this section, current school attendance of children of families that currently send at least one child to school is analyzed, based on the data collected for this study. Families without children currently enrolled were excluded. As expected, the highest attendance rate was found for the age group seven to fifteen. Differences based on gender were observed, but these differences were small. Except for the primary level, no significant associations were found between attendance and gender (Chi-square, for primary, $\chi^2 = 3.96$, $p=0.04$) for this sample. Table 7 details attendance by school sector: public or private, and within public schools, regular schools and schools under PRONADE.

In general, attendance from households that sent their children to private school is higher in all age groups. Regarding the two types of public schools, the attendance for all age groups is lower in communities that are served by PRONADE, except for the oldest age group. Except for the age group 13 to 15 (for public schools), no association was found between attendance and gender.

Table 7: School Attendance by Age Group, Sector and Sex

Age	Sector	Boys	Girls	Total
From 4 to 6 years*	PRONADE public	5.3%	5.3%	5.3%
	Regular Public	20.5%	23.1%	21.7%
	Private	60.0%	80.0%	66.7%
From 7 to 12 years*	PRONADE Public	92.1%	94.4%	93.3%
	Regular Public	95.7%	93.9%	94.9%
	Private	97.8%	100.0%	98.9%
From 13 to 15 years*,**	PRONADE public	76.9%	64.5%	70.2%
	Regular public	80.5%	71.1%	75.9%
	Private	91.7%	90.9%	91.3%

* Significant Differences by sector , K-W tests, p. 0.02 or less.

** Significant differences by sex, chi-square, p.0.05 or less.

Source: EGG-BID-CIEN Home Survey.

As expected, the location of schools was related in some way to the rate of attendance (Table 8). For the underserved school levels, the rate of attendance to urban schools was higher than the rate of attendance to rural schools. For the youngest age group, the difference between urban and rural schools was almost four times. Although gaps were comparatively lower, the rate of attendance for age groups 13 to 15 was also lower in rural communities. Regarding the age group consisting of 7 to 12 years, the difference in attendance rates was very small, although the attendance in urban communities was slightly higher. Given the sample size, these differences did not reach significance. The gap in attendance associated with gender tended to be higher in rural schools, especially in the smallest ones.

Table 8: School Attendance by School Size, School Age and Sex

Age	Size of School	Boys	Girls	Total
From 4 to 6 years*	Capital city	66.7%	55.6%	60.0%
	Urban regional city	38.5%	60.0%	47.8%
	Rural large	18.2%	15.0%	16.7%
	Rural medium	15.8%	15.4%	15.6%
	Rural small	13.0%	8.3%	10.6%
From 7 to 12 years	Capital city	97.6%	97.4%	97.5%
	Urban regional city	100.0%	98.1%	99.0%
	Rural large	92.3%	93.7%	93.0%
	Rural medium	94.2%	96.3%	95.1%
	Rural small	95.7%	90.6%	93.2%
From 13 to 15 years**	Capital city	100.0%	100.0%	100.0%
	Urban regional city	95.2%	93.3%	94.4%
	Rural large	75.0%	72.2%	73.8%
	Rural medium	73.8%	57.1%	64.8%
	Rural small	81.8%	71.2%	76.6%

* Significant Differences by sector , K-W tests, p. 0.05 or less.

** Significant differences only for girls.

Source: EGG-BID-CIEN Home Survey.

III.2.3 Daily Attendance

Daily attendance was examined by recording the attendance on the day of the visit and taking two random days out of each month from the attendance books in which the teachers marked student attendance, from February to May of 2004. The daily attendance analysis (Table 9) seeks to establish if some of the schools characteristics have an impact on the attendance of the students, particularly by gender.

As expected, attendance at private schools was consistently higher for the three grades that were examined, and the attendance in regular public schools was significantly the lowest in all grades, except for sixth grader girls. In general, no significant differences in attendance in function of sex were found, but it was observed an attendance trend that was higher for girls. In general attendance increases with the grade level as differences between school sectors tend to vanish.

In the Spanish speaking region, the lowest attendance rates were observed in first and third grades, and less so in sixth grade for boys. Attendance in schools located in the capital was significantly less in first grade but not in the other grades. Schools located in the western part of the country (Kaqchikel and Mam regions) had similar attendance rates, which was consistently above 90%. In the case of the Q'eqchi' region, a pattern was observed which contrasts with the other regions, given that attendance was higher in the lower grades and less in the final grades. The lowest attendance rate for sixth grade was observed in schools of this region.

As for school size, attendance varied according to the grade: it was lower in the first grades for the large urban schools, especially in first grade and it was higher in the sixth grade, noting a lower attendance in sixth grade in small rural schools. Concerning attendance by sex, for girls it was slightly higher, although this higher attendance was rarely significant.

Table 9: Attendance by Sector, Grade and Sex⁶

Sector	First		Third		Sixth	
	Boys	Girls	Boys	Girls	Boys	Girls
PRONADE Public	90.8%	90.7%	91.8%	93.3%	92.5%	91.3%
Regular Public*	83.1%	83.9%	84.2%	83.4%	87.6%	90.2%
Private	94.3%	95.0%	93.1%	95.3%	94.3%	96.9%
Total	85.5%	85.9%	86.7%	85.9%	89.4%	91.6%

* Significantly lower than the other schools.

Source: EGG-BID-CIEN Home Survey.

In summary, attendance is associated to the type of the school (sector), the region in which it is located, and in a less clear way, to the school size. It stands out that the size of the school, which functions as a proxy for the level of development and wealth of the

⁶ Significant difference, ANOVA, alfa 0.01 or less, Post Hoc Bonferroni, Test * significant difference, alfa 0.05 or less.

community where the school, is not clearly associated with lower attendance rates. Although this evidence is not conclusive, it challenges the hypothesis that the more rural, remote and poor the region, the lower the attendance of the students.

In examining attendance as a function of several physical characteristics of the school some interesting findings were discovered. Physical aspects of the school, such as having separate areas for the office, storage and kitchen were not clearly related to a higher attendance rate. The same was observed for the general state of the school building, and for the access to public services such as a piped water and electricity in the classroom. However, for some other physical attributes, clear differences in attendance were found, for boys and girls alike. Table 12 presents these findings.

Table 10: Attendance by Region, Grade and Sex⁷

Region	First		Third		Sixth	
	Boys	Girls	Boys	Girls	Boys	Girls
Capital	77.5%*	81.1%*	94.1%	92.5%	92.9%	95.7%
Spanish	69.0%*	69.0%*	69.8%*	63.6%*	89.6%*	95.3%
Kaqchikel	93.1%	92.3%	91.3%	92.8%	93.6%	95.5%
K'iche'	92.2%	94.3%	93.6%	91.5%	92.8%	92.4%
Mam	90.0%	91.0%	93.3%	93.1%	92.2%	92.0%
Q'eqchi'	90.3%	89.9%	78.0%*	76.7%*	77.3%*	79.4%*

Source: EGG-BID-CIEN Home Survey.

Table 11: Attendance According to the Size of the School, Grade and Sex

Sector	First		Third		Sixth	
	Boys	Girls	Boys	Girls	Boys	Girls
Capital	77.5%	81.1%	94.1%	92.5%	92.9%	95.7%
Department head	81.2%	79.7%	77.1%	75.9%	82.1%	89.9%
Rural large	90.7%	92.6%	88.0%	85.6%	92.2%	93.5%
Rural medium	85.9%	86.4%	89.5%	91.6%	93.3%	91.4%
Rural Small	88.8%	88.5%	88.8%	88.5%	87.9%	88.8%

Source: EGG-BID-CIEN Home Survey.

Table 12: Some Physical Characteristics of the School and Attendance by Grade and Sex

School characteristics		First		Third		Sixth	
		Boys	Girls	Boys	Girls	Boys	Girls
Play area	No	80.4%	79.8%	76.8%	75.6%	84.3%	85.6%
	Yes	89.0%	90.7%	92.9%	92.6%	93.6%	95.4%
Latrines	No	79.9%	82.3%	91.2%	89.6%	90.3%	91.1%
	Yes	86.1%	86.3%	86.4%	85.7%	89.3%	91.6%
Smell	Unacceptable	74.7%	68.8%	81.0%	74.7%	88.6%	92.9%

⁷ Significant difference, ANOVA, alfa 0.01 or less, Post Hoc Bonferroni, Test * significant difference, alfa 0.05 or less.

School characteristics		First		Third		Sixth	
		Boys	Girls	Boys	Girls	Boys	Girls
	Acceptable	89.4%	91.2%	87.8%	88.6%	92.1%	91.4%
Cleanliness	No	80.0%	73.6%	67.5%	63.0%	93.8%	89.1%
	Yes	85.8%	86.9%	87.8%	87.1%	89.3%	91.7%

Source: EGG-BID-CIEN Household Survey.

The availability of a play area was associated with greater attendance for boys and for girls at all grade levels, although the difference in attendance was lower in sixth grade. The differences in attendance by sex related to this aspect were not significant. The availability of latrines was associated with higher attendance in first and third grades, but not in sixth grade. This evidence suggests that this component has a greater importance for first grade. Again, the differences between sexes were not significant. An acceptable or unacceptable smell in the latrines and bathrooms, according to the judgment of the field researchers, was clearly linked to attendance in the first grades, but not in sixth grade. The attendance of girls was lower than boys in these grades when analyzing in function of the smell of the latrines. Lastly, the cleanliness of the school was also related to attendance and in schools that the researchers judged as clean, attendance was higher in the first grades, but not in sixth grade.

In general, the aspects that were examined did not have any effect on sixth grade attendance. Although the available information does not allow an explanation of this, it could be explained as a function of the investment that the students have already put into their education to reach the final grade in primary school. If so, these students attend regularly in order to capitalize on the product, finishing primary school, even when confronted with difficult conditions at school. Higher average attendance in this grade seems to concur with this interpretation.

Table 13: Existence of Books in School

Presence of Textbooks	PRONADE public	Regular Public	Private
Mathematics 1 st to 6 th grade	66.68%	76.53%	100.00%
Sciences 1 st to 6 th grade	63.08%	70.75%	96.30%
Social studies 1 st to 6 th grade	64.28%	69.05%	88.90%
Language 1 st to 6 th grade	66.68%	75.87%	92.60%

Source: EGG-BID-CIEN Home Survey.

The study also examined the relationship between the availability of books and attendance. Table 13 presents the average presence of books by sector and subject. There was a positive and significant correlation coefficient between of having access to textbooks and attendance, higher for first and sixth grades.

In order to determine the relative weight of each one of the physical characteristics of the school, a multiple regression analysis was completed, using a stepwise linear regression model with daily attendance as dependent variable. Daily attendance was calculated by dividing the total of students present at school by total enrollment, it's a proportion ranging from 0 to 1. Table 14 summarizes this analysis. Several aspects of physical infrastructure

negatively correlate with attendance, contrary to what had been expected (e.g., the better the infrastructure the higher the attendance). Nonetheless, this agrees with lower average attendance in schools in the capital and departmental urban centers. This suggests that these variables can be representing other (undefined) aspects of an urban nature which have an effect on daily attendance. The remaining variables correlate to the attendance variable as expected.

The multiple regression analysis allowed determining which variables predict school attendance, and the relative weight of each of these variables in this prediction. This analysis permitted to establish that a model with 22 variables of school explained 41.3% of the total variance. The rest of the variables, even though they correlated with attendance, do not predict it. A simpler model, that included the first 12 variables accounted for 39.6% of the variance, whereas the rest of the variables only explained the remaining 2.7% of the variance.

Five variables explain the most amount of variance, with at least a two percent of the total variance explained by each variable. The availability of a play area at the school is the variable that explains the most variance, indicating that the availability of this recreational facility increases most school attendance. Piped water availability in the school, separate office for the school principal and school building negatively predicted school attendance, and this confuses the interpretation, as it is commonly held that a good infrastructure helps students' daily attendance. The other variables of the simpler model explained between 10% of the variance.

Table 14: School Variables that Predict Daily Attendance

Variables	r with Atten- dance	B coeffi- cient	St. Error	Beta Coeffi- cients	t	Sig.
There is playground	0.39	0.15	0.00	0.48	34.86	0.00
Piped water in the school	-0.12	-0.10	0.01	-0.27	-18.60	0.00
School has electricity	-0.06	0.10	0.01	0.25	15.58	0.00
School size	0.13	0.04	0.00	0.32	15.09	0.00
Separate room principal office	-0.14	-0.09	0.01	-0.21	-15.04	0.00
Students in sixth grade	0.13	0.05	0.00	0.15	13.28	0.00
School is PRONADE	0.10	0.07	0.01	0.15	11.82	0.00
Latrine odor is tolerable	0.29	0.06	0.01	0.15	11.47	0.00
Separate room for kitchen	0.07	0.05	0.00	0.13	10.81	0.00
School accessible for vehicle	0.21	0.04	0.01	0.12	8.11	0.00
School is private	0.22	0.04	0.01	0.11	6.64	0.00
Building is in good shape	0.19	-0.03	0.00	-0.09	-6.54	0.00
Number of latrines	0.15	0.00	0.00	0.10	5.85	0.00
School has books	0.18	0.00	0.00	-0.06	-4.76	0.00
Number of classrooms	0.06	0.00	0.00	0.08	4.48	0.00
Separate room for storage	0.00	0.02	0.00	0.05	4.09	0.00
Separate latrines for boys/girls	0.01	0.03	0.01	0.05	3.92	0.00
Type of road to reach school	0.11	0.01	0.00	0.06	3.52	0.00
School is clean	0.19	0.03	0.01	0.04	3.40	0.00
Students in third grade	-0.05	0.01	0.00	0.03	2.37	0.02
Student is a boy	-0.01	-0.01	0.00	-0.02	-2.29	0.02
School floor with permanent materials	-0.06	0.04	0.02	0.03	2.21	0.03

Dummy variables are coded as 1=Yes; 0=No.

Source: EGG-BID-CIEN Home Survey.

III.2.4 Reasons for not Attending School

The census instrument explored reasons why the population between the ages of 7 and 14 years of age did not attend school. For classification purposes, those who did not attend school were grouped by age group, in primary school age (7-12 years) and in basic school age (13-15 years). The two most important reasons, that bind more than 50% of the response, are the lack of money and the student does not like school/ does not want to go to school. For the primary school age population, the first reason is slightly more frequent than the second, while for the basic school age population, the does not like school/does not want to go to school reason represents more than a third of the total of responses, while the lack of money was reported by a little less than a quarter of the absentees.

In terms of gender, the most important differences, for the primary level as well as for lower secondary level of education, are helping in the household and working. Girls are much more involved in chores at home than boys, while boys reported much more having

to work. In general, both reasons are cited with greater frequency for the basic level than for the primary level. Adding both reasons together, one finds that for boys this represents 8.4% of the reasons for absenteeism at the primary level, while for girls, it represents 9.9%. This is to say, in the primary, the involvement in labor activities negatively affects girls slightly more. In basic these reasons represent 20.1% of the causes for absenteeism for boys and 18.8% for girls. In contrast to the primary level, this type of responsibility negatively affects boys more than girls. At both levels, the results show that the reason consisting of parents not wanting their children to attend school affects girls slightly more than boys, particularly at the basic level.

Table 15: Reasons for Absenteeism by Sex and Level

Cause	Primary			Basic		
	Boys	Girls	Total	Boys	Girls	Total
Lack of Money	25.9%	26.2%	26.1%	24.2%	23.5%	23.8%
Does not like / Does not want to go	26.4%	25.0%	25.7%	34.5%	34.9%	34.7%
Parents do not want	10.6%	11.8%	11.2%	5.6%	8.4%	7.2%
Chores at home	2.5%	6.6%	4.7%	2.4%	11.6%	7.6%
Has to work	5.9%	3.3%	4.5%	17.7%	7.2%	11.7%
No school	4.2%	3.9%	4.1%	3.3%	2.9%	3.0%
Already finished studies	0.6%	0.5%	0.6%	1.9%	1.5%	1.7%
Other	23.9%	22.6%	23.2%	10.5%	10.0%	10.2%

Source: Analyses conducted by the authors, using the INE 2002 Population Census.

Also, the distribution of these reasons in function of ethnicity and area was examined (see Table A3.1 and A2 in ANNEX 3). This analysis shows some results that seem counter intuitive at first glance. The poorer indigenous population reports less the lack of money as the reason for not attending school than non-indigenous population. At the same time, the poorer rural population also reports this cause less than the urban population. For the indigenous urban population the most important cause is the lack of money, followed by does not like school; for the rural indigenous population the inverse is true. For the non-indigenous population, urban and rural, the lack of money is the most cited reason, followed by does not like school/does not want to go to school. Given the magnitude of this reason, with gender, area, and ethnicity taken into account, it is reasonable to hypothesize that the lack of pertinence of education contributes in an important way to abandon school. Gender differences tend to be more pronounced in the rural than urban areas and for the indigenous population than for the non-indigenous population. In the same way, having work responsibilities is more accentuated by area and ethnicity.

For the basic school population, the main reason for not attending school is does not like / does not want to go, regardless of ethnicity, urban or rural, or boys or girls. This represents almost 40% of the reasons for the non-indigenous population and around a third for the indigenous population. After lack of money, the third reason for absenteeism in this population is working in or outside of the household. For urban indigenous Guatemalans this represents 17.1% of the total and for the rural indigenous population, it represents 20.5%. For the urban non-indigenous population these two reasons represent 16% of the

reasons for absenteeism, while for the rural non-indigenous population the same reasons account for 19.9%.

III.2.5 Factors Associated with Attendance

In this section a Probit model was estimated with data from the EEG –BID-CIEN survey in order to find the determinants of school attendance. The variables used in the analysis are presented in Table 16, together with a brief description of each and the hypothetical direction of the presumed effect. They are variables that describe the context of the potential students in their communities and in their households, the school and the parental participation in the school life.

Table 16: Variables used in the Probit analysis

Variables	Expected Sign
Community Variables	
Distance, to Municipal urban center, in Km	Negative
Time, to reach municipal urban center, in minutes	Negative
Access, school can be accessed by paved road, (Yes=1, No=0)	Positive
Region, linguistic region in which the school is located, Guatemala city is the region of reference (Region1)	Negative
Area, where is the school located, Urban (1), Rural (0)	Positive
School Variables	
Latrines, restroom or latrines in the school	Positive
#latrines, number of restrooms or latrines in the school	Positive
School material, School is build with permanent materials, (Yes=1, No=0)	Positive
Household and Housing Unit Variables	
Spouse, both spouses live in the household, (Yes=1, No=0)	Positive
Father's education, last approved grade	Positive
Mother's education, last approved grade	Positive
Material, sum of: permanent materials in the roof, in the walls and in the floor. Ranges from 0 to 3	Positive
Services, access to public services ⁸ , ranges from 0 to 5	Positive
Home Appliances and transportation ⁹ , ranges from 0 to 5	Positive
Children, total of children in the household	Negative
Sex, sex of child (Male =1, Female=0)	Positive
Helps, child helps at home / fields with chores (Yes=1, No=0)	Negative
Hours, daily hours dedicated by child to help or to work	Negative
Parental Participation in Schools	
Opportunity, opportunity for participation in the school (1-5)	Positive
Support, material, in-kind/economical support to the school (1-5)	Positive
Learning, support to children learning, ranges from 1 to 4	Positive

⁸ Electricity, garbage disposal, piped water, human wastes disposal.

⁹ Electric or gas range, TV, Refrigerator, Other appliances, Car.

Two models were estimated. The first one examines attendance in the full sample, and the second one does the same for the sub-sample of families with at least one child attending school. The results are included in Table 17.

The most striking finding for the first model is that no child characteristic is included in the final model: neither gender nor helping at home or in the fields with chores bears an effect on attendance. Distance and time were included in this study as measures of school accessibility, and the type of available road to reach the school/community. Even though both distance and time are part of the model, their importance (as measured here) is negligible. This suggests that better ways to measure have to be devised, to better account for the impact of school accessibility.

The particular linguistic region in which the school was located was of importance for attendance. Children in regions two (Q'eqchi'), three (Kaqchikel), four (K'iche') and five (Mam), all had lower probabilities of attending school, as compared with children in region one (Guatemala City). The marginal effects for these regions indicate that children in these regions have among 18% to 28% less chance to attend school than children in region 1. If the school was located in urban or rural area did not have an impact.

That the area where the school is located did not account for attendance may be explained if one assumes that area is a proxy of economical status. Three different measures of the household economical status have been loaded in the model. That the house was built with permanent materials predicted school attendance: for each additional such a material an increment of 6% in attendance was predicted by the model. The same was true for the access to public services and of the ownership of home appliances and a car (see footnotes 9 and 10 in the previous page): for each additional access to a public service a 5% increment in attendance was predicted, and for each additional home appliance, 3%.

Parents' education has proven to be a strong predictor of children's school attendance in numerous studies. In this study, the father's education (or the male's figure in the household), but not the mother's, had an impact on attendance: for each additional year of education, an additional 3% of chance of attendance was found. The absence of any impact from the mother's education may be attributed to the generally very low education level of the rural adults' women in this sample. Neither the presence nor the absence of one of the spouses in the household, nor the number of children in the family predicted attendance.

Parent's participation in their children's education and in the school appears to be of importance¹⁰. Most interestingly, parents' support for learning was a strong predictor for attendance: for each additional point of support, an increase of 18% of attendance was predicted. Material support also had an impact, and for each additional form of support, an extra 2% of increment in attendance was expected. The opportunity to participate in the school had no impact on attendance.

¹⁰ But this has to be taken cautiously, as principals and parents report on the matter have been generalized to the whole sample, as a proxy, which may have the danger of overgeneralization.

Model 1 presents an image of attendance as a function of geographical location of the school, household economical status, parents' education and parents' participation in the school and in their children education. However, model 2, devised to explain why some children of a household attend to school whereas others do not, presents a partially different scenario.

Table 17: Determinants of School Attendance

Variables	Model 1 (n=1093, LR Chi ² = 351.7, p. =0.000)					Model 2 (n=867, LR Chi ² =446.4, p0.000)				
	Probit estimates			Marginal effects		Probit estimates			Marginal effects	
	Coef.	Std. Err	z	Dy/dx	Std. err	Coef.	Std. Err	z	Dy/dx	Std. err
Constant	-0.54	0.16	-3.37 ¹¹			1.17	0.23	4.99 ⁹		
Distance	0.00	0.00	3.44 ⁹	0.00	0.00	NA				
Time	-0.01	0.00	-2.45 ¹²	-0.00	0.00	NA				
Region 2	-0.66	0.29	-2.28 ¹³	-0.20	0.10	NA				
Region 3	-0.90	0.16	-5.50 ⁹	-0.28	0.06	NA				
Region 4	-0.77	0.15	-5.07 ⁹	-0.23	0.05	NA				
Region 5	0.64	0.14	-4.65 ⁹	-0.18	0.04	NA				
Fathers education	0.11	0.05	2.13 ¹¹	0.03	0.01	Exclude				
Materials	0.24	0.07	3.55 ⁹	0.06	0.02	0.37	0.07	5.28 ⁹	0.08	0.01
Services	0.19	0.07	2.91 ⁹	0.05	0.02	Exclude				
Appliances	0.11	0.06	1.8 ¹⁴	0.03	0.02	Exclude				
Support	0.15	0.06	2.42	0.04 ¹¹	0.02	0.25	0.08	3.10 ⁹	0.05	0.02
Learning	0.75	0.07	11.2 ⁹	0.18	0.02	0.65	0.08	7.82 ⁹	0.14	0.02
Sex	Excluded					-0.36	0.13	-2.86 ⁹	-0.08	0.03
Hours	NA					-0.42	0.03	-12.86 ⁹	-0.09	0.01

Source: EGG-BID-CIEN Home Survey and researcher's calculations –F. Rubio-.

The total amount of hours that children have to give to carry out home or field chores and/or to work for a salary impact the most on attendance: for each additional hour a 9% reduction of the probability to attend is predicted. And gender also plays a role, and girls have an 8% less chance to attend to school than boys. As will be seen in the following section, both work and attendance are clearly associated with gender.

For model 1, the household economical status was of great importance, but for model two this is less so: only the materials the house was built of had an effect: for each additional permanent material used in the house an increase of 8% of attendance was predicted. Then, for households that have at least one child in school, the home economy appears to

¹¹ p =< 0.004

¹² p =< 0.01

¹³ p =< 0.05

¹⁴ p =< 0.10

be a reason of importance for sending some children to school but not others, but this is less important as compared to all households.

Finally, parents' participation continues being of importance. As with model 1, support of learning was more important, representing an increment of 14% for each additional point of support for learning. Material, economical or in-kind support to the school had an impact too.

In summary, this evidence shows that in fact child attendance is determined by a variety of factors, associated with geographical location, household economical status and parents' characteristics, parents' participation and children's characteristics. Geographical location seems to be indicator of supply side factors, whereas the household aspects appear to reveal demand side factors. However, parents' participation may be interpreted as both: support for learning seems to be an indicator of parents' recognition of the importance of the education for their children. Hence, this somewhat reinforces the demand for education, as successful children would more probably continue demanding more education services. On the other hand, parents' material, economical and in-kind support reinforces the capacity of the local school to continue offering these services.

As a final point to close this section, this evidence suggests that gender discrimination, in a context of near universal coverage (for primary education), is associated with both economical factors and non economical factors. Child labor (either by way of formal work or by helping), negatively impacts attendance, and is associated with the economical status of the household, but girls appear to be more impacted than boys.

III.2.6 Attendance and Work

One of the child's aspects most closely related to attending school is child labor. In general, both aspects tend to be negatively correlated. In Guatemala's case the correlation between attending school and working is significant and negative ($r = -0.3$). Hence, a finer analysis of determinants of attendance would require to simultaneously taking into account attendance and work, as dependent variables.

Upon examination of the survey data in the school sample, it became clear that this sample was inadequate to examine the conjoint relationship attendance and work, given that these families were mostly young families, with elementary school age children. This was caused by the sample design that used the local primary school as the starting point. This effectively barred the possibility to properly examine the phenomenon for the younger children, the age group more likely to face the tradeoff of attending school and working. Given this, it was decided to use one of the INE national surveys. The most complete available sample is the ENCOVI 2000. Therefore, this database was transformed to allow examining this issue.

Given that there is a distinct pattern of attendance and work associated with the child's age, the school age population was categorized in three groups: 7 to 12, 13 to 15 and 16 to 18. For each group the same Bivariate Probit analysis was conducted, as to determine if the

predictor variables perform differently for each age group. In fact, the results show that many of the variables under study behave differently for these age groups.

Table 18: Variables used in the Bivariate Probit Analysis

Variables	Expected effect
Attend school (0=No; 1=Yes)	-
Works, employed looking for work, helps at home, work without salary (0=No; 1=Yes)	-
Regions, 1 to 8, 8 variables, country region where household is located. (1= located in the region; 0 = Located in the region, region 1 is reference)	Exploratory
Area, location of household (Rural = 0; Urban = 1)	Urban, more attendance, more, Less work
Extremely poor (Yes=1, No=0), No Poor is reference	Yes, Less attendance, more work
Poor, includes extremely poor. (Yes=1, No=0)	Yes, Less attendance, more work
Integrated household (0, One parent in the household; 1 Both parents in the household)	More attendance, less work
Head of household (0, Mother; 1, Father)	Father, More attendance, less work
Number of household members part of the EAP, excluding the child, as a proportion of total number of household member	The more members the less attendance; more work
Persons in household	More persons, less attendance, more work
Girls in household in relation to boys in household	The more girls, less attendance, more work
Father's education Number of approved grades	Higher number of grades passed, higher attendance in school, less work
Mother's education, Number of approved grades	
Mother's mother tongue (0= Non Spanish; 1=Spanish)	1, More attendance, less work
Sex (0=Feminine; 1=Masculine)	1, More attendance, more work
Ethnic origin (0=Indigenous; 1=Non Indigenous)	1, More attendance, less work
Age	The older the less attendance and the more work
Square age	

III.2.6.1 Attendance and work for Children 7 to 12

For the age group 7 to 12 (see Table A3.3 in ANNEX 3), the geographical location of the household was not associated with attending school (except for children in Region 6), for whom there was a positive association. However, work was associated with living in rural areas and household location in the regions 4, 5 and 6.

As for household characteristics, school attendance was negatively associated with household in extreme poverty and in poverty. No difference in attending was found for households with just one or with parents (integrated household). Similarly, participation of household member of the Economic Active Population (EAP) did not explain attending, nor did the proportion of girls to boys in the household. Household size and a male as the head of the household marginally intervene in accounting for attendance ($p = 0.06$ and 0.07 , respectively). Work was not explained by any of the measures of economic status. Household size predicted more working children ($p = 0.06$), as marginally and inversely did proportion of girls in the household (less girls, more working children) ($p = 0.08$). As for the EAP, the more household members were in the EAP the more likely that a child would work. Gender of the head of the household did not explain work by children.

The parents' education level was the strongest predictor of children attending school, but had no effect on children working. The mother's first language did not predict attending school but children from Spanish speaking mothers were less likely to be working ($p = 0.05$).

Some child characteristics were of importance to explain both attending school and working. Being a male was positively associated with attending school, but negatively with working, thus indicating that girls are less likely to attend school and more likely to work. Finally, the older the child the more likely that she or he was attending school and involved in working. This finding is supported by the fact that enrollment increases with age and that child's involvement in work too.

Marginal effects were estimated for three models: attends school and works; attends, does not work; and, does not attend, works. Children living in rural areas were 6% more likely to attend and to work than children living in urban areas, whereas urban children 4% more likely to attend school and not work. As for the region in which children lived, those living in regions four and six (14%) and region five (10%) were more likely to attend school and to work than children living in region 1, the region of reference (the metropolitan region). Children in regions four, five and six were less likely to attend school without working.

Poverty in the household was clearly associated with attending and working, and children in extremely poor households had 13% more likelihood to be in this condition than children living in other households, as were children living in extremely poor or poor households (7% more than children living in non poor households). Poverty of the household was also strongly associated with not attending school and working (10% for children in extremely poor households and 6% for children in extremely poor or poor households).

Children living in integrated households were 23% less likely to have to attend school and work than children living in households with just one parent, but this variable did not have predictive power for the other two models.

Household size was also important, and for every additional member in the household the probability of attending school and working increased by 1%.

As predicted, the more members of the household in the EAP the more likely children were expected to attend and work, the less likely to attend school without working and (marginally, $p=0.08$), the more likely not to attend school, and to work.

As would be expected, parents' education was positively associated (but weakly) with attending and working, attending and not working, and negatively related to not attending and working. In each case no more than 1% of change for each year of additional education was found. This weak effect is due the high attendance rate for the primary level, which most of the children in this age group attend to. By the same token, the mothers' spoken language had only a marginally significant ($p=0.08$) impact for the first model, a significant impact for the second model and no impact for the third model.

Child characteristics had a clear effect on all three models. Regarding gender, girls were 10% more likely than boys to attend school and to work; boys had 14% more chance to attend school without work and girls were 5% more likely not to attend school and to work. Then, this evidence shows a clear pattern of gender discrimination working against girls.

The child age also played an important role: the older the child the more likely that he or she was attending school and working, and the more likely that the child was not attending school and working.

In summary, for the age group 7 to 12, (the group with the highest attendance rate), attending school and working are interrelated. Of special importance for this work, these evidence shows that gender plays a role, and girls' schooling is more impacted for having to work than boys'.

III.2.6.2 Attendance and Work for Children 13 to 15

As seen before, attendance rates experience a sharp decrease starting at age 13. This section examines how works is related to school attendance for this group age, and which variables explaining both dependent variables (see Table A3.4 in ANNEX 3 for results).

Regarding school attendance, living in urban areas and in some regions (2, 4, 6, 7 and 8) was positively associated with it. Poverty status was negatively associated with school attendance, as was the proportion of the family members' part of the EAP. Similarly to the previous age group, parents' education was positively associated with attendance. No child characteristics were related to attending school for this age group.

As for work, rural children were more likely to have to work, as also were children living in households with a high proportion of members as part of the EAP. Likewise, girls were more likely to be working than boys. The others variables did not play a role in explaining work.

The analysis of marginal effects for all three models allowed establishing the relative importance of each determinant. Children in urban areas were more likely to attend school

and work (13%), more likely to attend school and not work (4%), whereas children living in rural areas were more likely to work (17%) and not to attend school than urban children.

Children living in different regions (regions 2, 4, 6 and 7) of the country were more likely to attend and to work than children living in the metropolitan region. Conversely, children living in regions 2, 4, 6, (and marginally, in region 7) of the country were more likely working and not attending school than children from the metropolitan region. It is of importance to underscore that these regions mostly concentrate indigenous population.

Children living in extreme poverty were 11% less likely to attend to school and to work, and 10% more likely to work and not attend to school than children living in no poor households. Children living in either extremely poor households or poor households were marginally (0.07 and 0.08) less likely to attend school and work (8%), to attend school without working (2%) and more likely (p.01) to work without attending school (11%) than children living in non poor households. Related to this, the higher the proportion of household members as part of the EAP, the lower the probability of attending school without working (18%), and the higher the probability of working and not attending school (24%).

Both integrate household and household size failed to play a role in any of the three models, as also did not the numbers of school age girls in relation to the number of school age boys in the household. Likewise, the gender of the head of the household was not a determinant for any of the models.

As for the previous age group, both mother's and father's education was positively related to attending school and negatively associated with working.

As for the age group 7 to 12, children gender also was a determinant for the age group 13 to 15. Boys were 5% less likely to attend school and work than girls, 9% more likely to attend school and not work, and girls were 6% (p.0.08) more likely not to attend to school and work. These results essentially replicate what was found for the younger age group.

III.2.6.3 Attendance and work for Children 16 to 18

This age group suffers the lowest attendance rate. Also, the rate of incorporation to the EAP is the highest for it. Therefore, the tradeoff between education and work should be highest. This section examines the determinants of attending school and working, using the same models as for the two previous age groups.

The results (see Table A3.5 in ANNEX 3) for this age group essentially mirror the results obtained for the other age groups, with some interesting differences. Contrary to the previous analysis, the model three, does not attend, does work comprises the majority of the cases. Then, for this age group, it is more important to explain why children do not attend school than why students attend school.

For attending school, some of the same variables reviewed before have a role: area, regions of the country, poverty status of the household, and child gender, whereas the other variables do not. However, the head of the household gender is a determinant now, which was not the case for the other age groups. As for work, the father's education is negatively related to it, suggesting that this variables acts as a buffering variable for work for this age group. Given the similarities, analysis is focused in the differences, and on the main topic of this work, children gender.

Children living in a household with a male head have 23% more chance to be attending school and working. Inversely, children living in households with a female head had 24% less chance of attending school and be working instead. Thus, this evidence indicates that female head of the household constitutes a handicap only for children of older age, but not for younger children.

Regarding gender, girls continue to be at disadvantage: boys of this age are 4% more likely to attend to school and not work, whereas girls are 12% more likely to work and not attend school.

III. 3 Retention, Progress and Completion

This section examines the retention rate and completion of final grades. For this, we will examine completion of primary, basic and fifth of upper secondary¹⁵. This section is based upon the work completed by F. Rubio, (one of the authors) in work done under the MEDIR Project of USAID Guatemala.

Table 19: Promotion and Drop Out by Level and Sex for 2003

Level	Indicator	Boys	Girls	Total
Primary	Passing	78.4%	79.5%	78.9%
	Drop out	5.2%	4.8%	5.0%
Basic	Passing	50.3%	57.0%	53.3%
	Drop out	9.0%	6.7%	7.9%
Upper secondary	Passing	58.4%	64.9%	61.7%
	Drop out	9.3%	8.7%	9.0%

Source: MEDIR Project.

This evidence allows to conclude that girls are more successful than boys both in attending school throughout the school year as well as in passing to the next higher grade, at all levels of the education system that this study examined.

To examine retention an analytical cohort model was used, following groups from first grade in primary school up to the final grade. Table 20 summarizes the completion rate for primary and secondary school.

¹⁵ Given that in Guatemala there are two terminal grades for upper secondary, fifth grade for the high school diploma and sixth grade for teacher training schools and trade schools, being promoted from fifth grade has been taken as indicator of upper secondary school completion

Table 20: Completion of Primary School, Basic and Upper secondary by Sex

Level	Area	Boys	Girls	Total
Primary (cohort group 1997-2002)	Urban	58.0%	59.4%	58.7%
	Rural	30.7%	28.1%	29.5%
	Country	38.4%	37.3%	37.9%
Lower secondary (1995-2003)	Country	25.4%	25.3%	25.4%
Upper secondary (1993-2003)	Country	8.8%	11.7%	10.1%

Source: MEDIR Project.

The completion rate for all levels is low, for boys as well as for girls. For primary school, less than 40% of those enrolled in first grade in 1997 finished primary in 2002. Slightly fewer girls than boys were able to finish primary. More important differences were found by area: the completion rate of primary school was higher for girls than for boys in urban schools and lower in rural schools. The largest differences were found for area: the completion of primary in urban areas almost doubles that of rural areas and for girls, more than double.

As seen in Table 20, girls have higher promotion rates and lower drop out rates. In spite of this, girls' completion rates in rural areas are lower than boys'. Given this fact, it is clear that promoted to the next upper grade girls do not get enrolled in it. Likewise, evidence shows that when girls are not promoted to the next upper grade or when they drop out during the school year, they have a smaller probability to be enrolled again in the school than boys.

MOE data does not allow conducting direct cohort analysis by ethnic origin. Instead, Census data was analyzed to determine which percentage of the population in school age has completed the different levels of formal education (see Table A3.6 in ANNEX 3). The school-age indigenous population completes any given school level at a much lower rate than their non indigenous peers. The gap associated with ethnicity grows larger with each school level: for the primary level indigenous completion is almost half that of the non indigenous, for the lower secondary it is just a third, and for the upper secondary, the completion gap is 3.5 times. The gap in completion is even bigger for indigenous girls, and this gap is even more pronounced for indigenous girls living in rural settings.

For 2001, only 18.7% of students finished primary school in rural schools which served an indigenous Guatemalan population and which did not have a bilingual program (around 70% of all schools). Schools located in the same geographic and sociolinguistic areas that offered some kind of bilingual education (see "Bilingual education in Guatemala: Situation and Challenges", World Bank – Fernando Rubio, Guatemala) had a higher completion rate higher than schools that did not offer bilingual education, but lower than the national rural average.

Now data obtained in household surveys collected for this study will be examined. Children from families with at least one child currently enrolled in the school had an average schooling of 5.6 years. Children coming from families with no child currently enrolled at school had a lower schooling, with an average of 3.23 years. This difference in

schooling was observed for both boys and girls. Children from the first group of families had higher average schooling in all age groups.

In the same way, past attendance for both groups of children was significantly different. For the first group, 71.4% of the children had attended school, although some of them no longer attended school; in the second group, only 46.8% of the children had previously attended school. There was not any statistical difference in the age of the children to which could be attributed the difference in attained education level.

Table 21: Primary Completion of Children of the Interviewees, by Family Type

Completed Grade	Children from families with at least one child currently enrolled						Children from families with no child currently enrolled		
	Currently attend school			No longer attend school			No longer attend school		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
First	0.7%	0.0%	0.4%	2.4%	6.1%	4.0%	10.8%	10.7%	10.8%
Second	1.5%	1.8%	1.6%	4.7%	3.1%	4.0%	10.8%	10.7%	10.8%
Third	6.7%	7.1%	6.9%	10.6%	13.0%	11.6%	27.0%	28.6%	27.7%
Fourth	1.5%	1.8%	1.6%	7.1%	13.7%	10.0%	8.1%	17.9%	12.3%
Fifth	10.4%	10.7%	10.5%	10.0%	8.4%	9.3%	8.1%	0.0%	4.6%
Sixth/more	79.3%	78.6%	78.9%	65.3%	55.7%	61.1%	35.1%	32.1%	33.8%

Source: EGG-BID-CIEN Home Survey.

The completion rate of primary school among those children of parents who currently send their children to school is much higher than the completion rate of those children whose parents not longer send them to school. Completion of girls is lower than that of boys in all cases, and it is statistically lower in the case of girls that no longer attend school but who have brothers or sisters that attend, and also lower in the case of parents who currently send no child to school.

Table 22: Average Schooling in Families that Send and do not currently Send their Children to School, by Sex

Children in school	Children's Attendance	Boys	Girls	Total
Yes	Go to school	4.2	4.3	4.2
	Went to school	6.1	5.0	5.6
No	Went to school	3.5	3.2	3.4

The analysis of schooling achieved of those who do not attend school shows clear differences between groups as well as gender. The average schooling of children from those households that actually send at least one of their children to school is a bit more than 2 years more than that of children from households who do not send any child to school. In the same way, the maximum schooling is higher for the first group than for the second group. The variance analysis shows that the difference between groups is much more important (Square Mean=452.7) than the difference within the groups (Square

mean=68.25), which suggests, as the rest of the evidence does, that there are strong differences between both groups of families.

Differences associated to gender, although small, concur with the rest of the information that has been examined here: girls have lower schooling on average, and the maximum school that they reach is lower. In the first group, the difference of schooling is almost a grade, and the maximum for boys is university while that for girls is 6th of upper secondary. In the second group of families the difference in schooling is lower, 0.3 years, and the maximum schooling for boys is 5th of upper secondary while that for girls is third of basic school.

Table 23 disaggregates the data by age group. Among those students that currently attend school, a similar pattern of change can be established over time. The level of schooling of young adults, from 19 to 24 years of age, shows a disparity in the education level obtained, and boys have almost three more years of schooling than girls. However, for the group of older adolescents (16 to 18 years old), girls have 1.5 more years of schooling than boys. For younger adolescents (13 to 15 years old) and for a younger group (7 to 12) there are no differences in the level of schooling attained. This suggests that if both sexes continue attending school, in general, they would maintain the same level of education.

On the contrary for those students who no longer attend school, either from the first group of families or the second group of families, in general, boys tend to have more schooling than girls, and this disparity does not diminish within younger age groups.

Table 23: Schooling by type of Family, Age Group and Sex

Age group	Sex of child	Homes with at least one child in school				Homes with no children in school	
		Attending		Attended, but no longer		Attended, but no longer	
		Schooling	Age	Schooling	Age	Schooling	Age
7 to 12	M	3.2	10.0	4.3	10.6	3.1	10.3
	F	3.3	10.0	2.7	10.9	2.4	10.0
	Total	3.3	10.0	3.5	10.7	2.8	10.2
13 to 15	M	6.1	13.9	5.0	14.1	3.8	13.9
	F	6.0	13.8	4.5	14.1	3.3	13.8
	Total	6.0	13.8	4.7	14.1	3.6	13.9
16 to 18	M	6.8	16.5	5.5	17.1	4.6	16.9
	F	8.3	16.4	5.1	17.3	5.0	16.4
	Total	7.3	16.5	5.3	17.2	4.7	16.8
19 to 24	M	12.5	20.8	6.7	21.0	3.8	20.5
	F	9.6	21.2	5.6	20.6	5.0	19.9
	Total	10.9	21.0	6.2	20.8	4.5	20.2
25 and older	M	-	-	7.0	30.2	3.0	29.5
	F	13.0	26.0	5.6	31.9	1.0	26.0
	Total	13.00	26.0	6.5	30.7	2.3	28.3

Source: EGG-BID-CIEN Home Survey.

In summary, children from households that still have at least one child in school have reached a higher average of schooling than those children from households that do not have any children in school and among those that continue attending school, gaps in school level tend to disappear.

Given that the level of schooling is being studied, it is logical to assume that the schooling of the fathers and mothers may be related to that of their children. In effect, the level of schooling both for fathers and mothers that have at least one child in school was higher than those parents that did not have a school age child attending school. Regarding work, there was no association found between working or the type of work and sending boys and girls to school. However, although not a drastic difference, there exists an association between accumulated wealth and sending and maintaining children in school.

Table 24: Aspects of the home associated with having or not having children in school

Aspects	Yes	No
Separate room for kitchen	84.6%	74.8%
Kitchen with firewood	76.4%	86.2%
Electricity	75.4%	65.9%
Television	39.0%	26.0%
Home with all adequate construction materials	20.4%	7.3%
Telephone (mobile or wired)	13.9%	1.6%
No public service	13.9%	18.7%
Refrigerator	13.4%	4.1%

Source: EGG-BID-CIEN Home Survey.

When asking the mothers or fathers if in their opinion there had been changes related to girls' education, 79.6% of those interviewed answered positively. Differentiating by the type of household, 82.7% of those interviewed with at least one child attending school answered positively, while only 66.3% of those interviewed who did not have any child in school had the same opinion.

III. 4 Students' Daily Eating Patterns and School Meals Availability

Nationwide, 11% of surveyed reported that their children did not eat every day before going to school. Almost half of the parents (41.8%) reported that their children did not eat well before going to school. As can be seen in Table 25, the rate of respondents that informed that their children did not eat every day before going to school was much higher for the Q'eqchi region than for the other regions. For the "do not eat well..." questions, the pattern of results is less clear cut: in all regions many children do not eat well before going to school, as little as almost three out of 10 (Spanish region) to slightly more than 6 out of ten (K'iche' region). As 72% of the respondents reported that this did not happen during the day of the visit or the day before, this seems to indicate that even though not eating well before going to school is quite a common problem, it does not occur every day.

Then, for all regions, excepting the Q'eqchi region, the main eating problem is not eating well, while for the Q'eqchi' speaking region both not eating and not eating well are important problems.

Table 25: Eating Patterns of Children attending School

Region	Do no eat every day* before going to school	Some times do not eat enough well before** going to school			
		Today	Yesterday	Other day	Total
Q'eqchi'	28.1%	28.6%	14.3%	57.1%	43.8%
Capital	12.5%	36.4%	0.0%	63.6%	50%
Kaqchikel	8.3%	10%	5%	85%	31.7%
K'iche'	3.3%	10.5%	5.3%	84.2%	63.9%
Mam	3.5%	0.0%	7.5%	92.5%	38.8%
Spanish	6.6%	23.8%	21.4%	54.8%	27.9%
Total	11.1%	16.9%	10.9%	72.1%	41.8%

*Chi-square = 36.68, p. 0.000; ** Chi-square = 20.75, p. 0.001

Source: EGG-BID-CIEN Home Survey.

The existence of a food program in public schools was also explored. As reported by parents, in 91.7% of schools there was a food program, and in 84.8% food was delivered every day. These figures are much higher than the reported by parents in 2003 (see report by CIEN, 2003, Evaluation of the Food School Program), thus suggesting an improvement in the program delivery from one year to the next.

No difference was found between these variables and attendance to school the day before the visit. For children currently attending school, the rate of attendance during the day before to the interview was of 92.5% for boys and 94.3% for girls, and this rate was statistically equal regardless of eating every day before going to school, eating well every day, the availability of a food program in the school or the frequency of the program. No difference by gender was found.

The average of absent days in the month before the interview took place was 0.53. Again, no difference was found in the average of day of absence in the previous month by gender.

III. 5 Student Performance

III.5. 1 Teachers Given Grades

In Table A3.7 (of ANNEX 3) average grades in mathematics for boys and girls, indigenous and non indigenous, are presented. Table A3.8 summarizes an analysis of variance, in which gender and ethnicity are fixed factors. This analysis tests, among others things, whether there are differences by sex and by ethnicity. It also explores interactions between sex and ethnicity. Table A3.9 and A10 present this information for Spanish language. In the Guatemala school system, grades range from 0 to a 100, and the approval cut point is 60.

For mathematics, the average grade was around 73, slightly higher for first grade (73.6) and six grades (74.1), and somewhat lower for second grade (72.9). This is an unexpected finding, given that the promotion rate for each grade are clearly different, and tend to be higher in the upper grades (MEDIR, 2002). For Spanish language, the situation was different, particularly for sixth grade. For first and third grade, the average was slightly under 73 (72.94 and 72.86, respectively), whereas for sixth grade it was 75.3%. However, these differences by grade failed to reach significance, for either subject

Regarding gender, no differences by gender were found in teacher given grades, either in mathematics or Spanish languages, for any of the explored grades. As for ethnicity, clear differences in teacher given grades were found for each grade, in the two subjects, both for boys and girls. The effect of ethnicity was highly significant for all grades ($F = 27.9, 39.2$ and 17.6 , respectively, $p = 0.000$). No gender by ethnicity interaction was found.

These differences by ethnicity may be the result of different learning opportunities or can be associated to different criteria to give the grades to students, may be associated with different size of the school or with the school location. While the teacher given grades data does not lend itself to conclusively give answer to these hypothesis (due to lack of a standardized criteria), the different explanations can be reduced with the data at hand. The possible effect of school size and school location was explored by way of one-way ANOVA. Nationwide, a significant effect for school size was found for the entire sample. However, when restricting the sample to those schools with an ethnic mixed student population, it did not follow a clear pattern of results. In first grade and sixth, a school size effect was found for mathematics, but not for Spanish language; the reverse was the case for third grade. Furthermore, it was not the case that the bigger the school, the higher the grades. Therefore, establishing a linear relationship between school size and grades was not possible. As for the school location, the analysis by region also showed a significant effect. The Q'eqchi' region had significant lower grades than the other regions, but it was not the case that all indigenous regions had lower grades than the non indigenous. In fact, the Kaqchikel region had the highest average grade. Again, the lower grades obtained by indigenous students can not be ascribed to the indigenous regions.

Other possible explanation was the sector (public-private) the students were attending to. Indigenous students receive lower grade in schools in both sectors. When restricting the sample only to those schools with an ethnic mixed school population, indigenous students continued receiving lower grades than non indigenous students. However, in public schools, the differences were significant only for Spanish language, but not for mathematics; in the private schools, the reverse was true. Again, no clear explanation can be given to the lower grades the indigenous students were given.

In summary, indigenous students do receive lower grades by their teachers than their non indigenous peers. This is independent of the school size, the linguistic region (but see the mention of the Kaqchikel region), and from the sector the schools belongs to.

III.5. 1 Tests results

This section analyzes the grades obtained by girls and boys in language and mathematics by area and ethnicity according to the tests taken by PRONERE in 2000 (Tables 26 and 27). In third grade, girls in rural schools have a performance significantly lower than boys in both tests. The difference was small but significant for the reading tests, and significantly bigger for mathematics. In the urban areas the scores for the reading tests were similar, but again boys significantly outperformed girls in mathematics. For sixth grade, rural boys obtained significantly higher scores than rural girls, in both tests. As for urban boys, no differences were found in the reading test, but boys again outperform girls in mathematics. With the exception of reading in urban settings, girls consistently receive lower scores than boys.

Table 26: Results in Reading and Mathematics Tests, by Grade, Area and Gender

Grade	Area ¹⁶	Reading				Mathematics			
		Boys		Girls		Boys		Girls	
		Mean	St. Dev	Mean	St. Dev	Mean	St. Dev	Mean	St. Dev
Third	Rural	58.6*	18.2	57.5	18.9	49.1**	17.0	45.0	17.2
	Urban	63.4	17.3	63.7	17.4	53.2 ⁺	16.0	51.1	16.6
Sixth	Rural	50.4 ⁺⁺	17.5	48.6	17.3	59.3 ⁻	18.7	56.3	18.9
	Urban	49.8	18.2	50.2	17.9	63.8 ⁻	16.7	63.0	16.6

* t-test = 3.5, p.=0.000; **t-test = 11.3, p.=0.000; ⁺t-test = 6.1, p. = 0.000

⁺⁺t-test = 3.7, p. =0.000; ⁻ t-test = 5.4, p. =0.000; ⁻ t-test = 2.23, p.=0.026

Source: PRONERE, 2000, analysis done by the authors.

Table 27: Average Tests Scores in Reading and Mathematics, by Spoken Language and Grade

Grade	Third Grade				Sixth Grade			
	Reading		Mathematics		Reading		Mathematics	
	Mean	St. Dev	Mean	St. Dev	Mean	St. Dev	Mean	St. Dev
Spanish Speaker	63.57*	16.53	48.5*	17.28	53.83*	16.67	59.94*	18.5
Mayan Speakers	45.03	16.35	40.0	16.27	38.44*	13.95	51.55	18.29

* t-test significant, p < 0.01

Source: PRONERE (2000). Table composition by the authors of this study using data from tables 20 and 21 of this report.

Regarding ethnicity, at the moment of this writing, the database with the ethnic and linguistic information was not available. Therefore, the 2000 PRONERE report was used instead. As can be seen, Spanish speaking students' reading scores were about one full standard deviation higher than the Mayan speaking students' scores. As for mathematics,

¹⁶ Results by area are not comparable, as PRONERE gave different tests to students in either area. These tests have 20 items that were similar, but at the time of this writing, listings of these common items were no available.

Spanish speaking students significantly outperformed Mayan speaking students, although the differences were less dramatic than for reading.

The aforementioned report did not present results by gender and ethnicity, neither by area, nor by linguistic group. Therefore it is not possible to clarify whether these scores are urban or rural, or based on the common items. Likewise, no analysis by gender or by linguistic can be made, nor can be any interaction of gender and ethnicity can be derived. However, given that in the general averages, boys consistently outperformed girls, and indigenous girls face a wider educational gap, it is reasonable to assume that national trends, as reviewed here, also apply to indigenous girls.

III. 6 Parents' Participation

Parents can be involved in three different ways in their children schooling (MEDIR, 1999): supporting the school, either economically or by providing their labor force; getting involved in the school management (which can vary according the legislation); and actively supporting their children learning. Support to children's learning may be provided at the household or at the school. These three approaches to parent participation have been labeled School Material Support, School Management Support and Children's Learning Support.

Parents' participation in the school is based on the premise that the school opens up opportunities for parents to be able to participate. This was explored in three ways: does the school have an organized parents' association (PA)? If so, does this association held regular meetings? And, does the teacher organize regular meetings with parents?

Regarding the parents association, 64.3% of the interviewees reported that in the local school there was a parents' association, and in 100% of the school at least one parent reported so, while in 63.9% of the schools all interviewees concur. Out of these, 70.7% of the parents also reported that they knew the PA held regular meetings, and in 84.7% of the schools at least one parent informed s/he knew about these meetings, but in only 29.2% of the schools all parents reported they knew about the regular meetings.

As for teachers organized meetings, 89.6% of the parents indicated that their children's teachers held meeting with parents, and in 93.4% of the schools at least one parent reported this way, although just in 37.7% all parents concurred.

Material and economic support to the school was by far the most mentioned form of support parents gave to the school. In all schools at least two of the interviewed parents indicated that they or their spouses gave this type of support to the school.

As a general measure of the capability parents had to intervene in managing the schools, parents were quizzed about their knowledge of the responsibilities of the PA. Of all parents, 43.4% did not know any of the PA responsibilities. Of the remaining 56.6%, 25.5% recognized one, other 20% identified 2 responsibilities, and only 11% could mention three or more responsibilities.

III.6.1 Learning Support at Home

Regarding help with school responsibilities, 68.6% of children currently attending school receive some type of help, with no difference by gender (boys, 68.3%, girls, 68.9%). The mother was the most frequent source of help (58.7%), followed by the father (32%) and by and older sibling (7.8%), whereas other relatives or other person provide such help for only 2% of the cases.

Even though no association was found between receiving help and gender, a significant association was found for school size, sector (public, private) and for linguistic region. In urban schools, 83.5% of students receive help with school responsibilities, while only 62.6% of rural students reported receiving this help. Likewise, 91% of students attending private schools also receive help, whereas only 65% of students attending public schools did. Regarding the linguistics regions, it was higher for Guatemala City (83.2%), followed by the Spanish only speaking region (75%), and –closely grouped- the Mam region (68.8%), the K'iche' region (67.9%) and the Kaqchikel region (64.6%), and last, the Q'eqchi region (59.9%).

The two extremes, Guatemala City and the Q'eqchi' region, (regions with the highest and the lowest educated parents), suggested that the crucial variable regarding receiving help is parents' education. Therefore, parents' education was recoded, and a chi-square analysis was run. In Table 28 the results are presented.

Table 28: Receiving Help with School Responsibilities by Father and Mother Education Level

Parents' Education Level, in years completed	Father			Mother		
	Boys	Girls	Total	Boys	Girls	Total
No formal education	62.9%	61.4%	62.2%	53.2%	60.3%	56.4%
From one to three years	58.3%	64.7%	61.1%	68.3%	67.7%	68.0%
From four to six years	66.7%	69.3%	68%	76.9%	69.3%	72.8%
From seven to 9 years	87.9%	50.0%	70.5%	87.5%	100.0%	93.3%
From ten to 12 years	95.1%	100%	97.4%	95.8%	100.0%	97.9%
College education	83.0%	82.5%	82.8%	81.6%	71.9%	77.1%

Source: EGG-BID-CIEN Parents' Interviews.

As can be seen, there is a clear association between parents' education level and whether their children receive any help with school responsibilities. The association is somewhat stronger for mothers' education (chi-square linear by linear association = 36.3, p. 0.000) than for fathers' education (chi-square linear by linear association = 35.4, p. = 0.000). It is important to underscore that this evidence suggests that only when mothers have an educational attainment beyond the primary level almost all students receive help with their school chores.

The different activities that students have to carry out at home can also be used to determine whether parents support their children learning, as household chores may diminish study time, therefore negatively impacting on learning. Two such activities, helping with domestic chores and working for a salary were explored. More girls (73.2%) than boys (68%) had domestic responsibilities, but this association was marginally significant (chi-square 2.65, $p = 0.061$). Very few children (2.9%) worked for a salary, just 5.1% of the boys and 2% of the girls. Given the reduced number of cases this won't be used in further analysis.

The impact of helping at household was then examined by looking at the average number of hours the student dedicated to reading and doing household work, playing and watching TV or listening to music. Having to do domestic chores clearly reduced study time, as well as leisure time, for both boys and girls.

Regarding gender differences, even though no significant difference by gender was found in study time, girls with domestic responsibilities have less available time for playing or for watching TV or listening to music.

In summary, about two third of parents provide help to their children with the school responsibilities. Also, about two third of all students have household responsibilities and have to do various domestic chores, either in the house, or with the various economical activities the family subsists on. This evidence shows that in general having to perform these chores significantly reduce study and leisure time, regardless of gender. Despite this, girls that help at home have significantly less available time to dedicate to leisure activities.

III.6.2 Learning Support at School

By large, parents' support to their children learning in the school was limited. The most frequent form of support was attending meeting with teachers, reported by 83% of all interviewees. Conferences with teachers were the second most common form of support at school, and 31% of the interviewees and 45% of their spouses (as reported by the interviewee). Other forms of support were mentioned scarcely, totaling 10% or less of all parents.

Table 29: Forms of Parents' Support to Student Learning at School

Forms of support	Interviewee	Spouse
Attended last meeting with teacher	83.4%	N.a.
Helped Teacher in the classroom	2.9%	2.4%
Other parents help teachers in the classroom	6.4%	
Receive grades	23.1%	11.9%
Conference with teacher	31.3%	45.1%
Check child progress	15.0%	14.2%
Discipline	6.1%	10.7%
Other	9.0%	4.0%

Source: EGG-BID-CIEN Parents' Interviews.

III.6.3 Impact of Parents Participation

The students' variables used for these analyses were grades in mathematics and Spanish language, daily attendance, and current attendance to school. For the school based indicators, grades and daily attendance, correlation analysis were run. For the household interviews base indicator, current attendance, t test were used to compare parents' participation level in relationship to their children current attendance.

Regarding students daily attendance correlations were low, but significant ($p = 0.000$). Opportunity for parents' participation has a Pearson correlation of 0.13, but actual parents' participation negatively correlated with daily attendance, $r = -0.04$, a very weak relationship, probably non important, even though significant. Material and economical support to the school have a more important relationship with daily attendance, with a correlation of 0.22. Support to learning had the highest correlation with daily attendance, with an $r = 0.26$.

However, for teacher given grades, the pattern of results was less clear. Opportunity for participation and material and economical support have low, negative correlation with grades, for both mathematics and Spanish language. On the other hand, actual participation in the school and support to learning had a positive, significant relationship with the given grades. Again, the support to learning correlated the highest (albeit low) with these indicators.

As for current attendance, children of parents with higher scores on opportunity for participation and parents with more participation in the school had a higher enrollment than children with parents with lower scores. On the other hand, no differences were found in enrollment in function of scores obtained in material and economical support and on learning support.

III. 7 Attitudes towards girls

Overall, most parents (79.6%) considered that the perceptions about sending girls to school have changed, for the better. A statistical similar result was found across all regions, funding source and school size. As would be expected, more parents with at least a child currently enrolled in the school have this perception than parents with no children attending school (82.7% and 66.3%, respectively), a very significant association (chi-square = 13.1, $p = 0.000$).

Parents identified three main reasons for this change. The first reason may be interpreted as an increase in the access to education services. This finding is in accordance with the push for increasing enrollment that has been the national policy during the last decade. Then, a policy of general application has had a positive effect of girls' access to education. Second, parents recognize that they have changed their attitude about their daughters' education. Generally speaking, this could be interpreted as a product of the intense public campaign for girls' education that started back in 1992. If so, the policy option with a focus on girls has also had a positive impact. The third reason, and the most interesting

from a conceptual point of view is the perception that girls themselves have changed (in comparison with previous generations), being more confident, assertive and having higher motivation. Although a small percentage of the parents reported this, it is an encouraging pattern of result upon which further developments could be based.

School principals were also asked about changes in girls' participation of the primary school system, changing perceptions about how girls are treated in the school, and about girls' participation of various non-curricular activities in the school. Regarding girls' attendance, 83.3% of the school directors considered that it has improved over the last ten years. Questioned about the reasons for this increase in attendance, principals identified changes in parents' attitudes as the most likely explanation: 55% of the principals gave this reason. Most principals (84.7%) estimated that the way girls are treated at school has also changed overtime. Of those who reported that no change had happened, eight (72.7%) considered that girls have always been treated fairly.

Asked about the reasons for this change, principals identified a series of possible explanations that can be interpreted as changes in the school and in the classroom that made of these learning spaces a more equitable learning environment. In all, 72% of all principals gave this type of explanation. The rest of the principals' answers implied an improvement of opportunities for girls' education. However positive, this results are to be taken with care. First, these are issues highly susceptible to the social desirability response pattern. As this response pattern was not controlled for, its possible effect cannot be ruled out. Second, principals may have provided memorized answers, either because they receive training on these issues or because they were exposed to the national public campaign for girls' education. Principals who reported having received training on gender issues tend to give more positive answers, but this trend did not reach significance. Likewise, principals who reported that teachers in their school have received this type of training, also tend to report more that girls' attendance was higher and that they receive a fairer training in the school, but this was not significant either. Finally, some principals may have just given the answers that the researchers expected to hear.

Boys significantly participate more in soccer team and in sports activities. This is not surprisingly, given that the general perception in the country is that soccer is a boys sport, and most sport tournaments consist of soccer games. In that sense, it is encouraging the high percentage (relatively) of schools with girls soccer teams. Other aspect of student participation that was examined was participation in the school government. Approximately the same number of schools have school government with participation of boys and girls. However, it was found that more boys than girls did participate in the school government. For the other aspects of student participation in the school, no significant differences by gender were found.

III.8 Costs

Parents sending their children to public schools have considerable annual expenditure in education, even though public schools are nominally free. In particular, secondary education costs are quite considerable, and certainly are a significant barrier for furthering

education for both boys and girls. Given the database transformations and the limitations and restrictions imposed, one should be careful about generalizing the results to the population as a whole. In the following Tables, non-weighted and weighted analyses are presented.

Table 30: Annual School Costs to Parents, by Gender, for Children 7 to 12

Cost per children	Gender	Non-Weighted Analysis (N=845)		Weighted Analysis (N=254083)	
		Mean	Std. Dev.	Mean	Std. Dev.
Attending child	Boys	Q488.5	Q1,156.8	Q536.43	Q1,425.05
	Girls	Q471.3	Q1,130.7	Q535.47	Q1,423.36
All children in the household	Boys	Q432.1	Q1,137.3	Q485.29	Q1,416.40
	Girls	Q418.8	Q1,077.3	Q478.21*	Q1,370.62

* t-test = 9.4, p.= 0.000

Source: ENCOVI 2000, Cost estimation by the authors.

The non-weighted analysis, parents spend somewhat more in boys than in girls, both when looking at cost for children currently attending school, and when examining this cost distributed among all children in school age in the household. The difference is small and does not reach statistical significance. The weighted analysis indicates that there is no difference for currently attending children, thus concurring with the non-weighted analysis. As for the distribution of costs among all school age children, there is a significant difference, but the difference in monetary terms is small, at just Q7.08¹⁷. In general, it may be concluded that for children 7 to 12 parents do not discriminate by gender, as annual school costs to parents are statically similar.

However, national averages can hide sub national differences, and there may be gender bias in parents spending in their children schooling. In Table 30 the same analysis is conducted by further distinguishing between urban and rural households. In the non-weighted analysis cost for boys is higher in all cases, but these differences fail to reach significance. However, when weighting the cases, all differences are significant, but the actual monetary differences are small. Urban parents significantly spend more on girls currently attending school, around Q29 more. When controlling by all children in the household, urban parents spend annually around Q4 in boys, a nil difference. Rural parents spend more in boys than in girls, both when looking at currently attending children as well as when controlling for all children in school age in the household, about Q34 and Q9 more in each case.

Table 31: Annual School Costs to Parents, by Gender and Area for Children 7 to 12

Area	Cost per children	Gender	Non-Weighted (N=298 & 547)		Weighted * (N=75948 & 178135)	
			Mean	Std. Dev.	Mean	Std. Dev.
Urban	Attending child	Boys	Q913.81	Q1,812.08	Q1,164.72	Q2,415.97

¹⁷ According to the Central Bank, Banguat, the average Exchange Rate of Quetzales for 1 US\$, during the year 2000, was 7.77. (www.banguat.org.gt)

Area	Cost per children	Gender	Non-Weighted (N=298 & 547)		Weighted * (N=75948 & 178135)	
			Mean	Std. Dev.	Mean	Std. Dev.
	All children in the household	Girls	Q896.10	Q1,738.88	Q1,193.85	Q2,351.50
		Boys	Q836.21	Q1,800.06	Q1,107.50	Q2,420.86
		Girls	Q820.24	Q1,675.23	Q1,103.60	Q2,291.25
		Boys	Q256.85	Q360.30	Q268.55	Q409.84
Rural	Attending child	Girls	Q239.84	Q423.49	Q254.76	Q518.30
		Boys	Q211.89	Q314.77	Q220.01	Q357.00
	All children in the household	Boys	Q211.89	Q314.77	Q220.01	Q357.00
		Girls	Q200.09	Q362.56	Q211.57	Q451.04

* t-test, all differences are significant, p. = 0.03 or smaller

Source: ENCOVI 2000, Cost estimation by the authors.

This evidence then suggests that rural parents tend to spend more in boys, but in strictly monetary terms, the additional spending is small.

Another form to explore for sub-national differences is by looking at the poverty status of the households (see Table A3.11 in ANNEX 3). Households in extreme poverty consistently spend more on boys than in girls. Furthermore, the by gender difference in spending is quite important: Q177 more in attending boys than in attending girls, or just Q0.40 in girls for each Q1 in boys. Households in poverty also spend more in boys than in girls, but the difference in spending is less dramatic. The weighted analysis shows that non poor parents also spend more annually in age 7 to 12 boys than in age 7 to 12 girls, around Q354 more, or Q0.89 in girls for each Q1 in boys. The evidence also suggests that as the family gets more affluent, there is tendency to more equity in parents spending in their children schooling.

Analysis for the age group 13 to 18 roughly resembles this, but the spending gender bias is more pronounced for this age group than for the previous one. Parents reported spending more for boys. The difference, significant for the weighted analysis, is of around Q282 or Q0.85 for attending girls for each Q1 in attending boys. (See Table A3.12 in ANNEX 3).

As presented in Tables A13 and A14 (in ANNEX 3), this phenomenon is observed when national data is analyzed by area and by poverty level. Urban parents spend around Q317 more on attending boys than in attending girls or Q0.90 for girls for each Q1 in boys. As for the age group 7 to 12, the gender gap in spending is more pronounced for rural parents. This group spends Q254 more in boys than in girls, or Q0.71 in girls for each Q1 in boys.

Extremely poor families spend Q177 more in boys, poor families spend Q222 more and non poor families spend Q354 more in boys than in girls. Relatively, this means that the first group spends just Q0.40 in girls for each Q1 in boys, poor families spend Q0.71 in girls for each Q1 in boys and non poor families spend Q0.89 in girls for each Q1 in boys.

The evidence just reviewed strongly suggest that the poorer the family the strongest the gender bias against girls in parents' spending for education. Be that the family lived in rural settings or that families were characterized as extremely poor or poor, a strong

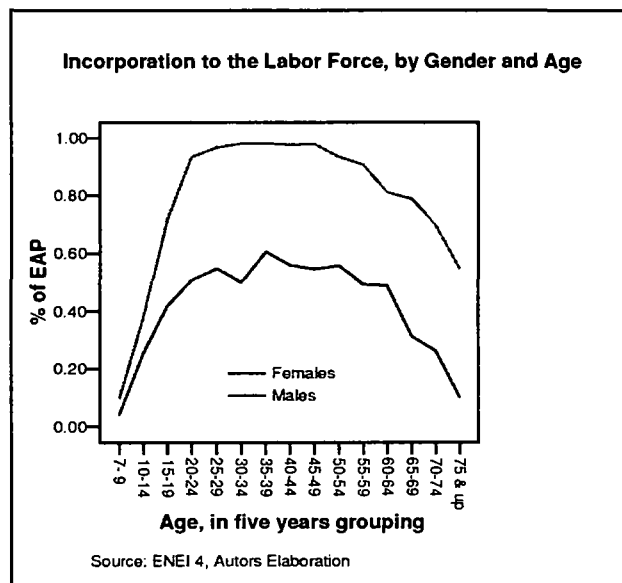
difference in parents' spending is clearly identified. However, the evidence also shows that even in the richest families, the gender bias is maintained: these families annually spend Q11,672.58 in boys and Q10,444.83 in girls, or Q0.89 in girls for each Q1 in boys.

Then, the analysis of school cost to parents indicates that parents do have a bias in school spending that favors boys in detriment of girls. This bias seems to be closely associated to the family affluence. Then, no difference is found for urban (richer) families, whereas for rural (poorer) families there is a difference. Likewise, families in extreme poverty significantly spend more in boys, and the difference in spending by gender is reduced as the family gets richer.

III.9 Incorporation to the Labor Force and Income Generation

The final part of the analyses conducted in this study is related to the girls and women incorporation to the Economic Active Population, EAP, population who is working, or is looking for work or is temporary unemployed. Three indicators will be examined to describe this: percentage of women and men that are part of the EAP, average hours work per week and average monthly income.

In the following graph appears what percentage of the population 7 and up is part of the economic active population. The first aspect that calls the attention is how early Guatemalan children start to be part of the EAP. By age 14 around 37% of the boys and 25% of the girls are members of the workforce. More men than women enter the labor force at all ages. By age 20 over 90% of all men are members of the PEA, and they remain so up to the 59 years, upon which the percentage of men that are members of the EAP starts to descend. On the contrary, women's participation of the EAP never reaches more than 61%. Their participation reaches a high point by age 29, and then a small decrease is observed, most probably due to maternity. Then, women's participation in the labor force increases again, reaching more than 60% of participation, with a small decline up to the 60-64 age group, upon which it starts to decline.



Not only women are a smaller proportion of the EAP, but women receive in average a smaller monthly income than men. Table A3.15 (in ANNEX 3) presents average monthly income by working men and women by educational level and ethnic origin: men have a higher average monthly income than women in all cases. Women with the same educational level than men have a lower income; indigenous women have a lower income than indigenous men. The same is true for non indigenous women and men. This is also

true for rural and urban women (not shown in the Table). In column five appears the average difference, in Quetzales, between men and women. In column six, women's monthly income is presented as a percentage of men's. The smallest difference is found among men and women with less than primary education (including no education), particularly between indigenous men and women. In this case, indigenous women have a monthly income that amounts to 92% the income of men. The highest difference is found for the primary level, especially for ladino men and women: ladino women's monthly income is only 57% of that of the ladino men. The income of women as percentage of men's increases as the educational level increases, but even the university educated women receive less income than university educated men: university educated women's income amounts to 75.5% of that of their male peers.

One possible explanation other than gender discrimination is average hours worked each week. Not only less women than men form part of the EAP, but in general women work significantly less hours per week than men (but the survey only counts as working hours those hours spent doing a job; hours spent doing home chores and taking care of household responsibilities are not considered working hours). In average, men work 45.4 hours a week, while women work in average 37 hours a week.

To examine the possible impact of hours worked, the monthly income was divided by the average hours worked in the month. This produced an average income by worked hour. Table A3.16 presents this. In general, women have lower hourly income than men: the average men hourly income is Q8.65, while women's is Q7.56, a little more than Q1 for men. This applies to both indigenous and non indigenous women. Indigenous persons in general have a much lower hourly income than non indigenous persons, and indigenous women have the lowest hourly income of all, at just Q3.68. However, it is interesting to underscore that indigenous women have a somewhat higher hourly income than indigenous men at both ends of the education spectrum: indigenous women with less than complete primary education and university educated indigenous women tend to have higher hourly income than indigenous men.

Whereas it is true that women worked shorter hours (for an income), it remains the case that men, for the same educational level and of the same ethnicity do get a higher income than women. Therefore, the gender gap in monthly income can be interpreted, at least partially, as the result of discriminatory practices against working women.

IV. CONCLUSIONS

The first general conclusion is that the girls' education situation in Guatemala has changed significantly over the last 15 years. Even though this study is not a formal evaluation of the different actions carried out during this time span, it strongly suggests that all the different interventions, from those oriented to changing the public opinion, through those focusing on teachers and the classroom, to those targeting specific girls have had a positive impact on the girls' education. The accompanying review of the literature, and of the different national policies, strategies, plans and interventions testify to the effort conducted

for different actors, from the government to the civil society organizations to the private sector.

In spite of this advance, this report also underscore that girls' continue facing barriers that make studying very difficult of almost impossible when compared to their male peers. It is also necessary to emphasize that whereas the gender gap is important, more pressing inequities are at play, namely, those associated with poverty and extreme poverty. In particular, for those children living in rural areas, and for those children of indigenous origin, achieving an advanced education (beyond primary education) is still a great hurdle.

Has enrollment improved?

Yes, coverage has significantly improved for both boys and girls. During the last decade enrollment has substantially increased, for all age groups, but particularly for the primary level age group, and to a lesser extent, for the preprimary age group. Increase in the secondary level has been slow and for this level the main problem facing both girls and boys is access.

For pre-primary school, coverage went from 19.3% in 1994 up to 44.2% in 2003. In primary school, net coverage increased from 68.2% in 1993 up to 89.2% for 2003. For the upper secondary level, net coverage increased slowly, going from a 9%, 20% in 1993 only up to 28.95% in 2003. Finally, net coverage on the upper secondary level went from 10.9% to 17.35%. Even when it's not possible to calculate coverage rates by areas and ethnicity, the evidence allows us to say that coverage in rural areas and among indigenous people is lower at all levels. In spite of such improvements, there's still a gap of gender in coverage, especially at the primary and the upper secondary levels.

Is there a gender gap in attendance?

Yes, a gender gap in attendance is observed in all levels and for all ages, from the five years onward, up to the 18 years of age. The country has not achieved yet universal attendance in any age group or educational level.

The gender gap is lower for the lower ages (5 to 6), in urban settings and is pronounced in the rural areas. The analyses conducted in this study indicate that a series of variables are responsible both for the lower than expected attendance rates and for the gender gap in attendance.

Attendance obtained from surveys, provides information about boys and girls who actually attend school. In average, only 73.7% of the population between seven and 18 years of age attends school, 75.7% for boys versus 71.7% for girls. It was observed that at the age of 11 years old, attendance is higher, 91.7% for boys and 89.9% for girls. In rural areas, attendance is lower with only 67.9%, 70.3% for the boys and 67.9% for the girls. In the study, results for attendance, according to the 2002 census, are shown for boys and girls, by urban and rural areas.

Most of the differences for attendance are observed among urban and rural areas and among indigenous and non-indigenous students. Non-indigenous women have the lower attendance rate at all levels. Attendance of indigenous girls at the primary level is only of 61.8% (58% in rural areas), at lower secondary school it's only of 10% (rural, 5.2%) and in upper secondary school is only 5.2% (rural, 2.1%).

The particular sample design that explicitly seeks for families that were not sending their children to school, not only controls for self-selection effects, but also allows distinguishing between two clearly different types of families. Even though this evidence does not allow inferring that most children who do not attend school are concentrated in a minority of families, the results found here motivate to pursue this further, with additional studies.

The Probit and Bivariate Probit analyses provide some light on the determinants of attendance in Guatemala. As for the sample used in this study, access to school, economical determinants and parents' characteristics appear to be of importance. In particular lack or presence of parent's support for learning appears to be of importance.

As with numerous studies elsewhere, the dichotomy attending school-working proved to be of importance, particularly for children 13 and older. By defining work in an extended manner, this study walks away from the more traditional view of salaried work. In this sense, girls are at a clear disadvantage: having to work, either at home or for a salary has a bigger effect for them than for boys.

Is there a gender difference in daily attendance?

No, there is not such a difference. This study introduced the concept of daily attendance, given that regular attendance to school is of great importance for learning. Daily attendance was associated with the type of school, the linguistic region and with several characteristics of the school, including infrastructure, appearance and availability of learning materials.

The higher attendance for boys and girls was found in private schools, in which was observed an average attendance of 94%. Attendance in the PRONADE schools was slightly lower, around 92%. But in the regular official schools, attendance was significantly lower around 84%. Attendance tended to be less in first grade and higher in sixth.

Regarding linguistic regions, attendance was significantly less in the Spanish-speaking region (69%), and higher in the Mayan-speaking areas (92%), while attendance in the city was slightly higher (79%) than the Spanish-speaking region.

Several structural features at schools are related to attendance. Specifically, the availability of a playground, whether there are restrooms or latrines, as well as how clean they are kept and if the school possess a clean environment too, were related to high attendance. When

it comes to the supply of learning materials, the availability for textbooks stands out and it was related to high attendance as well.

Is there a gender difference in internal efficiency?

Yes, but favoring girls over boys. Contrary to what has been reported before, girls' promotion and dropout rates are lower than boys at all school level, and except in the most distant and poor communities, this advantage is found nationwide.

In general, girls are promoted at a higher rate compared to boys and have lower desertion rates, except in rural, small and poor communities, in which girls are promoted at the same or lower rate than boys. For primary school, the girls' promotion rate in 2003 was 79.5%, while the one for boys was 78.4%; in middle school, the promotion rate was 57.0%, versus 50.3% of boys, and in upper secondary, the boys' promotion rate was 64.9% and the one for boys was 58.4%.

Are girls and boys completing primary school at the same rate?

No, despite girls being more successful than boys completing and approving the different grades, significantly less girls than boys complete their primary education. However, this is not the case for the lower secondary level, in which there is not a gender gap in completion, and girls are clearly more successful in completing the upper secondary level than boys.

At the primary level, only 37.3% of the girls that enroll in primary school complete it, versus 38.4% of the boys. Completion of primary school is related to the area: only 29.5% of the urban students actually complete it. Less rural girls (28.1%) than rural boys (30.7%) complete primary school, while the opposite happens in the urban regions (59.4% for girls and 58% for boys). The data from home surveys, confirm this results pattern.

Given that girls are more successful than boys when it refers to approving each grade, the lower success in completing school by girls, can be explained by non-academic reasons, which are related to the decisions made by parents in keeping their girls at school.

In particular, girls' involvement in home chores or in non-salaried economical activities with their families has a bigger negative impact for them than for boys.

Do girls receive lower grades than boys from their teachers?

There's no difference in the mathematics and Spanish grades between girls and boys at any of the observed grades (1st, 3rd. and 6th.). However, indigenous students obtained lower grades than the non-indigenous ones.

In mathematics, the average grade was of 73.6, in third grade of 72.9 and in sixth grade of 74.1, while the Spanish average grade was of 72.9, in third grade of 72.9 and 75.3 in sixth grade, without gender differences. Indigenous students had a mathematics grade average

of 71, while non-indigenous had a 77 average in the same class; indigenous students had a 70.5 average in Spanish and an average of 78 for the non-indigenous ones.

Is there a difference in academic achievement?

Girls, compared to boys, obtain lower scores in standardized tests for mathematics and reading, not only in third grade, but also for sixth grade. Indigenous students obtain much lower scores than non-indigenous ones, especially for reading tests.

With the exception of urban girls in the reading tests, girls obtained lower scores, compared to boys in the mathematics and reading tests administered in 2000 by *Universidad del Valle* through PRONERE.

Parental Participation

The parental participation is high, and some type of participation was observed in all schools. However, this participation is centered in the financial, material and manual labor support; participation in the school's management, as well as in learning aspects, is very limited.

Different ways of participation have an impact in a different manner over different indicators. Participation in the financial, material or labor support is related to those sons and daughters who attend school, but neither with their daily attendance, nor with their grades. On the contrary, to support children with the learning process, whether is at home or at school, it's related to an improved daily attendance and better grades. When parents assigned several home responsibilities, the time devoted to learn is considerably reduced for girls and boys. In particular, the spare, rest and entertainment time for girls is considerably reduced when several home responsibilities are assigned.

The Probit analyses showed that parents' support for learning has a big impact on attendance, and this support may have a buffering effect for girls when girls are faced with responsibilities at home. Likewise, the evidence suggests that lack of this support may accelerate abandoning the school for all children, especially for girls.

Have attitudes towards girls experienced any change?

Parents and school's principals concurred in affirming that the girls' education situation has improved during the last decade. However, parents who don't send any child to school reflect a lower change rate. .

Parents consider that the biggest change has been in the opportunities increase for girls (47%), followed by a change in the ideas towards girls' education (33%), while a small percentage aims at girls who are more motivated and are more assured of themselves (7%). The school's principals indicate that the biggest change has been given in the ideas towards girls' education (55%). When we talk about the change in classrooms, a little bit more than

half of the principals indicated that they were more equitable now, while another 18% indicated that opportunities for the girls' education have improved.

However, a tendency still observed is regarding a smaller girls' participation in school activities, whether they are sports, the school government or extra-curricular activities.

Do families invest more in boys' education than in girls' education?

Families invest more in boys' education than girls'. The average families' investment per student by year is higher for boys than girls and a higher proportion of boys than girls are enrolled in private schools.

At the national level, there's no difference in the investment per student by year for students between 7 to 12 years old. However, the national average hides not-official differences. Rural families spend less in girls' education and so do the poor families.

For the 13-18 years old group, it was observed that all families, urban or rural, poor or not, invest less in their girls' education compared to their boys'. Difference is higher for very poor families, and lower for not poor families. But even the wealthier families invest less in girls than boys, by investing Q0.89 in girls for every Q1 that it's invested in boys' education.

Likewise, less girls than boys are enrolled in cooperative schools and institutes. In 2003, 93 girls were enrolled in private primary schools versus 100 boys and 90 girls were enrolled in private lower secondary schools versus 100 boys. The disparity was even higher in cooperative institutes, in which only 75 girls were enrolled at the lower secondary level versus 100 boys enrolled in the same level.

Is there a difference in entering the work force? There is gender difference in income?

Even though this study did not pursue an in-depth investigation of labor and income issues, the brief analysis carried out allows answering affirmatively to both questions.

Much less women than men, are part of the Economically Active Population (EAP) and, in general, women, compared to men, obtain less income as a result of their work, whether calculating the monthly or the average income per hour.

As stated before, more men than women at any age are part of the EAP. It's important to recall how early boys and girls are involved in the EAP. It was found that 37% of the boys and 25% for the girls become part of the EAP, as early as fourteen years old.

Women not only represent a small percentage of the EAP, but those women who are part of it, obtain lower monthly incomes than their male counterparts. This is still observed even when women have the same level of education. In general, non-indigenous workers have a much higher income than indigenous ones, and indigenous women who have not

completed primary education or who do not have any level of education at all, have the minimum monthly average income in the country. In general terms, income for women versus the percentage of men's income will always be less, even though if women have the higher level of education, a university level, such women will only obtain 75.5% of the monthly income compared to what is perceived by their male counterparts.

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ANNEX 1. OPERATIONAL DEFINITIONS OF TERMS AND INDICATORS

Enrollment: Is the total amount of students enrolled by parents in any given (grade) level. It is collected by the Ministry of Education (MOE) each year during April.

Gross Enrollment: is the result of dividing the total amount of student enrolled in a given school level by the school age population for that level. School age population for each school level is estimated by the National Institute of Statistics (INE or Instituto Nacional de Estadística, in Spanish). Population estimates are based on the 1994 National Census.

Net Enrollment: is the result of dividing the total amount of student enrolled in a specific school level by the school age population for that level.

Attendance: is the result of dividing the total amount of children who report (or for whom a head household reports) that they are attending school (at any school level) by the total amount of children for whom a report is obtained. Information may be survey based or Census based. In this report, figures are based on the 2002 National Population Census, conducted by the INE, and in the home survey conducted specifically for this study. Analyses were performed by splitting these figures by the corresponding official school age.

Daily attendance: is the result of dividing the total amount of students present in the school at any given day by the total amount of enrolled student. Data may be obtained by field researchers during a school visit (head counting) or from teachers daily attendance records. In this study both are sources of attendance data were used. Enrollment data was provided by the schools principals, and this enrollment data is the same data collected by the MOE.

Dropout: is the result of dividing the total amount of students, who deserted school by September 30 in any given school year (SY), by the total amount of students enrolled in the SY. It is calculated both by school level and by grade level. By nature, it is a transversal indicator. In Guatemala there is not an official estimation of permanent ((longitudinal) school dropout.

Retention: is the result of dividing the total amount of students who finished and approved a particular (grade) school level by the total amount of students enrolled in year 1 for a particular school level. By definition, it is a cohort analysis (albeit, a group base cohort, not a person base cohort). As reported here, it does not control for repetition.

Completion: Same that the previous one, but defined on terms of graduating for a particular school level. Then, there is primary completion rate, lower secondary and upper secondary completion rate.

Repetition: Is the result of dividing the total amount of students who repeat a given grade by the total amount of students enrolled in that grade. It can be aggregated by school level. As repetition can be reduced either by increasing promotion, reducing dropout (desirable forms to reduce it) or by students abandoning for good the school, its interpretation is not unequivocal. Therefore, it is not used in this study, as there is no way to account for repetition with group level data.

ANNEX 2. SAMPLE DETERMINATION AND FIELD WORK FOR EGG-BID-CIEN HOME SURVEY

This survey was designed to focus the study according to the linguistic and ethnic landscape characterizing Guatemala. It was conducted from May to June of 2004 in a sample of public rural and urban schools. Urban private schools were also part of the sample. Field work consisted of schools visits and observations and household interviews. The objective was to collect non existing data regarding:

1. School attendance. To do this, attendance during the day of the visit was collected. To control for seasonal variations, students' attendance, as kept by teachers, was also collected. Using a randomize design of days, students' attendance was collected for two days of the week, for all preceding months of the current school year, from February to May. January daily attendance was not included due to the irregularities in the school year beginning.
2. Perceive change for the girls' education progress over the last decade. For this, school principals were interviewed and a similar set of questions were posed to parents, through the household interviews.
3. Attitudes towards girls in the school: as students, social competence, progress in school, etc., extra curricular responsibilities for boys and girls; girls participation in school government.
4. Grades from teachers during the current school year in mathematics and language. Following a randomize design, a sample of students - five boys and five girls per grade, in first, third and sixth grade were dawned in the school, and teachers were asked about these students' grades. Also, age, ethnicity and gender of students were recorded in these interviews.
5. Household interviews: These interviews were held to better understand the factors associated with attendance in rural school in different parts of the country, as explained above. The interview protocol explored variables though to be associated with school attendance. This included education and occupation of the head of the household as well as his/her spouse, house physical characteristics and house equipment, access to public services. For all children, both currently living in the house and currently living elsewhere, past and present education history was explored, and the reason for abandoning the school –it that was the case was established. Respondents also answered questions regarding general eating patterns of those children currently attending school. They also informed about their pattern of participation in their children's education, both at home and in the school. Likewise, respondents reported on (changing) perceptions regarding girls' education.

For the school visits and the households' interviews a sample taken from the main linguistic region of the country was selected. The resources allocated for the field work determined what the sample size was. A number of different criteria were taking into account in the sample design: linguistic, school location, school size, and school sources

of financial founding. Given the linguistic diversity of the country, schools were selected from the main linguistic regions of the country. Besides Spanish, the study included four Mayan languages (K'iche', Q'eqchi', Mam and Kaqchikel), that together account for around 80% of the Mayan speaking population (INE, 2002).

A second criterion was the location of the school. This study looks to shed light on the educational situation of rural and indigenous girls. However, to capture the full variability of the girls' educational situation, urban schools have to be included, as to avoid reducing the dispersion of the different indicators. Therefore, schools from Guatemala City and from the regional main cities (department cities) were also included in the sample.

As development in Guatemala is quite unequal (PNUD, 2002), it was necessary to control for this variable. It's been known that rate of community development is associated with the size of the community: the smaller the community, the more underdeveloped. Community size is associated with the size of the school that serves the community. Then, schools from different sizes were selected. School size was operationalized by using the number of teachers each school has. Small, medium and big schools were selected. Small schools were schools with three or less teachers (also known in Guatemala as multigrade or unitarian schools). Medium schools were rural schools with four or five teachers. This is the average rural school in Guatemala. Big schools were schools with at least seven teachers.

Finally, source to finance the school was also a criterion. Again, to capture full variability, it was necessary to include in the sample public funded schools, and privately funded schools as well. All private schools were big, urban schools. As for public school, in Guatemala there are two different mechanisms to operate public schools. The first, traditional one, requires a centralized operation, with total control the state of all schools sub-systems. As many such schools systems around the world, the Guatemalan traditional public school system is plagued with centralization, bureaucracy, slowness and unresponsiveness. In the second funding mechanism (called PRONADE), parents receive, through a banking account, funds to operate the local school. This includes recruiting, hiring and managing the teaching work force, buying basic school supplies, as well as running the supplemental school feeding program and maintaining the school facilities. The MOE retains power over curriculum, textbooks, students' evaluation, and application of all general norms, as well as over financial oversight. To explore whether these funding mechanisms have a different impact over attendance, particularly daily attendance, and over school retention and completion, schools from both type of schools were included in the sample. Having defined this criteria, schools were selected at random from the school listing provided by the MOE, using a systematic sampling routine without replacement.

In each school 30 students were selected using a randomized scheduled, ten from first grade, ten from third grade and ten from sixth grade, five girls and five boys for each grade. An equal number of boys (360) and girls (360) were selected for each grade,

except for sixth grade (360 and 357, respectively). For these students grades were obtained from the respective teachers. In total, grades were obtained for 2157 students.

In each community eight households interviews were also conducted. For this, out of the ten students for each grade, two were selected at random, one boy and one girl. Then, survey personnel visited the students' home to conduct the interviews. This allowed getting household information from households that currently had at least one child attending school.

In order to capture the full range of the distribution of the variables thought to be associated with school attendance, parents with no children currently attending school were also part of the sample. Two households in the vicinity of each school were randomly selected out of a list of families that did not sent any child to school. The list was provided by the school principals from public schools.

Tables 32 and 33 summarize the sample composition, both for schools and for households. The school sample appears classified according to the school location, the school size and the school financial source in Table 32. The household sample appears classified by the school area and the school size, as well as for whether in the household children (at least one child) are currently enrolled or not.

Table 32: Integration of Sample, by Area, School Size and Funding Sector

Area	School Size	Public Schools		Private School	Total	Parents Interviews		
		PRONADE	Regular			Children's Currently enrolled		
						Yes	No	Total
Urban	Guatemala City, Big	na	4	4	8	57	8	65
	Department Cities, Big	na	5	5	10	69	11	80
Rural	Big	2	10	na	12	72	24	96
	Medium	4	20	na	24	147	46	193
	Small	8	10	na	18	108	36	144
	Total	14	49	9	72	453	125	578

Source: EGG-BID-CIEN Home Survey.

Table 33 classifies the same information by the linguistic region in which the schools are located. It is important to mention that for the Mayan speaking regions not all respondents were Mayan speakers. Particularly in the urban, private schools, respondents were not Mayans. For communities where a Mayan language was spoken, bilingual field-personnel was hired, in order to assure accurate reporting of responses given by parents during the interviews.

Five hundred and seventy eight households in the five regions studied were interviewed. The distribution of the interviews by linguistic region, department and type of school are presented in Table 33.

Table 33: Integration of Sample by Region and founding sector

Region	Official PRONADE	Official Regular	Private	Total	Parents Interviews		
					Children Currently enrolled?		
					Yes	No	Total
Q'eqchi'	6	9	1	16	98	30	128
Capital	0	4	4	8	57	8	65
Kaqchikel	1	9	1	11	68	20	88
K'iche'	1	9	1	11	68	20	88
Mam	5	9	1	15	93	27	120
Spanish	1	9	1	11	69	20	89
Total	14	49	9	72	453	125	578

Source: EGG-BID-CIEN Home Survey

Table 34: Interviews by Linguistic Region, Department, and Type of School

Region	Department	Regular Public	PRONADE Public	Private	Total
Q'eqchi'	Alta Verapaz	72	48	8	128
Capital	Guatemala	32	na	33	65
Spanish	Jalapa	73	8	8	89
Kaqchikel	Chimaltenango	72	8	8	88
K'iche'	Quiche	72	8	8	88
Mam	Huehuetenango	72	40	8	120
Total		393	112	73	578

Source: EGG-BID-CIEN Home Survey

ANNEX 3. ADDITIONAL TABLES

Table A3.1: Reasons for not Attending School in Primary School by Ethnicity, Area and Sex

Ethnicity	Causes	Urban			Rural		
		Boys	Girls	Total	Boys	Girls	Total
Indigenous	Lack of money	30.7%	30.3%	30.5%	23.0%	22.5%	22.7%
	Does not like, Does not want to go	29.2%	29.0%	29.1%	27.4%	26.7%	27.0%
	Parents do not want child to go	9.0%	10.0%	9.5%	12.6%	13.8%	13.2%
	Has to work	4.7%	3.1%	3.8%	6.6%	3.9%	5.1%
	Chores at home	1.8%	4.5%	3.2%	3.0%	7.7%	5.5%
	Already finished	1.1%	1.0%	1.0%	0.4%	0.3%	0.4%
	There is not school	0.9%	0.8%	0.9%	5.5%	4.8%	5.1%
	Other	22.6%	21.3%	21.9%	21.5%	20.2%	20.8%
No Indigenous	Lack of money	32.8%	34.9%	33.8%	25.9%	27.3%	26.6%
	Does not like, Does not want to go	23.1%	19.6%	21.4%	25.2%	22.5%	23.9%
	Parents do not want child to go	6.3%	7.2%	6.7%	10.1%	11.0%	10.5%
	Has to work	3.8%	3.1%	3.5%	6.0%	2.6%	4.3%
	Chores at home	1.2%	3.4%	2.3%	2.5%	7.0%	4.8%
	There is not school	2.0%	2.1%	2.1%	4.2%	4.4%	4.3%
	Already finished	0.9%	0.8%	0.9%	0.6%	0.6%	0.6%
	Other	29.8%	28.9%	29.4%	25.4%	24.7%	25.1%

Source: Analyses conducted by the authors, using the INE 2002 Population Census.

Table A3.2: Reasons for not Attending School in Lower Secondary by Ethnicity, Area, and Sex

Ethnicity	Causes	Urban			Rural		
		Boys	Girls	Total	Boys	Girls	Total
Indigenous	Does not like, does not want to go	38.4%	40.9%	39.9%	32.9%	34.9%	34.1%
	Lack of money	28.9%	26.1%	27.2%	22.3%	21.1%	21.6%
	Has to work	16.0%	8.9%	11.8%	18.2%	7.6%	12.1%
	Parents don't want child to go	4.0%	6.8%	5.6%	7.5%	10.3%	9.1%
	Chores at home	2.1%	7.6%	5.3%	2.9%	12.4%	8.4%
	No school	0.7%	0.7%	0.7%	5.0%	3.8%	4.3%
	Already finished studies	2.0%	1.2%	1.5%	1.5%	1.1%	1.3%
	Other	7.8%	7.8%	7.8%	9.7%	8.7%	9.1%
Non-Indigenous	Does not like, does not want to go	36.1%	32.0%	33.8%	34.4%	33.6%	33.9%
	Lack of money	28.3%	30.2%	29.3%	23.3%	23.3%	23.3%
	Has to work	14.1%	8.8%	11.2%	18.8%	5.3%	11.5%
	Chores at home	1.2%	7.9%	4.8%	2.4%	13.5%	8.4%
	Parents don't want child to go	2.3%	4.4%	3.5%	5.2%	8.0%	6.7%
	Already finished studies	1.7%	1.4%	1.6%	2.4%	2.3%	2.4%
	No school	1.1%	1.1%	1.1%	2.9%	3.2%	3.0%
	Other	15.2%	14.2%	14.7%	10.6%	11.0%	10.8%

Source: Analyses conducted by the authors, using the INE 2002 Population Census.

Table A3.3: Variables explaining Attending School and Working in Children 7 to 12

Variables	Bivariate probit results						Marginal effects after probit								
	Attend school			Works			(Attend=1, works=1) y= 0.65116			(Attends= 1, works=0) y= 0.22669			(Attends=0 , works=1) Y=0.095553		
	Coef.	Std. Err	P> z	Coef.	Std. Err	P> z	Dy/dx	Std. Err	P> z	Dy/dx	Std. Err	P> z	Dy/dx	Std. Er	P> z
Area	-0.06	0.08	0.43	-0.17	0.07	0.02	-0.06	0.02	0.02	0.04	0.02	0.03	0.00	0.01	0.78
Region 2	0.08	0.17	0.64	0.09	0.13	0.48	0.04	0.04	0.38	-0.02	0.04	0.55	-0.01	0.03	0.72
Region 3	0.03	0.19	0.90	0.20	0.14	0.15	0.06	0.05	0.23	-0.05	0.04	0.14	0.00	0.03	0.93
Region 4	0.29	0.18	0.11	0.37	0.13	0.00	0.14	0.04	0.00	-0.09	0.03	0.01	-0.03	0.02	0.19
Region 5	0.19	0.17	0.26	0.27	0.12	0.02	0.10	0.04	0.01	-0.07	0.03	0.03	-0.02	0.02	0.41
Region 6	0.33	0.16	0.04	0.34	0.12	0.00	0.14	0.04	0.00	-0.08	0.03	0.01	-0.04	0.02	0.10
Region 7	0.14	0.16	0.40	0.20	0.12	0.11	0.07	0.04	0.06	-0.05	0.03	0.14	-0.01	0.02	0.56
Region 8	0.08	0.18	0.66	0.16	0.13	0.22	0.06	0.04	0.19	-0.04	0.04	0.25	-0.01	0.03	0.81
Poor extreme	-0.57	0.07	0.00	-0.08	0.07	0.22	-0.13	0.02	0.00	-0.01	0.02	0.59	0.10	0.02	0.00
Poor	-0.41	0.11	0.00	-0.02	0.08	0.78	-0.07	0.03	0.02	-0.01	0.02	0.63	0.06	0.01	0.00
Integrated household	-0.51	0.30	0.10	-0.55	0.27	0.04	-0.23	0.08	0.00	0.13	0.08	0.10	0.06	0.05	0.24
Household size	0.03	0.02	0.06	0.03	0.01	0.05	0.01	0.00	0.01	-0.01	0.00	0.12	0.00	0.00	0.16
# of EAP in household	-0.17	0.19	0.37	0.79	0.19	0.00	0.20	0.06	0.00	-0.23	0.06	0.00	0.05	0.03	0.06
Proportion of girls to boys	-0.03	0.04	0.52	-0.05	0.03	0.08	-0.02	0.01	0.04	0.01	0.01	0.14	0.00	0.01	0.74
Head of Household sex	0.54	0.30	0.07	0.41	0.27	0.13	0.22	0.09	0.01	-0.08	0.09	0.38	-0.07	0.07	0.27
Mother's ed.	0.05	0.02	0.01	0.00	0.01	0.90	0.01	0.00	0.10	0.00	0.00	0.41	-0.01	0.00	0.00
Father's ed.	0.08	0.02	0.00	-0.02	0.01	0.20	0.01	0.00	0.10	0.01	0.00	0.02	-0.01	0.00	0.00
Mother's speak Spanish	0.00	0.07	0.98	-0.14	0.07	0.05	-0.04	0.02	0.08	0.04	0.02	0.05	0.00	0.01	0.70
Child sex	0.18	0.08	0.02	-0.48	0.07	0.00	-0.10	0.02	0.00	0.14	0.02	0.00	-0.05	0.01	0.00
Child age	1.25	0.25	0.00	0.46	0.22	0.03	0.33	0.07	0.00	-0.07	0.06	0.24	-0.18	0.04	0.00
Child age square	-0.06	0.01	0.00	-0.02	0.01	0.17	-0.01	0.00	0.00	0.00	0.00	0.61	0.01	0.00	0.00
Constant	-5.50	1.17	0.00	-2.20	1.01	0.03									

Source: Analyses conducted by the authors, using the INE 2000 ENCOVI.

Table A3.4: Variables explaining Attending School and Working in Children 13 to 15

Variables	Bivariate probit results						Marginal effects after probit								
	Attend school			Works			(Attend=1, works=1) y= 0.58156			(Attends= 1, works=0) y= 0.07585			(Attends=0 , works=1) y=0.33104		
	Coef.	Std. Err	P> z	Coef.	Std. Err	P> z	Dy/dx	Std. Err	P> z	Dy/dx	Std. Err	P> z	Dy/dx	Std. Er	P> z
Area	0.50	0.10	0.00	-0.22	0.11	0.03	0.13	0.03	0.00	0.04	0.02	0.01	-0.17	0.03	0.00
Region 2	0.53	0.21	0.01	-0.21	0.20	0.29	0.13	0.06	0.03	0.04	0.04	0.24	-0.17	0.06	0.00
Region 3	-0.04	0.21	0.86	0.10	0.22	0.64	0.00	0.07	1.00	-0.01	0.03	0.62	0.02	0.08	0.84
Region 4	0.55	0.20	0.01	-0.15	0.19	0.44	0.15	0.06	0.01	0.03	0.03	0.33	-0.17	0.06	0.00
Region 5	0.16	0.19	0.39	-0.13	0.18	0.47	0.04	0.06	0.57	0.02	0.03	0.45	-0.06	0.06	0.35
Region 6	0.52	0.19	0.01	0.14	0.18	0.43	0.19	0.06	0.00	-0.01	0.02	0.68	-0.17	0.06	0.00
Region 7	0.37	0.19	0.05	-0.07	0.19	0.72	0.11	0.06	0.06	0.02	0.03	0.58	-0.12	0.06	0.04
Region 8	0.39	0.20	0.05	-0.26	0.21	0.20	0.08	0.07	0.21	0.05	0.04	0.20	-0.13	0.06	0.03
Poor extreme	-0.29	0.10	0.01	-0.04	0.15	0.77	-0.11	0.04	0.01	0.00	0.02	0.96	0.10	0.04	0.01
Poor	-0.29	0.12	0.01	0.18	0.12	0.13	-0.08	0.04	0.07	-0.03	0.02	0.08	0.11	0.04	0.01
Integrated household	0.47	0.33	0.16	0.22	0.43	0.61	0.19	0.12	0.11	-0.02	0.06	0.74	-0.16	0.12	0.19
Household size	-0.01	0.02	0.73	0.03	0.02	0.19	0.00	0.01	0.82	0.00	0.00	0.19	0.00	0.01	0.65
# of EAP in household	-0.58	0.24	0.02	1.30	0.31	0.00	-0.03	0.09	0.75	-0.18	0.04	0.00	0.24	0.09	0.01
Proportion of girls to boys	-0.02	0.04	0.63	-0.08	0.05	0.11	-0.02	0.01	0.21	0.01	0.01	0.14	0.00	0.01	0.76
Head of Household sex	-0.15	0.32	0.64	-0.14	0.41	0.74	-0.07	0.11	0.54	0.01	0.05	0.77	0.05	0.11	0.66
Mother's ed.	0.07	0.02	0.00	-0.01	0.02	0.58	0.02	0.01	0.00	0.00	0.00	0.32	-0.03	0.01	0.00
Father's ed.	0.07	0.02	0.00	-0.02	0.02	0.46	0.02	0.01	0.00	0.00	0.00	0.24	-0.03	0.01	0.00
Mother's speak Spanish	-0.03	0.10	0.74	-0.06	0.13	0.63	-0.02	0.04	0.58	0.01	0.02	0.66	0.01	0.04	0.77
Child sex	0.12	0.09	0.21	-0.73	0.13	0.00	-0.05	0.03	0.14	0.09	0.02	0.00	-0.06	0.03	0.08
Child age	-1.19	2.44	0.63	0.29	3.16	0.93	-0.37	0.87	0.67	-0.06	0.43	0.89	0.42	0.87	0.63
Child age square	0.03	0.09	0.75	-0.01	0.11	0.96	0.01	0.03	0.77	0.00	0.02	0.93	-0.01	0.03	0.75
Constant	10.67	17.04	0.53	-1.65	22.07	0.94									

Source: Analyses conducted by the authors, using the INE 2000 ENCOVI.

Table A3.5: Variables explaining attending school and working in children 16 to 18

Variables	Bivariate probit results						Marginal effects after probit								
	Attend school			Works			(Attend=1, works=1) y= 0.32146			(Attends= 1, works=0) y= 0.03624			(Attends=0 , works=1) y=0.62168		
	Coef.	Std. Err	P> z	Coef.	Std. Err	P> z	Dy/dx	Std. Err	P> z	Dy/dx	Std. Err	P> z	Dy/dx	Std. Er	P> z
Area	0.51	0.10	0.00	-0.28	0.15	0.07	0.16	0.04	0.00	0.03	0.01	0.01	-0.19	0.04	0.00
Region 2	0.86	0.22	0.00	-0.52	0.30	0.08	0.25	0.08	0.00	0.08	0.05	0.08	-0.33	0.08	0.00
Region 3	0.11	0.23	0.61	-0.47	0.29	0.11	0.00	0.08	0.98	0.05	0.03	0.18	-0.07	0.08	0.39
Region 4	0.37	0.19	0.06	-0.49	0.26	0.06	0.08	0.07	0.26	0.06	0.03	0.08	-0.16	0.07	0.02
Region 5	0.14	0.18	0.43	-0.19	0.26	0.47	0.04	0.07	0.60	0.02	0.02	0.43	-0.06	0.07	0.36
Region 6	0.44	0.18	0.02	-0.34	0.25	0.19	0.13	0.07	0.05	0.04	0.02	0.12	-0.17	0.07	0.01
Region 7	0.23	0.20	0.24	-0.34	0.27	0.21	0.05	0.07	0.44	0.03	0.03	0.21	-0.10	0.07	0.17
Region 8	0.57	0.21	0.01	-0.72	0.28	0.01	0.11	0.08	0.17	0.11	0.05	0.03	-0.25	0.07	0.00
Poor extreme	-0.40	0.14	0.00	0.27	0.20	0.18	-0.12	0.04	0.01	-0.02	0.01	0.02	0.14	0.05	0.00
Poor	-0.53	0.11	0.00	0.14	0.18	0.45	-0.18	0.04	0.00	-0.02	0.01	0.13	0.19	0.04	0.00
Integrated household	-0.35	0.41	0.39	-0.23	0.38	0.53	-0.14	0.13	0.29	0.01	0.03	0.80	0.11	0.15	0.47
Household size	-0.02	0.02	0.47	0.00	0.03	0.95	-0.01	0.01	0.46	0.00	0.00	0.94	0.01	0.01	0.50
# of EAP in household	-0.13	0.26	0.61	1.00	0.37	0.01	0.02	0.09	0.83	-0.07	0.03	0.01	0.09	0.09	0.32
Proportion of girls to boys	0.02	0.04	0.60	-0.04	0.06	0.47	0.01	0.02	0.74	0.00	0.00	0.42	-0.01	0.02	0.52
Head of Household sex	0.78	0.40	0.05	-0.09	0.37	0.81	0.23	0.09	0.01	0.02	0.02	0.29	-0.24	0.11	0.03
Mother's ed.	0.07	0.02	0.00	-0.02	0.02	0.36	0.02	0.01	0.00	0.00	0.00	0.08	-0.02	0.01	0.00
Father's ed.	0.07	0.02	0.00	-0.05	0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.00	-0.03	0.01	0.00
Mother's speak Spanish	-0.08	0.11	0.48	-0.18	0.16	0.27	-0.04	0.04	0.31	0.01	0.01	0.36	0.02	0.04	0.64
Child sex	0.26	0.10	0.01	-0.63	0.16	0.00	0.05	0.04	0.12	0.04	0.01	0.00	-0.12	0.04	0.00
Child age	3.20	3.16	0.31	3.36	3.95	0.40	1.35	1.11	0.23	-0.15	0.28	0.59	-0.96	1.15	0.40
Child age square	-0.10	0.09	0.28	-0.10	0.12	0.39	-0.04	0.03	0.20	0.00	0.01	0.59	0.03	0.03	0.37
Constant	26.63	26.76	0.32	25.45	33.37	0.45									

Source: Analyses conducted by the authors, using the NIS 2000 ENCOVI

Table A3.6: Completion of Primary School, Basic and Upper Secondary by Ethnicity and Sex, for 13 to 18 years youngsters (in %)

Level	Area	Indigenous			Non Indigenous			Total		
		Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Primary (13 to 18)	Urban	52.3	43.4	47.8	74.7	73.8	74.2	68.0	64.5	66.2
	Rural	30.4	20.5	25.4	45.0	41.6	43.7	37.6	30.7	34.1
	Total	37.4	28	32.6	60.6	59	59.8	50.9	45.9	48.4
Lower Secondary (16 to 18)	Urban	23.8	19.3	21.1	48.7	49.1	48.9	41.2	40.0	40.6
	Rural	7.6	4.6	6.0	15.6	14.8	15.2	11.5	9.5	10.5
	Total	12.8	9.5	11.1	33.4	33.8	33.6	24.9	23.6	24.2
Upper Secondary (19 to 21)	Urban	18.7	14.6	16.5	42.0	41.9	42.0	35.5	34.4	34.9
	Rural	4.7	2.5	3.5	10.1	9.6	9.9	7.3	5.9	6.6
	Total	9.7	6.7	8.1	29.1	28.9	29.0	21.5	20.0	20.7

Table A3.7: Students' Grades in Mathematics, by Grade, Gender and Ethnicity

Grade	Gender	Non indigenous			Indigenous			Total		
		Mean	Std. Deviation	N	Mean	Std. Deviation	N	Mean	Std. Deviation	N
First	Boys	78.60	16.388	133	71.82	15.284	224	74.34	16.022	357
	Girls	76.98	17.166	137	70.42	17.003	226	72.89	17.336	363
	Total	77.78	16.776	270	71.11	16.167	450	73.61	16.702	720
Third	Boys	77.22	16.104	147	70.06	16.453	215	72.97	16.667	362
	Girls	78.00	13.680	136	69.74	17.177	222	72.88	16.417	358
	Total	77.60	14.967	283	69.90	16.806	437	72.92	16.532	720
Sixth	Boys	77.41	13.132	142	72.00	16.248	216	74.14	15.301	358
	Girls	76.69	14.266	148	72.34	16.299	211	74.13	15.620	359
	Total	77.04	13.703	290	72.17	16.255	427	74.14	15.451	717

Source: EGG-BID-CIEN study, School observation.

Table A3.8: Tests of Between-Subjects Effects, Dependent Variable: Grade in Mathematics

Grade	Source	Type III Sum of Squares	df	Mean Square	F	Sig.
First	Corrected Model	7893.675(a)	3	2631.225	9.778	.000
	Intercept	3741164.749	1	3741164.749	13902.824	.000
	Ethnicity	7513.972	1	7513.972	27.923	.000
	Gender	385.842	1	385.842	1.434	.232
	Ethnicity * Gender	2.086	1	2.086	.008	.930
	Error	192671.212	716	269.094		
	Total	4102101.000	720			
	Corrected Total	200564.888	719			
Third	Corrected Model	10237.512(b)	3	3412.504	13.118	.000
	Intercept	3733759.289	1	3733759.289	14352.649	.000
	Ethnicity	10207.224	1	10207.224	39.237	.000
	Gender	9.194	1	9.194	.035	.851
	Ethnicity * Gender	50.787	1	50.787	.195	.659
	Error	186263.287	716	260.144		
	Total	4025355.000	720			
	Corrected Total	196500.799	719			
Sixth	Corrected Model	4154.891(c)	3	1384.964	5.921	.001
	Intercept	3844228.583	1	3844228.583	16434.588	.000
	Ethnicity	4112.480	1	4112.480	17.581	.000
	Gender	6.018	1	6.018	.026	.873
	Ethnicity * Gender	48.968	1	48.968	.209	.647
	Error	166778.439	713	233.911		
	Total	4111891.000	717			
	Corrected Total	170933.331	716			

a R Squared = .039 (Adjusted R Squared = .035)

b R Squared = .052 (Adjusted R Squared = .048)

c R Squared = .024 (Adjusted R Squared = .020)

Table A3.9: Students' Grades in Spanish Language, by Grade, Gender and Ethnicity

Grade	Gender	Non indigenous			Indigenous			Total		
		Mean	Std. Deviation	N	Mean	Std. Deviation	N	Mean	Std. Deviation	N
First	Boys	76.08	19.068	133	70.32	14.092	224	72.46	16.339	357
	Girls	76.91	18.300	137	71.29	16.728	226	73.41	17.526	363
	Total	76.50	18.652	270	70.81	15.462	450	72.94	16.943	720
Third	Boys	76.58	15.717	145	69.87	16.239	215	72.57	16.345	360
	Girls	79.96	13.759	136	68.99	16.909	222	73.16	16.643	358
	Total	78.21	14.872	281	69.42	16.570	437	72.86	16.485	718
Sixth	Boys	78.59	12.359	142	73.04	15.244	216	75.24	14.411	358
	Girls	79.29	13.130	148	72.66	15.065	211	75.40	14.649	359
	Total	78.95	12.741	290	72.85	15.139	427	75.32	14.521	717

Source: EGG-BID-CIEN study, School observation

Table A3.10: Tests of Between-Subjects Effects, Dependent Variable: Grade in Spanish Language

Grade	Source	Type III Sum of Squares	df	Mean Square	F	Sig.
First	Corrected Model	5618.885(a)	3	1872.962	6.679	.000
	Intercept	3660914.641	1	3660914.641	13055.304	.000
	Ethnicity	5457.046	1	5457.046	19.461	.000
	Gender	137.859	1	137.859	.492	.483
	Ethnicity * Gender	.750	1	.750	.003	.959
	Error	200777.780	716	280.416		
	Total	4037293.000	720			
	Corrected Total	206396.665	719			
Third	Corrected Model	14099.215(b)	3	4699.738	18.565	.000
	Intercept	3728185.033	1	3728185.033	14726.990	.000
	Ethnicity	13346.870	1	13346.870	52.722	.000
	Gender	266.564	1	266.564	1.053	.305

Grade	Source	Type III Sum of Squares	df	Mean Square	F	Sig.
	Ethnicity * Gender	773.675	1	773.675	3.056	.081
	Error	180751.409	714	253.153		
	Total	4006778.000	718			
	Corrected Total	194850.624	717			
Sixth	Corrected Model	6463.310(c)	3	2154.437	10.630	.000
	Intercept	3978130.202	1	3978130.202	19628.223	.000
	Ethnicity	6400.097	1	6400.097	31.578	.000
	Gender	4.443	1	4.443	.022	.882
	Ethnicity * Gender	50.080	1	50.080	.247	.619
	Error	144506.551	713	202.674		
	Total	4218518.000	717			
	Corrected Total	150969.861	716			

a R Squared = .027 (Adjusted R Squared = .023)

b R Squared = .072 (Adjusted R Squared = .068)

c R Squared = .043 (Adjusted R Squared = .039)

Table A3.11: Annual School Costs to Parents, by Gender and Poverty Level for Children 7 to 12

Poverty	Cost per children	Gender	Non-Weighted (N= 154, 411 & 280)		Weighted * (N=15843, 57680 & 70365)	
			Mean	Std. Dev.	Mean	Std. Dev.
Extreme Poverty	Attending child	Boys	Q119.31	Q132.06	Q296.61	Q1,131.77
		Girls	Q92.15	Q121.26	Q118.89	Q205.15
	All children in the household	Boys	Q94.55	Q103.17	Q183.27	Q568.50
		Girls	Q73.50	Q89.16	Q88.29	Q137.53
Poor	Attending child	Boys	Q295.44	Q383.55	Q775.03	Q1,308.68
		Girls	Q243.06	Q287.09	Q552.37	Q946.30
	All children in the household	Boys	Q231.78	Q285.76	Q668.69	Q1,215.56
		Girls*	Q206.88	Q245.33	Q437.60	Q765.47
Non Poor	Attending child	Boys	Q975.05	Q1,858.62	Q3,153.47	Q4,136.35
		Girls	Q1,014.78	Q1,812.69	Q2,798.89	Q3,740.67
	All children in the household	Boys	Q911.69	Q1,853.10	Q2,779.30	Q3,676.11
		Girls	Q919.76	Q1,741.83	Q2,522.14	Q3,360.98

* t-test, all differences are significant, p. = 0.05 or smaller

Source: ENCOVI 2000, Cost estimation by the authors

Table A3.12: Annual School Costs to parents, by gender, for children 13 to 18

Cost per children	Gender	Non-Weighted Analysis (N=845)		Weighted Analysis* (N=254083)	
		Mean	Std. Dev.	Mean	Std. Dev.
Attending child	Boys	Q1,684.73	Q2,836.61	Q1,885.47	Q3,279.17
	Girls	Q1,583.20	Q2,860.37	Q1,603.25	Q2,930.99
All children in the household	Boys	Q1,455.30	Q2,442.60	Q1,647.39	Q2,912.56
	Girls	Q1,341.53	Q2,382.29	Q1,418.53	Q2,633.87

* t-test , all difference are significant, p.= 0.000

Source: ENCOVI 2000, Cost estimation by the authors

Table A3.13: Annual School Costs to Parents, by Gender and Area for Children 13 to 18

Area	Cost per children	Gender	Non-Weighted (N=238 & 248)		Weighted * (N=63956 & 79932)	
			Mean	Std. Dev.	Mean	Std. Dev.
Urban	Attending child	Boys	Q2,628.94	Q3,607.04	Q3,143.14	Q4,349.57
		Girls	Q2,667.66	Q3,512.02	Q2,825.72	Q3,676.83
	All children in the household	Boys	Q2,290.24	Q3,094.38	Q2,790.11	Q3,853.02
		Girls	Q2,296.80	Q2,977.99	Q2,557.81	Q3,417.43
Rural	Attending child	Boys	Q778.58	Q1,277.54	Q879.17	Q1,393.25
		Girls	Q542.46	Q1,417.61	Q625.12	Q1,579.55
	All children in the household	Boys	Q654.03	Q1,100.59	Q733.06	Q1,229.31
		Girls	Q424.78	Q954.65	Q506.96	Q1,128.69

* t-test, all differences are significant, p. = 0.01 or smaller;

** t-test, all differences are significant, p. = 0.000

Source: ENCOVI 2000, Cost estimation by the authors

Table A3.14: Annual School Costs to parents, by gender and poverty level for children 13 to 18

Poverty	Cost per children	Gender	Non-Weighted (N= 154, 411 & 280)		Weighted ** (N=15843, 57680 & 70365)	
			Mean	Std. Dev.	Mean	Std. Dev.
Extreme Poverty	Attending child	Boys	Q364.90	Q1,465.76	Q296.61	Q1,131.77
		Girls	Q107.96	Q178.97	Q118.89	Q205.15
	All children in the household	Boys	Q209.32	Q732.41	Q183.27	Q568.50
		Girls	Q88.69	Q144.82	Q88.29	Q137.53
Poor	Attending child	Boys	Q725.40	Q1,115.11	Q775.03	Q1,308.68
		Girls	Q575.57	Q999.72	Q552.37	Q946.30
	All children in the household	Boys	Q616.63	Q977.63	Q668.69	Q1,215.56
		Girls*	Q459.01	Q800.52	Q437.60	Q765.47
Non Poor	Attending child	Boys	Q2,786.07	Q3,575.43	Q3,153.47	Q4,136.35
		Girls	Q2,758.93	Q3,656.70	Q2,798.89	Q3,740.67
	All children in the household	Boys	Q2,437.74	Q3,087.33	Q2,779.30	Q3,676.11
		Girls	Q2,362.92	Q3,026.34	Q2,522.14	Q3,360.98

* t-test, all differences are significant, p. = 0.05 or smaller

** t-test, all differences are significant, p. = 0.000

Source: ENCOVI 2000, Cost estimation by the authors

Table A3.15: Average Monthly Income, by Educational Level, Ethnicity and Gender

Highest Approved Educational Level	Ethnicity	Men		Women		Income Disparity	Women's Income as % of Men's
		Mean	St. Dev.	Mean	St. Dev.		
None	Indigenous	Q651.10	Q707.51	Q600.33	Q899.93	-Q50.77	92.2%
	Ladino	Q1,215.14	Q1,446.73	Q842.52	Q839.59	-Q372.62	69.3%
	Total	Q880.65	Q1,107.00	Q694.37	Q884.90	-Q186.28	78.8%
Primary	Indigenous	Q1,133.14	Q1,478.04	Q760.95	Q730.76	-Q372.19	67.2%
	Ladino	Q1,691.39	Q1,818.20	Q965.32	Q974.05	-Q726.07	57.1%
	Total	Q1,487.56	Q1,723.00	Q906.69	Q915.60	-Q580.88	61.0%
Secondary	Indigenous	Q1,939.40	Q2,274.98	Q1,188.79	Q1,148.03	-Q750.61	61.3%
	Ladino	Q2,739.45	Q2,741.90	Q1,933.92	Q2,172.17	-Q805.53	70.6%
	Total	Q2,574.68	Q2,672.12	Q1,823.82	Q2,070.22	-Q750.86	70.8%
University	Indigenous	Q3,186.64	Q2,672.71	Q2,019.98	Q592.06	-Q1,166.66	63.4%
	Ladino	Q6,296.78	Q6,755.87	Q4,613.34	Q4,669.65	-Q1,683.43	73.3%
	Total	Q5,901.86	Q6,467.27	Q4,454.62	Q4,569.34	-Q1,447.25	75.5%

Source: Authors elaboration, using ENEI 4, 2003.

Table A3/16: Average hourly income, by Educational Level, Ethnicity, Gender and Source of Employment

Highest Approved Educational Level	Ethnicity	Men		Men		Women's Hourly Income as % of Men's
		Mean	Std. Dev.	Mean	Std. Dev.	
None	Indigenous	Q3.06	Q3.97	Q3.37	Q10.90	Q1.10
	Ladino	Q6.58	Q7.67	Q5.71	Q12.03	Q0.87
	Total	Q4.37	Q5.89	Q4.08	Q11.31	Q0.93
Primary	Indigenous	Q4.24	Q8.31	Q3.27	Q6.15	Q0.77
	Ladino	Q7.80	Q12.91	Q5.51	Q8.59	Q0.71
	Total	Q6.29	Q11.33	Q4.71	Q7.88	Q0.75
Secondary	Indigenous	Q10.08	Q16.53	Q5.88	Q8.31	Q0.58
	Ladino	Q13.74	Q18.25	Q13.15	Q24.14	Q0.96
	Total	Q12.90	Q17.93	Q11.86	Q22.35	Q0.92
University	Indigenous	Q17.34	Q20.60	Q17.70	Q8.02	Q1.02
	Ladino	Q37.05	Q39.58	Q36.76	Q61.27	Q0.99
	Total	Q34.12	Q38.02	Q35.63	Q59.63	Q1.04
Total	Indigenous	Q4.75	Q9.40	Q3.68	Q9.12	Q0.77
	Ladino	Q11.39	Q19.03	Q10.13	Q23.86	Q0.89
	Total	Q8.65	Q16.11	Q7.56	Q19.63	Q0.87

EDUCATE GIRLS GLOBALLY

Girls' Education in Latin America

Final Report

Part II

Female Employment in Urban Latin America

June 20, 2005

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Lead

Most developing economies saw notable increases in female employment in the twentieth century. In Latin America this increase in female employment has occurred mainly over the last two decades. In Colombia and Uruguay, for example, female participation in the labor force grew from about one-third in the beginning of the 1980s to close to 50% in the late 1990s. At the same time male participation has been relatively constant at around 70%. The increase in female participation in the labor force has been especially great for married women, with rates approaching the rates of their single counterparts, and for women between 30 and 40 years old, whose participation levels are around 70%. Having children does not keep women away from the labor market as it used to do in the past.

The growth in female employment has been accompanied across Latin America by a steady increase in “formal” educational levels of women relative to men. At the end of the 1990s women’s levels of schooling in many countries reached and even surpassed male schooling levels, especially among the employed.

The market has rewarded the increase in female education with rates of return similar or even higher (as is the case for secondary education) than the returns to schooling for men. The higher returns, however, materialize only for those women who have a paid job. In the region female unemployment has been systematically greater than male unemployment. On average, female unemployment rate in 2002 was 11.1%, compared to the male rate of 7.7%, and the length of unemployment spells in most countries is greater for women than for men. At the same time, and even though women’s earning capacity in the labor force relative to men has steadily increased over the last two decades, female labor income continues to be smaller than male (women’s wages are approximately 83% of male wages). On the other hand, women in the region are overrepresented in domestic employment, in the category of unpaid family workers, in low-wage occupations, and in the informal sector (i.e. not covered by social security or formal contracts).

The studies in this report seek to explain the reasons behind the differences in unemployment, wages and occupations between men and women, and between indigenous and non-indigenous populations in three countries of Latin America. We also present a series of proposals for reform to correct inequities and expand opportunities for women and girls.

Besides looking at the effects that poverty, education, and other demographic characteristics have on employment, occupational choice and earnings of women, these studies look for more subtle issues that also determine those outcomes. It is important to note that differences in employment, occupational choice or earnings do not result from differences in curricula: boys and girls study the same subjects in school; therefore, “formal” education is not to blame, at least directly. The issues that matter are more complex. In some cases, problems arise as simple public policy issues, such as distorted incentives that can easily be corrected by policy reforms. In other cases, the challenges are more difficult and have their roots in the way men and women in our societies

formulate their expectations towards employment and the way employers formulate their expectations towards men and women as employees.

Distorted Incentives

Institutions can play an important role in influencing unemployment, earnings levels, and occupational choice. One of the most important factors here is distorted incentives, which often promote worse female outcomes in labor markets. In Bolivia, for example, employers must cover the costs associated with pregnancy and post-partum. As a result, employers, seeking to minimize costs, do not hire women for jobs that can be done by men. As a result, women that need to work are forced to accept jobs in the informal sector, lower paid or less secure. For governments that want to avoid disincentives to child-bearing, this problem has a simple solution: have the government pay these costs, thus equalizing the expected costs of employing a woman versus a man.

Expectations about Employment

Expectations of men and women in society affect the problems of unemployment, lower earnings, and occupational choice. It is no secret that in many LAC countries families promote traditional “female” roles for girls and discourage them from going into professions traditionally reserved for boys. After all, as shown in the study of rural issues undertaken alongside this study of urban issues, families in LAC invest less on average in their teenage girls’ education compared to the boys’, and even the wealthiest families invest close to 10% more in boys’ than in girls’ education. These societies—in the home and in school—subtly, and not so subtly, lower women’s expectations and encourage them to believe that lower paying employments are natural and right for them. These influences play a key role in shaping women’s preferences, which in turn lead them into lower-paying occupations. As a result, women in LAC cluster in traditionally “female” occupations which places our region among the most segregated in the world. The study from Bolivia shows that, at the level of the individual, the problem of segregation is partly related to differences in opportunities in primary and secondary schooling (i.e. that men have more schooling at these levels than women) and partly related to other influences, in both the home and workplace. In particular for the indigenous populations, the differences in education are more strongly related to the segregation in occupations (i.e. among the indigenous the educational gap is even larger, and it has a higher impact on the differences in occupations of men and women).

The study from Peru presents evidence that expectations play a role in the observed differences in earnings between men and women. In their analysis when a man and a woman with similar characteristics apply for the same job, the woman’s desired wage is almost 10% lower than the man’s.¹ This may happen because women value their work less than men (in which case the solution could be found in education and other socializing influences), or because women interiorize the employer’s preferences towards men, which leads them to offer their work at lower prices, in order to secure their

¹ The woman does not know the desired wage of the man and vice versa.

employment (in this case the problem is related to employers' attitudes towards women), or it could be a combination of both factors.

Employers Perspectives and Expectations

Attitudes of employers also affect the problems of unemployment, lower earnings and occupational choice. The studies in this book showed that employers' decisions play a definite role in the spectrum of occupations that women choose. Employers are more inclined to hire women for secretarial positions and men for technical ones. They view family commitments as a disadvantage for women across all the occupations, and they perceive women as less capable of working under stress or extending their schedules. Employers also have less confidence in married women than in married men, as married women are much more prone to request excuses to absent than married men. To an important extent, employers view women versus men in ways similar, if not identical, to the views that men and women bring to work from home and school. In fact, it is not clear from these studies whether employer perspectives have significance substantially independent from those views brought to the workplace from home and school.

Clearly, these attitudes limit the panorama of jobs that women perform in the economy, restricting their access to positions in formal and well-paid employments.

Education as a Solution

Education can be a useful tool to help correct the problems discussed above. Education plays an important role in the formation of young men's and women's expectations. Whether differences in expected earnings respond to differences in aspirations between men and women or to bargaining strategies is part of a wider research agenda that these studies just begin to uncover. In the meantime, education at home and in the schools plays a key role in generating similar aspirations for wages and employment quality for both men and women, and it can also communicate to employers a higher consciousness of gender equity. Promoting more equal aspirations would probably, by itself, increase employers' commitment to gender equity and could reduce a considerable part of the observed differences in earnings.

The study from Argentina shows that education, both in terms of quantity and quality, can play an important role in finding a job in a non-segregated sector, and that this effect is even more true for women than for men. Education, particularly for women, increases the chances of finding a "formal" and better paid job.

Even if "formal" education does not openly admit any gender differences, there remains work to be done in terms of the textbook contents, for instance, as these still show to boys and girls a world where there are more men than women, and where men play more productive roles than women (as shown in the other study).

Education, starting at home and then in school, is the path that can lead women to believe that they have the same rights and opportunities as men, and that they can ask for the

same rewards from the labor market and the society as a whole. These studies stress the importance of education at all levels—from programs to reduce illiteracy to secondary education, higher education, and adult training—as tools to reduce occupational segregation as well as income disparities. They also emphasize the need for special programs for indigenous populations—as always, the most disadvantaged. Quality of education is more important than years of education.

The challenge of promoting an equal sense of opportunity and aspiration for girls is more likely to happen in schools featuring strong parental and community participation. Experiences with community-based schools in all regions of the world show that when traditional families can see their schools as extensions of the family, they will often let girls go to school, where before they wouldn't. In the UNICEF Community schools in Upper Egypt, for example, traditional fathers often see an expanding sense of opportunity for girls whom they wouldn't allow out of their homes before the schools. Now some of the fathers will even let their girls go to Cairo to college.

By opening spaces for real self-governance, in which parents and especially fathers gain real authority and a sense of “ownership”, working with teachers, traditional people move away from the traditional, habitual spaces that keep women and girls down. They become “conscious” and can gain a sense of responsibility for educating girls even in one village meeting when the girls stand, speak to them and appeal to them to be heard.²

If traditional people in rural cultures can feel this sense of responsibility for opportunity and empowerment of girls, one cannot doubt that more cosmopolitan city-dwellers, with girls graduating from high school, can feel a similar sense of responsibility and opportunity. The process used by Educate Girls Globally (EGG) in northern India features rural girls speaking to traditional community meetings, and their statements play an important role in shifting people's attitudes.³ Why not create similar spaces and encourage women and girls to express their aspirations?

The creation of spaces where girls would be encouraged to express their hopes and aspirations might constitute an important step in changing the attitudes of women and girls toward their own lives and also of their elders at home, school, and workplace toward their possible place in the world. If EGG's experience in northern India is any guide, such a simple thing could make an important difference in starting to change attitudes toward the role of women in society. The change would include both general attitudes—of parents, teachers and employers—and also of women and girls themselves toward their own possibilities and opportunities.

The challenge of empowering women in Latin American societies must now face some subtle and complex challenges having to do with private as well as public behavior. Accomplishing reform in these circumstances requires reform models that are outside

² Interview with Anjula Tyagi, director of project in Uttaranchal, conducted by SBMA for EGG. See also evaluation on the project done for the International Center for Research on Women, New Delhi, 2005.

³ Interview with Anjula Tyagi, SBMA, [March 10, 2005].

traditional public policy reforms. We have sketched the nature of the challenges. Our societies can increase opportunities for women empowerment, as proposed in the Millennium Development Goals, if they implement policies that address these challenges. Their efforts must be directed not only at the labor markets, but also at other sectors of the society, including schools, families and workplaces, where today's girls are creating their visions of the women of tomorrow.

The Project on Girls' Education in Latin America

The Project on Girls' Education in Latin America was financed by the IABD through the specialized institution Educate Girls Globally (EGG). EGG hired research teams to carry out six studies in the following countries: Argentina, Bolivia, Guatemala and Peru. The project was designed to understand better the qualitative differences in the education of boys and girls, with special attention to the role of ethnicity, and how those differences contribute to labor-market biases. In order to do this, two main studies were conducted: i) an analysis of rural girls' primary education and ii) an analysis of urban female employment and its links with secondary education.

The first study focused in the primary education in the rural areas as secondary education is still very limited in rural areas of the Region. It was executed in Bolivia, Peru and Guatemala and it is developed in a separate volume.

The second study focuses in secondary education in urban areas and its links with female employment and earnings. It was carried out in Bolivia, Peru and Argentina and its results are the matter of this volume.

Contents of the Final Report

The final report of the Project on Girls' Education in Latin America has two parts. The first part contains an introductory chapter and the final versions of the studies on Rural Girls' Education in Bolivia, Peru and Guatemala. The second part contains an introductory chapter and the final versions of the studies on Urban Female Employment in Bolivia, Peru and Argentina.

This document contains the second part of the report. Its contents are:

- I. Introduction
- II. Urban Female Employment in Bolivia
- III. Urban Female Employment in Peru
- IV. Urban Female Employment in Argentina

Apart from the introduction, each chapter corresponds to the final draft report submitted by each research team, revised and edited by EGG. Each chapter has an introduction that serves as a framework for the studies performed by the research teams, the main results and conclusions.

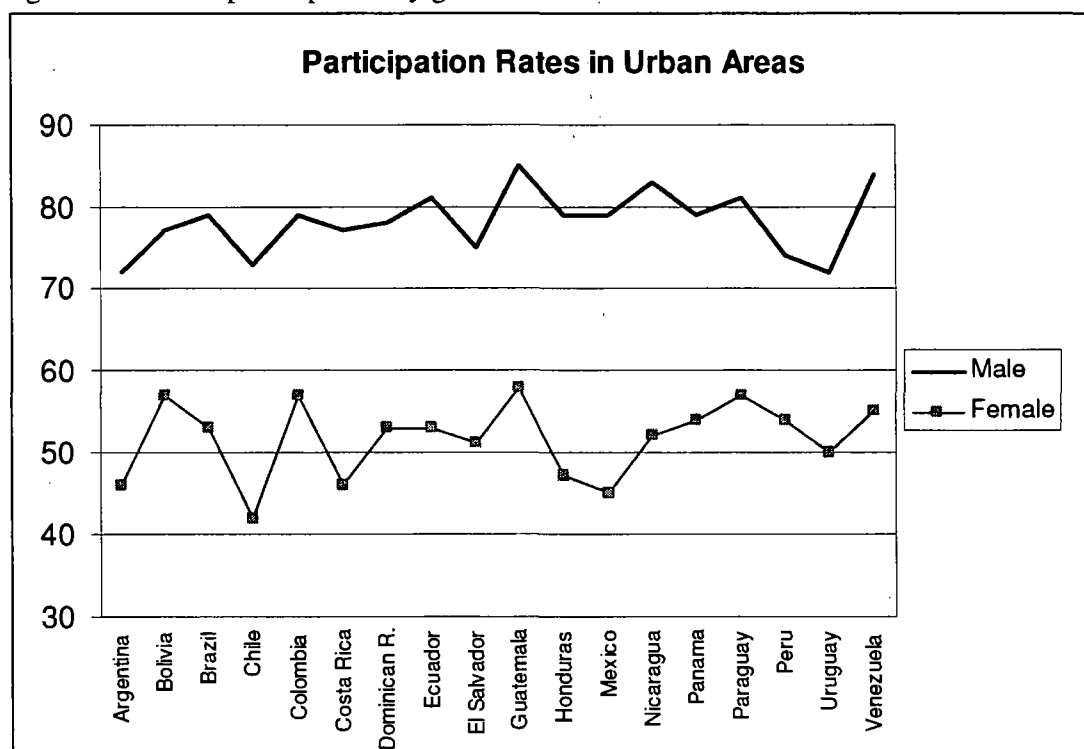
I. Introduction

This introductory chapter has three parts. In the first one we present a state of the art in female labor markets in Latin America that motivates the analysis. In the second one we explain briefly the methodology followed in the research. The last part includes a summary of the results found by the studies that constitute this volume.

I.1 Background

In the majority of developed economies there has been a notable increase in female labor supply during the twentieth century. In Latin America this steady increase of female participation in the labor force has taken place mainly over the last two decades. In countries like Colombia and Uruguay it grew from about 34% in the beginning of the 1980's to close to 50% in the late 1990's. At the same time male participation has been relatively constant at more than 70%. The increase in labor force participation has been notorious particularly for married women, with rates of participation that resemble the ones from their single counterparts, and for women between 30 and 40 years old, whose levels of participation are around 70%.⁴

Figure 1. Rates of participation by gender - countries

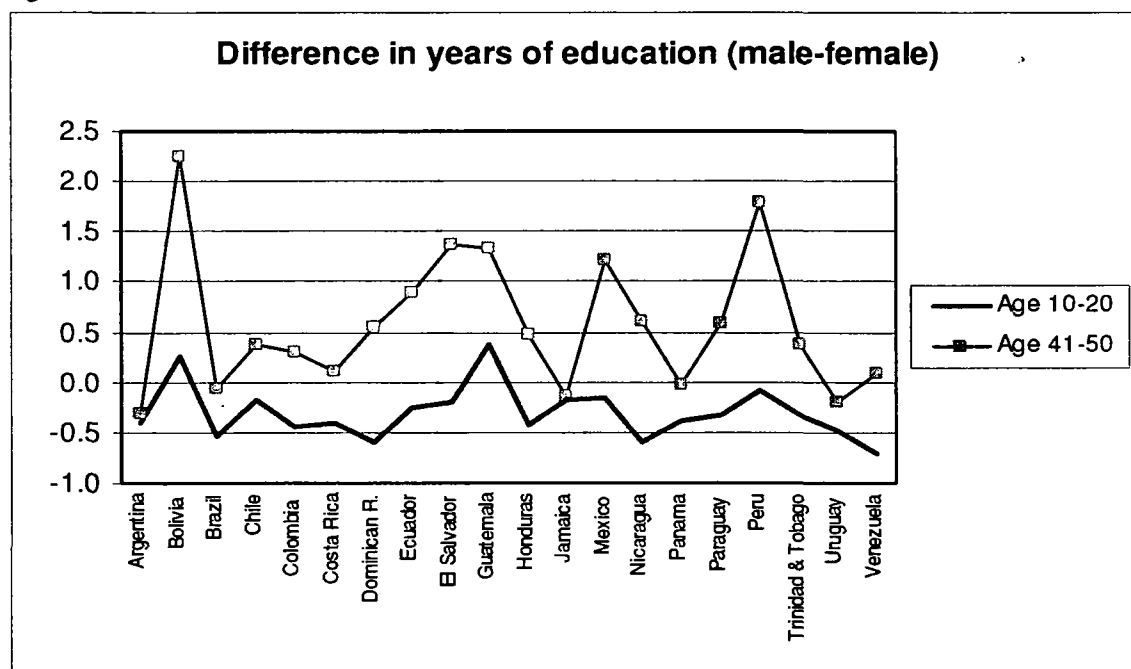


Source: CEPAL- Panorama Social de AL 2002-2003. All figures correspond to years 2000 – 2002.

⁴ Labor force participation has the form of an inverted U shape against age. (Tenjo et al. 2004)

The growth in women participating in the labor market has been accompanied in all countries by a steady increase in educational levels of women relative to men. In many countries at the end of the 1990's women levels of schooling reached and even surpassed male schooling levels, in particular those of female participants in the labor force. As shown in Figure 2, this feature is common to the majority of countries in the Region nowadays.

Figure 2.



Source: De Ferranti et al. World Bank (2003). All figures correspond to years 1998 – 2001, except Dominican Republic (1995) and Trinidad & Tobago (1992).

The increase in female education has been rewarded by the market in the sense that in general women have similar rates of return to schooling than men. In particular the returns to secondary education of women are in general larger than for males.⁵ That pattern, however optimistic, is true only for women who are employed. In the Region female rates of unemployment are systematically higher than males'. On average in the Region, the female rate of unemployment in 2002 was 11.1% and the male rate was 7.7%⁶. Also the duration of unemployment is higher for women than for men. According to Piras (2004) in nine countries of the region female unemployment spells were longer than male, and the situation was reverse only in four countries.

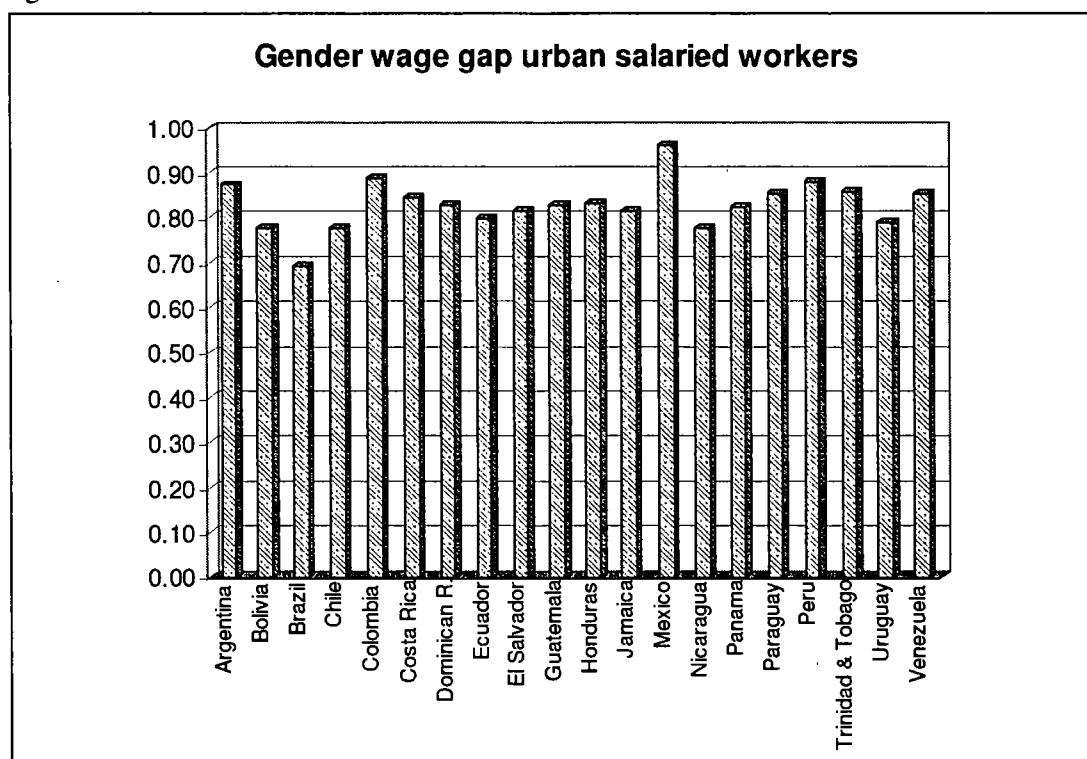
⁵ This results is observed in Table A.30 of De Ferranti et al. (2003) after estimating Mincer regressions for men and women of $\ln(\text{hourly wage})$ for primary job of individuals between 25-55 against educational dummies, age, age squared, regional dummies, urban/rural dummy, corrected for selectivity with number of children and school attendance.

⁶ Figures from CEPAL (2004), page 158.

One possible reason for this can be the same increase in female participation in the labor force described above, as one could assume that the labor market is responding to the incorporation of the new labor force in a relatively slow manner. Other sources for this can be related to employers' attitudes toward hiring women, to the type of occupations where women work or look for jobs, and to the way expectations are generated both in men and women in our societies. These matters are analyzed in depth on the chapters of this report.

Together with a higher unemployment rate, women earnings continue to be smaller than those of males, even though this trend is reducing over time. Duryea et al. (2004) show that women's earning capacity in the labor force relative to men has been increasing over the last two decades and this may have attracted more women to participate.

Figure 3.



Source: De Ferranti et al. World Bank (2003). All figures correspond to years 1996 – 2001, except Trinidad & Tobago (1992).

Some recent analyses show that women enter the labor market with initial wages that are lower than males' and that the higher female returns to schooling are not always enough to compensate for that initial disadvantage (Tenjo et al., 2004). One possible explanation as to why women's initial wages are lower than males' can lie on the fact that men and women have different expectations and probably different attitudes towards risk. The chapter by Benavides and Ñopo in this report shows that when you look at men and women that are basically identical in their characteristics and that are applying for the

same position, the desired salary of women is systematically lower than the desired salary of men.

Figure 3 shows the gender wage gap for urban salaried workers in almost all countries of Latin America at the end of the century. This wage gap was calculated as the ratio of the mean of the counterfactual wage that men would have earned if they had been paid like women over the actual average male wage. The fact that it is always less than one implies that the market is systematically rewarding women with wages that are approximately 83% of male wages.

Women in the Region are still the main fraction in the domestic employment (for each man in this sector there are approximately 29 women), in the unpaid workers group, and in some countries the informal sector is still predominantly female (defined as employment not covered by social security or formal contracts).

The fact that women cluster in occupations that are traditionally “female” has not shown any improvement since the 1990’s and the Region exhibits one of the highest levels of occupational segregation in the world. An average Duncan (Duncan and Duncan (1995)) index of 35 for eight countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Honduras, Mexico and Peru), indicates that 35% of men and women in those countries would need to trade occupations to be equally represented by gender in all occupations. (De Ferranti, 2003) In this report Muriel finds that the Duncan index in Bolivia is about 38, but she expands this analysis to other more exact measures of occupational segregation, finding that occupational segregation is due in large part as a consequence of differences in opportunities and choices in the primary and secondary education levels.

What is behind these differences in opportunities and choices? What determines that women suffer more from unemployment and get jobs with worse characteristics and wages? These are some of the issues that the researchers have analyzed in the present study.

I.2 Methodology

The studies of urban female employment and secondary education in urban areas in Argentina, Bolivia, and Peru have elaborated a diagnosis of female employment, which focuses on a diagnosis of the supply of labor and of demand for labor in their countries. For this diagnosis the researchers have relied mainly on official data, in order to determine what sectors of the economy women are under- or over-represented, what sectors have better paid jobs, what are the main characteristics of the male and female labor supply in terms of age, education, marital status, informality and wages, paying attention to the issues of ethnicity when the data allow it.

The team from Argentina has based their analysis on the “Encuesta Permanente de Hogares” [EPH], and on its special module on education for 1998, the team from Bolivia on the Census and the “Programa Regional de Mejoramiento de las Encuestas de

Condiciones de Vida en América Latina y el Caribe” [MECOVI] data, and the team from Peru on the National Household Survey [ENAHO] data. The researchers tried to uncover the determinants of urban labor force participation rates by gender, what could encourage the participation of women (and/or indigenous people) in the sectors of the economy that are better paid, what determines their earnings and the earnings gap by gender and by ethnicity.

In addition to this, the research teams have designed additional survey instruments to gather additional data.

In Bolivia a survey at the secondary schools was conducted in order to relate actual employment opportunities (participation in the labor market, employment and earnings) with secondary school characteristics (private or public, career counseling or not, parental expectations, treatment of girls, etc.).⁷ The survey seeks to understand whether the present curriculum and specific aspects of the education given at the schools respond to the demands of the labor market and enhance young people’s ability, particularly women, to obtain suitable employment in the formal sector and to uncover at the secondary school level differences by gender in teachers’ expectations or youngsters expectations toward their future.

The team from Argentina investigated at the secondary school level whether the curriculum responded to the labor market demands, the young people study learning processes of the curriculum contents and their expectations about their future jobs.

The characteristics of the labor demand were analyzed through a second instrument designed by the researchers in the three countries (Peru, Bolivia and Argentina). It was a Survey of Employer Attitudes that investigated the demand side of the labor market, including factors that may result in discrimination (conscious or sub-conscious) against the employment of women or indigenous people, and also factors related to the pertinence of education. The main objective of this survey was to know the employers perspective on male and female characteristics that could lead to hiring more men than women, or paying them more for a similar work.

In addition to this, the Peruvian team elaborated a survey to potential workers that applied to a position in the same firms that are interviewed in a previous instance. The results of this gave a clearer picture of the characteristics of the labor demand not only from the employers’ perspective but also from the actual or potential employees’ perspective in the city of Lima.

⁷ It was supposed to be done also in Argentina but due to bureaucratic problems it was not possible to do it.

I.3 Main Results

This section summarizes the main results found by the research teams in each study. This part is based on the results included in chapters II, III and IV of this report.

I.3.1 Female labor force participation: levels and determinants

In Bolivia labor market outcomes reveal large differences by gender in participation rates and wages, and employment sectors are markedly different across men and women. However, from the analysis of the data, apparently the differences observed by ethnicity are more important than the gender differences.

In terms of labor force participation, male rates have been decreasing over time in Bolivia, passing from a 71% in 1976 to a 60% in 2001. In Peru this rate has been relatively constant around close to 77% during the period 1986-2001. Female rates in Bolivia, on the other hand, have shown a large increase from about 19.5% in 1976 to 40% in 2001 and in Peru they also have increased from close to 48% in 1986 to close to 56% in 2001. Of the labor participants in Bolivian urban areas, 27% are indigenous and 73% are non-indigenous, since the majority of the indigenous population is located in rural areas.⁸

While in Bolivia (as in the rest of Latin America) the higher participation rates are for the population between 25 and 45 years old, the indigenous female adolescents (10-17) begin to participate in the labor market at very early ages, with participation rates of 41%. Among the elderly, indigenous women (and men) are poorer and less likely to have social benefits and more frequently participate in the labor force than non-indigenous women (and men).

By looking at educational levels, it is clear that in Bolivia on average the female indigenous population is the most disadvantaged. The schooling gap by ethnicity is much larger than the gender gap: the difference between indigenous and non indigenous women in the labor force is close to 6 years of schooling, the gap between indigenous men and women in the labor force is 2 years, and the gap between non-indigenous men and women in the labor force is practically zero.

In Bolivia and Peru singles' participation rates are considerably lower than married participation rates. Singles' male participation rates are almost 30 percentage points lower than married male participation rates, but there is little difference in participation rates between single and married women. This result means that, although traditionally married women had participated less in the labor force since a large fraction of them were devoted to household chores or raising children, this behavior has been changing with time.

Among the married, participation rates of indigenous men (and women) are higher than participation rates of non-indigenous men (and women). Regarding home obligations,

⁸ Indigenous population defined as those with mother tongue Quechua, Aymara or other native language.

having more children in the household is related to higher participation in the labor market for men and to lower participation in the labor market for women. Regarding poverty, while women do participate less than men independent of poverty, the participation rates of non-poor indigenous women is almost 76%, higher than the indigenous male rate and very close to the non indigenous male rate among the non-poor.

The estimation of econometric models to explain female labor force participation leads to the conclusion that when a woman is more educated, single, immigrant to the city, or household head, she is more likely to participate in the labor force. When there are more children in the household, when she is indigenous or poor, she is less likely to participate in the labor force. This analysis is complemented with a similar model estimated for men. In that case it is found that more educated and single men are less likely to participate in the labor force, but if a man is an immigrant to the city, household head, has more children in the household, is indigenous or poor, or lives in the principal cities he is more likely to participate in the labor force. Both male and female participation increase with age until 41 years old, and then they begin to decrease with age.

In Argentina⁹ the analysis is concentrated on the young between 18-29 years old. Labor force participation of women 25 to 29 has increased largely over the period (1974-2002), while men in that age group have maintained more or less constant participation. A decrease in youth participation rates has happened simultaneously with a large increase in the demand for education, which is even higher for women. Specifically for this young population, the authors found that there is a strong and negative correlation between the decisions to study and/or work, at the same time that the size of the groups who only work and who neither study nor work has diminished with time. The authors have found that secondary education affects positively the probability to be economically active, more so after completing the level, particularly among women. School attendance reduces the probability of participation significantly and noticeably, more for boys than for girls.

1.3.2 Employment and unemployment

Even if in the Region unemployment is higher for females than for males, in Peru the unemployment rate for females in general is lower than for males, with the exception of the population with higher education. Among this group, the trend is for female unemployment rates to exceed the males' by as much as 3 percentage points, but the differences seem to be reducing. On average, unemployment rates among single individuals were slightly above the corresponding rates for the married. While for youngest age group (14 to 25 years old) there are almost no gender differences, the oldest individuals (46 and older) show higher unemployment rates for males.

In Argentina, employment has decreased between 1974 and 2002 for males and increased for females in the 25-29 age range, and it has decreased for both boys and girls aged 18-24. At the same time unemployment has increased abruptly for both age groups and genders.

⁹ It is based on five yearly observations of the EPH between 1974 and 2002.

The paper from Argentina estimated reduced-form models for the probability of being employed against the alternative of being unemployed or out of the labor force.¹⁰ In the relevant range, employment chance increases with age. Being married or cohabitating decreases employment chances for women while increases them for men. As expected, attending school decreases the chances of being employed, especially for men. Men's employment probability is much higher than women's among individuals who are not currently at school. Among the group who attends school chances of employment do not differ by gender.

Educational attainment and having graduated from high school or from college explain females' chances of being employed but not males'. Apparently the effect on employment of the type of school does not depend on the school characteristics by themselves but on unobservable variables that determine both the high school choice and the likelihood to continue studying beyond secondary level. Repetition significantly reduces employment chances only for females. Failing a high-school year indicates bad performance and maybe less employment opportunities available.

The example of siblings who are more advanced in their studies reduces the chances of young individuals to be employed, both for men and women. Birth order does not determine the chances to be employed for a male, but for women being the eldest child decreases her likelihood of being employed.

I.3.3 Formality

The authors of the studies have used several definitions of informality. Independently of the definition of informality, they find that it has increased in the last decades but that the female share of the informal sector is decreasing. In Peru the informal sector is no longer predominantly female, as it used to be.

In Argentina models to explain the probability of having a formal job were estimated. It was found that age significantly increases the chances of being formal, more educated individuals are more likely to have formal jobs, parental education significantly affects chances of having a formal job, and belonging to larger families decreases the probability of being formal. The effects of educational attainment and of parental education on chances of being formal are stronger for females.

¹⁰ The model controlled for age, age squared, marital status, school attendance, educational attainment, high school characteristics, secondary educational history –failure, abandonment, delayed entry–, parental education, siblings' education, birth order, family size–, family income, employment situation of the household head and location.

Table 1

Urban Argentina	Females	Males
Formal workers ¹¹	33%	43%
Informal workers	67%	57%
Urban Peru	Females	Males
Formal workers ¹²	32%	34%
Informal workers	68%	66%

Source: Chapters of Peru and Argentina, this report

Regarding differences in formality by gender, the study from Peru reports that, based on the matching estimators, the gender differences in formality rates would have been two base points lower if males and females shared the same distribution of observable human capital characteristics. This counterfactual exercise revealed that the formality rates for females would have been above than that for males between 1996 and 2001.

I.3.4 Occupations and segregation indexes

Labor markets in general exhibit gender differences in occupations. As there are occupations that require strength or particular manual capabilities at which either males or females can perform better, some occupational segregation by gender is expected. While some of the gender specific requirements have decreased with the recent advances of technology, the expected trend of a fall in occupational segregation has not been observed everywhere. Such is the case of Peru, where gender occupational segregation has increased slightly during the last years.

The Duncan index evolution shows that the gender occupational segregation increased in Peru for the last five years. While no differences are found by marital status, segregation is high and volatile among non-educated workers and is lower among those with higher education (college degree or above). The chapter from Peru shows that the occupational segregation if males and females exhibited the same distribution of observable human capital characteristics would be between two and three base point lower, as measured by the Duncan index.

The occupational distribution in Bolivia shows the uneven distribution of men and women by skill requirements of the jobs: while 71% of occupied women are low skilled workers, 58% of occupied men are low skilled workers. Correspondingly, there are more women than men in low paid occupations, as shown in Table 2, and this difference tends to increase when looking at ethnicity.

The occupational decomposition shows that in Bolivia the bulk of men are working in trade, manufacturing, transportation, storage, communications and construction, while most women work in trade, domestic services, manufacturing, hotels, restaurants and

¹¹ With retirement benefits.

¹² Short term and long term contracts in public administration, armed forces, unionized or registered at the public social security system, excluding unpaid family workers.

education services. In Argentina men are more concentrated in trade, transportation, public administration and construction, while women concentrate in trade, health care services, teaching and domestic services. As in Bolivia, women tend to occupy positions that require lower qualifications than men.

Table 2

Urban workers 19-65 by gender and ethnicity, Bolivia 2001

Sector of occupation	Men			Women		
	Total	Indigenous	Non-indigenous	Total	Indigenous	Non-indigenous
High paid	38.7%	28%	42.4%	29.7%	10%	36.9%
Low paid	61.4%	72%	57.6%	70.3%	90%	63.1%

Source: Bolivia's chapter, this report.

The model estimated in Bolivia to explain the probability of working in an occupation with a low segregation index indicates that women (indigenous or not) are less likely to belong to an occupation with a low segregation index, even after controlling for other covariates (age, education, marital status, household demography and others).

A model to study the determinants of the probability of working in a leading sector (financial sector, public administration, defense, education, health, or professional and personal services) was estimated in Argentina, conditional on the individual being employed. While age appears to have a significant effect on the probability of having a job in a leading sector for women, this was not the case for men. Education plays an important role in finding jobs in a leading sector, and the effect is stronger for females. A woman with at least some college education has twice the chances to find a job in a leading sector than a similar woman with no college education, and when this woman graduates from college, her chance to have such a job increases more than three times.

Women from private high schools are more likely to get jobs in leading sectors than those coming from public ones. Parental education significantly affects men's probability of having a job in a leading sector but not women's, and the contrary holds with siblings' education. Total income of other members of the family has a positive and significant effect on the probability of having a leading-sector job.

1.3.5 Earnings and the wage gap

The study from Peru analyzes the evolution of the gender wage gap in hourly wages, monthly earnings and total income generated by women for the period 1986-2001, and compares the actual size gaps with the counterfactual gaps that would have resulted if males and females exhibited the same set of characteristics.

The gender wage gap (raw difference between mean male wage and mean female wage) shows a cyclical pattern: it increases in periods of recession and it decreases in periods of

expansion. During the periods of real wage recovery (1991-1993 and 1997-2000) the gender wage gap reaches minimum values (roughly 20% of average females' wages). The gender wage gap fluctuated around 45% during 1986-2001. Using matching estimator techniques, the authors calculate that such gap would have been fluctuating around 25% if males and females had the same distribution of observable human capital characteristics in every single year¹³. This implies that less than half of the hourly wage gap can be attributed to workers observable characteristics and the rest remains unexplained.

The gender gap in monthly labor income is bigger than the gender gap in hourly wages, because, on average, males work more hours per week than females. The monthly earnings gender gap shows a decreasing trend for the last fifteen years: by the late eighties it was around 100%, by 2001 it was around 80%. The authors compute that if males and females exhibited the same distribution of observable human capital characteristics in the labor markets, the gender gap in monthly earnings would have attained 80% during the late eighties and slightly less than 60% by the early 2000's.

The chapter by Benavides and Ñopo reports a remarkable increase in the female generation of income¹⁴ during the recent years. By the end of the eighties females were generating approximately 20% of total labor income and by the early 2000's they were responsible for close to 30%. If males and females in the population shared the same distribution of human capital characteristics, females would have generated 10 base points above than what they are generating, that is 40% of total labor income by the early 2000's.

The analysis in Argentina shows a large decrease in real wages of young during their period of analysis (1974-2002), without noticeable differences by gender, for all young population aged 18-29. Secondary education has a positive impact on the remunerations earned by youth, in particular for those who have completed the level. The impact is higher for boys than for girls and it becomes clearer as they move forward in the educational structure. Higher education increases male income more than female income and the difference is higher than for secondary school.

The estimation of earnings equations in Bolivia shows that wages increase very slightly with schooling before 10 years of education, for both males and females. Only after this threshold, education starts to show its returns in terms of earnings. However, men's hourly wages are higher than women's hourly wages at all education levels, and in general non indigenous women earn considerably more than indigenous women.

Although general returns to schooling are about 0.09, indicating that one more year of education implies a 9% increase in hourly wages, the returns to primary education are only 2%, to some secondary education are 4% and to more than 12 years of education are

¹³ The observable characteristics taken into account in this analysis were age, schooling, marital status and geographical context.

¹⁴ Generation of income is defined as the percentage of total labor income generated by the female Peruvian labor force.

8%. Experience has positive effect on earnings and the dummy of being woman shows a systematically negative effect: being a woman decreases wages between 17% and 24%, controlling for age, schooling, marital status and other variables. The interaction between having more children in the household and being female also has a negative effect on earnings. This model was enriched by adding to it the predicted probability of being in a less segregated occupation: this variable has positive returns on earnings and captures part of the returns to education, since the coefficient on schooling diminishes in size when it is included.

1.3.6 Firms attitudes and expectations towards gender

The studies included in this report investigated the characteristics of the demand for labor from the employer's perspective in the cities of Lima, Buenos Aires and La Paz. In each case the researchers designed a survey and a sample of firms to apply it, with the purpose of identifying the perceptions that employers have on men and women in a variety of occupations and sectors of the economy.

The analyses revealed that employers view family commitments as a disadvantage for women across all occupations. Women's lack of strength works as a disadvantage in the case of blue-collar occupations. The lower disposition to travel is also a disadvantage for women to work in sales. On the other hand the employers perceive women as better communicators and being more easy-going, which together with their appearance can constitute a plus in sales. Female organization skills and being more meticulous were seen as an advantage in the blue-collar occupations.

Men are perceived as more able to work under stress and to extend their labor schedules (and to work at night), especially in administrative tasks, where also training and experience are reported as clear male advantages. Physical strength has more importance for the blue-collars, cleaning and security workers.

The most highlighted disadvantages for males are in terms of their lack of discipline, lack of disposition to follow instructions and unpunctuality. In La Paz it was mentioned that men party more and drink more, which affects their work performance. These preferences were relatively the same for all firms, disregarding firm's size or the age, gender, education or tenure of the employer interviewed.

Regarding women the analysis from La Paz suggested that they are perceived differently by employers depending on their marital status. They perceive that married women work harder, and are more responsible and disciplined than single women. At the same time single women are perceived as faster learners, and as having more time and ability to concentrate. Married women in particular are more prone to absenteeism, due to their family obligations, much more than married men.

Half of the interviewed employers in Bolivia manifested that the pregnancy and post-partum costs disincentive female hiring, since in that country these costs are covered exclusively by the firms.

The analysis posed to the employers a series of direct questions to find out whether the employers had specific preferences for hiring men or women. The majority of them responded not to have any specific preference for any gender, and most of the firms do not reveal to have any favoritism to recruit managers, administrators, personnel chefs, supervisors, professionals, scientists or technicians. Hiring disparities by gender are more evident among unskilled workers: employers prefer women for client attention and men for security or cleaning, occupations that require more physical strength.

However, the study from Argentina shows that there is a large gap between what employers say and what they do, regarding gender equity at hiring. While 85% the employers in the Services sector considered gender irrelevant at recruiting personnel for technical or supervisory positions, 83% of the firms interviewed in that sector had technicians or supervisors exclusively male. Firms in the Industry sector were predominantly male in Buenos Aires, while in the Services sector were more mixed and with higher female representation.

1.3.7 Preferences of young people towards career choices and the environment

With a survey designed to inquire about the adolescents' expectations once they finish their school, the Bolivian team tested the hypothesis that women choices of investing in human capital could be discouraged by the type of jobs attributed to them in the family and in the society.

While the possible discrimination or segregation in the labor market issues does not seem to be taken into account by women when they decided to get more education, there are large differences between men and women choice of professions or occupations. For every woman who would like to study pure sciences or engineering, 2 men would like to study that, and for every woman who would like to be a technician, close to 4 men would choose that profession. Females would prefer more to study medicine or associated fields, education sciences, social sciences, law, politics or secretarial work. For every man approximately 9 women would like to be secretaries, and in educational sciences, the rate is of 1 man for every 3 women.

The data showed that on average men wish to study 5.8 additional years and women 5.44 additional years. An OLS analysis of the wished years of educations of the secondary students showed that mothers' education and sports frequent practice are related to more years wished, while students that work and girls are less inclined towards studying longer.¹⁵ While sports may stimulate the desire to accumulate human capital, by increasing discipline and ability to face different challenges, the negative relation between women and wished year of studies suggests that they choose shorter professions and may be less inclined than men to study further than the baccalaureate level.

¹⁵ This analysis controlled for school characteristics (of both sexes, bilingual, morning schedule), extracurricular activities (sports, artistic activities and work), parental years of education and gender.

I.3.8 Secondary education: performance and skills acquired for work

Argentina's chapter documents the dramatic increase in secondary enrollment in that country over the past decades. This change has been characterized by the facts that girls attend more, have better performance indicators and are more likely to be attending the grade that corresponds to their age than boys. Currently 57 out of 100 graduated students of secondary are girls.

For this project the authors integrated information on the scores of standardized tests in Math and Language for students in the last year of secondary education with a questionnaire with socioeconomic characteristics filled out by the students that take the test and with a schools census by the Ministry of education for 6 provinces geographically distributed in 4 out of the 5 regions of the country. With this rich data set,¹⁶ the authors estimated models to determine the factors associated with students' outcomes in standardized Math and Language tests, controlling for socioeconomic background, school, and regional indicators.

As it was observed in the primary level in rural Peru¹⁷, the results in Math were better for men and in Language for women¹⁸. Poverty and family size are inversely related with performance, while better scores were associated with higher parental education and books' availability at home. Public and rural schools tend to have worse outcomes on average in terms of performance on these tests, and larger classrooms were associated with better outcomes, an apparently counterintuitive result.¹⁹ The effects of teachers and non teachers (administrative staff) per classroom differ by type of school. The results show that students who repeated at least one year during secondary school get on average worse scores than those who did not repeat.

This analysis was complemented by a qualitative analysis performed in 12 schools, 8 public and 4 private schools located in the urban industrial area of Buenos Aires' province. They investigated teachers' perceptions of boys' and girls' potentials for Math and Language and measured the basic skills acquired in the prescribed Math and Language curricula by students in secondary school that could be related to their future the labor market entrance and performance.

Probably related to the teacher's claim that secondary students lack the minimum abilities that were supposed to be taught in primary school, the test results show persistent failures in Math, both in the areas of the taught curricula and the learned one.²⁰ Teachers'

¹⁶ This is the first time that these data are merged in Argentina.

¹⁷ See report on girls' education in Peru, in Part I of this report.

¹⁸ A result has been documented in other contexts such as the PISA test.

¹⁹ This can happen when better schools have more demand and therefore more students per classroom. The effect of class size in student outcomes has shown ambiguous results in the literature, as shown un Hanushek (1986).

²⁰ The prescribed curriculum is the one contained in the official documentation in effect for each level and orientation. The taught curriculum refers to the particular content selection that each institution and teacher

selection of contents indicates that their vision of their students' future prospects is very short-term, where emphasis is placed on the requirements of entry-level jobs i.e. low-qualification jobs. Teachers' curricular decisions do not seem to provide sufficient basis for a labor path of increasing quality.

makes to organize teaching time. The learned curriculum refers to the contents mastered by students who have received a certain taught curriculum.

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WOMEN LABOR MARKET CONDITIONS IN URBAN BOLIVIA

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I. Introduction

Both, labor market conditions and labor force participation in Bolivia, still display pronounced differences by gender group. One main reason, usually pointed out in the literature, is the human capital gap, since education is higher for men than for women. However, discrimination and segregation problems as well as personal choices related to tastes and family conditions also can determine labor force participation and quality labor market insertion of women compared to men.

This paper analyzes individual characteristics that can explain the differences in urban labor conditions by gender in Bolivia. Because in this country exists marked socio-economic disparities between indigenous and non-indigenous people, this feature is also considered within the research.

The study has been developed under the premise that women education levels determine mainly their urban labor force participation and their employment and wages conditions. It is also analyzed factors as age; experience; family conditions (marital status, number of children, home headship, etc.) and apparent "stereotypes" and innate abilities that could determine urban labor problems by gender.

Some empirical studies have been developed in Bolivia. Indeed, in terms of employment, Ramírez (2003), using segregation indicators, identifies the existence of occupational segregation problems by gender in Bolivia, principally for unskilled work.

Moreover, the empirical literature on labor income shows that education is the most important factor explaining wage inequalities. Using Mincer's regressions, some studies as Fields et al. (1998) and Andersen (2001a), found that the number of years of education determine more than two-thirds of the explained income. Other papers, as Rivero and Jiménez (1999) and Ramirez (2003), using the Oaxaca decomposition showed that diverging human capital endowments between women and men explain to a large extent the discrepancies in gender wages. From another point of view, Moensted (2000) observed that educational returns in Bolivia do not seem to be linear, getting higher returns for superior education than for primary and secondary instruction. A second notable result of these studies is the wage discrimination against women, measured by a dummy variable or by wage decomposition methodologies. Some investigations found, for example, that male wages are more than 20% higher than female wages, still controlling for some indicators of human capital (see, for example, Pérez, 1997; and Mercado et al., 2003).

Besides those important findings, there are no studies analyzing women labor force participation factors and still it is unclear why occupational segregation and wage discrimination against women do exist. This study attempts to address these concerns and find some important new results. First, education levels explain not only the labor income but also how education increases the women probabilities of being in the labor force as well as to belong to the less segregated occupations. Second, home responsibilities (duties) controlled by gender, are the most important factors that limit the women labor force participation. These factors also restrict women to get involved in less segregated occupations and to have higher earnings, and could affect negatively their work performance. Third, different stereotypes and

innate abilities between women and men seem to explain to a large extent an occupational segregation scheme and labor income gaps by gender. Lastly, it is questioned that the taste for discrimination or the statistical wage discrimination against women are important factors to explain the labor income gap by gender. Some discrimination problems against women seem to be present due to pregnancy and post-pregnancy potential costs that firms have to pay when they decide to hire women; but this is rationally justified in terms of minimizing cost.

The structure of the study is as follows. Section II contains a brief theoretical discussion concerning occupational segregation and wage discrimination problems, identifying individual characteristics and choices that could explain them. Section III describes, with the support of official Bolivian databases, the main personal characteristics by gender and ethnicity according to labor force participation, occupational category sectors and income. Here, it is developed four statistical analyses. The first one studies the factors that explain women labor market participation based on Probit models. The second builds on occupational segregation indexes: Duncan & Duncan, Karmel & Maclachlan and Borghans & Groot (1999). The third statistical analysis, based on Probit models, identifies the characteristics to belong in less segregated occupations. Finally, Mincer's regressions are estimated in order to explain the income gap by gender. Section IV describes additional characteristics that explain labor market problems against women, based on surveys specifically developed for this study. Conclusions and recommendations can be found in Section V.

II. The theory

Occupational segregation

Gender differences in human capital can explain, in a good part, the worse labor market conditions that women usually face compared to men, and it can still influence women working decisions.

The first theoretical concern is reflected into labor occupations, where women population can be relatively scarce in some specific works or, by the contrary, abundant. It means that occupational distributions by gender are different. The human capital theory justifies these dissimilarities under the neoclassical hypotheses, where occupational segregation would be the result of the labor's market efficient behavior.¹ Generally women have smaller levels of human capital compared to men and therefore, they have lower productivities. This characteristic causes, on one hand, that women look for jobs according to their labor skills and, on the other hand, that employers segregate this type of workers by putting them into different occupations, in order to maximize the firm's profit.

The human capital here is not only conceived through formal education - primary, secondary or superior - but also takes into account training and working experience. Under this wide concept, women population could also be in an unfavorable position. Commonly women concern about home keeping activities and taking care of children. On one hand, this would cause them to get involved in temporary or permanent retirements from the labor market comparing with males, and it will be reflected in less years of working experience. Therefore, it could lead to a self-segregation, by stimulating selections for occupations that have more

¹ See Banker (1997) and Preston (1999) for a survey of occupational segregation theories against women.

flexible schedules and less responsibility. Because of these female population “preferences”, women could face constraints for doing training courses in both labor market sides, supply and demand.

Under feminist theories, however, household works as well as other “female” occupations, where women participation is predominant, are conceived as a result of woman subordinated position within the family and within the society and not as a personal choice. In extreme cases, cultural restrictions establish which occupations are accepted for them and which are not. The stereotypes created around women capabilities (i.e. home keeping, docility, physically weak, etc.) can carry them to an unfavorable situation to get some occupations such as management and administrative tasks. Nevertheless, it is also important to observe that women can get more advantages in other tasks, for instance, some services and commerce.²

An important aspect around the occupational segregation problem for some women is the positive causality between restrictions of having a “female” occupation and low levels of human capital. More educated women, for example, have generally less children and fewer responsibilities at home and therefore, they are less constrained to work in “women occupations” than those with low education.

For the specific case of Bolivian urban labor market, it is important to highlight that the occupational segregation problem can be stronger for indigenous women due to differences in human capital by ethnicity. On one hand, they have usually less years and worse quality levels of education, and they are poorer compared to non-indigenous people (see, for example, Andersen and Muriel (2002)). Indigenous women are home workers within their families and merchants in their communities and, they make use of these skills when migrate to urban areas. On the other hand, many of them work in other homes and, for this reason; they can counteract some segregation problems against their female bosses (usually non-indigenous), making easier for them to work outside home.

Occupational segregation and labor income gap by gender

An important consequence of occupational segregation is the gender income gap. This causality can be explained theoretically through several points of view. The dual labor market theory, for example, postulates that there exist two types of sectors or occupations in the economy. The first one is the primary and requires permanent workers with high instruction levels, paying them relatively good salaries with promotion possibilities in the companies. The last one is the secondary and, by the contrary, it has unfavorable labor conditions since requires fewer skills and it is less concerned with the permanency of the employees (Doeringer and Piore, 1971). Under this context, women’s lower instruction levels, accompanied with their domestic responsibilities (that limit their permanency scope at work) discriminate them to be in secondary occupations, with lower labor returns.

It is possible here to view a second argument related to the previous one, under the hypotheses that differences in wages exist among sectors as a result of labor market imperfections such as

²Anker (1997) lists the characteristics usually attributed to women and their impact over occupational segregation by gender (see Table 1 of this paper).

“efficiency wages”.³ Considering that labor force can be disaggregated according to skill levels (usually measured by years of schooling), it is possible that intensive skilled sectors pay wages that are relatively higher compared with the rest of the economy.⁴ Additionally, if a country is relatively more abundant in unskilled workers compared to the skilled ones, the labor supply of the first group will be relatively abundant compared with the second one. These two possibilities show that educational differences by gender will have a bigger significance on income gap by gender.

Bergmann (1974) still points out that women labor income can be smaller because feasible occupations for them are fewer, comparing to those available for men. This is another kind of excess of supply in “female” occupations that can explain the labor income gap.

The occupational segregation problem, and their effects on labor income, however, has not totally been explained by dissimilarities between men and women. The literature enacts that imperfect and asymmetric information exist in measuring productivity at the individual level. It is possible to get knowledge of some proxy variables such as years of education and labor experience. Nevertheless, there are other factors like intelligence, health and innate capabilities that influence productivity, which neither employers nor researchers have information. In this way, the average gender differences in human capital can be labeled and constitute a signal for the labor market towards a poorer performance of women's work, resulting in lower demand for them. Such an attitude could explain one part of discrimination against women (statistical discrimination) and the persistence of the wage gap.

A second explanation comes from the fact that prejudices against women (or an ethnic group) can exist from some employers (taste discrimination). Becker (1971) considers that there exists a subjective additional cost in a company by hiring an individual that belongs to the group that dislikes. This behavior produces a smaller demand for this group and, therefore, to its equilibrium wage. The impact on the labor market, however, should not be permanent, because non-discriminatory employers could increase their profit by hiring the discriminated workers, reducing the wage gap in the long run that was created by such prejudices.

The fact that wage gap by gender is persistent can be the outcome, nevertheless, of additional costs incurred by hiring women that are economically justified. A first reason is the higher probability of women's retirements compared to men, which carries out recruiting costs. A second reason is that most women have periods of inactivity around the birth of their children. In Bolivia, this period is usually given one month and a half before and one month and half after the childbirth and, by law, the firm has to pay for this period of inactivity.

Human capital and labor market

The previously described theories show that occupational segregation and wage discrimination problems against women generally have a common factor that is attributed to differences in human capital by gender.

³ This means that some firms are willing to pay higher salaries in order recruit, retain and motivate their workers.

⁴ The stylized facts show that wages are higher in firms that have higher ratios of capital/employment, size, profits and product market power. This kind of firm could well be relatively more intensive in skill workers.

It is possible to find, in this way, a double causality between the labor problems and human capital. As Altonji and Blank (1999) stated, choices of education levels depend on the socio-economic environment of the individuals. By this means, the jobs attributed to women in the family and in the society can condition them, possibly through their parents, to get better prospects on employment and education. Furthermore, labor market discrimination and segregation against women can discourage themselves to invest more into their own education.

An important implication of this situation is a type of “poverty trap” that could be generated since women usually have a stronger influence in human capital accumulation of their children (see Andersen and Muriel (2002); and United Nations (2003)). In this way, low educational levels of today's women can discourage investments in education of future workers, limiting, therefore, the potential income growth of future generations.

III. Empirical analysis

In the previous section, it has been detailed in a shortly way, the theories through which individuals' characteristics can determine their labor conditions and also can influence the decisions of participating in the labor market. Using available official data of Bolivia, in this section it is discussed empirically the relevance of these characteristics as determinants of labor force participation, occupations and labor incomes by gender.

III.1. Urban labor force participation

Table 3.1 describes population in working age (PWA) by gender, according to their economic activity condition for the Census of the years: 1976, 1992 and 2001.

It is observed that women participation in the labor force has been growing over the time. In the urban area, women that were employed or unemployed (economically active population) in 1976 represented the 24.82% of the population in working age (PWA), but in 2001 the percentage increased to 41.56%. In contrast, men participation in the labor force slightly decreases over the time, which could be attributed to per capita income growth with further human capital accumulation in adolescents and young people, leading to a higher economically inactive population.

Although, labor force participation of men and women has contrary trends over the time, the gap is still high. In 2001 for each 100 men that were in PWA about 61 of them were working or looking for a job, and for each 100 women in PWA only 42 of them were economically active.

TABLE 3.1
OVER 10 YEARS OLD POPULATION BY GENDER, ACCORDING TO ECONOMIC CONDITION OF
ACTIVITY AND GEOGRAPHICAL AREA

DESCRIPTION	ECONOMICALLY ACTIVE EMPLOYED	ECONOMICALLY INACTIVE	ECONOMICALLY INACTIVE	TOTAL Percentage	Number
MEN					
1976					
Bolivia	71.10%	2.40%	26.50%	100.00%	1,553,110
Urban area	61.54%	3.60%	34.85%	100.00%	647,601
1992					
Bolivia	66.19%	2.24%	31.57%	100.00%	2,228,656
Urban area	58.03%	3.29%	38.68%	100.00%	1,289,915
2001					
Bolivia	60.19%	3.42%	36.39%	100.00%	2,957,387
Urban area	56.39%	4.27%	39.34%	100.00%	1,843,695
WOMEN					
1976					
Bolivia	19.52%	0.36%	80.12%	100.00%	1,646,057
Urban area	24.27%	0.55%	75.17%	100.00%	713,263
1992					
Bolivia	41.00%	0.51%	58.49%	100.00%	2,332,638
Urban area	33.59%	0.73%	65.68%	100.00%	1,411,688
2001					
Bolivia	39.95%	1.14%	58.91%	100.00%	3,043,481
Urban area	40.01%	1.55%	58.44%	100.00%	2,008,328

Source: Own elaboration based on CENSUS 1976,1992 and 2001 data - National Institute of Statistics

Table 3.2 shows population in working age in 2001 by gender and ethnicity, for Bolivian urban areas. For both men and women, it is observed that indigenous people is fewer compared to non-indigenous one. This is because indigenous people are mainly concentrated in the rural areas of Bolivia and not in the urban areas.⁵

Within each population group, it can be observed that indigenous people has a higher participation in the labor force. Among men, 75.59% of indigenous group work or look for a job and 56.75% of non-indigenous people are economically active (EA). Among women, 48.77% of the indigenous group participates in the labor force compared with the 39.42% of non-indigenous ones.

⁵ Indigenous people have been determined according to their mother language, which can be: quechua, aymara or other native language.

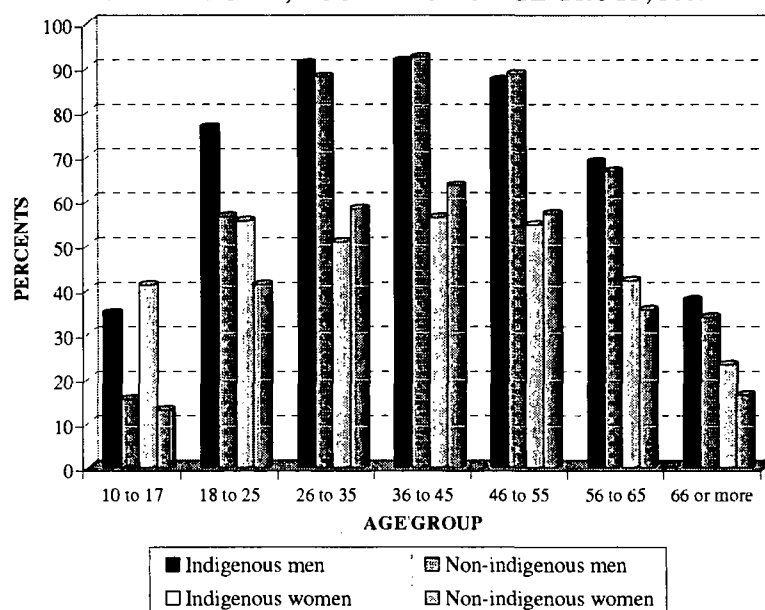
TABLE 3.2
OVER 10 YEARS OLD URBAN POPULATION BY GENDER AND ETHNICITY, ACCORDING
TO ECONOMIC CONDITION OF ACTIVITY, 2001

DESCRIPTION	ECONOMICALLY ACTIVE	ECONOMICALLY INACTIVE	TOTAL
MALE POPULATION			
Indigenous	26.06%	12.99%	20.92%
Non-indigenous	73.94%	87.01%	79.08%
TOTAL	100.00%	100.00%	100.00%
Indigenous	75.59%	24.41%	100.00%
Non-indigenous	56.75%	43.25%	100.00%
FEMALE POPULATION			
Indigenous	27.10%	20.27%	23.11%
Non-indigenous	72.90%	79.73%	76.89%
TOTAL	100.00%	100.00%	100.00%
Indigenous	48.77%	51.23%	100.00%
Non-indigenous	39.42%	60.58%	100.00%

Source: Own elaboration based on CENSUS 2001 data – National Institute of Statistics

Figure 3.1 shows urban labor force according to the age group, considering each EA group as the percentage of its own PWA.

FIGURE 3.1
OVER 10 YEARS OLD URBAN LABOR FORCE BY GENDER
AND ETHNICITY, ACORDING TO AGE GROUP, 2001



Source: Own elaboration based on CENSUS 2001 data – National Institute of Statistics

In general terms, it is observed a higher labor force participation of people of 19 to 65 years old. The exception is that the indigenous women group begins to work at an earlier age. It is worth to note that for the age group from 10 to 17 years old, indigenous women have the highest participation in the labor force (as a percentage of their PWA), with 41.07%. In this age group, adolescent indigenous men occupy the second position with 27%, and finally, about 10% of both non-indigenous male and female populations participate in the labor force.

For people that are over 18 years old, it is observed that men labor force participation is higher compared to women's participation. With exception of the 18 to 25 years old age group, there are no remarkable differences among indigenous and non-indigenous men. For women, it seems that the non-indigenous in between 26 and 55 years old participate in a higher proportion in the labor force rather than the indigenous ones.

Finally, it is interesting to notice that within each gender group of over 56 years old, there is a higher proportion of indigenous people working or looking for a job (compared to economically inactive) rather than for non-indigenous people. It can be explained because, as it will be seen later, the first ones are generally poorer than the second ones and, therefore, they have to produce a labor income still in the third age.

Comparing Figure 3.1 with Table 3.2 it is observed that the labor force participation gap by ethnicity is a consequence of a higher EA of adolescents and young indigenous people. Excluding the age group of 10 to 25 years old, for instance, the data shows a higher non-indigenous EA (within each population group): of 48.15% of indigenous women working or looking for a job compared to 64.28% of non-indigenous women; and to 81.71% of indigenous men participation in the labor force, compared to the 88.16% of non-indigenous men.⁶

Figure 3.1 shows a first decisive characteristic that explains labor market participation, through a relationship between age and EA in a U inverted shape. The low participation of adolescents and young people reflects, as a result, less needs to generate income given their economic dependence and, also an alternative use of the time, spent on education (mainly for non-indigenous people). The low participation of third age people in EA responds to pensions that some of them have, as well as to their limited own physical conditions for working.

A second factor that can affect the choice of participating in the labor market is related to education. Table 3.3 presents the average years of schooling for the population older than 19 by gender and ethnicity. Comparing first labor force participants by gender, it is observed that men have, on average, a higher level of instruction than women, although the gap is low. In urban area, women who are working or looking for a job have, on average, 8.70 years of education, and men in EA have 9.76 years of education. The educational gap becomes relevant if it is compared the population by ethnic origin. Indigenous women, in particular, are located in the worst position, with a gap of schooling years of 2.65 compared to indigenous men, and 5.62 compared to non-indigenous women.⁷

⁶ Table A1 in annex A present in more detail the PWA by age group, gender and ethnicity.

⁷ Table A2 in annex A presents with detail educational gap by gender and ethnicity.

TABLE 3.3
AVERAGE YEARS OF SCHOOLING OF OVER 19 YEARS OLD BY GENDER AND
ETHNICITY ACCORDING TO ECONOMIC CONDITION OF ACTIVITY, 2001

DESCRIPTION	ECONOMICALLY ACTIVE			ECONOMICALLY INACTIVE		
	Indigenous	Non-indigenous	Total	Indigenous	Non-indigenous	Total
MALE POPULATION						
Bolivia	5.62	9.63	7.93	5.07	10.69	8.76
Urban area	7.28	10.66	9.76	6.36	11.27	10.28
FEMALE POPULATION						
Bolivia	3.51	9.72	7.04	2.75	8.63	6.17
Urban area	4.63	10.25	8.70	3.56	9.55	7.91

Source: Own elaboration based on CENSUS 2001 data – Bolivian National Institute of Statistics

Among indigenous, there is a slightly propensity of men and women with higher education to participate in labor force. In the urban area, for example, economically active indigenous women have 4.63 years of schooling compared to 3.56 years of schooling of inactive indigenous women. Between indigenous men the difference is 7.28 to 6.36. Among non-indigenous people, most educated women are also in a relative higher proportion in EA; however, men with more years of schooling are economically inactive. This last characteristic could reflect a preference for using the time in superior education among young men.

A third factor that can explain the choice of being in the labor market is about individuals' selections that are related and influenced by family responsibilities. The Figure 3.2 presents labor force participation from 19 to 65 years of age by gender and ethnicity according to marital status.

Figure 3.2a shows EA for each group according to marital status. In all of the cases it is observed that the labor force is essentially married population (or who live as a couple).⁸ In the two opposite sides are married indigenous men with the 78.28% of them in the labor force, and non-indigenous women married with the 54.56%. Single people occupy the second position in EA participation in each group, with higher proportion for non-indigenous people: 33.53% of women and 30.30% of men. Finally, widow, divorced or separated (other) population is the less significant in EA; it represents 7.25% of feminine EA and 3.91% of masculine EA.

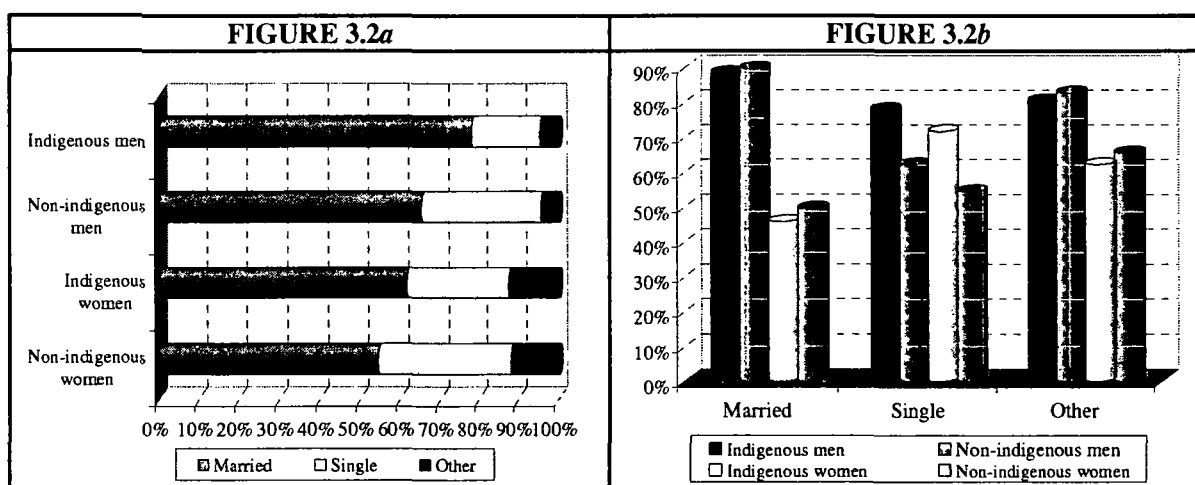
Figure 3.2b shows the labor force as a proportion of PWA (in this case population between 19 to 65 years old) according to marital status. The highest gap in the labor force by gender is between married men and married women, without significant differences by ethnicity: for each 100 married men about 89 of them are working or looking for a job and for each 100 married women, 48 are economically active. This gap can explain, in good part, the

⁸ A similar situation is verified in the PWA.

differences within EA by gender that have been described previously, since most of the population in working age is married.

The married gender gap suggests that family responsibilities are still marked in Bolivia, with male population producing monetary income and female population working at home. This remark is supported by the research of Wanderley (2003). In this work, she concludes, that from a sample of 118 families, that both domestic tasks and caring for children are essentially women jobs.

FIGURE 3.2
URBAN LABOR FORCE OF 19 TO 65 YEARS OLD BY GENDER AND ETHNICITY,
ACORDING TO MARITAL STATUS, 2001



Source: Own elaboration based on CENSUS 2001 data – National Institute of Statistics

Notes: Married population includes not only those legally constituted but also people that live in couple. The category “other” includes widow, separated or divorced population.

For single people, it is observed that indigenous people are in more proportion in the labor force rather than non-indigenous ones. Since most of single people are younger, this result is corroborated with Figure 3.1, where non-indigenous people, usually participate in the labor market at a later age, probably because they use their time to obtain more education when they are young.

Finally, it is observed that the gender gap decreases for widow, divorced or separated population, compared to the married gender gap. It is the result of lower men participation as well as higher women participation in the labor force. The lower gap can be explained because, on one side, mothers assume more responsibilities in the family having to work to generate income, since they usually live with the children. On the other side, men have fewer responsibilities in supporting economically their families.

A second characteristic related to home obligations that could determine women labor force participation, is related specifically to children at home. Table 3.4 shows the ratio of the number of children per adult by house as a proxy variable of caring for children at home. The characteristic of the house has been attributed to each individual person, who belongs to it and

who is between 19 to 65 years old. Children are considered as those who are 6 years old or less and adults are the population over 19 years old.⁹

Table 3.4 shows, according to the economically active condition, that the ratio has marked differences by gender. The male population that is economically inactive (EI) has an average ratio of children per adult quite smaller than female EI: 0.17 compared to 0.41. This gap suggests that men are EI for other reasons rather than caring for children, but for EI women this task seems to be an important reason for staying at home. Between feminine populations, it can also be observed that the ratio is, on average, smaller for labor force people rather than for economically inactive people: 0.34 compared to 0.41.

For each gender group the PWA was disaggregated in two: 1) individuals that have a ratio of children per adult higher than the population average ratio (for a given gender group); and 2) individuals that have a ratio lower than the population average ratio. According to this, it is separated the individuals into economically active and economically inactive people. This calculations show that men with a higher rate of children per adult in their house participate in a higher proportion in the labor market than men that have a rate under the average: 84.75% compared to 77.89%. Within female population it can be seen the opposite, a smaller percentage of EA women with high rates of children per adult and a greater percentage of EA women with rates lower than the average: 48.99% compared to 54.75%.

TABLE 3.4
URBAN POPULATION OF 19 TO 65 YEARS OLD BY GENDER ACCORDING TO THE RATIO
OF CHILDREN PER ADULT, 2001

DESCRIPTION	ECONOMICALLY ACTIVE	ECONOMICALLY INACTIVE	TOTAL
AVERAGE			
Men	0.32	0.17	0.29
Women	0.34	0.41	0.37
POPULATION PERCENTAGE OF OVER AND UNDER TOTAL AVERAGE (0.29 FOR MEN AND 0.37 FOR WOMEN)			
Men			
Over the total average	84.75%	15.25%	100.00%
Under the total average	77.89%	22.11%	100.00%
Women			
Over the total average	48.99%	51.01%	100.00%
Under the total average	54.75%	45.25%	100.00%

Source: Own elaboration based on CENSUS 2001 data – National Institute of Statistics

Finally, labor force participation is analyzed considering the level of individual's poverty. Figure 3.3a shows population by gender and ethnicity according to four categories of poverty: non-poor, roughly poor, poor (moderate) and very poor (indigent and marginal). This indicator is built by Bolivian National Institute of Statistical through the "unsatisfied basic needs" that

⁹ This indicator is because there is no information of number of children at family level, only at house level. The house can have one or more families.

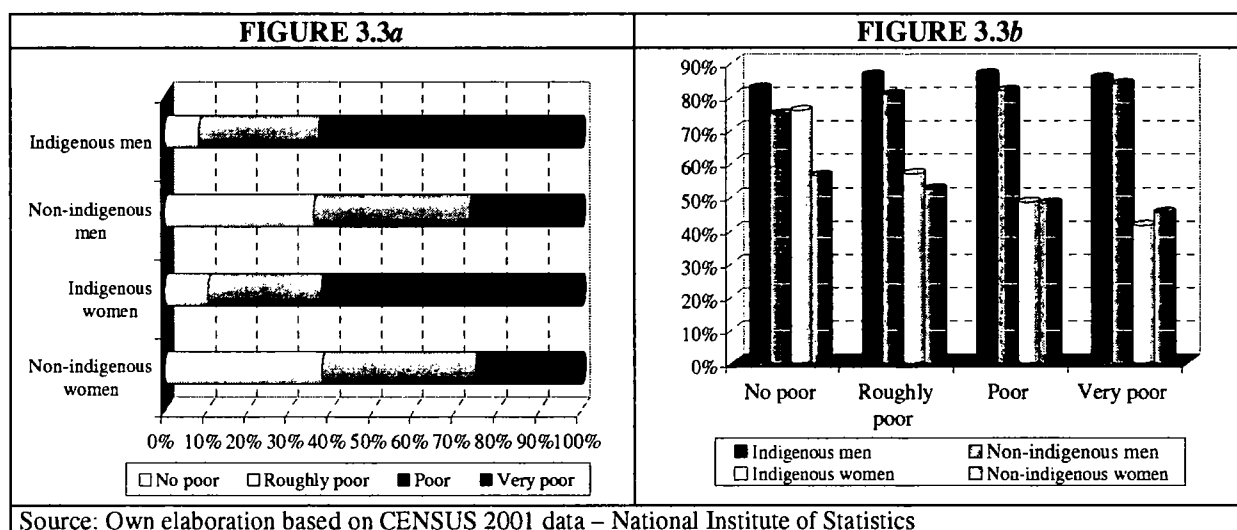
are evaluated considering housing and individual characteristics: use of water services, basic sanitation and combustible, years of education and health attendance.

A first result, which has been documented in the literature, is that non-indigenous population is mostly non-poor: in the first two categories – non-poor and roughly poor– it is found the 74.88% of women and the 73.45% of men. Indigenous population, on the other hand, is generally poor or very poor: the 62.14% of indigenous women and the 62.80% of indigenous men belong to the two last categories – poor and very poor.

Figure 3.3b shows the labor force participation as a proportion of PWA for each category of poverty. Among men, it is observed that when they are non-poor they participate relatively in less proportion in the labor force. Among women the contrary fact can be seen, non-poor women participate in more percentage in the labor force than poorer women. It is interesting to note that the 75.94% of non-poor indigenous women are working or looking for a job, a high percentage compared to women EA population (see Table 3.1).

The gap by gender found in Figure 3.3b seems to reflect two important aspects: differences in responsibilities at home between men and women and opportunity costs for female population. In this way, poor women are generally less educated (in quality and quantity) and they have fewer opportunities of getting a good job rather than more educated women. In this case, the use of the time in domestic tasks seems to be not only an occupational stereotype imposed by the society, but also a good way of dividing the responsibilities at home. As the family is less poor, however, mother domestic tasks can be carried out through recruiting domestic workers in Bolivia. Additionally, since less poor women are generally more educated, the opportunity cost of not working in labor market and staying at home becomes higher.

FIGURE 3.3
URBAN LABOR FORCE OF 19 TO 65 YEARS OLD BY GENDER AND
ETHNICITY ACORDING TO THE LEVEL OF POVERTY, 2001



III.1.1. Econometric analysis

The potential factors that could explain female labor force participation can be analyzed through models of binary choice. In general terms, in these models the dependent variable assume only two values: $y = 1$ if observation k ($k = 1, 2, 3, \dots, K$) has a given characteristic and $y = 0$ otherwise. The explanatory factors are collected in a vector x and related with y through the following probabilities,

$$(3.1) \quad \begin{aligned} \text{Prob}(y = 1) &= F(\beta'x) \\ \text{Prob}(y = 0) &= 1 - F(\beta'x) \end{aligned}$$

The vector of coefficients β resume the x impact over the probability of having (or not) the given characteristic, and $F(\cdot)$ is the cumulative distribution function. The marginal effects are determined through the

$$(3.2) \quad \frac{\partial E(y)}{\partial x} = \left(\frac{dF(\beta'x)}{d(\beta'x)} \right) \beta = f(\beta'x) \beta$$

where $f(\cdot)$ is the density function that corresponds to the cumulative distribution $F(\cdot)$. For the cases studied here it is worked with the Probit model, which assume that $f(\cdot)$ is a normal distribution function.

Results

Probit model has been estimated for female urban population in working age, between 19 and 65 years old, using Census data of 2001. The dependent variable used is: $y = 1$ if the individual is working or looking for a job (if it belongs to EA population) and $y = 0$ otherwise. The explanatory variables are: 1) years of education; 2) age; 3) squared age (given the EA U inverted shape according to age group, see Figure 3.1); 4) an ethnicity dummy, which takes the value one if individual is an indigenous person and zero if otherwise; 5) the index of “unsatisfied basic needs” for measuring poverty; 6) a dummy variable of whether the individual lives in the main cities of Bolivia (La Paz, Santa Cruz and Cochabamba); 7) a marital status dummy (equals one if the person is single and zero if otherwise); 8) the ratio of children per adult; 9) a dummy variable of whether the individual is immigrant; and 10) a home headship dummy. The econometrics estimation results are in Table 3.5.

The basic regression - (1) and (1a)- considers the dependent variable as a function of two main factors, usually studied in the literature: years of education and age. In (1) coefficients have the expected signals and are significant at 1% level. On one hand, as woman is more educated the probability of participating in the labor force increases. On the other hand, the positive coefficient for age and negative coefficient for squared age show that the possibility of a woman being EA increases with age, but at decreasing rates. In (1a) the marginal effects of explanatory variables are calculated. It is interesting to note that age has a higher impact rather than years of education over woman probability of participating in the labor force.

TABLE 3.5
Probit model: Women probability of being in the urban labor force, 2001
(In between 19 to 65 years old)

Variables	(1)	(1a)	(2)	(2a)
Years of schooling	0.0220 (0.0002)***	0.0088	0.0174 (0.0003)***	0.0069
Age	0.1070 (0.0006)***	0.0426	0.1263 (0.0006)***	0.0503
Age squared	-0.0013 (0.0000)***	-0.0005	-0.0016 (0.0000)***	-0.0006
Ethnicity dummy			-0.1284 (0.0030)***	-0.0511
Poverty			-0.1176 (0.0027)***	-0.0468
Dummy for principal cities			0.0974 (0.0027)***	0.0388
Single dummy			0.2940 (0.0029)***	0.1159
Ratio: children adults			-0.1478 (0.0025)***	-0.0588
Immigrant dummy			0.0399 (0.0023)***	0.0159
Household head dummy			0.2755 (0.0027)***	0.1085
Constant	-2.0566 (0.0107)***		-2.2638 (0.0135)***	
Number of observations	1,333,498	1,333,498	1,333,498	1,333,498

Notes: a) Between parentheses are the standard errors; b) (***) means that the coefficient is significant at 1%; c) the standard errors have been calculated using the robust covariance-variance matrix; d) the database used is the Census 2001.

The second regression - (2) and (2a)– considers the dependent variable as a function of all of the explanatory variables described before. All coefficients are significant at 1% level. Through the marginal effects, it is observed that two factors are most relevant over woman probability of participating in the labor force: being single and being household head. Both characteristics show that selections related to family responsibilities determine fundamentally female EA population: the man assumes the responsibility of getting income and the woman is dedicated to domestic tasks. When the woman has to be household head - essentially because she is widow, divorced or separated – she has additional responsibilities at home, having to work also for monetary payment in order to support and sustain their children. In this case she is strongly stimulated to participate in the labor force.

Other variables that increase the possibility of getting women to work or look for a job are - besides the ones in (1) - living in the main cities of Bolivia and being immigrant. Regarding the first variable, a positive coefficient seems to reflect the higher economic activities in these regions compared to other cities in Bolivia, where more and better employment opportunities could stimulate women participation in the labor market. In the case of immigrant women it is known that one of the causes of changing residence, from rural to urban or from urban to urban, are certainly to look for a (better) job.

In regression (2) and (2a) it can also be observed that the probability of women labor force participation diminish when she is indigenous and poor. This result is broadly consistent with the previously commented premise: the opportunity costs of spending time working at home instead of working in the labor market are lower for these type of women, and probably do not compensate the choice of being EA given the family responsibilities. Lastly, it is observed that the higher is the ratio of children per adult, the probability of female labor force participation decreases. In the same sense, the single dummy result reflects the family responsibilities division by gender.

The previous observations are supported with Probit regressions analysis for masculine population (see Table A.3 in Annex A). On one hand, single men, or with a fewer number of children per adult in the house, have less probability of being in the labor force. This shows that this kind of men have less responsibilities of generating income for the family. On the other hand, when men are indigenous or poor, they have higher possibilities to work or to look for a job. In this case, indigenous or poor families seem to have further marked separation responsibilities, perhaps because income gap by gender in these families is relatively higher than in other cases. In fact, Mincer's regressions (described later) will show, for example, that indigenous women perceive the lowest income in the labor market, even controlling for other variables that explain income.

Comparing the econometric results with the Figures and Tables described previously, it is possible to have some conclusions over the characteristics that determine women labor force participation. First, usually more educated women are in the labor market, nevertheless, this variable is not found as the most important. Second, decisions within the family are the most significant factors. Married women with children in the house assume mainly domestic tasks, but when they are household heads they have the additional responsibility of generating income. Finally, the socio-economic factors around the families - where do they live and if they are poor - seem to define women labor force participation choices. When these conditions are better, there are more possibilities of having EA women.

III.2. Labor characteristics by gender

Once described the characteristics of women who participate in the labor force, the second step has been to determine in what kind of occupations and areas they work in, and to compare the differences or similarities with men population. Table 3.6 shows the occupied population in between 19 to 65 years old, according to occupational category. The occupations have been arranged beginning with the total earned average hour income, from major to minor.

TABLE 3.6
URBAN WORKERS OF 19 TO 65 YEARS OLD BY GENDER AND ETHNICITY, ACCORDING
TO OCCUPATION CATEGORY, 2001

OCCUPATION	MEN			WOMEN		
	Total	Indigenous	Non-Indigenous	Total	Indigenous	Non-Indigenous
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Directives in public administration and firms	3.47%	1.05%	4.32%	2.26%	0.34%	2.95%
Armed forces	0.65%	0.42%	0.72%	0.01%	0.01%	0.02%
Professionals, scientific and intellectuals	7.88%	2.88%	9.65%	10.69%	2.29%	13.72%
Technicians and other supporting professionals	10.03%	4.51%	11.99%	7.43%	1.94%	9.41%
Office employees	3.82%	1.61%	4.60%	8.03%	1.09%	10.53%
Machineries and installations operators	15.72%	15.98%	15.63%	0.59%	0.38%	0.67%
Workers of services and sales	14.86%	15.01%	14.81%	38.29%	48.41%	34.64%
Extractive industry, construction and manufacturing workers	32.26%	43.26%	28.36%	10.79%	12.64%	10.12%
Other unskilled workers	5.12%	5.90%	4.84%	19.53%	27.37%	16.70%
Agriculture, cattle and fishing	6.20%	9.39%	5.06%	2.37%	5.54%	1.23%
Skilled workers	11.99%	4.35%	14.69%	12.96%	2.63%	16.69%
Semi-skilled workers	29.57%	22.09%	32.22%	16.05%	3.41%	20.61%
Unskilled workers	58.44%	73.56%	53.08%	70.99%	93.96%	62.70%

Source: Own elaboration based on MECOVI 2002 and CENSUS 2001 data -National Institute of Statistics

Within male population, it is observed that workers are concentrated mostly in the extractive industry, construction and manufacturing (32,26%) - having indigenous people the higher proportion, 43.26%, followed in importance by the operators of machineries and installations with the 15.72% and services and sales with the 14.86%. In contrast, female population works in services and sales activities in a proportion of 38.29%; being indigenous women who mainly work in these sectors with a 48.41%. The second category in importance is other unskilled workers that group the 19.53% of women. Gathering the two categories, it is observed that the 57.82% of women and the 75.77% of indigenous women are concentrated in these two types of occupations.

In order to analyze the differences of occupational concentration by gender the categories are separated into three groups: skilled (the first three categories), semi skilled (the next three categories) and unskilled (the last four categories).¹⁰ These calculations show that the major discrepancies are found in the two last categories, with a higher percentage of men rather than women who are semi skilled, with a gap of the order of 13.52%. For unskilled workers the

¹⁰ This division responds to the educational differences and to the categorization of the occupations.

contrary happens, women work in a higher proportion in these tasks compared to men, with a gap of 12.55%.

It is important to notice, however, that in the category of skilled workers, where the income is higher, the percentage of women is a little bit higher than men's. This difference happens because the proportion of professional, scientific and intellectual people is higher for women population, although in directive labor positions and army forces happens the contrary fact.

Two additional comparisons arise from Table 3.6: the differences by gender within each ethnic group and the disparities by ethnicity for the women population. Among indigenous people, it can be observed that women are mainly concentrated in the occupations where skill-work is not required, the 93.96% of them are positioned within this category; 20.40 percentage points more than men. By the contrary, in the semi skilled category there is a higher proportion of men than women: 22.09 % against 3.41%. Among non- indigenous population, there are also a higher proportion of unskilled women as well as skilled men; nevertheless, the gaps are minor. The 62.70% of women are unskilled against the 53.08% of men; and the 32.22% of semi skilled men in comparison to the 20.61% of women.

Finally, it can be seen that the highest differences are between indigenous and non-indigenous women. The concentration of the former in unskilled jobs is, in percentage terms, 31.26% higher than the latter.

Table 3.7 shows the same occupied population of the previous Table, divided according to the economic sectors. In the same way as in the previous case, the sectors have been ordered from major to minor, according to the average income per hour.

In trade; manufacturing; transportation, storage and communications; and construction sectors and, in less importance, agriculture, cattle raising, hunts and forestry, it is found the highest proportion of men, totalizing the 70.75%, with a higher concentration of indigenous population, 80.04%. In contrast, female population has been grouped in the trade; domestic services; manufacturing; hotels and restaurants and education sectors; totalizing the 77.46%. Within these sectors, indigenous women are mainly concentrated in trade and domestic services (60.10%) compared to non-indigenous women (39.23%).

At the end of the Table, the economic sectors have been grouped in two categories: those that pay the highest labor income (the first 9 sectors) and those that pay the lowest labor income. In the first group it is found the 38.63% of men and the 29.68% of women, showing that there is a major male population rather than female population, which have better sectorial jobs (in labor income terms). The gender differences within indigenous population, however, are higher, 17.90%, compared to non-indigenous people, 5.54%. There are also a low proportion of indigenous women, around 10%, located in the better-paid sectors.

TABLE 3.7
IN BETWEEN 19 TO 65 YEARS OLD URBAN WORKERS BY GENDER AND ETHNICITY,
ACCORDING TO ECONOMIC SECTOR, 2001

OCCUPATION	MEN			WOMEN		
	Total	Indigenous	Non-indigenous	Total	Indigenous	Non-indigenous
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Financial intermediation	1.00%	0.19%	1.29%	0.91%	0.08%	1.21%
Electricity, gas and water	0.79%	0.46%	0.91%	0.14%	0.02%	0.18%
Education	4.95%	3.24%	5.56%	10.63%	3.04%	13.43%
Public administration, defense and social security	5.41%	4.16%	5.86%	2.36%	0.45%	3.07%
Social and health services	2.16%	0.89%	2.61%	5.21%	1.59%	6.55%
Real state, managerial and rent services	5.73%	2.23%	6.98%	3.68%	0.77%	4.76%
Communitarian, social and personal services	4.00%	3.10%	4.32%	5.18%	3.77%	5.70%
Transportation, storage ,communications	14.59%	13.72%	14.90%	1.57%	0.37%	2.01%
Service of extraterritorial organizations	0.07%	0.03%	0.09%	0.08%	0.01%	0.11%
Mining	1.88%	2.54%	1.64%	0.26%	0.29%	0.24%
Construction	13.73%	20.93%	11.16%	0.49%	0.44%	0.51%
Fishing	0.07%	0.05%	0.08%	0.01%	0.02%	0.01%
Trade	18.31%	16.92%	18.80%	32.54%	41.24%	29.33%
Manufacturing	17.29%	18.59%	16.82%	11.52%	10.73%	11.81%
Hotels and restaurants	2.82%	2.58%	2.90%	10.45%	12.56%	9.68%
Agriculture, cattle raising, hunts and forestry	6.84%	9.87%	5.75%	2.65%	5.75%	1.51%
Domestic services	0.37%	0.50%	0.32%	12.31%	18.86%	9.90%
High paid sectors	38.63%	27.98%	42.43%	29.68%	10.09%	36.89%
Low paid sectors	61.37%	72.02%	57.57%	70.32%	89.91%	63.11%

Source: Own elaboration based on MECOVI 2002 and CENSUS 2001 data -National Institute of Statistics

III.2.1. Statistical analysis

The potential occupational segregation problems are determined using two statistical methods. In the first one, occupational segregation indexes are elaborated to identify not only the differences in occupational distribution by gender, but also their relation with disparities of years of schooling. The second one studies women characteristics that make more (or less) probable for them to work in less segregated occupations. This last analysis is made using the results of occupational segregation indexes and the Probit models described before.

Segregation indexes

One way of measuring the potential problems of occupational segregation by gender is through segregation indexes. The simple technique usually used in the literature is the Duncan & Duncan dissimilarity index. It calculates the proportion of women and men that should

change occupations in order to have the same occupational distribution by gender. Mathematically, it can be expressed as follows,¹¹

$$(3.3) \quad OS_{DD} = \frac{1}{2} \sum_{j=1}^J \left| \frac{F_j}{F} - \frac{M_j}{M} \right|$$

where the sub index j makes reference to the j^{th} ($= 1, 2, \dots, J$) occupation category; F_j (M_j) are women (men) that work in j ; F (M) it is the total number of women (men) workers. This index can assume a minimum value of zero if there are not differences among occupational distributions by gender, and a maximum value of one under complete segregation.

Although the index allows to measure in a simple way the occupational segregation, the literature observes that changes of occupations required for having an equal participation between women and men in each occupation - proportional to their respective labor force - can modify the occupational distribution. To correct this problem, it is used the Karmel & Maclachlan index, that measures the fraction of workers that has to change in such a way that occupational distribution is unaffected. This index is measured in the following way:

$$(3.4) \quad OS = \varphi \sum_{j=1}^J \left| \frac{F_j}{F} - \frac{M_j}{M} \right|$$

where $\varphi = FM / T^2$ and $T = F + M$. As before, the index assumes values between zero when there is no occupational segregation, and one with complete occupational segregation.

Borghans and Groot (1999) develop an index that allows not only to study occupational segregation but, at the same time, educational segregation. They consider three components. The first one, called presorting, is concerned with segregation as a consequence of differences in education by gender. The second one concerns postsorting (given the level of education) as a result of differences in occupational choices and opportunities. Finally the third, which they call reintegration, is also a kind of postsorting but narrows the gap between occupational and educational segregation. In this last case different types of workers generated by education come together in the same occupation.

First, to measure the educational segregation index, the authors divide the labor force in I education levels, $i = 1, 2, \dots, I$; so a variation of (3.4) can be used,

$$(3.5) \quad ES = \varphi \sum_{i=1}^I \left| \frac{F_i}{F} - \frac{M_i}{M} \right|$$

¹¹ See, for example, Borghans and Groot (1999), Oliveira (2001) and Ramirez (2003) for a discussion of occupational segregation indexes.

where F_i (M_i) is the number of women (men) with the education level i and $T_i = F_i + M_i$. The index can be interpreted as the fraction of women that should change their education levels, with substitution, in order to annul educational differences of workers by gender.

Using (3.4) and (3.5), the authors determine the total segregation index as

$$(3.6) \quad TS = \phi \sum_{i=1}^I \sum_{j=1}^J \left| \frac{F_{ij}}{F} - \frac{M_{ij}}{M} \right|$$

where F_{ij} (M_{ij}) is the number of women (men) with the education level i in the occupation j and $T_{ij} = F_{ij} + M_{ij}$. To obtain the three components of the segregation index, the authors define: $F_{ij}^{educ} = (F_{ij} / T_i) \times T_{ij}$ ($M_{ij}^{educ} = (M_{ij} / T_i) \times T_{ij}$) as the number of women (men) with education level i that is distributed over all occupations in proportion to their educational sex ratios; and $F_{ij}^{equal} = (F / T) \times T_{ij}$ and $M_{ij}^{equal} = (M / T) \times T_{ij}$ as the equal distribution by gender where neither OS nor ES occurs. TS thus measures the distance between actual and equal distribution considering the educational and occupational segregations problems.

The second component (the result of segregation over differences in occupational choices and opportunities given the educational distribution by gender) can be measured as

$$(3.7) \quad AS = \sum_{i=1}^I AS_i = \sum_{i=1}^I \sum_{j=1}^J \left| \frac{F_{ij}}{T} - \frac{F_{ij}^{educ}}{T} \right| = \sum_{i=1}^I \sum_{j=1}^J \left| \frac{F_{ij}}{T} - \frac{\frac{F_i}{T_i} T_{ij}}{T} \right|$$

Under complete presorting problems, AS index should equal to zero. This index measures the distance between the actual distribution and the distribution that would be expected with complete presorting due to educational segregation.

The third component of segregation is calculated considering the overrepresentation in occupations by gender. The index TS can be divided into male and female components,

$$(3.8) \quad TSF_j = \phi \sum_{i=1}^I \max \left\{ \frac{F_{ij}}{F} - \frac{F_{ij}^{equal}}{F}, 0 \right\}$$

$$(3.9) \quad TSM_j = \phi \sum_{i=1}^I \max \left\{ \frac{M_{ij}}{M} - \frac{M_{ij}^{equal}}{M}, 0 \right\}$$

Equations (3.8) measures the overrepresentation of women compared to men for occupation j considering all levels of education, and (3.9) measures the overrepresentation of men compared to women. Using these expressions, the authors find the factor of reintegration

$$(3.10) \quad R = \sum_{j=1}^J R_j = 2 \sum_{j=1}^J \sum_{i=1}^I \min \{ TSF_j, TSM_j \}$$

The indicator measures (twice) the summation of all occupation-specific factor proportion where reintegration occurs. This can reduce occupational segregation because $OS = TS - R$. Correlating the distinct indexes, the authors finally determine the first component: $(ES - R)/OS$ as the presorting index.

Empiric results from the segregation indexes

Table 3.8 presents the results of previously described segregation indexes. In these calculi occupied population in the army forces was excluded since, according to law, male people essentially compose this occupation.

In the second column of the Table, it is observed the differences between men and women. In this case, according to Duncan & Duncan it is showed that the 37.78% of the workers should change occupation in order to equal the gender distributions. Nevertheless, with the Karmel & Maclachlan index the estimated occupational segregation (OS) is relatively minor: 18.03%. If it is analyzed the components of the OS as per occupational category, relative OS ,¹² the directives in public administration and firms; professionals, scientific and intellectuals and technicians and other supporting professionals show low segregation percentages. This result is compatible with that showed in Table 3.6. These workers have, at the same time, high educational levels, which suggest that segregation problems by gender for more educated population are, in average, lower. However, there is an exception to this rationale that can be found within agriculture, cattle and fishing sector, which are routed in low OS index as well as low years of education. Finally, Table shows that machineries and installations operators are mainly composed by men, which can mark a “male type” occupation, since there is an important percentage of men (respect to women) that are within these activities.

Analyzing in the same column the educational segregation (ES) it is observed that the segregation index is quite minor, compared to the OS , 5.67%. Regarding the components of ES by occupational category,¹³ it is found that the major component falls upon between the analphabets. This result is mainly explained by the analphabet indigenous women participation that rises to the 20% of the occupied population of this group.

The total segregation is a little bit higher than the Karmel & Maclachlan OS index which shows that there is a reintegration process that allows men and women from different education levels to be positioned in the same occupational category (given that $OS = TS - R$).

Finally, the presorting and postsorting indexes show similar magnitudes, revealing that the segregation problems are the result of educational gap, as well as the occupational choices and opportunities.

¹² Relative OS is defined for each occupational category as the difference, in absolute terms, between women (as a proportion of F) and men (as a proportion of M) occupied in this category. Such difference is multiplied by the total occupied population, T , and divided into the population who work in that activity.

¹³ Relative ES is defined for each educational category, as the difference, in absolute terms, between women (as a proportion of F) and men (as a proportion of M), which are found in that category. This difference is multiplied by the total occupied population, T , and divided into the population who has that level education.

It is interesting to notice that the postsorting index is relatively higher for the cases of primary and secondary education, showing a relative importance of occupational segregation as a consequence of the differences in opportunities and choices in the mentioned educational levels.

TABLE 3.8
SEGREGATION INDEXES, 2001

INDICES	White	Indigenous	Indigenous non-Indigenous	Indigenous
1. OCCUPATIONAL SEGREGATION				
Duncan & Duncan	37.78%	31.28%	42.90%	37.99%
Karmel & Maclachlan	18.03%	14.92%	20.49%	18.45%
Directives in public administration and firms	8.07%	22.84%	6.67%	36.78%
Professionals, scientific and intellectuals	9.98%	6.58%	12.27%	33.30%
Technicians and support professionals	4.28%	15.24%	2.54%	31.87%
Office employees	20.45%	7.63%	22.67%	37.55%
Service and sale workers	26.74%	31.60%	24.19%	4.73%
Agriculture, cattle and fishing workers	9.71%	4.60%	21.85%	41.06%
Extractive, construction and manufacturing	16.56%	13.77%	18.63%	6.14%
Machineries and installations operators	36.77%	37.43%	36.52%	20.30%
Unskilled workers	32.07%	35.20%	30.16%	2.01%
2. EDUCATIONAL SEGREGATION				
Borghans & Groot	5.67%	9.35%	3.53%	26.47%
Analphabet	24.80%	28.28%	10.55%	43.44%
Primary (eight years)	1.89%	2.10%	1.53%	16.75%
Secondary (four years)	6.86%	18.31%	3.50%	26.75%
University	0.91%	15.61%	0.04%	37.86%
Superior non-university	8.06%	10.73%	11.26%	32.63%
3. TOTAL SEGREGATION	15.34%	19.22%	16.53%	24.93%
4. POSTSORTING	15.67%	18.22%	16.43%	17.24%
5. POSTSORTING (excluding primary and secondary education)				
Borghans & Groot	18.39%	15.55%	20.07%	8.09%
Analphabet	11.51%	9.94%	22.87%	7.90%
Primary (eight years)	21.24%	17.76%	26.17%	12.52%
Secondary (four years)	20.22%	14.29%	20.71%	5.03%
University	8.51%	8.31%	8.43%	0.88%
Superior non-university	15.70%	9.47%	16.92%	3.61%
6. REINTEGRATION	3.33%	3.33%	3.33%	3.33%
7. RATIO 1/5/6/5	1.43.43%	1.43.43%	1.43.43%	1.43.43%

Source: Own elaboration based on CENSUS 2001 data –National Institute of Statistics

In columns three and four from the Table an exercise that allows marking gender differences is showed within ethnic groups. For indigenous population, the *OS* index is minor and the *ES* index is major than the indexes found in column two. For non-indigenous population the results are divergent: *OS* and *ES* are, respectively, major and minor than those found in column two.

The educational segregation estimations are widely compatible with the information of Table 3.3, where it was observed an important educational gap by gender among the indigenous population in contrast to non-indigenous population. With regards to occupational segregation against women, the data suggest that this problem is present mainly within non-indigenous population.

The above-mentioned results are corroborated in comparing the presorting and postsorting indexes. The presorting index is higher in the indigenous population than in the non-indigenous one, showing that the segregation component attributed to educational differences is higher in the first case. On the other hand, the postsorting index is higher for the non-indigenous workers, demonstrating that the segregation component derived from preferences and employment opportunities is higher for these workers.

Table 3.8 also shows that for both ethnic groups, the segregation index *OS* by occupational categories is higher in machineries and installations operators, unskilled workers and service and sale workers. In the two last activities it is found a higher participation of women labor force than in the first category.

The last column of the Table analyzes the occupational differences by ethnicity for women. In this exercise a quite higher educational segregation can be observed, compared with the former ones, 26.47%. The occupational segregation index seems to be explained by these differences, since the presorting component is 97.24% and the postsorting component is the lowest. It is also interesting to notice that the reintegration index is the highest, demonstrating that some women with different ethnicities and education levels are likely to be positioned in similar activities.

Probit model

Besides the apparent relationship between occupational segregation and educational differences by gender discussed before, it comes forth the motivation to study additional factors that explain occupational segregations problems. The question relevant in this case is: Which are the characteristics that lead a worker to be involved in less (or more) segregated occupations? Some characteristics can be initially observed. First, the occupation that has the major segregation index against women – machineries and installations operators – is essentially explained by the qualities, and possible preferences, properly related to male population. Second, in the case of army forces (not discussed in the segregation indexes) the low female population responds to the legal restrictions over their participation. Finally, the office employees and service and sale workers occupations are biased toward major female population. In this case, the stereotypes around women –docility, better personal relationships, more honesty, more attractive physical appearance, etc. – can facilitate women's participation in these activities.

Besides, the above-mentioned observations, the additional characteristics that define occupational segregation problems are studied through a Probit model. In this case, the dependent variable y equals one when the individual is positioned in the occupations that have the less segregation index and zero otherwise. From Table 3.8 it has been taken into consideration the three first activities - directives in public administration and firms; professionals, scientific and intellectuals and technicians and other supporting professionals – as the ones that show the lowest segregation levels.¹⁴ The model has been estimated for the occupied population between 19 and 65 years old. The explanatory factors which are considered are: 1) years of education; 2) experience (age minus years of education minus six); 3) squared experience; 4) indigenous woman dummy; 5) non-indigenous woman dummy 6) dummy equal to one for single people; 7) the children per adult rate; 8) dummy equal to one for the immigrant people; and 9) home headship dummy. The results from these econometric estimations are shown in Table 3.9.

In the basic regression – (3) y (3a) – the dependent variable is analyzed in function of years of education, experience and the binary variables of indigenous and non-indigenous women. The estimations show that years of education have a positive impact over the probability of working in less segregated occupations. In the same way, experience is a factor that represents a positive effect over such probability, despite the decreasing marginal rates. The negative sign of the women dummy variables' coefficients show, for instance, non-observed characteristics that limit women population to be inserted into less segregated occupations.

Regression (4) and (4a) include additional explanatory variables. In this case the indigenous women dummy is not anymore statistically significant, showing that the addition of new variables explains the initial segregation problems found against these women. On the other hand, the non-indigenous woman dummy continues being significant, but only at the 10% level. However, the dummy is not robust at the exclusion of the non-significant variables in the regression.

It is interesting to notice that the dummy for single people shows a divergent coefficient to the one expected under the family responsibilities intuition within home, already described. Regarding the difference from the regressions of Table 3.5, both women and men are included in the analysis; a dummy has been created only for married women. Nevertheless, this variable did not result statistically significant (these results are not included). In this case, the results suggest that women responsibilities within their home are not factors that influence over some kind of (self) occupational segregation, unless not in a significant way. Observing that the coefficient of the children per adult ratio is not significant corroborates the just mentioned appreciation. Additional regressions were also made separating this ratio by gender but the variable continued being statistically irrelevant (these results are not included).

¹⁴ It is important to notice that the agriculture, cattle and fishing workers also present a low segregation index. Nevertheless, this activity has two particularities. First, this is not a certain urban occupation, since there are geographical requirements for its performance. On the other hand, there are many gender tasks divisions, which are not observed adequately in an aggregate way. Because of these two reasons it has not been considered in this category division.

The negative coefficient for single dummy can be interpreted, in this case, as lower experience and possibly less training in these populations, making less probable to work in less segregated occupations.¹⁵ This is because single people are usually younger.

To finish, Table 3.9 shows that household heads have a lower probability to work in less segregated occupations. This can reflect the major family responsibility of these individuals, carrying them to a more aggressive participation in the labor market.

TABLE 3.9
Probit model: Probability of being in the less segregated occupation, 2002

Variables	(3)	(3a)	(4)	(4a)
Years of schooling	0.2664 (0.0117)*	0.0215	0.2636 (0.0118)*	0.0210
Experience	0.0488 (0.0082)*	0.0039	0.0349 (0.0094)*	0.0028
Experience squared	-0.0006 (0.0002)**	-4.5E-05	-0.0004 (0.0002)***	0.0000
Women indigenous dummy	-0.2480 (0.1276)**	-0.0173	-0.1226 (0.1323)	-0.0091
Women non-indigenous dummy	-0.2203 (0.0490)*	-0.0169	-0.1053 (0.0596)***	-0.0082
Single dummy			-0.1383 (0.0730)***	-0.0103
Ratio: children_adults			-0.0622 (0.0725)	-0.0049
Immigrant dummy			0.0849 (0.0742)	0.0072
Home headship dummy			0.2458 (0.0652)*	0.0203
Constant	-4.7878 (0.1822)*		-4.7189 (0.1978)*	
Number of observations	6,789	6,789	6,789	6,789

Notes: a) Between parentheses are the standard errors; b) (*), (**) and (***) mean at the 1%, 5% and 10% of significance respectively; c) the standard errors have been calculated using the robust variance-covariance matrix; d) (3a) and (4a) describe de marginal effects; e) the database used is the MECOVI – 2002.

¹⁵ Remember that the less segregated occupations are the ones that have higher labor income levels.

III.3. Income gap by gender

In this section is analyzed the income gap by gender, trying to find out the relevance of workers personal characteristics and the potential salary discrimination problems. Figure 3.4 shows the logarithm of the hourly income of the main activity for eight educational categories: a) analphabet, b) not finished primary, c) finished primary, d) not finished secondary, e) finished secondary, g) superior non-university (professors, technicians, armed forces and police), h) university education and i) other superior education. The data for a certain category has been determined using the years of education average of the occupied population in this category.

In Figure 3.4a can be seen two different characteristics according to the population's years of education. Up to 10 years, both for males and females, there is no a positive income trend; in particular, there are similar income levels for workers with full and partial primary education. This characteristic affects more to women, since 44.55% of them rely into this category, comparing to men who represents 34.05%. In this segment, men incomes are relatively major than women income.

For workers of over 10 years of education it is showed a positive relationship between labor income and schooling years. In this case, the gender gap is less clear, educational returns are similar; aside from the education at universities, which favors men. And, within other superior courses category where women are more benefited.

FIGURE 3.4
URBAN WORKERS OF OVER 19 YEARS OLD: INCOME PER HOUR (IN LOGARITHMS) VERSUS YEARS OF EDUCATION, 2002

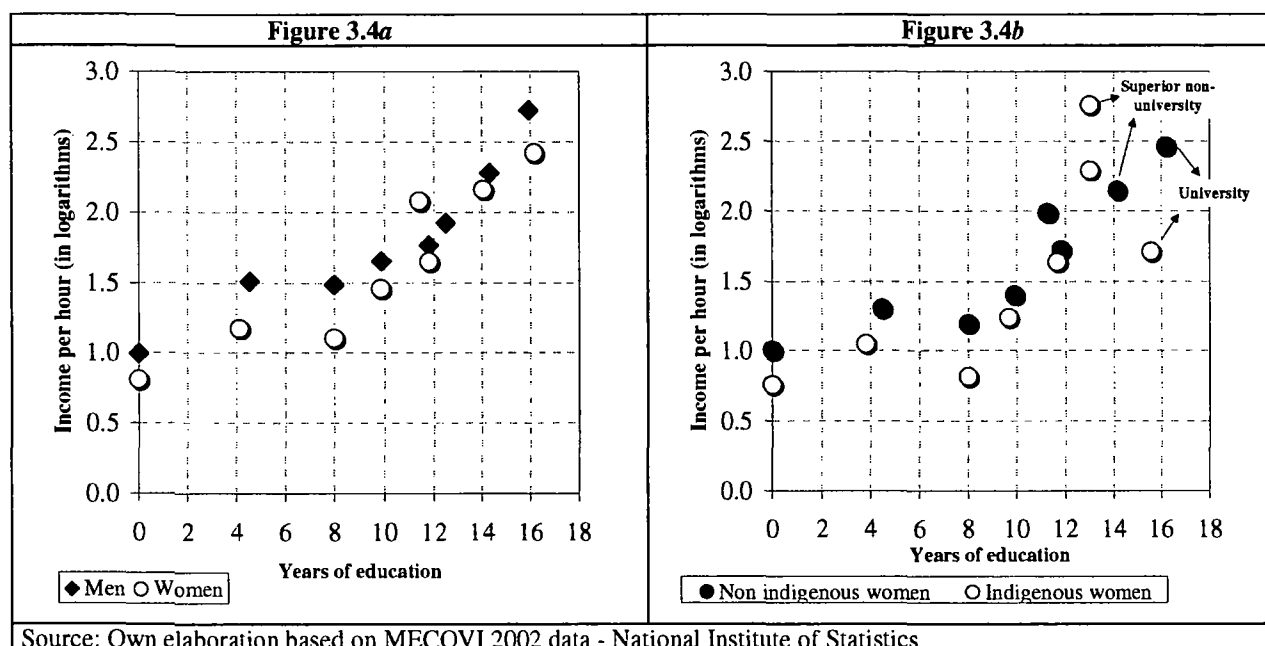


Figure 3.4b shows the relationship between women income and education by ethnicity. Here, two different histories are presented when analyzing the relationship between the variables in their different levels. Up to 8 years of education, the decision for further education, in terms of income, could be non profitable. Within this population, there are 82.34% of total indigenous women and only 30.31% of non-indigenous women, showing that this problem is concentrated on the first ones. In this segment, it can also be seen that non-indigenous women are in a relatively better situation, which can be partly explained by ethnic educational quality differences, as stated in Andersen and Muriel (2002).

Figure 3.5 shows the relationship between income and years of education according to occupational categories. Generally speaking, there is a positive relationship within occupational categories with better incomes and higher education levels. In Figure 3.5a three groups can be underlined. The first one collects all unskilled workers (according to their educational levels) within the following categories: agriculture, cattle and fishing workers; unskilled workers; extractive, building and manufacturing and services and sale workers. Within the second group, there are machinery and installations operators and office employees, whose income levels are set at medium levels compared with rest of the population. Within the last group with a jump in educational returns, there are workers with the higher educational and income levels, they are (scaled by higher education): technicians and other supporting professionals; directives in public administration and firms and professionals, scientific and intellectual people. Within this group directives in public administration and firms get the higher incomes, which could be the result of their higher responsibilities inside the firm or institution. It is worthwhile to explain that indigenous women participation in the latter occupation is undersized.

FIGURE 3.5
URBAN WORKERS OCCUPATION OF OVER 19 YEARS OLD: INCOME PER HOUR (IN LOGARITHMS) VERSUS YEARS OF EDUCATION, 2002

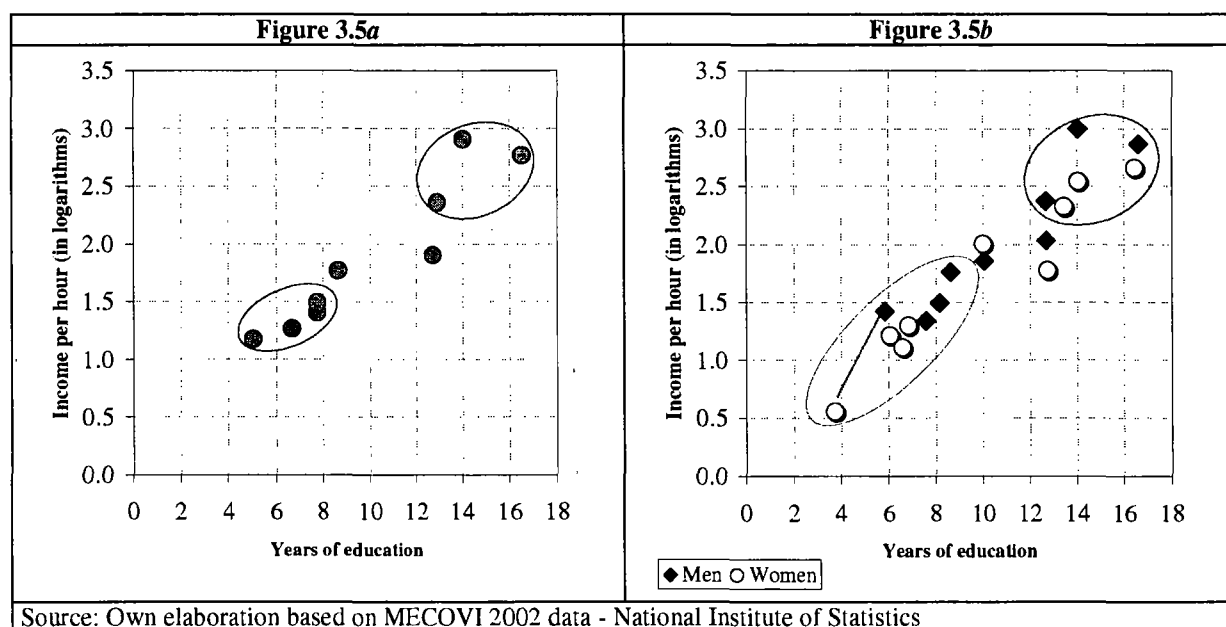


Figure 3.5b shows the relationship between incomes and education by gender and occupational groups, all of them divided according to the three explained groups. In the first group, it is observed that women obtain, in general, lower incomes inside their occupational category; however, they have on average less education. The extreme case can be found within agriculture, cattle and fishing workers, where income gap as well as educational gap by gender is remarkable. In the third group, the highest gender wage gap is for directives in public administration and firms although education levels are similar. This can be partly explained because men usually fill the highest responsibility posts.

Finally, Figure 3.6 shows the relationship between income and education by economic sectors. At the aggregate level, Figure 3.6a explains two differentiated group by labor incomes. The first one, which is characterized by low income levels and less skilled workers, are represented by agriculture, cattle rearing, hunting and forestry, domestic services, hotels and restaurants, building, trade, mining, manufacturing, services of extraterritorial organizations and transportation, storage and communications. The second one, is characterized by high income levels and skilled workers; they are allocated within the public administration, defense and social security, social and health services, real state, managerial and rent services, financial intermediation, electricity, gas and water and education. Comparing income and educational gaps between these two groups it is possible to think in a skill premium, which could not be explained by education.

FIGURE 3.6
URBAN WORKERS OVER 19 YEARS OLD BY ECONOMIC SECTOR: INCOME PER HOUR (IN LOGARITHMS) VERSUS YEAR OF EDUCATION, 2002

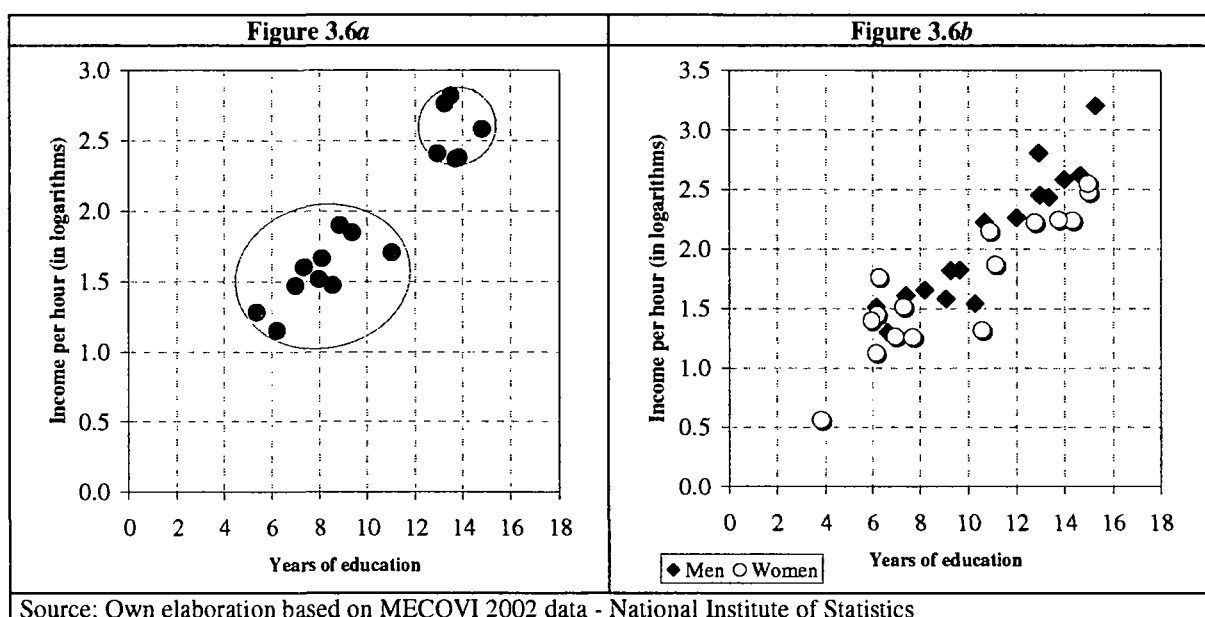


Figure 3.6b shows the relationship between income and years of education by economic sector and gender. In opposition to the previous Figure, there are no marked differences within sectors. However, there is a slight trend towards women labor incomes to be less than men's,

and it can explain the income gap by sector groups in Figure 3.6a, since most women are concentrated in low pay sectors.

III.3.1. Mincer's Regressions

The following step is to analyze the all-possible characteristics that explain the labor income gap by gender. An analysis is developed using the well-known Mincer's function (1974), also called *human capital earnings function*. It is described as

$$(3.11) \log(w_k) = \alpha_0 + \rho_s S_k + \beta_0 z_k + \beta_1 z_k^2 + \varepsilon_0$$

where the sub index k makes reference to the k^{th} ($= 1, 2, \dots, K$) worker; w is the labor income, S is the years of education; z is the years of labor experience and ε_0 is certain unobservable factors. As may be observed, the function relates earnings with human capital proxy variables (S, z). It is expected that ρ_s and β_0 be positive and β_1 be negative (the latter under the assumption of decreasing returns of z). The coefficient ρ_s represents the average return of years of education and its rate is determined as $r = [\exp(\rho_s) - 1] * 100$. The rate r measures the increase of the income (in percentages) that is derived from an additional year of education (see Wright, 1999).

In this study, the Mincer's regression is determined as

$$(3.11a) \log(w_k) = \alpha_0 + \rho_s S_k + \beta_0 z_k + \beta_1 z_k^2 + \delta d_k + \lambda' x_k + \varepsilon_1$$

where d_k is a vector that includes dummy variables for ethnicity and gender. These variables are interpreted as unknown factors that can be attributed to discrimination problems. The x_k vector contains other variables that explain labor income.

The impact of occupational segregation status on earnings is also analyzed, specifying an Ordered Probit model based on Miller and Volker (1985)¹⁶ and Miller (1987) methodology. Taking into account the segregation indexes calculi described in Table 3.8, three segregation levels are defined: a) high segregation occupations (armed forces,¹⁷ machinery and installations operators, services and sale workers and unskilled workers); b) middle segregation (office employees and resource extraction, construction and manufacturing workers); c) low segregation occupations (professionals, scientists and intellectuals, agriculture workers, cattle and fishing workers, managers in public administration and private firms and technicians and support professionals).

The probability of being in a given level of occupational segregation is specified here as

$$\begin{aligned} (3.12) \text{ Prob}(y = 0) &= F(-\beta'x) \\ \text{Prob}(y = 1) &= F(\mu_1 - \beta'x) - F(-\beta'x) \\ \text{Prob}(y = 2) &= F(\mu_2 - \beta'x) - F(\mu_1 - \beta'x) \end{aligned}$$

¹⁶ See Miller (1987).

¹⁷ This occupation has not been considered in the segregation indexes estimations. However, MECOVI 2002 data shows that all the workers that belong to this occupation are men.

where the discrete variable y assumes the value of 0 when the worker belongs to the high segregation occupation level, 1 if she has an occupation of middle segregation status and 2 if she belongs to the low segregation occupation level. μ_1 and μ_2 are unknown parameters to be estimated with β . Once the Ordered Probit model has been estimated, the probability is calculated for each worker. This procedure generates a new variable to be included in (3.11a).

Results

Before analyzing labor income, the Ordered Probit model is estimated to predict the probability that an individual will be employed in one of the three occupational segregation levels described previously. Human capital variables are focused on: years of education, experience, experience squared and years of working in the firm. The econometric estimates are shown in Table 3.10.

Contrary to the previous econometric analyses, the parameters estimated using the Ordered Probit model are harder to interpret. A positive coefficient, however, can be associated with a higher probability of being located in a less segregated occupation. In Table 3.10 it is observed that the coefficients are positive, having the mentioned interpretation. The exception is experience, but this variable is not significant.

Table 3.10
Ordered Probit Model: Probability of Being in Less Segregated Occupations, 2002
(from 19 to 65 years of age and with positive main labor income)

	(5)	(6)
Years of education	0.1182 (0.0048)***	0.1184 (0.0047)***
Experience	-0.0012 (0.0046)	
Experience squared	0.0002 (0.0001) ***	0.0002 (0.0000)***
Years of working in the firm	0.0163 (0.0026)***	0.0162 (0.0025)***
μ_1	1.1719	1.1850
μ_2	2.0819	2.0950
Number of observations	4,632	4,632

Notes: a) In parentheses are the standard errors; b) (***) means at 1% significance; c) Standard errors have been calculated using the robust variance-covariance matrix.

Based on regression (6), the probabilities for all the workers are predicted, creating a new variable: the probability of being in a less segregated occupation.

Next Mincer's regressions are estimated. The dependent variable used is the logarithm of the income per hour of the main work. The results are shown in Table 3.11.

Table 3.11
Mincer's Regression: The Dependent Variable is the Main Job Income per Hour, 2002
(from 19 to 65 years of age)

	(7)	(8)	(9)	(10)	(11)	(12)
Years of education	0.0940 (0.0037)***	0.0201 (0.0097)**	0.0150 (0.0097)	-0.0247 (0.0223)	-0.0287 (0.0221)	-0.0285 (0.0220)
Years of education × secondary education dummy		0.0188 (0.0060)***	0.0193 (0.0060)***	0.0135 (0.0077)	0.0131 (0.0075)	0.0134 (0.0076)
Years of education × superior education dummy		0.0610 (0.0069)***	0.0625 (0.0069)***	0.0414 (0.0099)***	0.0408 (0.0097)***	0.0414 (0.0096)***
Experience	0.0323 (0.0038)***	0.0344 (0.0038)***	0.0266 (0.0041)***	0.0192 (0.0054)***	0.0200 (0.0058)***	0.0199 (0.0057)***
Experience squared	-0.0004 (0.0001)***	-0.0006 (0.0001)***	-0.0005 (0.0001)***	-0.0004 (0.0001)***	-0.0004 (0.0001)***	-0.0004 (0.0001)***
Women dummy	-0.1742 (0.0291)***	-0.2371 (0.0290)***	-0.1876 (0.0339)***	-0.2287 (0.0582)***	-0.1123 (0.0516)***	
Indigenous dummy	-0.2021 (0.0335)***	-0.2328 (0.0328)***	-0.2514 (0.0327)***	-0.2518 (0.0501)***	-0.2477 (0.0499)***	-0.2491 (0.0497)***
Dummy for principal cities			0.0808 (0.0283)***	0.0965 (0.0296)***	0.0936 (0.0286)***	0.0938 (0.0288)***
Single dummy			-0.2037 (0.0385)***	-0.2095 (0.0244)***	-0.2215 (0.0240)***	-0.2167 (0.0238)***
Ratio children/adults × women dummy			-0.1374 (0.0508)***	-0.1569 (0.0589)**	-0.1441 (0.0511)**	-0.1291 (0.0547)**
Probability of being in a less segregated occupation				1.2160 (0.6068)*	1.2937 (0.6065)*	1.2691 (0.6013)*
Firm size (number of workers)				0.0042 (0.0009)***	0.0038 (0.0008)***	0.0039 (0.0009)***
Labor productivity				0.0046 (0.0015)**	0.0042 (0.0015)**	0.0041 (0.0015)**
Agriculture and fishing dummy				-0.5255 (0.0229)***	-0.5518 (0.0252)***	-0.5557 (0.0254)***
Mining dummy				-0.3991 (0.0597)***	-0.3772 (0.0536)***	-0.3873 (0.0571)***
Construction dummy				0.1625 (0.0234)***	0.1378 (0.0308)***	0.1336 (0.0310)***

Table 3.11 Continued

	(7)	(8)	(9)	(10)	(11)	(12)
Hotels and restaurants dummy				0.2313 (0.0430)***	0.2368 (0.0365)***	0.2359 (0.0378)***
Communitarian, social and personal services dummy				0.2855 (0.0430)***	0.2842 (0.0395)***	0.2858 (0.0414)***
Education sector dummy				0.4879 (0.0996)***	0.4308 (0.0914)***	0.4476 (0.1007)***
Self-employed worker dummy × women dummy					-0.2154 (0.0953)**	-0.3379 (0.0702)***
Employee dummy × women dummy						-0.1642 (0.0663)**
Constant	0.1917 (0.1917)***	0.6518 (0.0760)***	0.8034 (0.0856)***	0.9325 (0.1196)***	0.9690 (0.1172)***	0.9758 (0.1173)***
Number of observations	4,544	4,544	4,544	4,023	4,023	4,023

Notes: a) In parentheses are the standard errors; b) (*), (**) and (***) mean at the 1%, 5% and 10% of significance respectively; c) The standard errors have been calculated using the robust variance-covariance matrix; d) For regressions (10), (11) and (12), the robust standard errors are estimated also using the clusters correction (13 clusters derived from the labor productivity data by sector of activity).

In the basic regression (7) the human capital proxy variables and the dummy variables for ethnicity and gender are included. As predicted, years of education and experience impact positively on labor income and experience squared impacts negatively. The dummy variables coefficients show that women earn, on average, 17% less than men and indigenous people earn 20% less than non-indigenous people. These estimates mean that indigenous women earn 37% less than non-indigenous men. These results are consistent with those found in previous studies (see, for example, Rivero and Jiménez, 1999; Moensted, 2000; Andersen, 2001a; and Andersen and Muriel, 2002).

Because (looking at Figure 4.6) it seems that the Bolivian urban area has non-linear returns to education (which is also documented by Moensted, 2000), additional variables are introduced in regression (8) that allow changing the slope of these returns as the individuals have more years of education. These new variables are statistically significant, showing a better approach of measuring educational returns. The results show that, for workers of up to 8 years of education (primary education), one additional year of education increases their income by only 2.03% ($r = 2.03$). For workers from 9 to 12 years of education, the increase of the income is a little more, 3.93%, and for workers of over 12 years of education it is much more, 8.18%.

The third regression (9) considers the explanatory variables used in Table 3.5. The positive coefficient of the dummy for principal cities suggests that these cities have higher earnings on average. The negative coefficient of the single dummy seems to be related to less years of labor experience and possibly low productivity (this will be discussed in the next section).

Lastly, the ratio of children per adult multiplied by the women dummy variable shows that women get lower earnings as they have more children in their houses. This is because additional work at home can limit them from working efficiently in the labor market. This variable has been considered also for men, expecting an opposite sign, since there is more pressure on them to generate labor income as they have more children. This variable, however, was not significant.¹⁸

It is important to notice that the first variable in the regression - years of education - is no longer significant. This result shows that up to 8 years of education, the returns of education are not robust factors for explaining earnings.

Regression (10) adds variables that measure the effects of the probability of being in less segregated occupations and certain differences between firms and economic sectors on individual earnings.

The first variable has a positive coefficient; suggesting that labor income is higher as the probability of being in less segregated occupations increases. With the inclusion of this variable in the regression, the years of education \times secondary education dummy coefficient is no longer significant, and the years of education \times superior education dummy coefficient declines. These changes respond to the positive relationship between the probability of being in less segregated occupations and years of education. In general terms, this observation can be interpreted in the following way: as the worker is more educated, she has a higher probability of being in less segregated occupations, thus obtaining higher earnings.

The next two variables included in regression (10) are associated with the “efficiency wages” hypothesis: the firm size, measured by the number of workers, and labor productivity by economic sector.¹⁹ The signs of these variables’ coefficients are consistent with this hypothesis, and the estimated elasticities with respect to (non-logarithms) income per hour are, in both cases, equal to 0.06. The remaining variables are sector dummies that are statistically significant (and robust to specification changes) for explaining earnings.

Regressions (11) and (12) are the results of a deeper analysis of the negative coefficient estimated for the women dummy variable, figuring out if this variable really explains discrimination wage problems against women. At a first step, a discrete variable for self-employed worker women is included in (11); these women cannot be discriminated by a boss. The coefficient estimated for this variable is negative and significant, at the level of 5%, suggesting that their labor productivity is low. Notice that this variable partly explains the women dummy coefficient, since its level decreases 50% compared to previous regressions.

At a second step, a dummy variable for women employees that is related to wage discrimination and to other labor problems (like pregnancy and child-birth costs) is considered in (12). In this case, the women dummy is excluded from the regression (because it is related with the two new women dummy variables). The estimation shows that both women dummies

¹⁸ The immigrant dummy is also considered; however, this variable is not significant.

¹⁹ This last variable has been measured using the census data and the gross national product by sector, both for 2001. 13 sectors could be related by these two databases. The variable is an index equal to 100 for the highest labor productivity sector.

are relevant for explaining the income gap by gender. However, the results suggest that self-employed women workers are in a worse situation than those that are discriminated in the labor market!

IV. New labor features by gender based on fresh surveys information

Although Bolivia has relatively good information of individuals' characteristics related to the labor market, some relevant features for this study are not observed in official surveys. For this reason, three additional surveys were applied: 1) a survey at the home level; 2) a survey about adolescents' future work and education expectations; and 3) firms' interviews.

The surveys have been focused on two Bolivian cities: La Paz and El Alto. La Paz, on one hand, is one of the cities with less poverty problems; 65.5% of the population is not poor. In El Alto, on the other hand, only 33.1% of the people are not poor. These characteristics make some relevant data comparison.

The first survey has been carried out considering two main goals. The first of these is to seek more precise information on human capital differences between the population groups, in working experience and years of education through training. The second goal is to analyze occupation differences by gender according to labor market problem perceptions and family responsibilities.

The survey was carried out in 200 homes, 110 located in the city of La Paz and 90 located in the city of El Alto. The sample has 876 persons; 469 of these are from 19 to 65 years of age. From this last sub sample, the survey has 47.12% men and 52.88% women; 35.18% indigenous and 64.82% non-indigenous; 26.65% single and 66.53% married (or living as a couple), widows, divorcees and separated persons are the remaining population.

The urban school survey was carried out in 23 schools, having interviewed 1,138 students in the last year of high school. Through this survey, it was possible to identify the perceptions and perspectives of the students with regards to: 1) more years of education; 2) influence of the socio-economic surrounding on education (or profession) desired; and 3) differences in the future insertion in the labor market and in the responsibilities in the home by gender.

Of the 1,138 total students, 54.1% are women and 7.2% are indigenous (learned to speak in a native tongue), with an average age of 17.3 years. Some of the characteristics of the schools allowed identifying 58.2% of those interviewed as students of the morning school schedule, 24.2% of bilingual schools and 94.3% of schools for both sexes.

Lastly, the interviews of firms have been carried out considering two main purposes. First, the perceptions of employers related to productivity disparities by gender have been investigated in terms of years of education and experience, and others characteristics attributed to a given sex or marital status. Second, it has been researched firms recruiting preferences by gender, relating these choices with stereotypes, segregation and discrimination problems.

39 firms were interviewed, 51.8% belongs to the industrial sector, 24.7% to the services and 22.5% to trade. The informants are managers, directors or personnel chiefs of the firms, having all of them superior levels of education. The interviews were conducted privately.²⁰

IV.1. Human capital differences by gender: New findings

Training and labor experience

The first concern around non-observed human capital differences by gender is related to working experience and years of education through training. The survey at the home level examined these topics for the relevant sample - people from 19 to 65 years of age, that have on average 10.08 years of formal education (school and university). In this sample men are relatively more educated (11.00 years) than women (9.27 years) and indigenous people are less educated (6.53 years) than non-indigenous people (12.00 years). These characteristics are consistent with those observed previously with the census data.

The information gathered allows observing additional educational gap between the populations studied (that was not found in the official Bolivian surveys). Besides the years of formal education, further skills acquired through courses, seminars and workshops were inquired on. Table 4.1 shows the percentage of people that has received this kind of training and the average years of education related to it. It is worth noting that these persons also have more years of formal education (12.7) compared to those that did not have any training.

TABLE 4.1
DID YOU RECEIVE SOME TRAINING (BESIDES OF FORMAL EDUCATION)?

	Men	Women	Indigenous	Non-indigenous	La Paz	El Alto	Total
Yes	14.93%	14.11%	5.45%	19.41%	21.07%	7.49%	14.50%
No	85.07%	85.89%	94.55%	80.59%	78.93%	92.51%	85.50%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Average years of training (additional education)							
Only people that answered yes	0.74	0.91	0.86	0.60	0.88	0.66	0.83
The entire sample	0.11	0.13	0.17	0.03	0.19	0.05	0.12

Insignificant differences by gender are observed; 14.93% of men and 14.11% of women have had training courses. In contrast, only 5.45% of indigenous people receive this additional education compared to 19.41% of non-indigenous people. Indigenous women are in the most unfavorable position, since only 3.53% of them have had some training.

Lastly, it is noted that the percentage of people from La Paz that had some kind of training is higher compared to people from El Alto. This gap seems to be related to socio-economic differences between these cities.

²⁰ See annex for the description of the sample design.

At the end of the Table, the average years of training is shown. The years of education of the feminine population that has some training seems to be the most underestimated in official surveys, since this education is on average almost one year (0.91). Indigenous people's education, in contrast, is less underestimated because only 0.6 years is added. For the average population groups, however, training has a marginal contribution because it is between 0.03 and 0.17 years.

Figure 4.1 evaluates the labor experience gap by gender and ethnicity. It shows the accumulated percentage of people according to the first job age. There are no significant differences by gender among the population that began to work between 5 and 18 years of age (see Figure 4.1a) that is consistent with Table 3.1. For those over 19 years of age, however, men worked at an earlier age compared to women, having, on average, a labor experience gap of almost three years.

FIGURE 4.1
HOW OLD WERE YOU AT YOUR FIRST JOB?
(accumulated participation in percentage according to age)

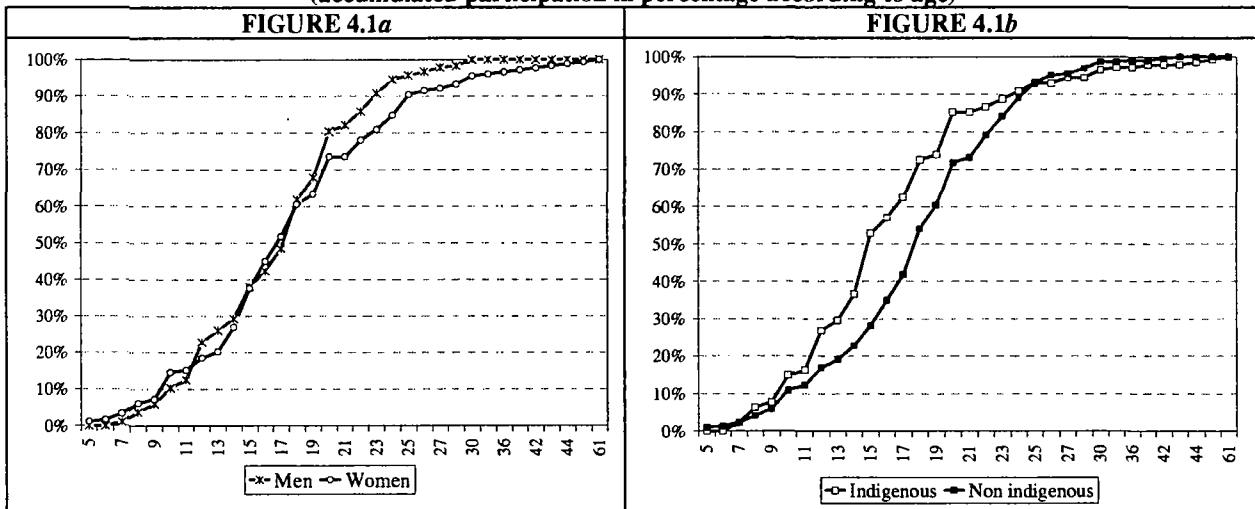


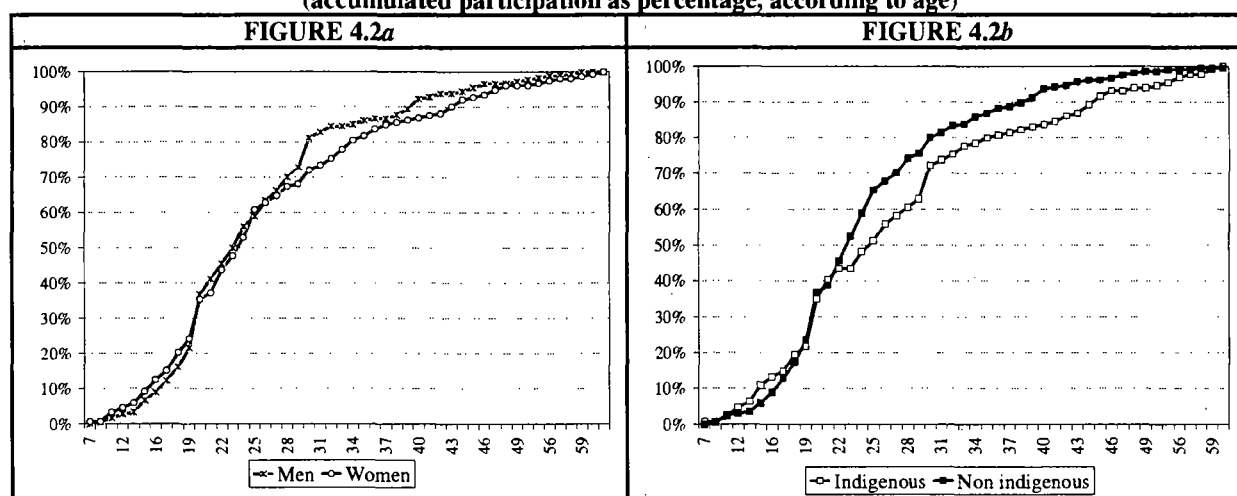
Figure 4.2 shows the age of the first job of the present occupation. Comparing this information with the previous figure, it is interesting to note that 90% of the sampled persons had their first job at under the age of 25; however, only 60 percent began working in their present occupation. Furthermore, the correlation between both variables is low in this age stratum, 0.07, compared to 0.71 in the sample of over 25 years of age. This characteristic suggests that people that worked at an early age have a higher chance of changing occupations, hence limiting their labor experience returns.

The gap in average years of experience is also significant: for the first job it is 21.70 years and for the present occupation, 13.65 years. Such disparity suggests that the proxy of experience used in the literature (age minus years of education minus six) is misleading.

Figure 4.2a shows that, up to the age of 25, present occupation working age is similar by gender. After this age, however, there is a higher proportion of men that have more working experience in their present occupations compared to women. The average years of experience

in this last age stratum is, on average, 10.57 for men and 6.97 for women, with a gap of 3.6 years, which is almost three times the entire sample gap by gender (1.25 years).

FIGURE 4.2
HOW OLD WERE YOU WHEN YOU BEGAN TO WORK IN YOUR PRESENT OCCUPATION?
(accumulated participation as percentage, according to age)



Analyzing the differences by ethnicity (see Figure 4.2b), it is observed that there is a slightly higher proportion of indigenous, compared to non-indigenous people, that began working between the ages of 7 and 18. Nevertheless, for people over 18 years of age the tendency is the opposite; non-indigenous people work at an earlier age in their present occupation. In this age stratum, years of working experience is, on average, 11.88 for non-indigenous people and 10.50 for indigenous people (with a gap of 1.38 years).

The survey also analyzes the presence of labor interruption periods of over 2 months. Table 4.2 shows that for the relevant population – from 19 to 65 years of age – there is an important percentage of workers that were inactive during certain periods; this is relatively lower for men than for women.

TABLE 4.2
DID YOU LEAVE YOUR JOB FOR A PERIOD OF OVER 2 MONTHS?

	Men	Women	Total
No	58.55%	50.82%	54.79%
Yes	41.45%	49.18%	45.21%
Why? (for people that answered yes)			
Family responsibilities ⁽¹⁾	6.25%	45.56%	27.06%
Education	20.00%	8.89%	14.12%
Disease	17.50%	14.44%	15.88%
Other	56.25%	31.11%	42.94%
Total	100.00%	100.00%	100.00%

⁽¹⁾ Includes pregnancy, care of children and domestic tasks.

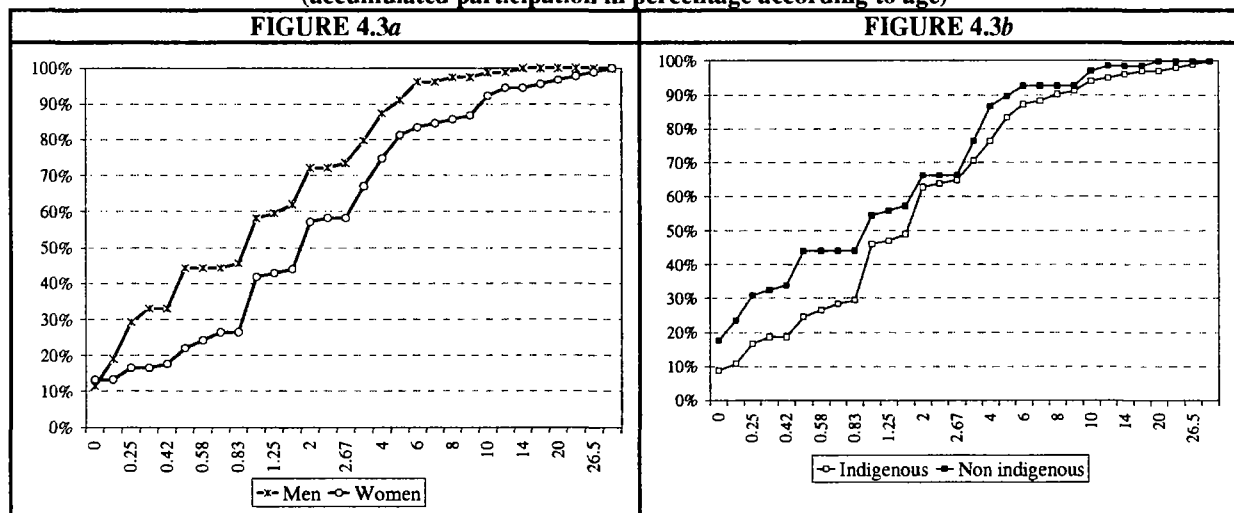
Among the labor interruption causes, it is observed that women remain temporarily inactive essentially because of family responsibilities (pregnancy, care of children and domestic tasks). Men, on the other hand, have usually other reasons for interruption, like retirement, discharge, labor unconformity and lack of clients. This result confirms, in some way, that domestic responsibilities limit feminine participation in the labor force.

Lastly, Figure 4.3 shows the years of labor interruption by gender and ethnicity, which was calculated considering all the periods of inactivity.

In Figure 4.3a it is observed that men have less years of work interruption than women. On average, men have 1.93 years of inactivity and women have 3.94 (with a gap of 2.01 years); indigenous women have the highest period of inactivity (4.50 years).

Comparing the ethnic groups, it is observed that non-indigenous people have fewer years of inactivity (see Figure 4.3b) than indigenous people. On average, the years of labor interruption are 2.35 for indigenous people and 3.44 for non-indigenous people.

FIGURE 4.3
YEARS OF LABOR INTERRUPTION
(accumulated participation in percentage according to age)



In summary, the survey analysis shows that human capital accumulation –in training and experience– has additional disparities between the population groups studied. On one hand, some people with high years of formal education also have same kind of training. Indigenous women, who are the least educated, are also the least trained. These characteristics partly explain the non-linearity of the returns of education that were found in Mincer's regressions.

On the other hand, years of working experience are generally less for women than for men. Taking in to account the periods of inactivity, it is estimated that working experience is 2.5 years higher for men compared to women and that the present occupation working experience is 4.06 years higher. This result shows that the income gap and, possibly, the segregation occupational problems, respond, in some way, to differences in years of experience that are not considered in the empirical literature.

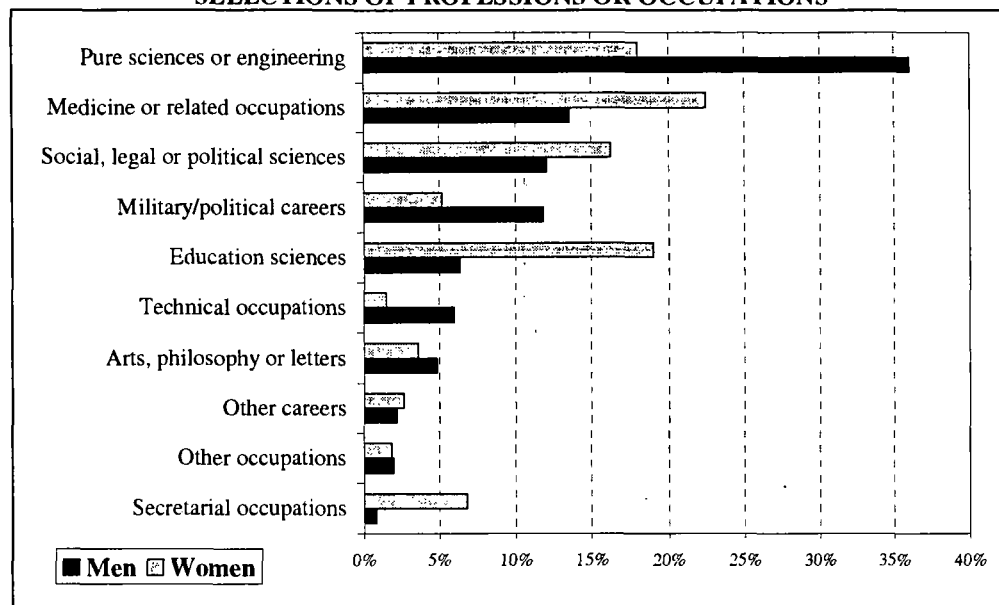
Preferences surrounding higher education by gender and the influence of the environment

The second concern around non-observed human capital differences by gender is related with a previously described theory, where women choices of investing into their education could be discouraged by the jobs attributed to them in the family and in the society, and by the discrimination and segregation problems. This hypothesis was investigated through the adolescents' survey.

The students interviewed were asked questions in order to reveal their preferences on accumulating more years of education in the hypothetical cases that they would have not limitations for doing so (of time, of family responsibilities, of an economic nature). 98.85% of the men and 99.84% of the women responded affirmatively, meaning that they would like to have a profession or occupation. Many of these wished to continue studying and working at the same time (53.83% of women and 61.85% of men), possibly due to the fact that they implicitly consider their economic limitations. This result suggests that the possible discrimination or segregation in the labor market issues do not seem to be taken into account by women in the decisions regarding obtaining more education.

The additional years of education are slightly higher for men. On average, men wish to study 5.82 more years and women, 5.44 more years. The strong disparities between men and women are found in the election of professions or occupations, as shown in Figure 4.4.

FIGURE 4.4
SELECTIONS OF PROFESSIONS OR OCCUPATIONS

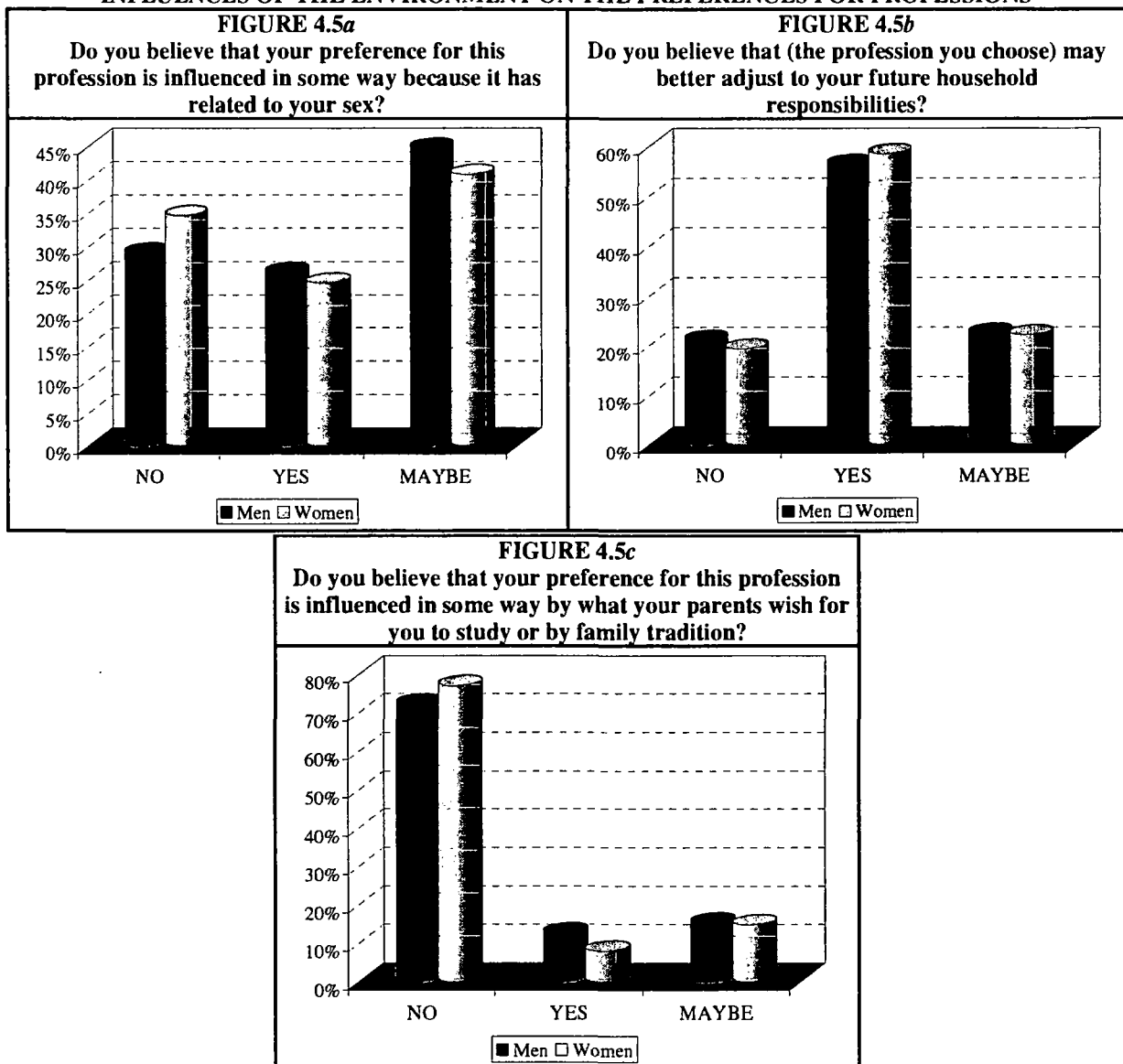


The masculine population generally prefers to study pure sciences or engineering compared to the feminine population: 36.05% compared to 18.05%. The greater participation of men in the technical fields is also notorious: for each woman who would like to be a technician, close to 4 men choose the profession.

The feminine population, on the other hand, is to be found in a greater proportion in medicine or associated fields, education sciences, social sciences, law, politics or secretarial work. The gap in the latter activity is noteworthy, where for each man approximately 9 women would like to be secretaries. The difference is also relevant in the case of educational sciences, with a rate of 1 man for each 3 women.

Once the professions preferences were established by gender, the following step was to determine to what degree these elections were influenced by the social environment, with regards to stereotypes, future household responsibilities and the influence of parents. Figure 4.5 presents the results of this analysis.

FIGURE 4.5
INFLUENCES OF THE ENVIRONMENT ON THE PREFERENCES FOR PROFESSIONS



In the first question, “Do you believe that your preference for this profession is influenced in some way due to the fact that it has more to do with people of your sex?”, there is a high positive response, although affirmative (YES) to a lesser degree. 67.90% of the students answered YES or MAYBE, this being relatively more the case in the feminine population: 70.93% compared to 65.37% in the masculine population.

It is interesting to note that women in La Paz are those who least perceive an influence related to gender, for 47.39% of them answered NO; in the rest of the cases (men from La Paz and women and men from El Alto), the percentage is around 27%. Given that there are no significant differences in the professions chosen between cities by gender, the previous result may be a reflection of greater socio-economic development in the city of La Paz with regards to the city of El Alto.

The second question, “Do you believe that (the profession of your preference) may better adjust to the responsibilities that you may have in your future household?”, also reveals a high percentage of persons that answered favorably: 56.40% in the case of men and 58.54% in that of women. Notwithstanding, when responsibilities are asked to be identified, the association of caring for children or household tasks on the part of women is as important as the responsibility of sustaining economically the household. As well, many students related the responsibilities directly with their fields of study; for example, studying medical sciences may help the family be in a good state of health. The answers show that the professions or occupations do not present a significant direct relation with the responsibilities generally attributable to gender.

Lastly, Figure 4.6c presents the results of the question on the influence that the family has on professional preferences. It is interesting to note that the majority of the population interviewed answered NO: 72.29% of men and 77.07% of women. This difference is slightly higher in La Paz (78.11%) than in El Alto (71.70%).

The previous result suggests that the parental influence on the type of profession that the children choose is presently low. As well, almost all of the students (95.69%) believe that their parents support their decisions on accumulating greater human capital.

Lastly, correlations were analyzed through regressions by OLS on the years of educations wished with respect to the characteristics of the school (of both sexes, bilingual, morning schedule), the extracurricular activities (sports, artistic activities and work), the years of education of the parents and gender. The variables that significantly affect the years of education of the students' sample (1138 individuals) have been the years of education of the mothers and sports (as it is more frequent); the students that presently work are less inclined towards studying longer. As well, it has been noted that women wish to have relatively less years of education,

$$\text{Years of education} = 0.02 \text{ myeduc} + 0.18 \text{ sport} - 0.26 \text{ dwork} - 0.33 \text{ dwoman}$$

$$(1.48) \quad (1.93) \quad (-1.84) \quad (-2.45)$$

where *myeduc* = years of education of the mother; *sport* = 0 if the student did not practice any sport during the last 5 years, equals 1 if she practiced 1 or 2 times per week, equals 2 for 3 to 5

times and equals 3 for 6 or more times; *dwork* is the work dummy (equals one if the student is working and zero otherwise); and *dwoman* is the dummy for woman.

The results suggest that sports may stimulate the desire to accumulate capital, for it may increase discipline and help to confront different challenges. The people who work, on the other hand, may be less inclined towards studying for long periods of time, possibly due to economic limitations. Lastly, the negative relation between women and year of studies suggests that they choose shorter professions and, possibly, are relatively less inclined towards having levels of specialization above the baccalaureate level as compared to men.

IV.2. Discrimination and occupational segregations features

Firms' responses surrounding discrimination and segregation problems

On the demand side of the labor market, it has been investigated initially the employers perceptions over differences in years of education and labor experience by gender. These questions are related to statistical discrimination theory where, as mentioned before, the firms evaluate productivity levels through years of education and labor experience average of the labor groups.

With regards to education, the question asked was: Do you believe that exist, on average, years of education gap by gender in the labor force of your city?. Only the 35.9% of the informants has answered YES. 14.3% of this last percentage considers that women have higher education than men. It is interesting to note that these answers are related to specific workers skills needed by the firms. It is also noted that only the 7% of the trade sector firms has said YES and it seems to be associated with the intensive use of unskilled jobs in this sector, where firms mainly demand this kind of workers in the labor market. The gender gap in years of schooling is, on average, around one year, which is highly compatible with Table 3.3 (where differences on education were analyzed with Census data).

A similar question has been asked to identify years of experience gap by gender. In this case, 56.41% of the firms think that such differences exist and only 5% of this percentage believes that women have more years of experience. The disparities mentioned are also related with the specific workers that the firms demand. Note that this result is consistent with those found with the survey at home level, where a significant gap was observed in years of experience by gender.

In summary, the results underrate the statistical discrimination problems in La Paz and in El Alto, because the perceptions are compatible with education and experience disparities found between men and women. Also the firms' explanations suggest that the answers given respond to specific firms work requirements, and not at the labor force level.

The following Tables show additional questions that allow knowing other possible productivity disparities by gender that are not related with either education or experience. Table 4.3a shows that more than 71% of the informants believe that no specific sex works harder, learns faster or has higher dexterity.

The differences favor women in the cases of being more responsible and disciplined. The informants argue that worker women are more concerned with maintaining their employment, due to their family economic obligations. Also, they are more orderly and punctual. Men, on the other hand, usually go to parties – they make “Single’s Friday” not necessarily on Fridays – where they drink a lot, affecting negatively their work performance. This problem is characteristic to the Bolivian society.

TABLE 4.3a
WHO, MEN OR WOMEN, DO YOU CONSIDER THAT

	Men	Women	No one	Total
.. work harder?	15.38%	12.82%	71.79%	100.00%
.. are more responsible?	2.56%	48.72%	48.72%	100.00%
.. are more disciplined?	2.56%	41.03%	56.41%	100.00%
.. learn faster?	12.82%	7.69%	79.49%	100.00%
.. have higher dexterity?	26.32%	2.63%	71.05%	100.00%

Lastly it is observed that a higher percentage of informants responded that men have higher dexterity compared to women. The explanations are related essentially with innate characteristics and differences in specializations by sectors, which are observed mainly in the industrial sector.

Table 4.3b shows the differences between non-single and single women. On one hand, it is observed that the former work harder, are more responsible and disciplined than the latter, which respond to family obligations disparities. On the other hand, a higher percentage of the informants argue that single women learn faster because they have more time and ability to being concentrated.

TABLE 4.3b
WITHIN WOMEN WORKERS, WHO DO YOU CONSIDER THAT

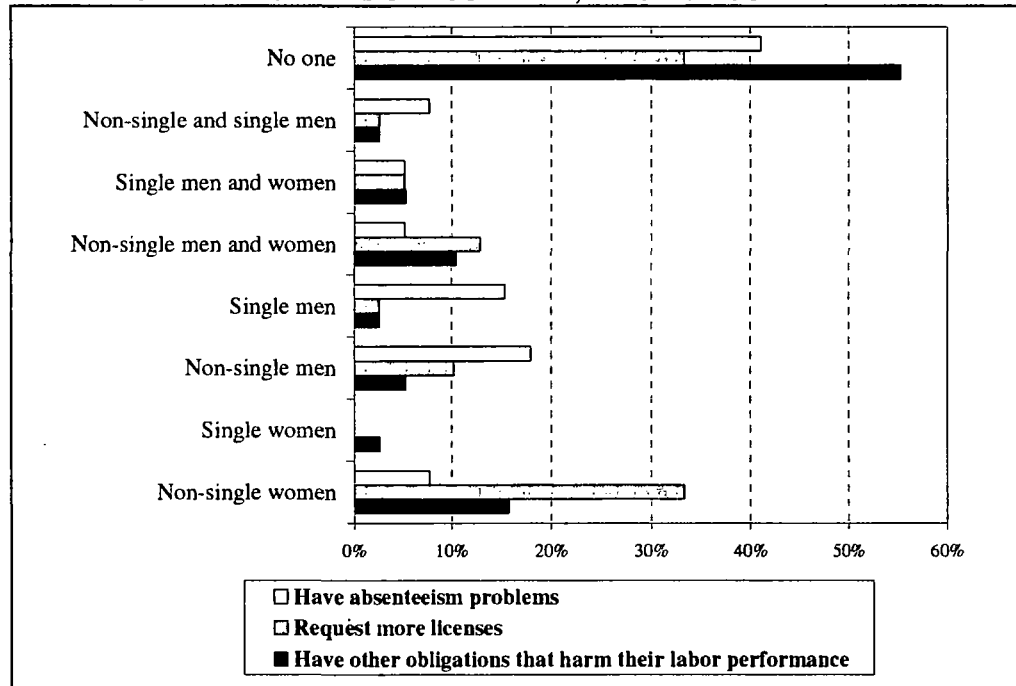
	Non-single	Single	No one	Total
.. work harder?	30.77%	15.38%	53.85%	100.00%
.. are more responsible?	38.46%	15.38%	46.15%	100.00%
.. are more disciplined?	28.21%	5.13%	66.67%	100.00%
.. learn faster?	5.26%	21.05%	73.68%	100.00%
.. have higher dexterity?	10.81%	8.11%	81.08%	100.00%

Lastly, Figure 6 presents the differences between men and women related to absenteeism, licenses and labor performance problems. The 41.0% of the informants consider that no specific occupational group has absenteeism problems. The other 41.0% of the informants believes that single and/or non-single men are more frequently absent of the work, which is consistent with the results exposed in Table 4.3a.

In the case of license requirements it is observed that principally married women, and in less relevance married men, are those that request more licenses. The main reason is the family

obligations that are related principally with children care. Although in a lower percentage, these obligations also harm their labor performance in the firm.

FIGURE 4.6
FROM THE WORKERS OF YOUR FIRM, WHO DO YOU BELIEVE THAT



Next it was analyzed some discrimination problems derived from pregnancy and post-pregnancy costs. 91.7% of the informants mentioned that their firms cover the 100% of such costs, and 51.3% of them believe that this social obligation - settled down by the Labor Law – disincentives women hiring: in a high degree answered the 23.1% and in some degree the 28.2%. This result suggests that these costs are relevant when evaluating labor market insertion characteristics of the feminine population.

It has been also asked if the informants think that the Government could resolve the firms cost increase due to pregnancy and post-pregnancy subsidies. The 52.6% of them has answered NO, mainly because they have little faith that the Government could do something. The remaining 47.4% has answered YES, and they give various requirements and advices to the Government to make this possible. Those are resumed in the following points:

- The Government should subsidize these costs and not the firms, since it disincentives women hiring.
- The Government should lower the post-pregnancy subsidy, reduce the maternal inactivity period of labor and eliminate (or reduce) the suckling hours.
- The Government could solve the problem with social funds or social security programs.
- The Government should promulgate policies that are compatible with the social and managerial Bolivian reality. The Labor Law, for example, was created in the '40s and is not related with this reality.

- The Government should create support programs and collaborate to the firms to reduce these costs.

Lastly, it has been investigated if there are additional preferences of hiring workers of a specific sex. The purpose was to analyze the possible taste discrimination problem that was theoretically postulated by Becker. 81.6% of the informants has responded NO, 10.5% prefers to hire women and the remaining 7.9 % men. The arguments, in all the cases, are related to the specific tasks and worker functions that the firms need, being women sometimes more suitable and, in other cases, men. One firm answered that she prefers to hire women due to an anti-discrimination policy that has for them.

With regards to occupational segregation problems by gender, Table 4.4 presents the hiring preferences of firms in different occupations. It is interesting to note that most of the firms do not have any favoritism for some specific sex for recruiting managers and administrators, personnel chefs and supervisors and professionals and scientist and technicians. When some preferences are present, however, men are favored, and it is explained by their stereotypes or innate abilities, as manage capacity and physical force.

TABLE 4.4
THE FIRM PREFERS RECRUIT MEN OR WOMEN FOR

	Men	Women	No one	Total
Managers and administrators	21.05%	5.26%	73.68%	100.00%
Personnel chefs and supervisors	14.29%	5.71%	80.00%	100.00%
Professionals, scientist and technicians	17.95%	5.13%	76.92%	100.00%
Employees	35.29%	2.94%	61.76%	100.00%
Client attention workers	0.00%	60.53%	39.47%	100.00%
Personal of cleaning	23.08%	23.08%	53.85%	100.00%
Personal of security	66.67%	7.69%	25.64%	100.00%

For unskilled workers the hiring preferences disparities by gender become more evident, except for the personal of cleaning. The firms prefer to hire women for client attention, however, men are hired for security and others unskilled chores. The explanations of these differences are also related with stereotypes and innate capabilities attributed to each gender. Most of the firms argue that women have a better client treatment, are more attentive, patient, helpful and careful. Men, on the other hand, have higher physical force and can have heavier or nocturne works.

Note that the results showed in Table 4.4 are highly compatible with Tables 3.6 and 3.8, where segregation problems were concentrated in unskilled jobs and occupational opportunities were relevant factors for explaining the segregation indexes levels.

Workers' choices versus discrimination and segregation problems

On the supply side, Tables 4.5 and 4.6 analyze the differences by gender surrounding the perceptions on the opportunities of having positions of greater responsibility at work. These questions belong to the survey at the home level. In the first table it may be observed that most

informants, both men and women, would like to have a position of greater responsibility in their company or business; nevertheless, they would need more education, more years of experience in the company or have more clients. In the Others category, only a low proportion of women answered that they feel limited by caring for children and by domestic tasks.

On the other hand, the people that do not desire greater responsibility have as their main reasons family responsibilities, educational level and lack of interest. In this case, it is observed that 52.38% of the men that answered NO said that they do not desire or do not have interest in greater responsibility and in the case of women the most important reason is family responsibilities. It is noted that one of the alternative responses was "Discrimination by gender", which was chosen by a very low percentage and is included in the Others category.

TABLE 4.5
WOULD YOU LIKE TO HAVE A WORK POSITION OF GREATER RESPONSIBILITY?

	Men	Women	Total
Yes	88.07%	79.33%	84.05%
No	11.93%	20.67%	15.95%
Total	100.00%	100.00%	100.00%
If yes: What are the reasons that limit you?			
Years of experience in the firm	8.39%	5.04%	6.93%
Lack of a higher level of education	9.68%	5.88%	8.03%
There is no opportunity	19.35%	15.97%	17.88%
Low experience and education	24.52%	21.85%	23.36%
Lack of clients	30.32%	44.54%	36.50%
Others motives	7.74%	6.72%	7.30%
Total	100.00%	100.00%	100.00%
If No: Why?			
Family responsibilities	23.81%	38.71%	32.69%
The time is spent on education	14.29%	3.23%	7.69%
Lack of interest	52.38%	29.03%	38.46%
Others motives	9.52%	29.03%	21.15%
Total	100.00%	100.00%	100.00%

Table 4.6 analyzes the perceptions of individuals with regards to their personal capacities. In a way that is similar to the previous case, it may be observed that most people feel capable of assuming positions of greater responsibility within the company or business. When the answer is negative, the reasons pointed out are of a family nature, of years of experience and other reasons that include illness, age and lack of capital.

Comparing the two tables, it is interesting to note that family responsibilities are the main reasons for women to not want to or not feel capable of assuming labor positions of greater responsibility. Nevertheless, the potential problems of occupational segregation or discrimination do not seem important. Apparently, the desires or perceptions of the persons are very marginally related to those reasons.

TABLE 4.6
DO YOU FEEL CAPABLE OF ASSUMING A POSITION OF GREATER RESPONSIBILITY?

	Men	Women	Total
Yes	87.31%	76.53%	82.76%
No	12.69%	23.47%	17.24%
Total	100.00%	100.00%	100.00%
If No: Why?			
Family responsibilities	29.41%	30.43%	30.00%
Experience	29.41%	8.70%	17.50%
Others	41.18%	60.87%	52.50%
Total	100.00%	100.00%	100.00%

Students' perceptions on discrimination and segregation in the labor market

From the survey about adolescents' expectations, Figure 4.7 presents the summary of perceptions of the labor market where each student has been asked if persons of the opposite sex choosing the same profession have better opportunities of finding work, a better chance of being promoted, or of having a good salary.

In Figure 4.7a there is a high proportion of men (50.58%) and women (53.66%) that do not believe that people of the opposite sex have better chances of finding work. Among these, 61.74% of the students from La Paz share this position, versus 42.88% of the students from El Alto. Furthermore, those who responded YES or MAYBE, believe that the different opportunities are related to: 1) the possibility that people of the opposite sex educate themselves or strive more at work; 2) the differences with regards to capacities, innate abilities and stereotypes; 3) preferences for hiring the opposite sex and; 4) the personal advantages for obtaining work.

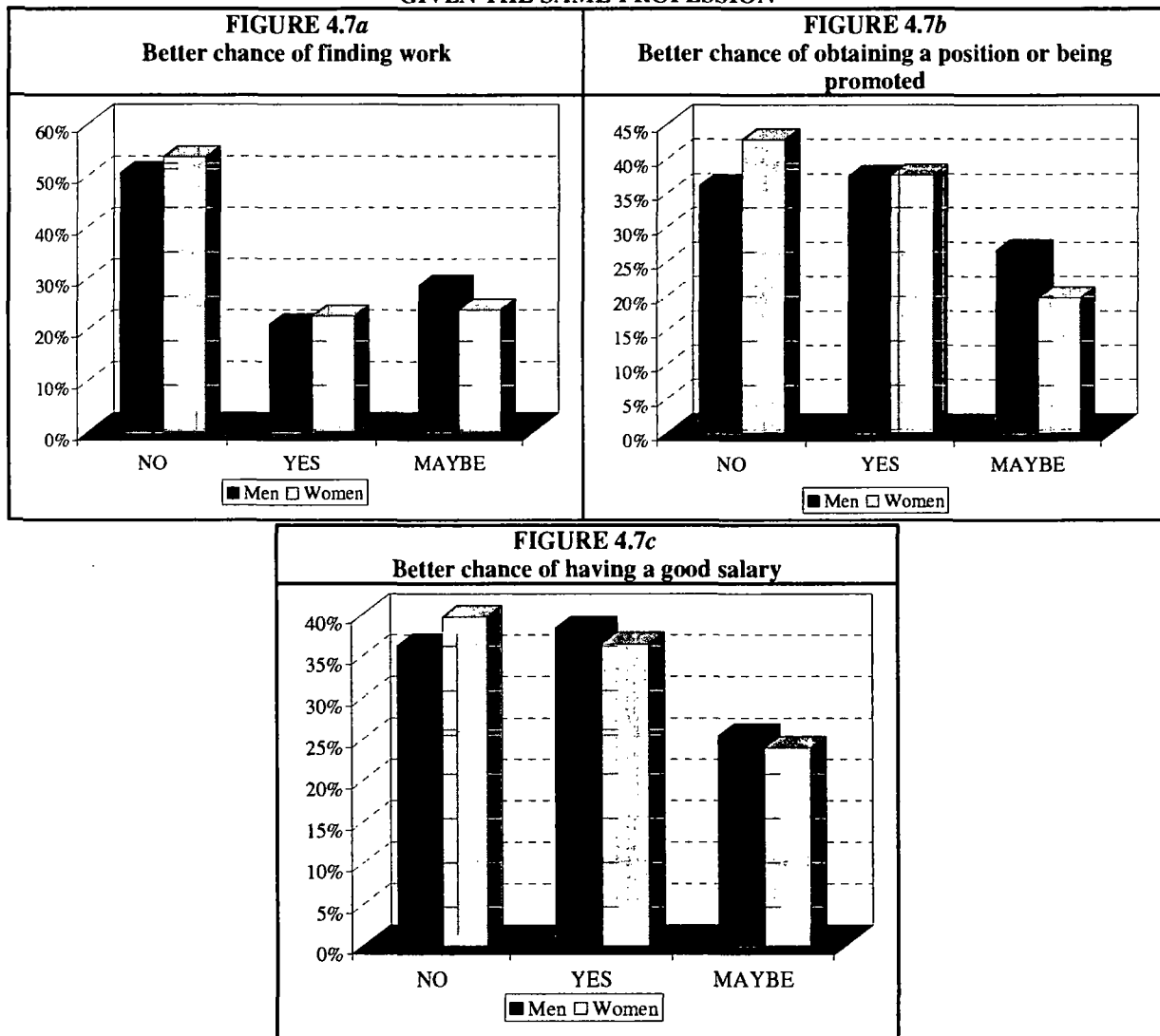
Although there is a part of students that perceive problems of discrimination and segregation in the labor market, a greater proportion of these consider that there is gender equity. As well, the men - although to a lesser degree than the women - perceive the existence of these problems towards them.

With regards to perceptions surrounding the greater chance of improving position, in Figure 4.7b, there is a reasonable proportion of men (36.05%) and women (42.76%) that do not believe in this possibility, although with less relevance than in the previous case. Here also, those from La Paz give less credit to this premise in a greater degree (52.67%) compared to those from El Alto (26.89%). When the answer was favorable (YES or MAYBE) the reasons are mainly due to the characteristics or qualities attributed to gender and, to a low degree, to problems of discrimination, both for men and women.

Lastly, Figure 4.7c shows that 36.24% of men and 39.67% of women interviewed believe that the persons of sex opposite theirs do not have considerable chances of earning a good salary; La Paz with 49.29% and El Alto with 27.06%. In this case, when the answer is YES or MAYBE, many women (more than men) perceive problems of discrimination, although the

effort and personal capacity as well as the qualities attributed to gender also appear as important explanations in the salary differences by gender.

FIGURE 4.7
PERCEPTIONS SURROUNDING GREATER WORK OPPORTUNITIES OF THE OPPOSITE SEX,
GIVEN THE SAME PROFESSION



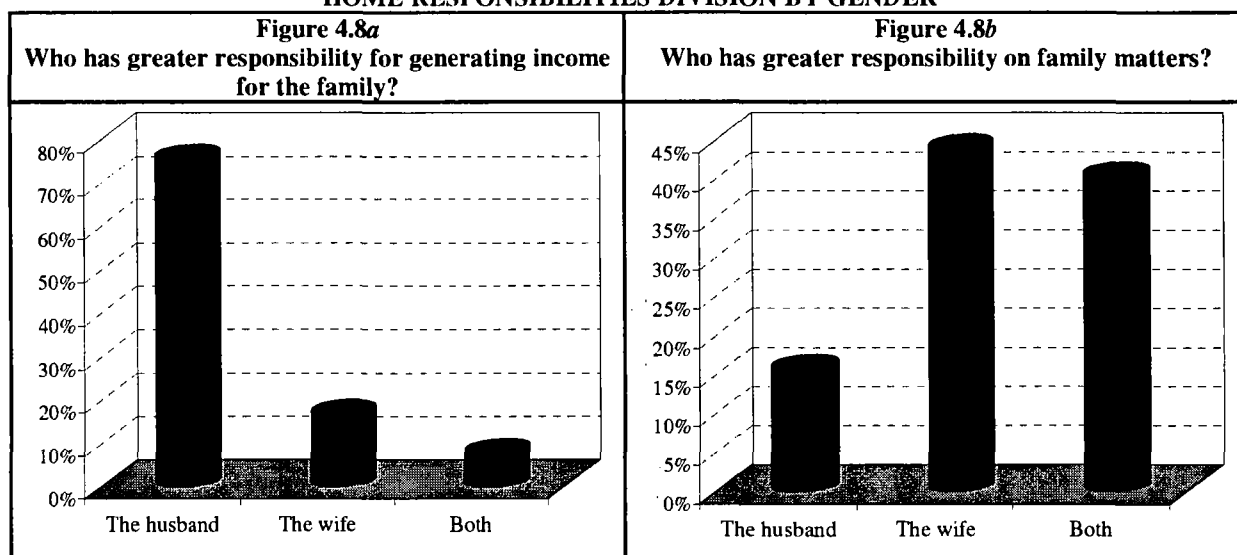
IV.3. Family responsibilities division by gender

Besides the links found between family responsibilities differences by gender and women labor market problems and occupational choices, it has been asked specific question related to these disparities. From the survey at the home level, it has been investigated the responsibilities assumed within the home for people that are married or living together. Figure 4.8 presents the results of this analysis.

On one hand it may be observed that while the husband (or mate) is the one who is usually responsible for generating income for sustaining the home (75.64%), a large part of wives

have greater responsibility in family matters (43.91%). Nevertheless, there is also a high percentage of homes (40.38%) that point out that the domestic responsibilities are shared by both women and men to the same degree. These results show that there are definitely still divisions of habitual responsibilities by gender within the home and that the masculine population does support the family with domestic responsibilities.

FIGURE 4.8
HOME RESPONSIBILITIES DIVISION BY GENDER



Next, from the survey of adolescents' expectations, it was asked the likely responsibilities that the students will assume in the home with regards to the caring of children, housework and the generating of income for supporting the home. Table 4.7 presents the results of this analysis.

To a greater degree with regards to the caring of children and to a lesser degree in the case of housework, it is observed that students in general consider making themselves responsible to the same extent as their partners, although a greater proportion of women have this perception as compared to men. The differences between cities are low; nevertheless, the percentage is relatively higher in La Paz than in El Alto. In the case of housework, a greater proportion of men consider assuming this responsibility to a lesser degree than their wives, and women to a greater degree than their husbands.

Lastly, the greatest difference between men and women is the generation of income for sustaining the home. Although 75.65% of the women believe that they will assume this responsibility to the same degree as their future husbands, only 37.55% of men agree with the notion. Half of men interviewed believe, on the other hand, that they shall have greater responsibility than their wives in generating income for sustaining the home.

Comparing the results between the two surveys, family responsibilities division by gender at home seems to be less relevant for the new generations, since only around the 15% of young men believes that their wives will have more housework responsibilities compared to the 44% of women from 19 to 65 years old that at the moment have. In addition, 76% of young women

believe that they will have equal income generation responsibilities to that of their husbands; however, only the 17% of women from 19 to 65 years old have.

TABLE 4.7
PERCEPTIONS ON THE RESPONSIBILITIES THAT WILL BE ASSUMED
IN THE HOME

What responsibilities will you have in your home?	Men	Women	Total
Caring for children?			
Yes, with less responsibility than your spouse	5.75%	2.76%	4.13%
Yes, with responsibility equal to that of your spouse	67.43%	74.84%	71.44%
Yes, with greater responsibility than your spouse	13.98%	11.53%	12.65%
Others	12.84%	10.88%	11.78%
Total	100.00%	100.00%	100.00%
Housework (in general)?			
Yes, with less responsibility than your spouse	15.33%	4.87%	9.67%
Yes, with responsibility equal to that of your spouse.	55.36%	66.23%	61.25%
Yes, with greater responsibility than your spouse.	11.88%	17.86%	15.11%
Others ⁽¹⁾	17.43%	11.04%	13.97%
Total	100.00%	100.00%	100.00%
Generation of Income for Supporting the Home?			
Yes, with less responsibility than your spouse.	4.41%	5.84%	5.18%
Yes, with responsibility equal to that of your spouse.	37.55%	75.65%	58.17%
Yes, with greater responsibility than your spouse.	50.00%	13.31%	30.14%
Others ⁽¹⁾	8.05%	5.19%	6.50%
Total	100.00%	100.00%	100.00%

⁽¹⁾ when the student answered No, be it because she or he will not assume responsibility or because he or she does not wish to marry

V. Concluding remarks and recommendations

This research has been carried out in order to analyze labor market conditions and labor force participation in Urban Bolivia controlling mainly by gender group. The analysis was based in three main differences between women and men: human capital - years of education and work experience, family conditions (marital status, number of children, household headship, etc) and 'stereotypes'.

With regards to women labor force participation, the results found in this research are summarized in the following points. First, education is constituted as an important explanatory factor. When women have more years of education, they have a higher probability of being in the labor force - nevertheless, this factor is not the most important. This characteristic reflects the average years of educational gap between EA and EI women, with almost one more year of education for EA. Second, EA population and age have an inverted U-shaped correlation: there is a higher proportion of adults working or looking for a job compared to young or third age people. The indigenous women group has the highest proportion of the population that get into the labor market at an earlier age, but the adult indigenous women proportion is relatively lower than non-indigenous people and indigenous men.

Third, the most important factors that explain women labor force participation are related with family responsibilities and “stereotypes”. It is less probable that married women with children get into the labor force - because they have more housework responsibilities, while men with these characteristics have a higher probability of belonging to the EA population. This result shows that social occupation division inside the household by gender is still marked in Bolivia. Because most of the EA population is married, it also explains significantly the labor force gap by gender. However, when women are household headship, they have more responsibilities for generating income, having, therefore, a higher probability of working or looking for a job.

Finally, family socio-economic features such as the place where they live and poverty determine also the women labor force participation choices. When these conditions are better, there are more possibilities for women to be EA. This result seems to be related with women opportunity costs. On one hand, living in the main cities of Bolivia (La Paz, Santa Cruz and Cochabamba) can incentive women to participate in the labor force, probably because there are more job opportunities. On the other hand, poor women are generally less educated (in quality and quantity), have more children within the household and have fewer possibilities to get a good job compared to more educated and less poor women.

With regards to labor characteristics by gender, the following results were found. First, women are usually concentrated in unskilled occupations – with low earnings; 93.96% of indigenous women belong to this category. However, within skill occupations there are no marked differences by gender, being men relatively more concentrated in semi-skilled occupations. Second, there are also some specific jobs where women – or men – work. According to the Karmel & Maclachlan index, women are concentrated in unskilled jobs, i.e. office, service and sale jobs. In contrast, men work as machineries and installation operators and as extractive, construction and manufacturing workers.

Third, analyzing the gender gap by economic sector it is found that a few proportion of women, principally indigenous women, works at high paid sectors compared to men. One reason of this result is that the trade sector, which has low labor incomes, concentrates the 32.54% of female population (the 41.24% of indigenous women) compared to the 18.31% percent of males.

Fourth, the Borghans & Groot’s occupational segregation index shows that gender differences in education – presorting - and occupational choices and opportunities – postsorting - have a similar relevance in explaining this problem. The educational gap is more important within indigenous people, and occupational choices and opportunities are more relevant within non-indigenous population. The educational differences by gender are relevant for workers that have primary and secondary instruction in terms of illiteracy and postsorting. Additionally, between indigenous and non-indigenous women educational differences explain almost all the occupational segregation problems.

Lastly, it is found that years of education are the most important factor of the explained probability of being in less segregated occupations. Family responsibilities are also relevant factors that restraint women to work in less segregated occupations, which is related principally with choices. Additionally, the “stereotypes” attributed to each gender seem to

have an important role in explaining why women are concentrated in some occupations and are scarce in others, and this is related mainly with job opportunities.

Regarding the income gap by gender, some interesting results emerge from the study. First, returns to schooling are low for workers with 8 years of schooling and they rise as years of education increase. Because indigenous women have, on average, low education, it explains in good part their low labor income. Second, to some extent, women's work performance is limited as more children live in the household. Third, it is found that as women workers are more educated, they have a higher probability of being in less segregated occupations, thus obtaining higher earnings. That is, education is also relevant to determine labor income through occupational segregation problems. Finally, self-employed women labor productivity is low, and this represents the 50% of the explained income gap by gender. However, women employees also receive low salaries than the rest of the workers (*ceteris paribus*).

The new data collected for this study made possible to analyze additional characteristics that are not observed in official data. First, it was found further human capital differences between the population groups analyzed in the survey at home level. The training period courses are important for a segment of the population; however, there are no marked differences by gender. Here, indigenous women are also disadvantaged since they have the least years of training. This result could also explain, to some extent, high educational returns for workers with more than 12 years of schooling (see regressions of Table 3.11) because usually more educated workers have also higher training period courses. However, on average, for all the population these courses have marginal contribution on the returns to years of education.

The marked gap by gender - related to human capital - was found in years of experience. On average, men have around 3 more years of labor experience than women. This characteristic is present in both the first job and the actual occupation. Women also have higher periods of inactivity compared to men, with a gap of 2 years. Additionally it was found a high disparity of experience between the first job and the actual occupation (around 8 years). These results suggest, on one hand, that the experience proxy variables usually used in the literature are misleading and, on the other hand, that labor income gap by gender is also explained by non-observed labor years of experience gap by gender.

In addition, the desire to accumulate human capital is shared by men and women students, being the additional years of education slightly higher for men. The strong disparities by gender are found in the election of professions or occupations. A higher proportion of men, for example, would like to study pure sciences or engineering, and more women than men prefer education sciences. This tendency is related to different choices - between men and women - that results from gender specific tastes.

Second, the firms' interviews suggest that statistical and taste discrimination problems are not relevant to explain labor income gap by gender. Furthermore, some productivity disparities by gender that are not related with either education or experience seem to favor women workers; for example, they are considered more responsible and disciplined than men. However, married women request more work licenses that harm their labor performance. A form of discrimination against women is presented because pregnancy and post-pregnancy costs disincentives women hiring, but it is rationally justified in terms of minimizing costs.

The most important differences between men and women in the labor market are attributed to stereotypes and innate abilities. Women, for example, are preferred for customs services and men for security jobs. It is highly possible that these disparities are more important within unskilled workers, thus explaining the high segregation indexes in occupations mainly with this kind of workers.

These results are compatible with the analysis of secondary students' expectations. Around the half of the students perceive that there are no different labor market conditions – in terms of finding jobs, having better chance of promotion and having a good salary. When they believe that such differences exist, the main reasons are related with innate abilities, capabilities and stereotypes, being discrimination problems not really important.

Lastly, the survey at home level corroborates the perceptions around different family obligations between women and men. When women do not want - or they do not feel capable – to assume a work position of higher responsibility, the main reason is household obligations – childcare and housework. However, most women would like to have a work with higher responsibility. In Addition, husbands have greater duties for generating income for the family and women on other household matters.

These family responsibilities division, however, seems to be less marked for young people. There is a low proportion of students that believe that women have more obligations concerning childcare and housework. In addition, while 75.65% of women think that the income generating duties has to be equal, about 50% of men believe that they will have higher responsibilities compared to their wives.

Recommendations

It is still much to be done in order to have similar labor market conditions between women and men. The formal education policies are important instruments to reduce occupational segregation problems and labor income disparities. These policies should be mainly concentrated toward indigenous women, because they are most disadvantaged. Observing that this group of population has the highest proportion of adolescents working, it seems that exist a tradeoff between working and studying. Therefore, it is essential to have programs stimulating the adolescent indigenous women education at home and/or at work. Many of them, for example, work as domestic employees, so by Law the bosses should be forced to send adolescent workers to school.

In addition, the intensification of the programs for reducing illiteracy are also highly advisable because - according to the Karmel & Maclachlan index - it explains, in an important way, the occupational segregation problems.

The education in Bolivia, however, seems to be poor when related with the productive sector, mainly primary education (given its low return on labor income). So, it is required important changes in educational policies to be focused on programs that effectively improve productivity and, therefore, generate higher income. Training policies also are highly recommended in this context.

Besides the relevance of education for productivity, however, women policies to reallocate them to high paid sectors and occupations are desirable, as well as improving other productivity determinants, such as physical capital and technology, in sectors (or occupations) where women are concentrated. The most needed population here seems to be the self-employed women workers - principally indigenous women - since their income is almost 34% lower compared with the rest of the workers.

It is also recommended policies that look towards the promotion of equal family responsibilities between husband and wife. These policies should be implemented in several levels. First, in the labor force analyzed – population among 19 to 65 years – men participation in domestic tasks and children care should be encouraged. Second, at the school, professors should receive training courses related to family gender equity issues, so that such knowledge can be transmitted to their students. Third, the curriculum should give higher relevance to gender equity as well as human rights matters. Finally, parents also should be educated to promote gender equity with their children.

Although little can be done to reduce innate abilities and stereotypes disparities by gender, it is possible to stimulate, in some way, a more equitable selection of occupations by gender, in order to reduce segregation problems, by education and campaign programs.

Finally, the main cause of discrimination problems against women seems to be associated with the pregnancy and post-pregnancy costs. These costs should be assumed, in a good part, for the society, since it is a social cost. In this context, the Government should, for example, create a fund exclusively to cover the three months of inactivity cost for the pregnant women that is stipulated by Law. The firms' recommendations are strongly supported here, which were described previously.

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Annex

A.1. Additional data

TABLE A.1
BOLIVIA: OVER 10 YEARS OLD POPULATION BY GENDER AND ETHNICITY, ACCORDING
TO CONDITION OF ACTIVITY AND GEOGRAPHICAL AREA, 2001

DESCRIPTION	POPULATION				TOTAL			
	Male		Female		Male		Female	
	Indigenous	Non-indigenous	Indigenous	Non-indigenous	Indigenous	Non-indigenous	Indigenous	Non-indigenous
TOTAL POPULATION								
Total	1,281,969	1,710,935	46,345	89,264	940,224	1,922,685	2,268,538	3,722,884
10 to 17 years	109,622	165,668	3,229	6,336	292,485	939,922	405,336	1,111,926
18 to 25 years	224,990	411,126	9,607	28,209	136,310	431,310	370,907	870,645
26 to 35 years	263,942	468,875	11,193	25,558	123,531	190,223	398,666	684,656
36 to 45 years	258,521	347,536	9,609	15,562	107,213	112,940	375,343	476,038
46 to 55 years	196,103	196,711	6,734	8,853	84,479	79,976	287,316	285,540
56 to 65 years	126,468	81,522	3,835	3,502	75,039	72,588	205,342	157,612
66 or more	102,323	39,497	2,138	1,244	121,167	95,726	225,628	136,467
Urban area	488,716	1,353,141	28,576	81,276	331,538	1,564,123	848,830	2,998,540
10 to 17 years	33,727	118,340	1,187	5,090	56,598	745,258	91,512	868,688
18 to 25 years	95,404	326,205	5,423	25,604	54,581	371,406	155,408	723,215
26 to 35 years	114,170	382,700	7,493	23,722	55,048	154,568	176,711	560,990
36 to 45 years	111,513	284,941	6,511	14,425	44,895	88,556	162,919	387,922
46 to 55 years	76,584	157,690	4,539	8,226	34,546	63,454	115,669	229,370
56 to 65 years	36,350	58,520	2,402	3,158	32,372	60,363	71,124	122,041
66 or more	20,968	24,745	1,021	1,051	53,498	80,518	75,487	106,314
Rural area	793,253	357,794	17,769	7,988	608,686	358,562	1,419,708	724,344
10 to 17 years	75,895	47,328	2,042	1,246	235,887	194,664	313,824	243,238
18 to 25 years	129,586	84,921	4,184	2,605	81,729	59,904	215,499	147,430
26 to 35 years	149,772	86,175	3,700	1,836	68,483	35,655	221,955	123,666
36 to 45 years	147,008	62,595	3,098	1,137	62,318	24,384	212,424	88,116
46 to 55 years	119,519	39,021	2,195	627	49,933	16,522	171,647	56,170
56 to 65 years	90,118	23,002	1,433	344	42,667	12,225	134,218	35,571
66 or more	81,355	14,752	1,117	193	67,669	15,208	150,141	30,153

Table A.1 continued

DESCRIPTION	ACTIVE POPULATION				INACTIVE POPULATION		TOTAL	
	EMPLOYED		UNEMPLOYED					
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
MALE POPULATION								
Total	750,244	1,027,906	37,569	63,364	307,811	765,658	1,095,624	1,856,928
10 to 17 years	53,198	94,992	2,327	4,367	150,161	463,527	205,686	562,886
18 to 25 years	128,432	243,645	7,072	18,075	42,320	172,388	177,824	434,108
26 to 35 years	162,180	282,377	8,963	17,535	20,181	37,908	191,324	337,820
36 to 45 years	155,178	205,533	8,070	11,879	17,835	17,708	181,083	235,120
46 to 55 years	117,361	120,920	5,895	7,345	17,211	15,317	140,467	143,582
56 to 65 years	75,472	53,947	3,410	3,094	20,940	22,303	99,822	79,344
66 or more	58,423	26,492	1,832	1,069	39,163	36,507	99,418	64,068
Urban area	269,038	769,805	22,152	56,521	94,043	629,762	385,233	1,456,088
10 to 17 years	14,082	63,187	739	3,356	27,767	365,505	42,588	432,048
18 to 25 years	49,450	183,259	3,553	15,923	16,285	153,760	69,288	352,942
26 to 35 years	66,823	220,511	5,673	15,939	7,239	32,419	79,735	268,869
36 to 45 years	63,246	159,541	5,285	10,868	6,360	14,198	74,891	184,607
46 to 55 years	44,170	91,649	3,902	6,763	7,061	12,669	55,133	111,081
56 to 65 years	20,573	36,382	2,129	2,775	10,261	19,585	32,963	58,742
66 or more	10,694	15,276	871	897	19,070	31,626	30,635	47,799
Rural area	481,206	258,101	15,417	6,843	213,768	135,896	710,391	400,840
10 to 17 years	39,116	31,805	1,588	1,011	122,394	98,022	163,098	130,838
18 to 25 years	78,982	60,386	3,519	2,152	26,035	18,628	108,536	81,166
26 to 35 years	95,357	61,866	3,290	1,596	12,942	5,489	111,589	68,951
36 to 45 years	91,932	45,992	2,785	1,011	11,475	3,510	106,192	50,513
46 to 55 years	73,191	29,271	1,993	582	10,150	2,648	85,334	32,501
56 to 65 years	54,899	17,565	1,281	319	10,679	2,718	66,859	20,602
66 or more	47,729	11,216	961	172	20,093	4,881	68,783	16,269

Table A.1 continued

DESCRIPTION	MESTIZO POPULATION				INDIGENOUS POPULATION		TOTAL	
	Indigenous	Mestizo	Indigenous	Mestizo	Indigenous	Mestizo	Indigenous	Mestizo
Male population								
Total	531,725	683,029	8,776	25,900	632,413	1,157,027	1,172,914	1,865,956
10 to 17 years	56,424	70,676	902	1,969	142,324	476,395	199,650	549,040
18 to 25 years	96,558	167,481	2,535	10,134	93,990	258,922	193,083	436,537
26 to 35 years	101,762	186,498	2,230	8,023	103,350	152,315	207,342	346,836
36 to 45 years	103,343	142,003	1,539	3,683	89,378	95,232	194,260	240,918
46 to 55 years	78,742	75,791	839	1,508	67,268	64,659	146,849	141,958
56 to 65 years	50,996	27,575	425	408	54,099	50,285	105,520	78,268
66 or more	43,900	13,005	306	175	82,004	59,219	126,210	72,399
Urban area	219,678	583,336	6,424	24,755	237,495	934,361	463,597	1,542,452
10 to 17 years	19,645	55,153	448	1,734	28,831	379,753	48,924	436,640
18 to 25 years	45,954	142,946	1,870	9,681	38,296	217,646	86,120	370,273
26 to 35 years	47,347	162,189	1,820	7,783	47,809	122,149	96,976	292,121
36 to 45 years	48,267	125,400	1,226	3,557	38,535	74,358	88,028	203,315
46 to 55 years	32,414	66,041	637	1,463	27,485	50,785	60,536	118,289
56 to 65 years	15,777	22,138	273	383	22,111	40,778	38,161	63,299
66 or more	10,274	9,469	150	154	34,428	48,892	44,852	58,515
Rural area	312,047	99,693	2,352	1,145	394,918	222,666	709,317	323,504
10 to 17 years	36,779	15,523	454	235	113,493	96,642	150,726	112,400
18 to 25 years	50,604	24,535	665	453	55,694	41,276	106,963	66,264
26 to 35 years	54,415	24,309	410	240	55,541	30,166	110,366	54,715
36 to 45 years	55,076	16,603	313	126	50,843	20,874	106,232	37,603
46 to 55 years	46,328	9,750	202	45	39,783	13,874	86,313	23,669
56 to 65 years	35,219	5,437	152	25	31,988	9,507	67,359	14,969
66 or more	33,626	3,536	156	21	47,576	10,327	81,358	13,884

Source: Own elaboration based on CENSUS 2001 data – Bolivian National Institute of Statistics

TABLE A.2
LEVEL OF EDUCATION OF OVER 19 YEARS OLD POPULATION BY GENDER AND ETHNIC,
ACCORDING TO CONDITION OF ACTIVITY AND GEOGRAPHICAL AREA, 2001

DESCRIPTION	ACTIVE POPULATION				INACTIVE POPULATION	
	EMPLOYED		UNEMPLOYED			
	Indigenous	Non Indigenous	Indigenous	Non Indigenous	Indigenous	Non Indigenous
MALE POPULATION						
BOLIVIA	682,988	909,906	34,500	57,462	146,670	263,702
None	83,731	25,751	3,764	1,282	33,119	9,896
Primary	434,458	296,782	22,109	17,374	75,677	54,879
Secondary	124,858	339,146	7,380	24,929	27,058	97,670
Superior non university	28,673	108,504	747	5,208	6,299	32,670
University	11,268	139,723	500	8,669	4,517	68,587
URBAN AREA	250,228	690,705	21,126	51,889	62,326	231,172
None	12,253	8,728	1,444	825	9,001	5,673
Primary	137,491	162,013	13,108	14,030	31,091	39,852
Secondary	75,997	290,800	5,545	23,436	14,790	88,256
Superior non university	15,494	94,959	581	5,034	3,847	30,505
University	8,993	134,205	448	8,564	3,597	66,886
RURAL AREA	432,760	219,201	13,374	5,573	84,344	32,530
None	71,478	17,023	2,320	457	24,118	4,223
Primary	296,967	134,769	9,001	3,344	44,586	15,027
Secondary	48,861	48,346	1,835	1,493	12,268	9,414
Superior non university	13,179	13,545	166	174	2,452	2,165
University	2,275	5,518	52	105	920	1,701
FEMALE POPULATION						
BOLIVIA	461,826	595,378	7,576	22,995	477,642	638,346
None	155,646	26,281	1,748	487	195,473	51,769
Primary	256,059	184,806	4,468	4,789	243,333	234,362
Secondary	33,506	191,095	1,020	8,357	28,418	209,506
Superior non university	13,200	103,839	202	3,938	7,542	63,660
University	3,415	89,357	138	5,424	2,876	79,049
URBAN AREA	193,535	513,964	5,781	22,135	204,640	518,790
None	38,593	14,298	1,113	411	63,790	25,718
Primary	120,760	141,510	3,501	4,393	115,390	163,399
Secondary	23,675	176,649	868	8,107	18,614	192,258
Superior non university	7,506	94,230	167	3,868	4,450	60,006
University	3,001	87,277	132	5,356	2,396	77,409
RURAL AREA	268,291	81,414	1,795	860	273,002	119,556
None	117,053	11,983	635	76	131,683	26,051
Primary	135,299	43,296	967	396	127,943	70,963
Secondary	9,831	14,446	152	250	9,804	17,248
Superior non university	5,694	9,609	35	70	3,092	3,654
University	414	2,080	6	68	480	1,640

Source: Own elaboration based on CENSUS 2001 data – Bolivian National Institute of Statistics

A.2 Additional econometric analysis

TABLE A.3
Probit model: Men probability of being in the urban labor force, 2001
(In between 19 to 65 years old)

Variables	(i)	(ia)	(ii)	(iia)
Years of schooling	-0.0273 (0.0004)***	-0.0068	-0.0147 (0.0004)***	-0.0035
Age	0.2451 (0.0007)***	0.0614	0.1787 (0.0008)***	0.0431
Age squared	-0.0030 (0.0000)***	-0.0008	-0.0023 (0.0000)***	-0.0006
Ethnicity dummy			0.0072 (0.0040)***	0.0017
Poverty			0.0465 (0.0036)***	0.0112
Dummy for principal cities			0.1483 (0.0034)***	0.0372
Single dummy			-0.4908 (0.0038)***	-0.1276
Ratio: children adults			0.1576 (0.0049)***	0.0380
Immigrant dummy			0.0761 (0.0030)***	0.0183
Home headship dummy			0.2660 (0.0036)***	0.0662
Constant	-3.2037 (0.0127)***		-2.1283 (0.0169)***	

Notes: a) Between parentheses are the standard errors; b)(***) means that the coefficient is significant at 1%; c) the standard errors have been calculated using the robust covariance-variance matrix.

A.3 Urban surveys: Sample design

Survey at home level²¹

The sample design for the survey in the cities of La Paz and El Alto is constituted of a List of Primary Units of Sampling (UPMs) from the MECOVI household survey sample selection of 2002. The specific sub-sample is representative and allows performing inferences at the level of the MECOVI 2002 sample.

The MECOVI household survey 2002 has a total of 76 UPMs; 40 UPMs in the city of La Paz and 36 UPMs in El Alto. The UPMs are stratified by the poverty level, according to the following strata:

- 1: High stratum (non-poor)
- 2: Half stratum–High (roughly poor)
- 3: Half stratum–Low (poor, moderate)
- 4: Low stratum (very poor, indigent and marginal)

Based on the structure of the previous stratification, the sub-sample has been determined for the Survey at Home Level. The following Table shows the structure of the sample for both cities:

Table A.4

City	Stratum 1	Stratum 2	Stratum 3	Stratum 4	Total
La Paz	4	12	9	2	27
El Alto	1	3	9	9	22
Total	5	15	18	11	49

From each UPM chosen in the sample, it was selected - in a second stage- 5 non-independent housings of the MECOVI 2002. Because interviews rejections and other problems to collect the information when surveying, some housing could be replaced, having 3 additional housings selected for this purpose. However, in some UPMs the 5 housings could not be completed even using the replacements. So, it was necessary to select 10 UPMs more in both cities. The UPMs selection was aleatory, with the same selection probability.

Survey about adolescents' future work and education expectations

The sample mark has been the Directory of Educational Units 2003 of the Ministry of Education. It was made a filter of fiscal and private educational establishments at secondary level that belong to the cities of La Paz and El Alto in the morning, afternoon and night school schedules. It was identified the educational units that have proximity to the UPMs geographical areas selected for the previous survey. Once identified the educational units, it was selected a total of 14 aleatorily schools in the city of La Paz and 13 in El Alto, between

²¹ This part was extracted from the Xperta Report. Xperta was the consultant responsible of the design and elaboration of the surveys.

private and fiscal educational establishments. It was chosen approximately one for each UPM in both cities.

Once selected the educational units, the survey has been applied to all the students of the last course at the secondary level.

Firms' interviews

The Directory of Economic Establishments of the INE and the National Directory of Trade and Services have been the mark for the selection of the firms in the industrial, services and trade sectors.

Firstly it was made a preliminary selection of those firms that have a number of employees reported equal or higher than 10. Then, once applied the filter, it was chosen 62 firms, being the necessary number 40. This selection was made taking into account the probability that some of the firms could reject the interview; that in fact happened.



**Women in the Labor Markets.
A Problem of Expectations.
Perú 1986-2001**

**Martin Benavides
Hugo Ñopo**

March, 2005.

Women in the Labor Markets. A Problem of Expectations. Peru 1986-2001⁺

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1. Introduction

Female participation in the workplace has changed during the last fifteen years. Peru has not been an exception to this global phenomenon. Nowadays more females participate into the labor market, combining their jobs with household responsibilities. That increase in labor market participation for females has been accompanied (or driven) by changes in human capital characteristics of the labor force, both for females and males. Also, the employment dynamics of the markets have changed. Comparing 2001 and 1986 we can document important reductions in the average tenure and the average unemployment spells for Metropolitan Lima.

This paper is an attempt to document the evolution of females' participation in the labor markets for the period 1986-2001 in Metropolitan Lima and Urban Peru, analyzing the observed changes in human capital characteristics, occupational structures, formality, the dynamics of the markets and labor earnings (measured both in per-hour and monthly terms). To our knowledge, there is no technical study in this area as comprehensive as the one we present here for Peru. Garavito et al.(1997)¹ traces an evolution of the gender research in the Peruvian labor markets. One of the most important early pieces to highlight in this avenue is the analysis of determinants of women participation of Del Valle (1976)². Later, the works by Schafgans of the early nineties improved substantially on the understanding of issues such as female's contribution on the Peruvian society and fertility determinants with their links to labor market participation (Schafgans(1991a)³ and Schafgans(1991b)⁴).

Another brand of studies developed later using the Peruvian Encuesta Nacional de Niveles de Vida—ENNIV, for 1991, 1994 and 1997. Garavito(1994)⁵, Felices(1996)⁶ and

¹ Garavito, Cecilia; Maria Elena Vattuone and Fortunata Solorio, **La Investigación de Género en el Perú**. Consorcio de Investigación Económica, Lima, 1997.

² Del Valle, Delma, **Factores Determinantes de la Participación de la Mujer en el Mercado de Trabajo**. Dirección General de Empleo, Ministerio de Trabajo, Lima, 1976.

³ Schafgans, Marcia, **The Extent and Impact of Women's Contribution in Peru, a Descriptive Analysis**, in *Women's Work, Education, and Family Welfare in Peru*, ed. by B.K. Herz and S.R. Khandker. World Bank, Washington D.C. 1991.

⁴ Schafgans, Marcia, **Fertility Determinants in Peru, a Quantity-Quality Analysis**, in *Women's Work, Education, and Family Welfare in Peru*, ed. by B.K. Herz and S.R. Khandker, World Bank, Washington D.C. 1991.

⁵ Garavito, Cecilia, **Participación de la Mujer en el Mercado Laboral y Diferencial de Ingresos por Sexo** in *La Mujer en el Mercado de Trabajo*, ed. by Elias, Lidia and Cecilia Garavito, ADEC/ATC, Lima, 1994.

⁶ Felices, Guillermo, **El Nuevo Papel de la Mujer en los Mercados de Trabajo**, in *Caminos Entrelazados: La Realidad del Empleo Urbano en el Perú*, ed. by Gustavo Yamada. Universidad del Pacífico, Lima, 1996.

Flores(1999)⁷ analyzed gender differences in wages and tested different hypothesis of discrimination in the labor markets, with an emphasis on wage differentials. These studies relied on the utilization of the Blinder-Oaxaca decomposition. They report that the average difference in hourly wages between males and females is around 40% of what males earn. Also, they found that approximately half of that gender wage gap is explained by gender differences in observable characteristics that the labor market rewards (being age, education and experience the most relevant). Felices(1996) pointed out that the gender wage gap has been reducing during the middle of the nineties.

Ñopo(2003)⁸, analyzing the labor markets in Metropolitan Lima during 1986-2000, proposes an alternative to the Blinder-Oaxaca methodology for the decomposition of the gender wage gaps. Pointing out the need of accounting for only comparable characteristics of males and females, he found that, after controlling for comparable observable characteristics such as age, schooling, marital status and migratory condition, on average, males earned an hourly wage that was 28% above than those of females. Additionally, the gender wage gap is bigger among the low-income individuals than among those with high incomes. As a consequence of the emphasis on comparable characteristics, he found that the Limenian labor market operates in a segmented way. Such segmentation is clearly defined by observable characteristics. For individuals with ages around the 40's, married, with one or two children, born in Lima, with a college degree and more than ten years of occupational experience, it is possible to find males but almost impossible to find females in the occupied labor force. For individuals with ages around the 30's, single but with one or two children, born out of Lima, with less than a high-school diploma and around three years of occupational experience, it is possible to find females but almost impossible to find males in the occupied labor force. In such a way, there are basically three segments of the working population according to characteristics: the male-dominated, the female-dominated and the mixed. Coincidentally, the wages of the individuals in the male-dominated groups are found at the top of the distribution of wages of the labor market, while the wages of individuals in the female-dominated groups are at the bottom of that distribution. Such segmentation, that favors males, accounts for a wage premium of 12% of average female hourly wages.

Another finding of Ñopo(2003) is the cyclicity of the gender wage gap in Peru. He found that the gender wage gap tends to be bigger during bad economic periods. This finding does not contradict the result of Felices(1996) about the reduction of the gender wage gap during the mid-nineties but complements it. The gender wage gap decreased during the mid-nineties but reported an increasing behavior during the late eighties and also during late-nineties (period that Felices(1996) did not cover with his analysis).

On the other hand, from a macro-level perspective, it is interesting to note that gender occupational segregation in Peru is substantially high when compared to the rest of the world. In that respect, Moreno et al. (2003) suggest the existence of some pre-sorting mechanisms in the labor markets where females, anticipating their lower success have

⁷ Flores Medina, Rosa, *La Mujer Peruana y la Brecha Salarial*. Unpublished mimeo, SASE 1999.

⁸ Ñopo, Hugo, *Matching as a Tool to Decompose Wage Gaps*. Unpublished mimeo, Northwestern University, 2003.

lower expectations, decide to apply to the occupation were they think they would have more chances of being hired and then decide to “invest” less in their search processes and in their human capital. In such a way, it configures a “bad” equilibrium situation achieved just as a result of self-fulfilled prophecies (information problems). According to a model like that, there is also room for a “good” equilibrium, in which females are aware that it is on the best interest of the employers to not discriminate and as a consequence decide to invest more for their labor market success. Once females have invested in their marketable characteristics, the gender differences in observable characteristics are expected to decrease and so, it is also expected a reduction for the possibility of statistical discrimination as well. Such reduction would reinforce the stability of the good equilibrium.

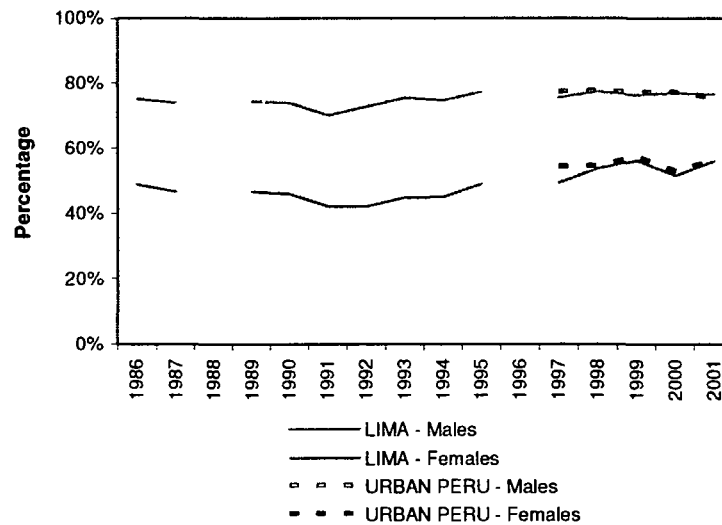
This study relies on the methodology developed by Ñopo(2003) for sections 2 through 6, extending it to the analysis of formality and occupations. For that purpose, using matching techniques, we generate counterfactual situations through which we can answer questions of the type: “How would the gender occupational segregation change in the hypothetical case that females and males exhibit the same distribution of human capital characteristics?” or “How would the gender differences in formality change under the same hypothetical situation?” For that analysis, the data comes from the Peruvian National Household Surveys, (Encuestas Nacionales de Hogares-ENAHOG), covering Lima from 1986 to 2001 (with the exception of 1988 y 1996) and Urban Peru from 1997 to 2001.

Such analysis of counterfactual situations of sections 2 through 6 is complemented with an analysis of discriminatory practices in the hiring procedures in some particular labor markets. For that purpose, in sections 7 and 8 we complement the results of Moreno et al. (2003) with the results obtained from interviewing the participants of their study in a second round. Such re-visiting of the participants of the study emphasizes on exploring the role of expectations in the decision making of job seekers and potential employers.

2. Participation

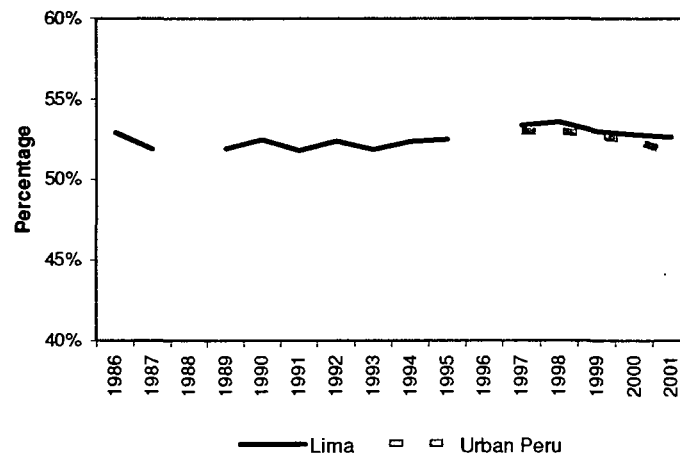
During the last fifteen years, participation rates in the labor markets have been increasing for females. While by the middle of the eighties slightly less than one half of working age females participated in the labor markets, that participation rose to 56% in 2001. On the other hand, males’ participation has been constant over the period of analysis, with slight variations between 75% and 78%.

Granh 1
LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Participation Rate by Gender



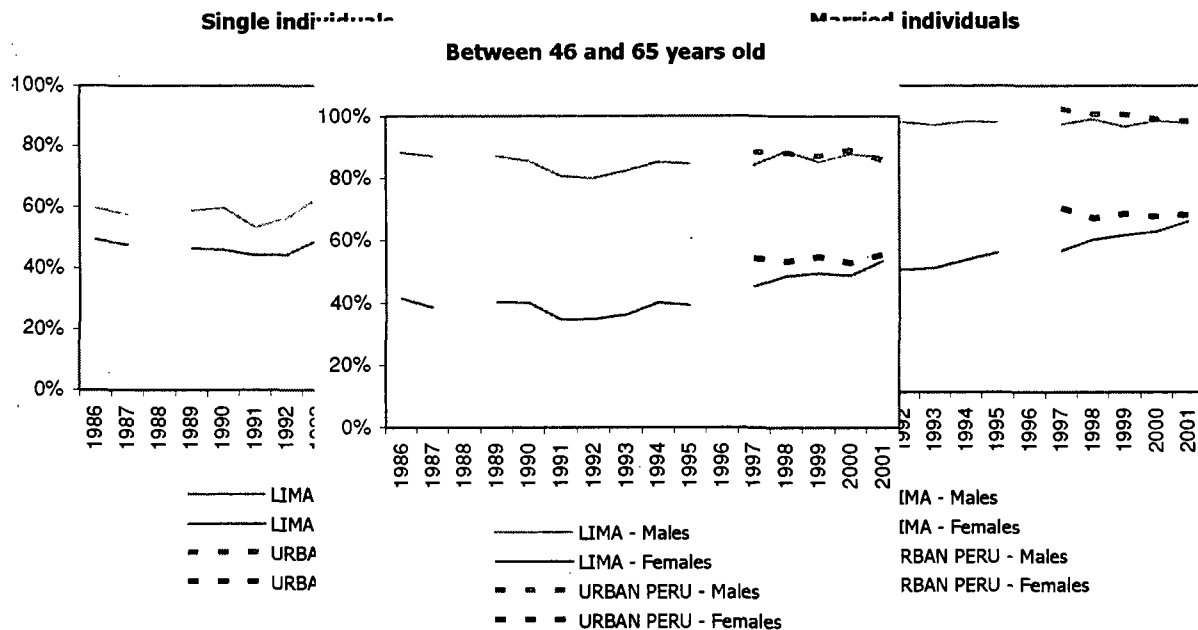
This increase in participation rates for females, accompanied by the stability of that of males', implied slight changes in the gender composition of the labor force. In 1986, the Limenian labor markets showed 52% of females. By 2001 that percentage increased slightly to 53%, although the national tendency of that gender composition is decreasing for the last five years of analysis.

LIMA 1986- 2001 and URBAN PERU 1997-2001
Gender Composition of the Labor Force
(% of females)



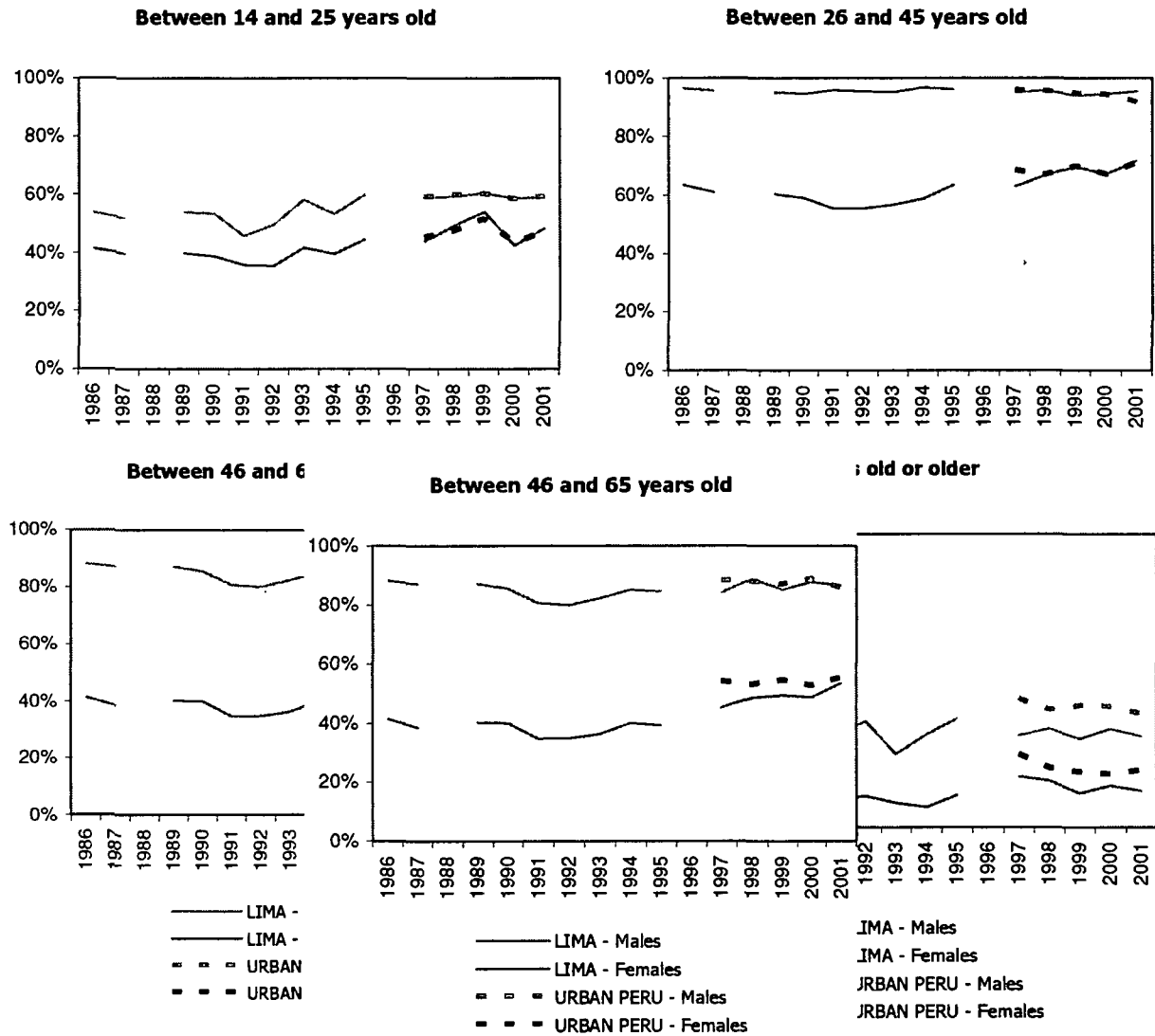
An analysis of gender differences in participation for different segments of the market will reveal interesting stylized facts. In terms of differences by marital status, the data reveals small gender gaps in participation among singles but substantial gaps among the married. For females, there are almost no differences between those who are single and their married counterparts. For males, on the other hand, the differences are noticeable. The participation rate among single males is slightly above 60% while the corresponding rate among the married is around 90%.

Graphs 3a and 3b
LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Participation Rate by Gender and Marital Status



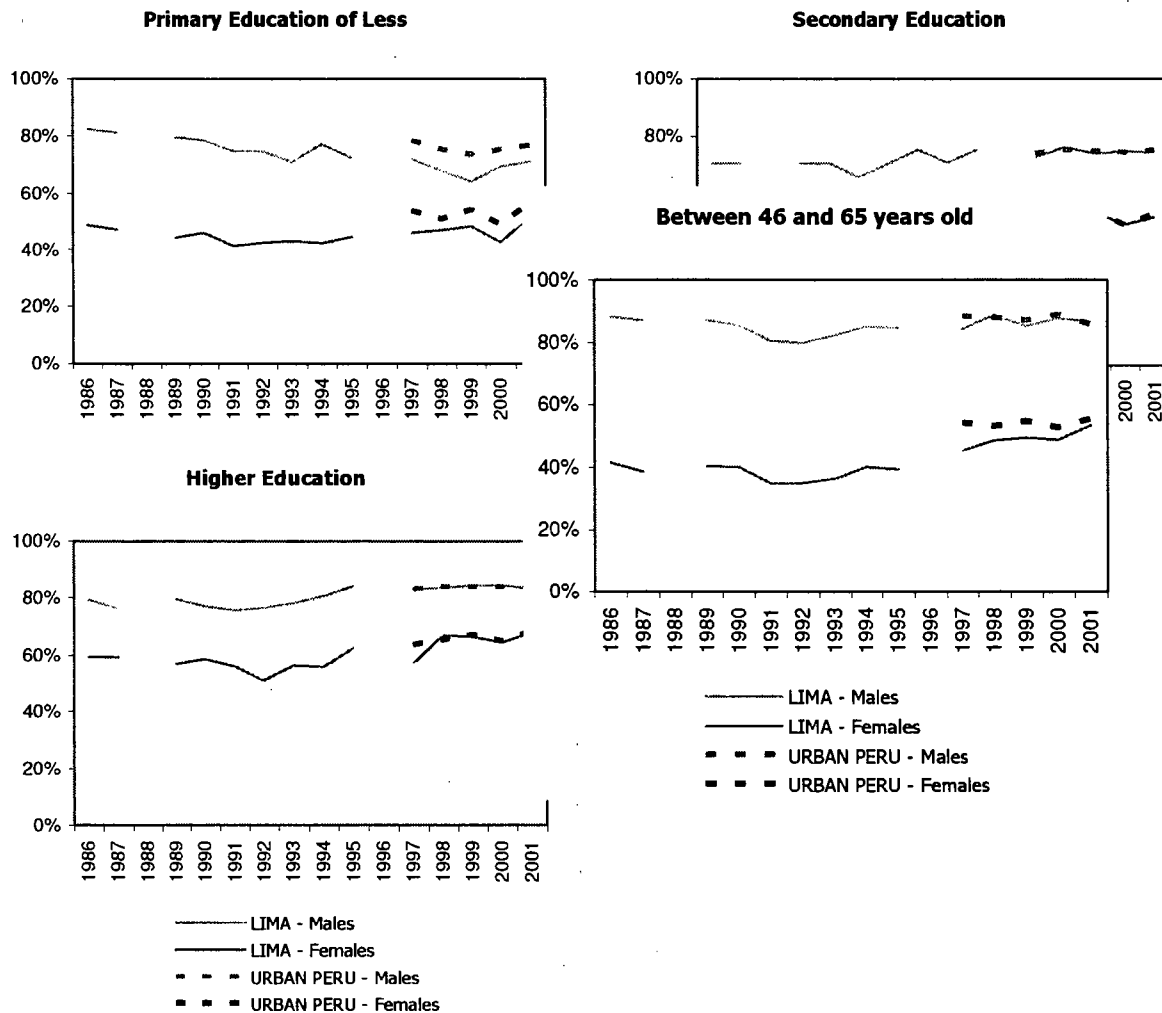
An analysis of participation by age also reveals interesting differences. As expected the data reveals differences in participation rates over the life cycle. The age group with the highest participation is the one that comprises individuals between 26 and 45, with participation close to 100% for males and 70% for females. The highest gender gap in participation is found among those individuals between 46 and 55 years old, but these differences have been decreasing during the period of analysis, due to an increase in female participation (rather than a decrease in male participation).

Graphs 4a, 4b, 4c and 4d
LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Participation Rates by Gender and Age



There are also differences in participation gaps by educational attainment. The gap found among those with only high school is smaller than the gaps at the other two groups. The gap among those with elementary education or less has been decreasing during the last fifteen years in Lima, but remained roughly constant during the last five years in urban Peru.

Graphs 5a, 5b and 5c
LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Participation Rate by Gender and Educational Attainment



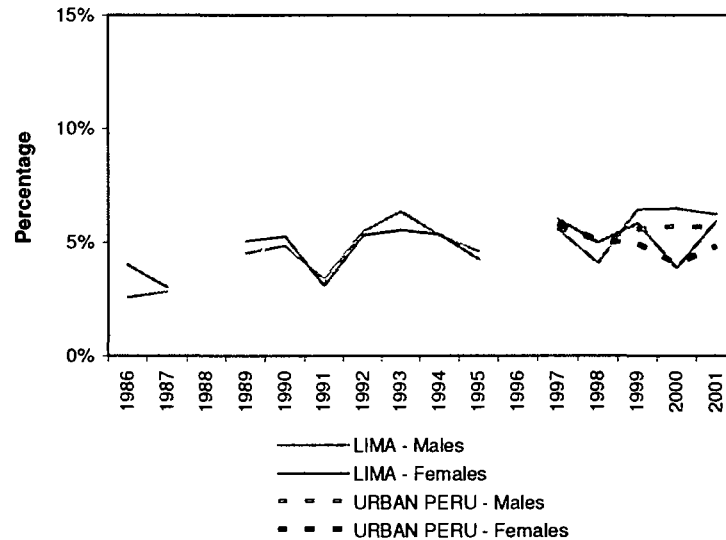
3. Employment

a. (Un)Employment Rates

The unemployment rate does not show enormous gender differences during the period of analysis, neither in Lima nor in Urban Peru. The only year for which there are noteworthy differences is 2000, when unemployment rates for males were 2 points above that of females, both in Lima and nationally.

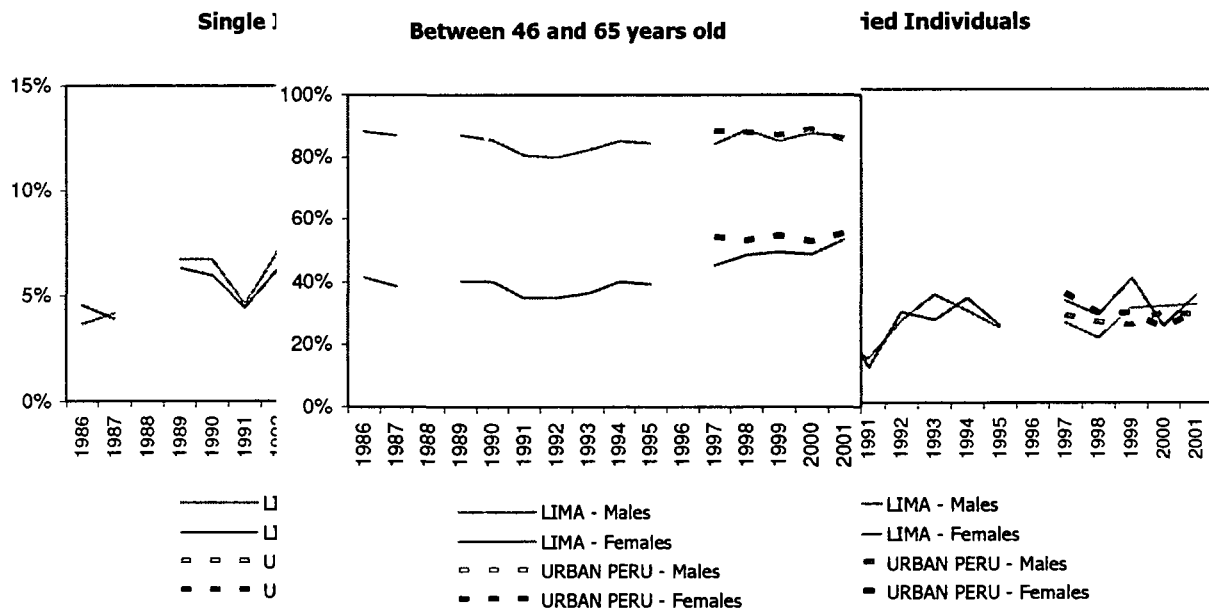
The measure of unemployment that we are computing for this section is the one that comes from dividing the number of unemployed economically active individuals by the number of working age individuals. Hence, this unemployment rate incorporates participation effects. Its evolution is shown next.

LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Unemployment Rate by Gender



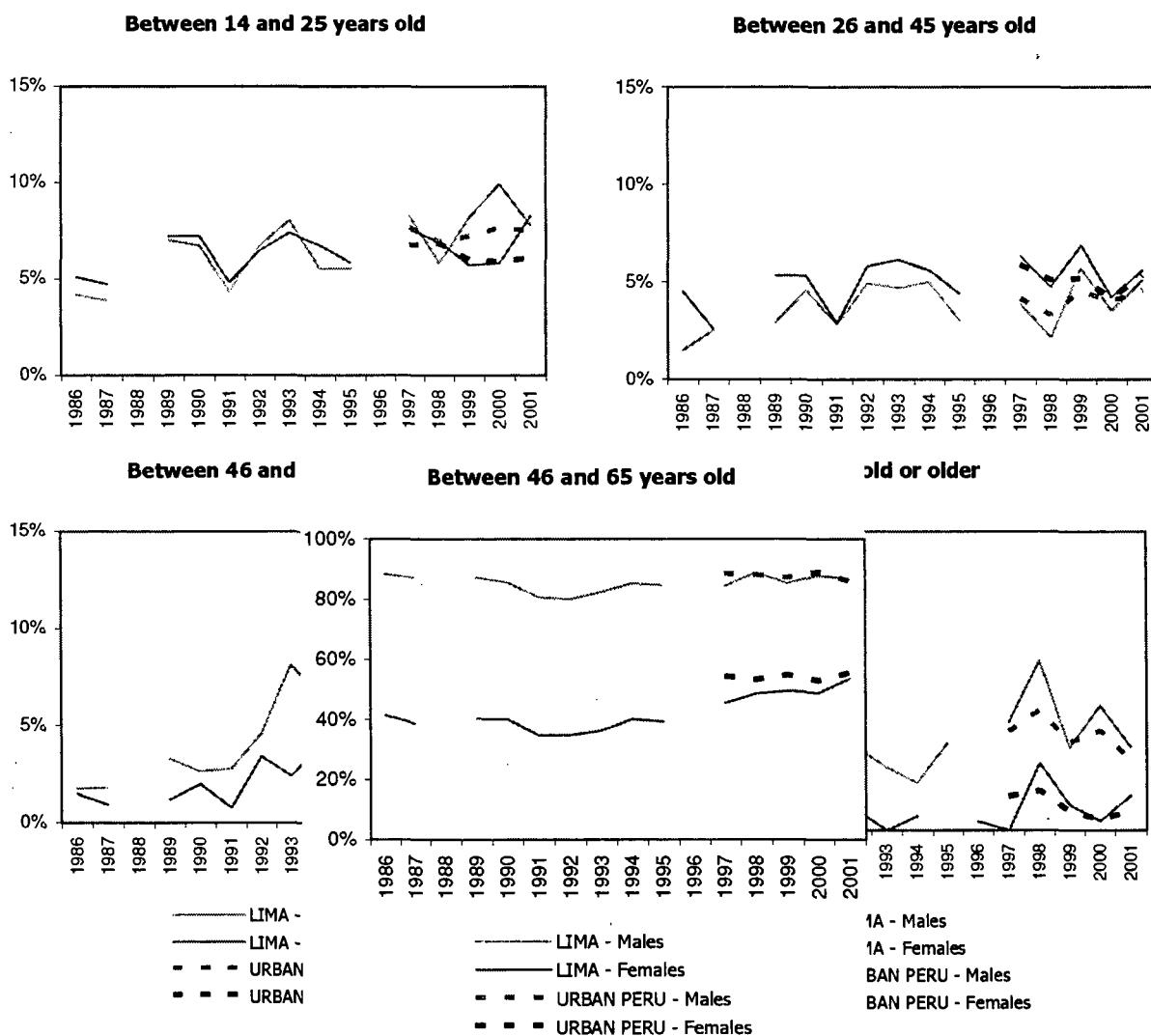
On average, unemployment rates among single individuals were slightly above the corresponding rates for the married. Looking at gender differences, the unemployment rate among single females differ from that of single males the most in year 2000 (almost 4 base points), being the unemployment for males higher. Among the married, the gender differences in unemployment fluctuated, favoring females and males alternatively.

Graph 7a and 7b
LIMA 1986-2001 and URBAN PERU 1997-2001



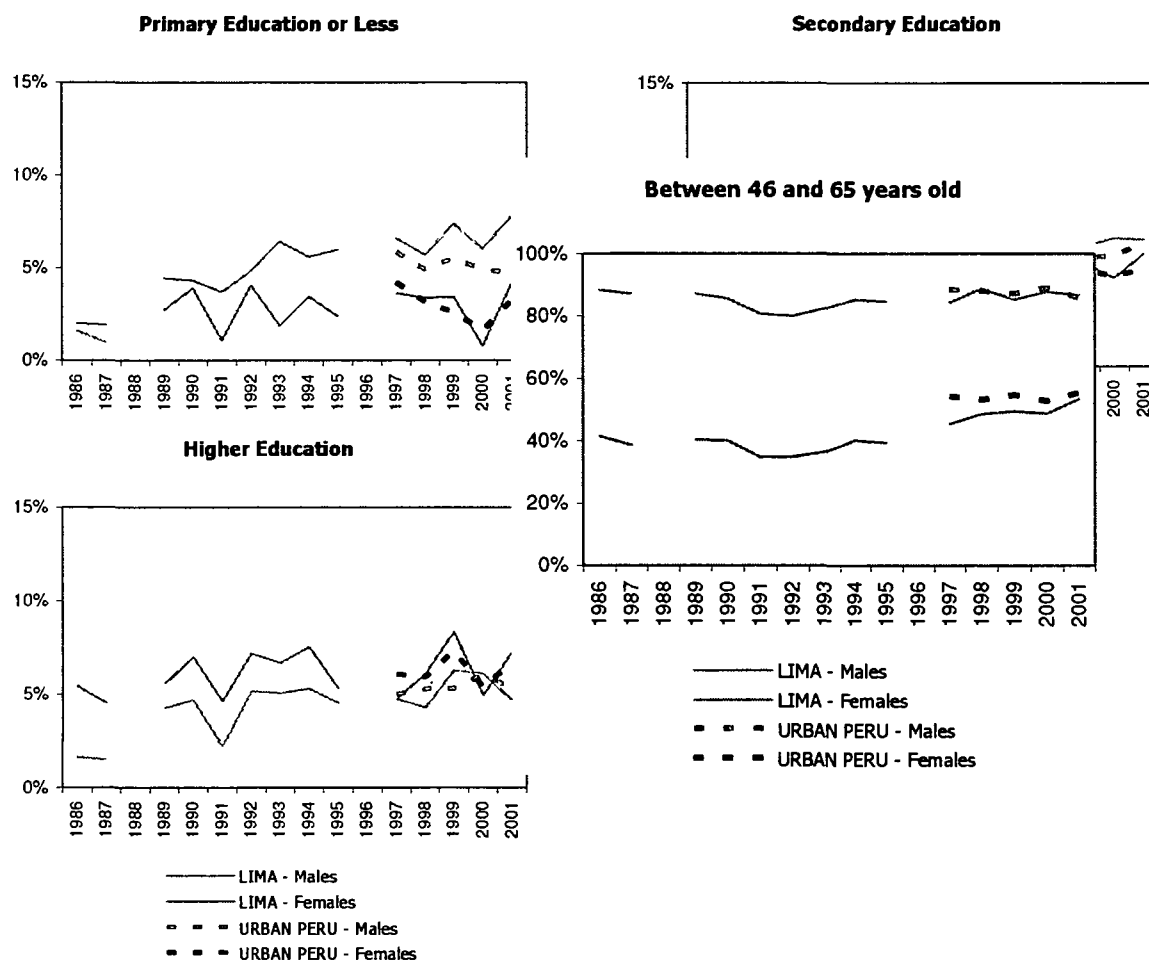
There are interesting gender differences in unemployment that vary increasingly with age. The lowest age group (14 to 25 years old) shows almost no gender differences. The two oldest groups (46 to 65 and 66 and older) show higher unemployment rates for males, differing from that of females in as much as 5%.

Graph 8a, 8b, 8c y 8d
LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Unemployment Rate by Gender and Age



High school graduates do not show important gender disparities in unemployment, but within the primary education and the higher education groups, different patterns are observed. Among the primary educated individuals, the unemployment rate for males is above that of for females in Lima and that difference has been increasing during the period of analysis. Among the highly educated individuals the unemployment rate for females has been above that of for males in as much as 3%, but the differences seem to be reducing.

Graphs 9a, 9b and 9c
LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Unemployment Rate by Gender and Educational Attainment



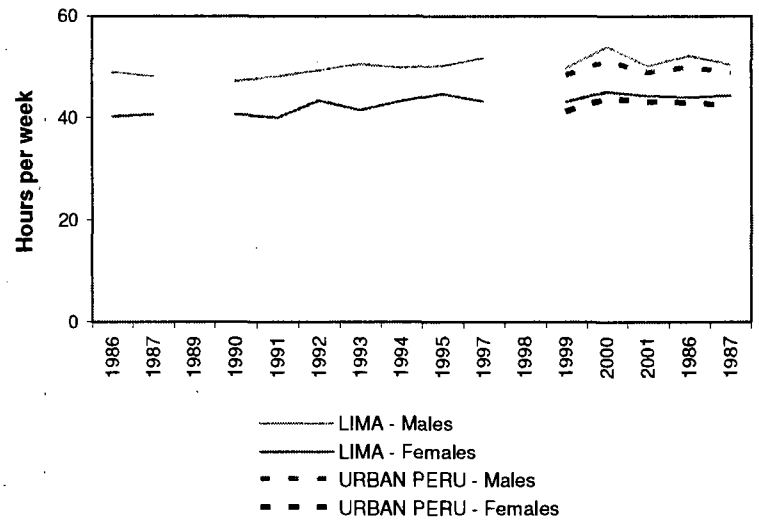
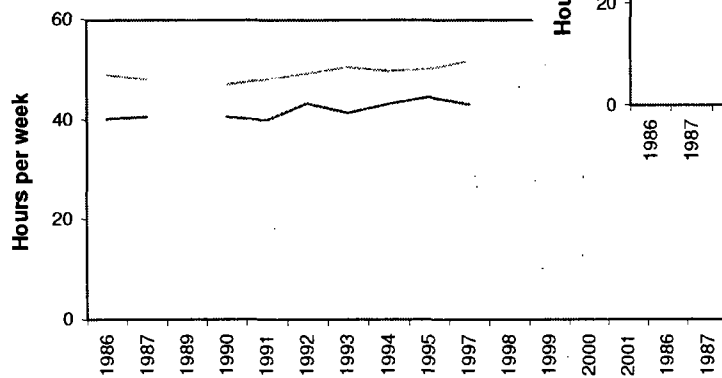
b. Hours Worked

An important change in the supply side of the labor markets for the last fifteen years has been the increase in the number of hours worked. This happened for both, males and females, but the increase was higher among females. While by 1986 an average female in Lima worked 40.19 hours per week and an average male did it for 48.92 hours; by 2001 the average female and the average male offered 44.35 and 50.41 hours respectively. This represents an increase of 3.05% in the average number of hours supplied by males, but accompanied by an increase of 10.35% for females for the fifteen years under analysis. While the gender gap in number of hours worked in the Limenian market was 21.72% in 1986, that gap reduced to 13.66% by 2001. For the rest of urban Peru that gender gap is slightly higher (15.06% in 2001). On average, workers in the urban labor markets work less hours than their Limenian counterparts by approximately two hours per week.

Most of the gender gap in hours worked occurs among the married individuals, the 26-45 age group and the highly educated.

LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Hours Worked per Week by Gender

LIMA 1986-2001 and URBAN PERU
Evolution of Hours Worked per We



— LIMA - Males
 — LIMA - Females
 - - - URBAN PERU - Males
 - . - URBAN PERU - Females

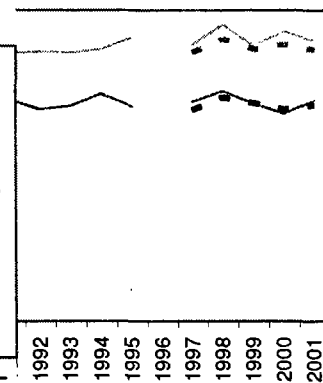
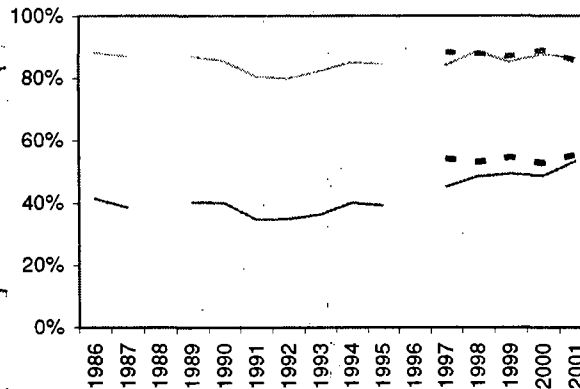
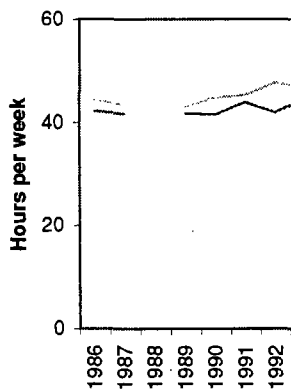
Graphs 11a and 11b

LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Hours Worked per Week by Gender and Marital Status

Single Individuals

Married Individuals

Between 46 and 65 years old



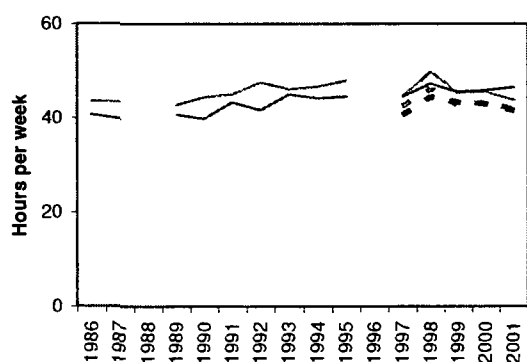
— LIMA - M
 — LIMA - F
 - - - URBAN
 - . - URBAN

— LIMA - Males
 — LIMA - Females
 - - - URBAN PERU - Males
 - . - URBAN PERU - Females

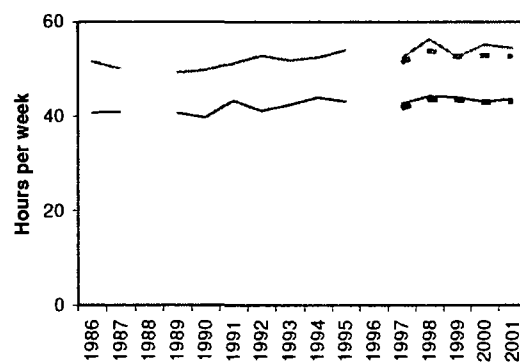
1A - Males
 1A - Females
 BAN PERU - Males
 BAN PERU - Females

Graphs 12a, 12b, 12c and 12d
LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Hours Worked per Week by Gender and Age

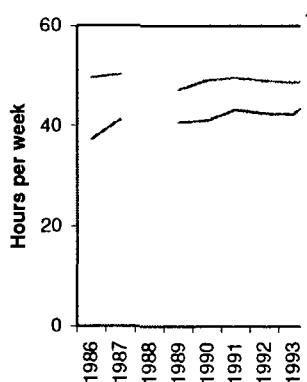
Between 14 and 25 years old



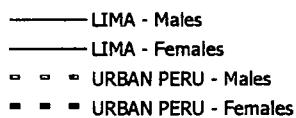
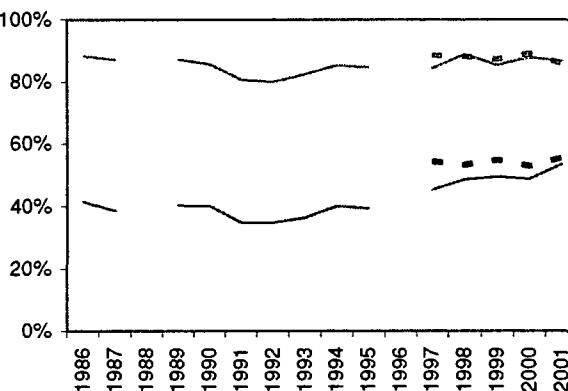
Between 26 and 45 years old



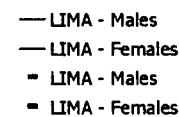
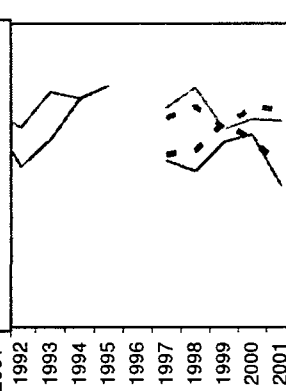
Between 46 and 65 years old



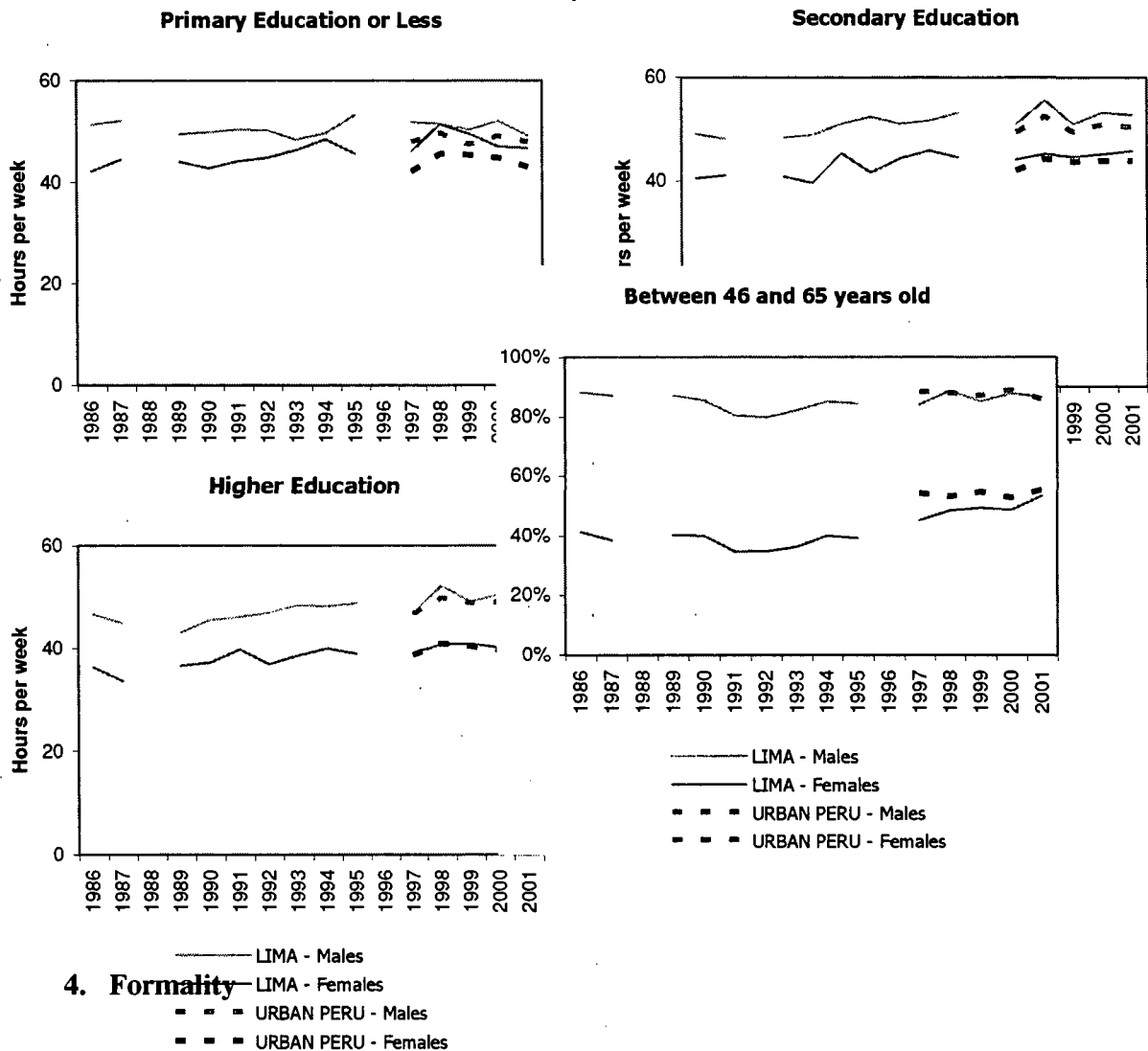
Between 46 and 65 years old



65 years old or older



Graph 13a, 13b and 13c
LIMA 1986-2001 and URBAN PERU 1997-2001



4. Formality

Our analysis of employment (or unemployment) has to be complemented with an analysis of the quality of the jobs that males and females had during these years. One indirect measure of quality is the formality. For that purpose we will combine the analysis of three different measures.

The first measure (A) considers a worker as formal if she/he works in the public administration or the armed forces, if they are unionized, or registered at the public social security system. Unpaid family workers are not considered formal workers.

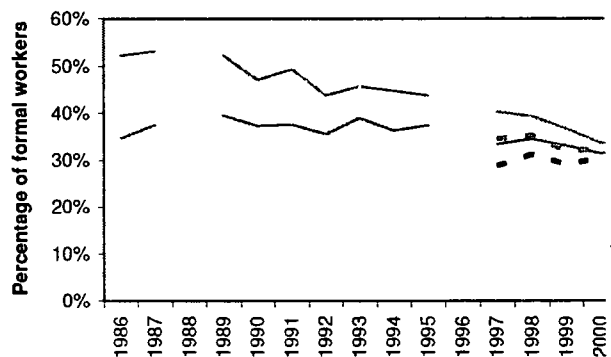
The second measure (B) of formality is similar to the previous but includes in the formal sector all those workers with any kind of health insurance.

The third measure (C) expands the notion of the first one to consider short-term and long-term contracted individuals as formal workers.

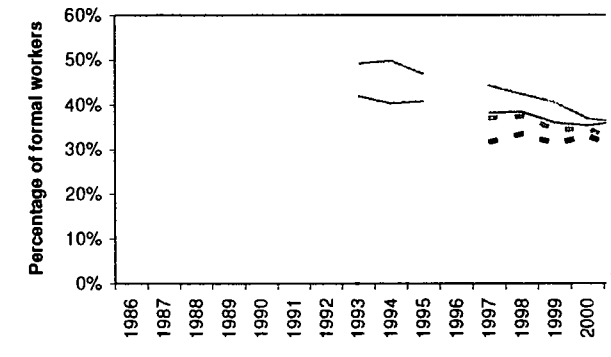
Finally, we combined these three possible definitions into one (ABC).

The information necessary to compute these measures is under analysis, for that reason some of the measures are shown below.

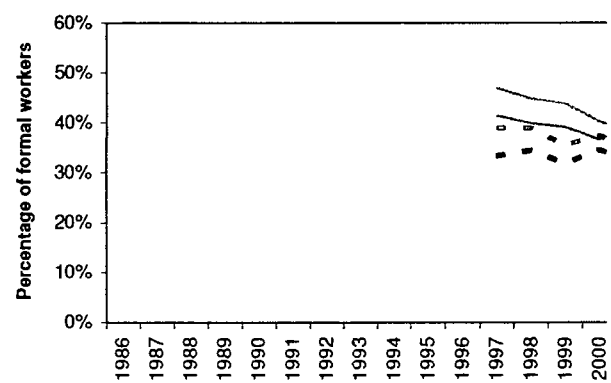
**LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Formality (A) by Gender**



**LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Formality (B) by Gender**

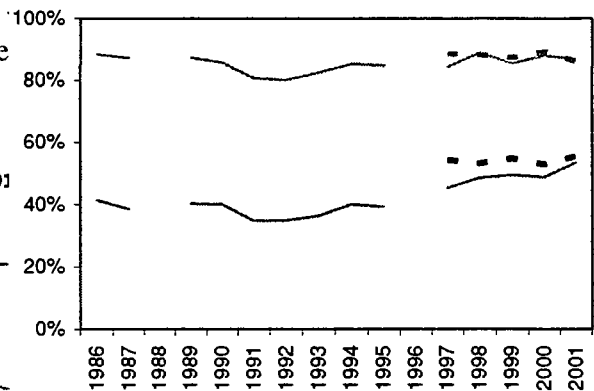


**LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Formality (C) by Gender**

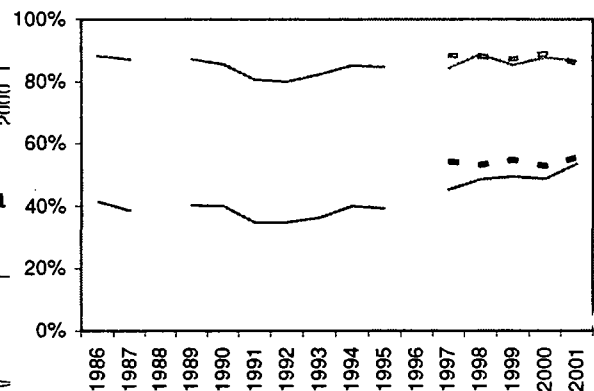


— LIMA - Males
— LIMA - Females
□ □ □ URBAN PERU - Males
■ ■ ■ URBAN PERU - Females

Between 46 and 65 years old

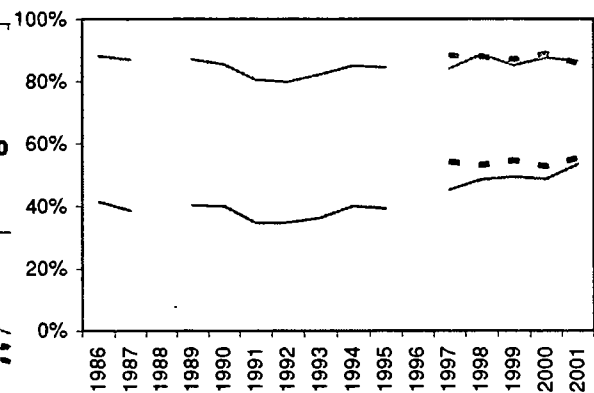


Between 46 and 65 years old

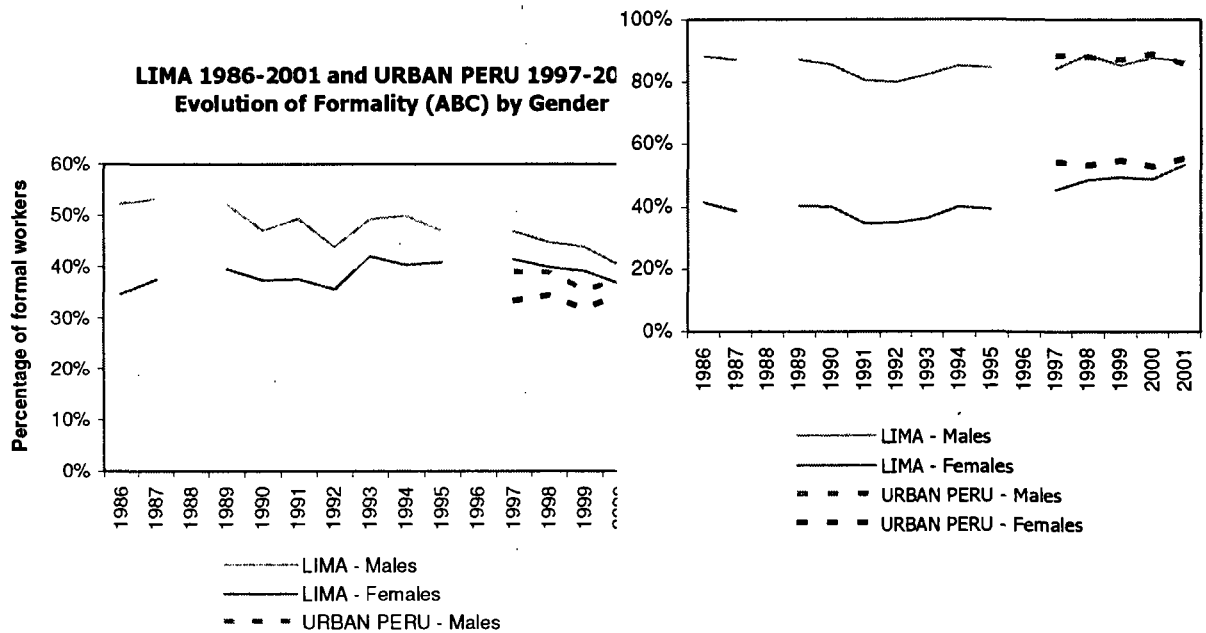


— LIMA - Males

Between 46 and 65 years old



— LIMA - Males
— LIMA - Females
□ □ □ URBAN PERU - Males
■ ■ ■ URBAN PERU - Females

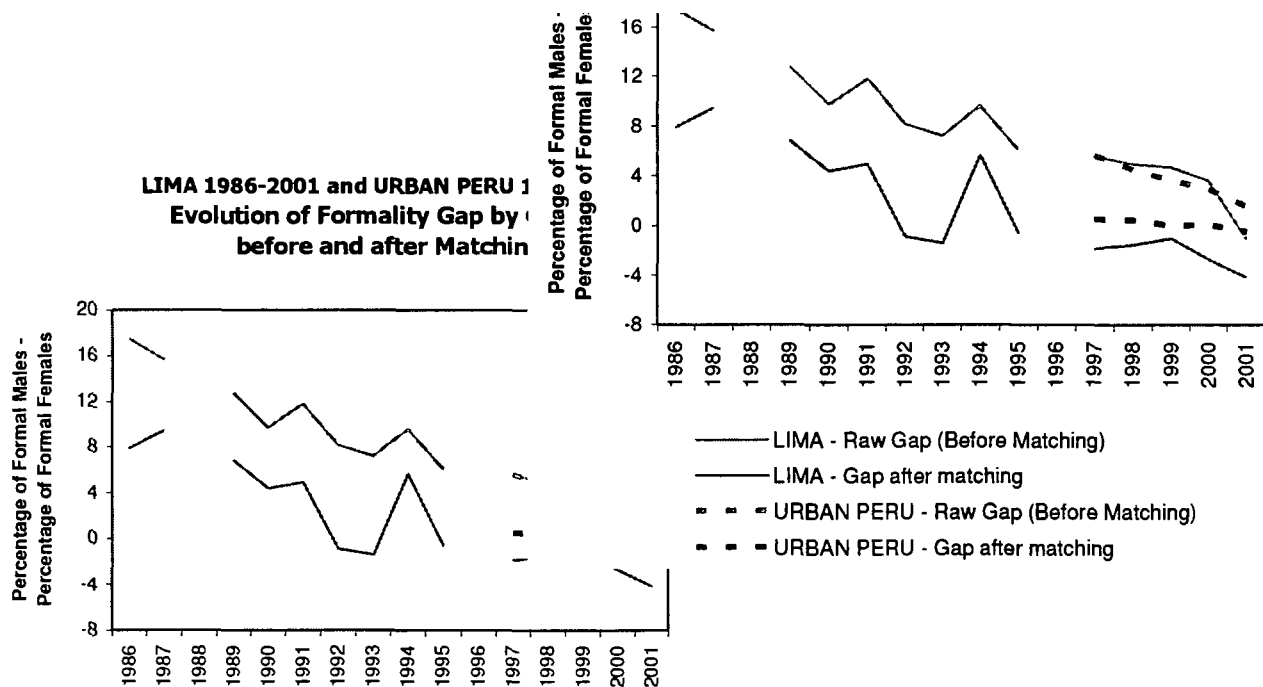


All the measures used for this analysis coincide at pointing out that the gender differences in formality that prevailed by the mid-eighties are almost non-existent by year 2001, both for Lima and nationally. The statistics show an important decrease in formality for male workers and a slight increase in formality for females, as a result, the gap gets smaller. If we relate quality of the jobs with their degree of formality, we see a deterioration of the jobs during the last fifteen years, affecting disproportionately more males than females.

Following Ñopo(2003) we can ask for the counterfactual question “To what extent the gender differences in formality rates can be explained by gender differences in observable human capital characteristics?” or more specifically “What would be the gender formality gap if males and females had the same distribution of observable human capital characteristics?” For that purpose, we applied matching on characteristics between the groups of males and females.⁹ In such a way, every single observation of a female was matched to an observation of a male with exactly the same observable characteristics.¹⁰ The resulting sample (the “After Matching” sample) is the one that allows us to answer the counterfactual question. These results are shown next.

⁹ The econometric implementation of these counterfactual situations (for this sections and the next two) can also be done with regressions instead of matching; the results would not differ substantially. As Angrist (98) pointed out: “Differences between regression and matching strategies for the estimation of treatment effects are partly cosmetic. While matching methods are often more transparent to non-specialists, regression estimation is more straightforward to implement when covariates are continuously distributed...” (op. cit p.255). For the sake of methodological consistency within the paper, and considering the bounds on the extension of it, we focus on the matching results.

¹⁰ The instruments for such observable characteristics were age, schooling, marital status for Lima and Urban Perú and geographical context only for Lima.



Based on the matching estimators, we can report that the gender differences in formality rates would be reduced in two base points if males and females shared the same distribution of observable human capital characteristics. Interestingly, this counterfactual exercise also reveals that the formality rates for females would have been above than that for males for the last five years in our sample. It is no longer the case that the informal sectors are female-dominated. Next, we will turn to the analysis of the occupational structures of the labor force and report its evolution.

5. Occupations

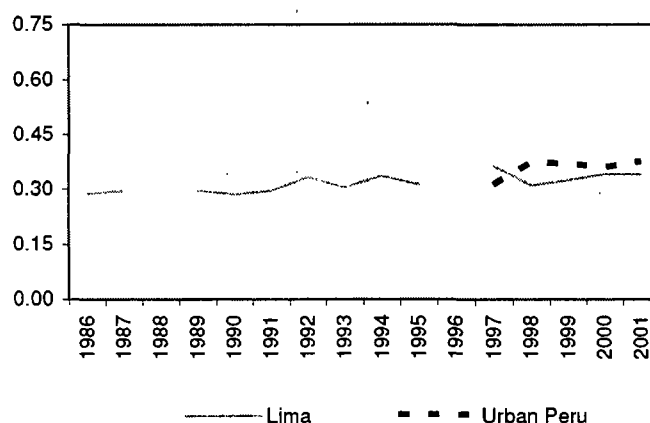
Almost all labor markets show gender differences in occupations. This gender occupational segregation is, to some extent understandable, as there are occupations that require physical force or particular manual capabilities at which; generally, either males or females are better. With the advent of technology these gender specific requirements have been falling, and so, many labor markets have shown a reduction in occupational segregation. This has not been the case for Peru. The gender occupational segregation, measured by the Duncan Index (Duncan(1955)) increased slightly for Lima during the last fifteen years and for Urban Peru during the last five years. Also, the prevalence of unpaid family workers is still higher among females than among males.

a. Analyzing the Market as a Whole: The Duncan Index.

The Duncan index, the most commonly used measure of occupational segregation, can be interpreted as the percentage of females that would have to switch jobs (from those in female-dominated occupations to others male-dominated) in order to achieve a labor force with no segregation. An index close to 0 denotes the existence of no segregation in the labor force; an index close to 1 denotes the existence of high segregation. According to

that, the gender occupational segregation increased in Lima for the last fifteen years and in Peru for the last five. The segregation in Urban Peru is slightly higher than the one observed in Lima.

LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Duncan Index



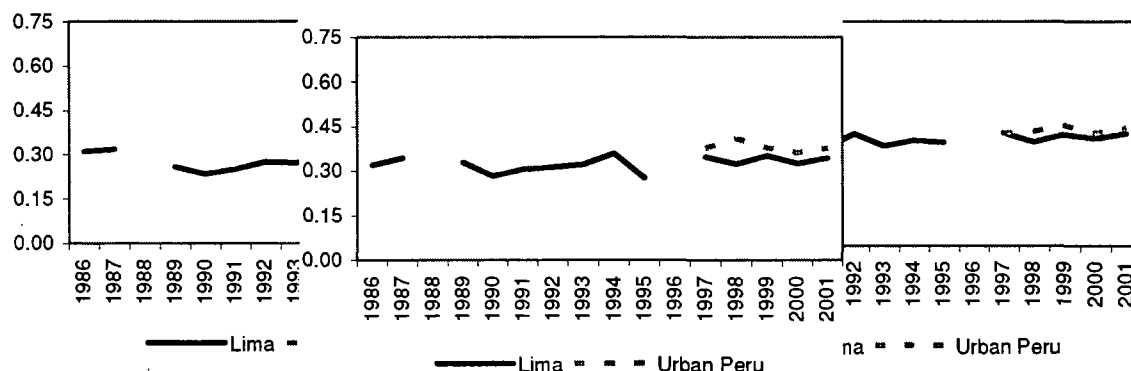
The results also suggest that these differences in occupations do not vary by marital status. Married and single individuals show similar levels (and evolution) of occupational segregation. The age group between 26 and 45 shows the lowest occupational segregation. The oldest group (the one that comprises individuals who work after the retirement age) shows the highest levels and the highest volatility of segregation. The segregation varies interestingly with educational attainment. It is high and volatile among non-educated workers and reduces as the individuals attain higher degrees. Among those with higher education (college degree or above) the Duncan index has been below 0.2 for the last ten years. The distinction between public and private sector also deserves special attention. During the late eighties the occupational segregation by gender in both segments of the market was roughly the same.

Granh. 20a and 20b

Single Indi

Between 14 and 25 years old

I Individuals

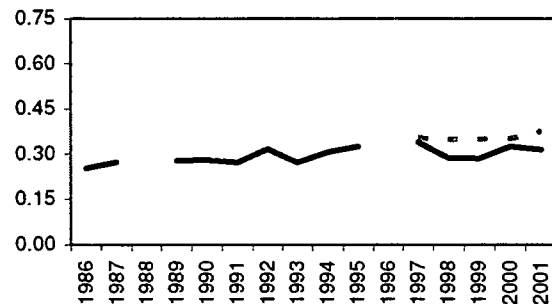
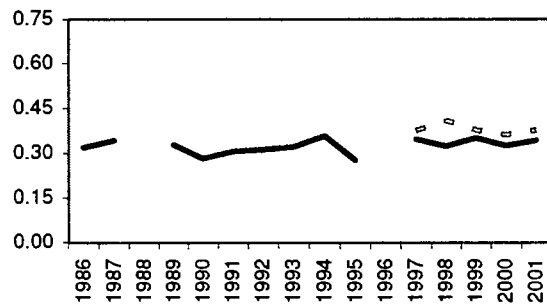


Graphs 21a, 21b, 21c and 21d

Between 14 and 25 years old

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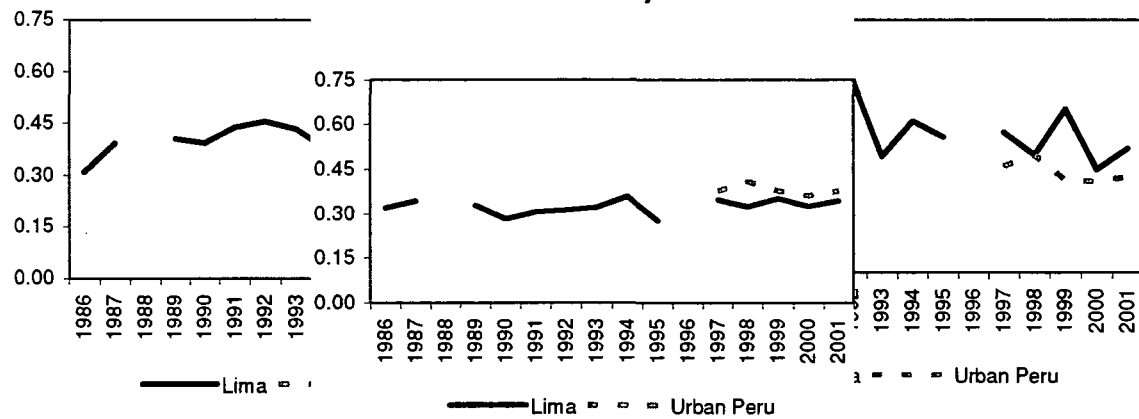
Between 26 and 45 years old



Between 46 and 65 years old

66 years old or older

Between 14 and 25 years old



— Lima

— Lima

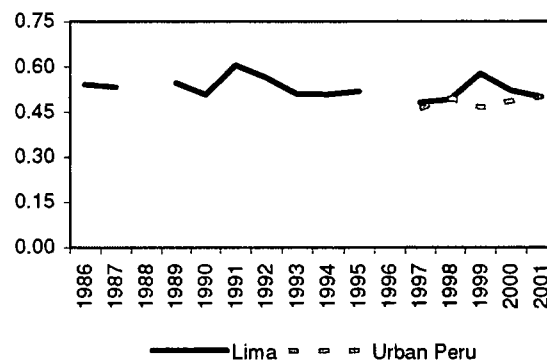
— Urban Peru

Graphs 22a, 22b and 22c

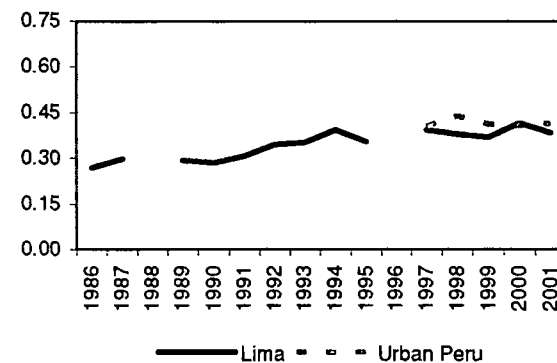
Primary Education or Less

UR
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Secondary Education

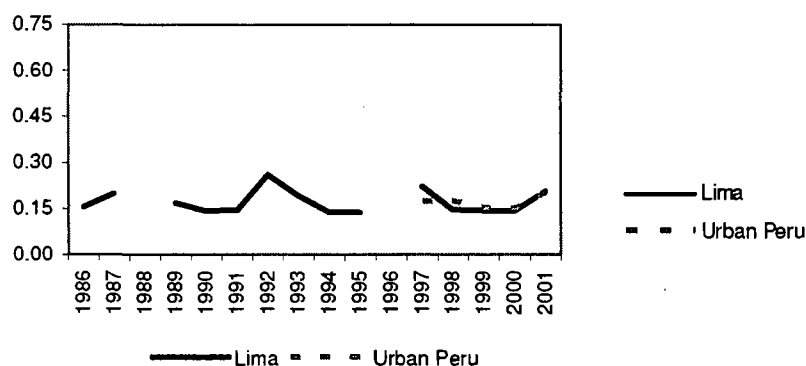


— Lima



— Lima

Higher Education



In terms of firms' activities, the sectors for which the occupational segregation is the lowest are manufacture of final goods and trade, restaurants and hotels. On the other hand, the segregation in the construction sector has been the highest of the labor markets.¹¹ Analyzing the occupational segregation by firm size also reveals interesting dynamics. The occupational segregation among the self-employed (mono-personal firms) has been higher than the segregation in bigger firms, especially after 1994. The segregation in medium sized firms (between 6 and 49 workers) has declined and the segregation in the other segments of the market remained roughly constant, with more volatility among the bigger firms.

Graphs 23a and 23b

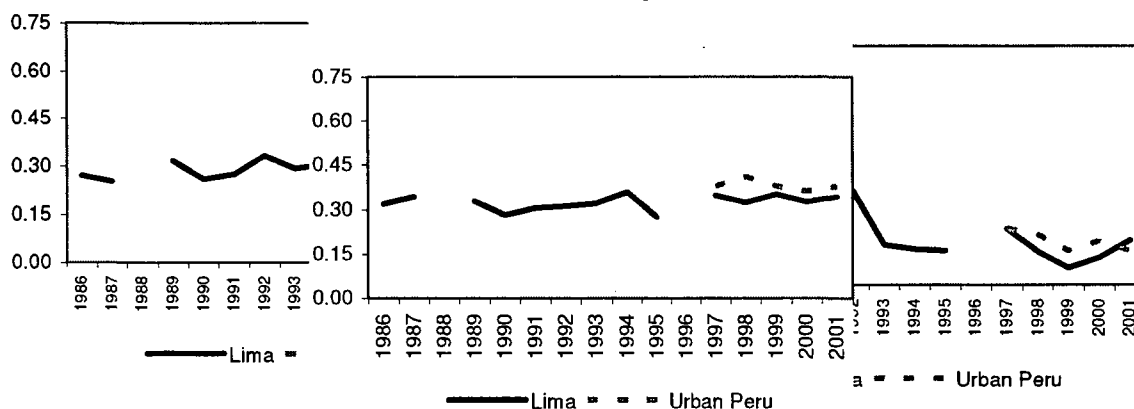
URBAN PERU 1997-2001

Non-Public Workers

icar

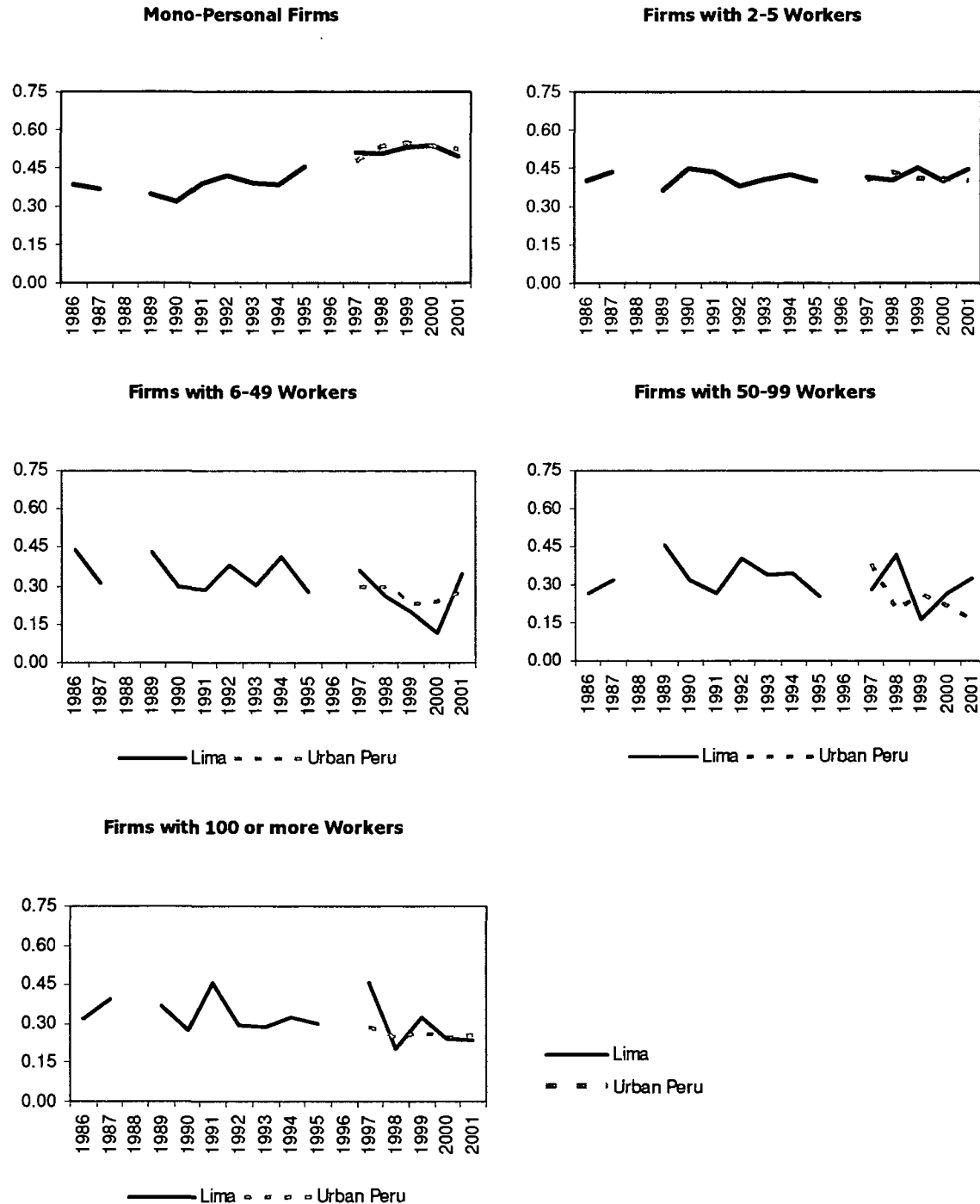
Public Workers

Between 14 and 25 years old



¹¹ The results corresponding to occupational segregation by firm activities are not reported, but they are available at request from the authors.

Graphs 24a, 24b, 24c, 24d and 24e
LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Duncan Index by Firm Size

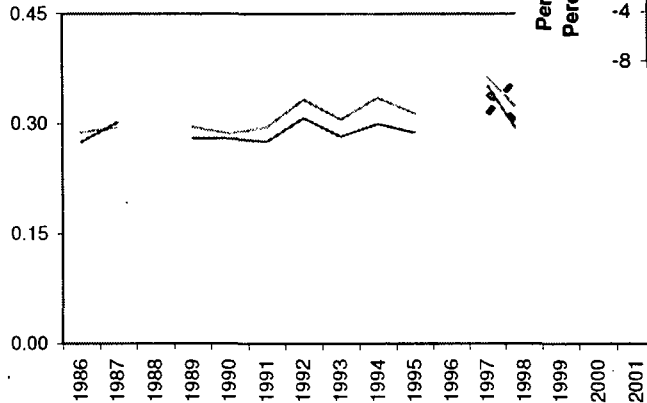


A counterfactual exercise, analogous to the one performed previously for the formality gender gap, can be performed at this point. For that purpose, we may ask “What would be the occupational segregation in case males and females exhibit the same distribution of

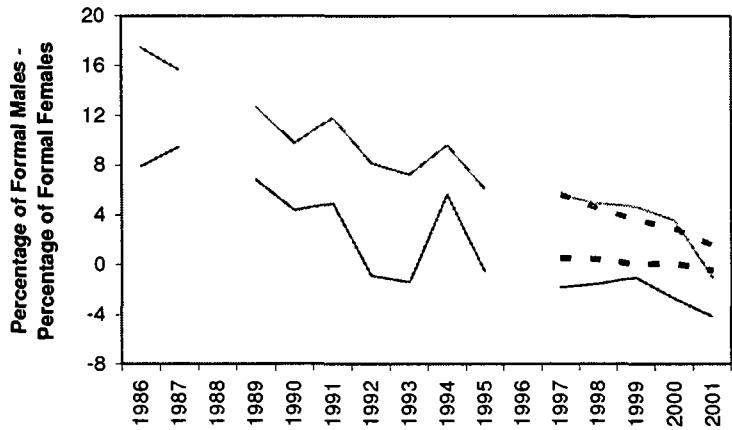
Evolution of Formality Gap by Gender before and after Matching

observable human capital characteristic that question. It is expected a reduction in occupational segregation, measured by

LIMA 1986-2001 and URBAN PERU 1997-2001
Duncan Index Before and After Matching



— LIMA - Before Matching
— LIMA - After Matching
- - - URBAN PERU - Before Matching
- - - URBAN PERU - After Matching

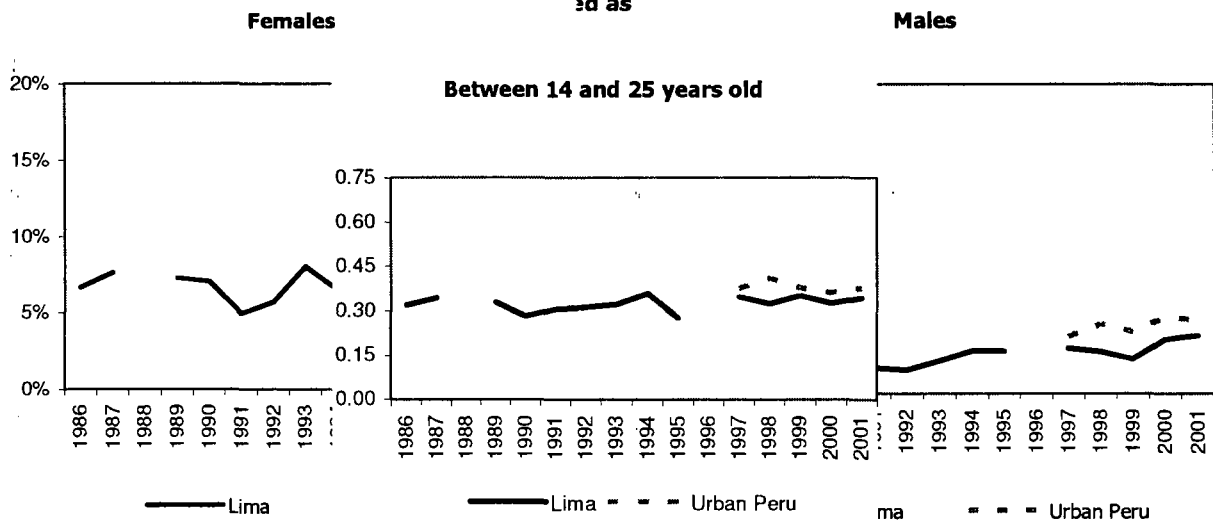


— LIMA - Raw Gap (Before Matching)
— LIMA - Gap after matching
- - - URBAN PERU - Raw Gap (Before Matching)
- - - URBAN PERU - Gap after matching

b. Unpaid Family Workers

Our analysis of occupations should be complemented by an analysis of the unpaid family workers, as this is a segment of the labor market with clear female prevalence. An analysis of the evolution of the proportion of females and males that fall into that category of workers reveals that female participation in that segment of the markets is almost twice as much as males'. Also, the segment reveals slight increases in participation (as proportion of the total employed labor force), especially for the last five years in Lima. In that case, almost one out of every eight females was considered as an unpaid family worker.

Graphs 26a and 26b
LIMA 1986-2001 and URBAN PERU 1997-2001
as



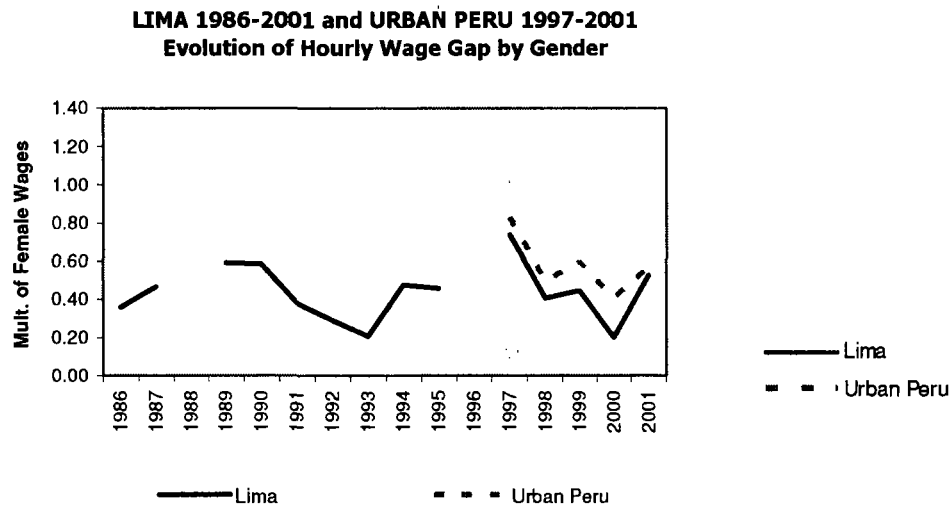
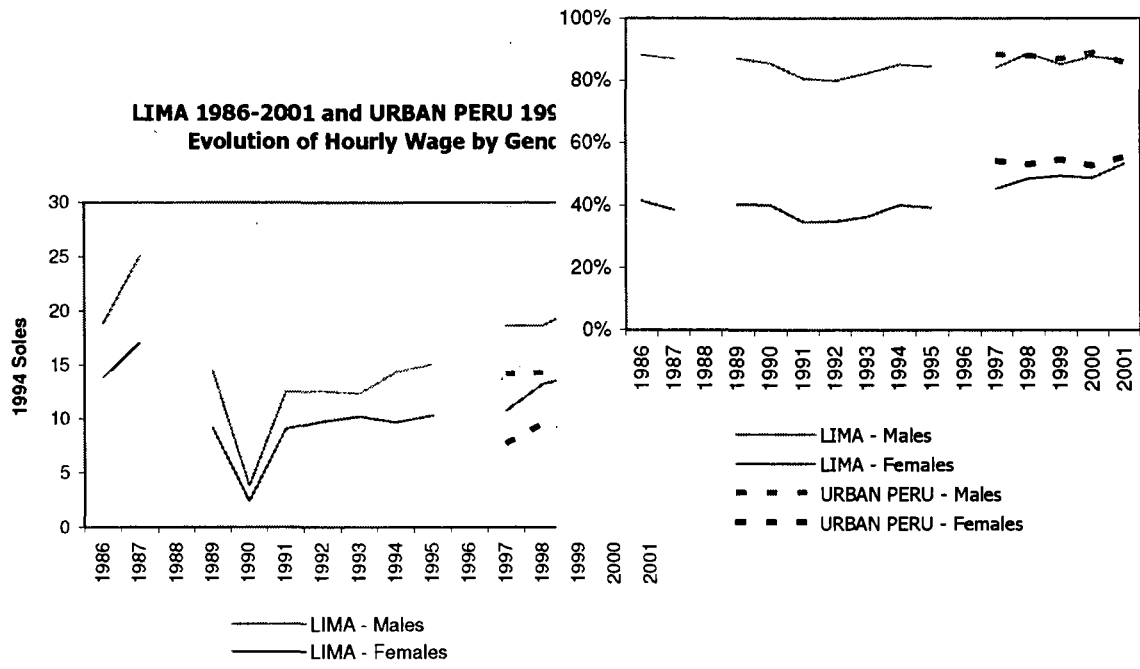
6. Wages

The last section of this diagnosis of the situation of females in the labor markets is devoted to wages. This is probably one of the most important outcomes that the workers get from their active participation in the labor markets, so deserves special attention. The last fifteen years have seen some changes in the gender differences in wages, with some cyclical movements and some other directed towards the reduction of gender differences. In this section we will explore three different measures of wages. First, closely aligned to the traditional literature, we analyze gender differences in hourly wages. Second, looking at a measure that combines the effects of hourly wages and number of hours worked, we analyze gender differences in average monthly earnings, both at the main and secondary occupations (without considering self-consumption and in-kind payments). Third, exploring a measure that incorporates labor market participation on top of hourly pay and hours worked, we analyze the total labor earnings.

For these three measures of labor market pay we will analyze the gender differences that arise from simple comparison of all males and females; and also we analyze a counterfactual situation in which males' and females' human capital characteristics are equally distributed. As pointed out by Ñopo (2003), the matching technique employed for the estimation of such counterfactual situations is equivalent to the traditional Blinder-Oaxaca decomposition, but only in the common support of the distributions of observable characteristics.

a. Average Hourly Wages

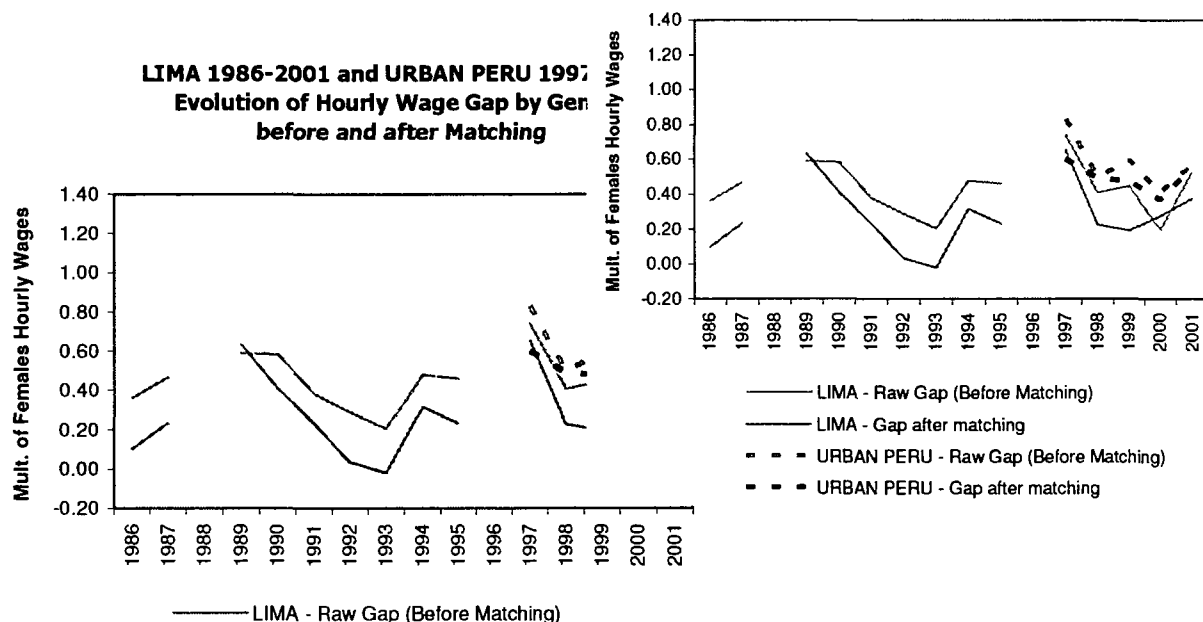
In order to explore gender gaps in hourly pay, let's explore the evolution of real wages over the period. After the hyperinflation of the late eighties, real wages drop dramatically. Those recovered slightly in the early nineties and remained roughly constant until the end of the decade. In term of gender wage gaps, there is an interesting cyclicity. After the periods of real wage recovery (1991-1993 and 1997-2000) the gender wage gap reaches minimum values (roughly 20% of average females' wages).



A first stylized fact to note on the evolution of the gender wage gap is its cyclicity. It reached peaks in the late-eighties and during the mid-nineties, reaching a minimum in 1993, right after the hyperinflation was controlled and the country started a (short) expansionary phase. The counterfactual question that could be posted at this stage is “What would be gender wage gap in Peru for that period in case males and females had the same distribution of observable human capital characteristics in every single year?” An answer to that question is provided with the next graph.

It reveals that the gender wage gap, which fluctuated around 45% during 1986-2001 for Metropolitan Lima and was slightly higher for Urban Peru during 1997-2001, would have been fluctuating around 25%. Less than one half of the gender wage gap can be explained by gender differences in human capital characteristics (age, schooling, marital status for Lima and Urban Peru and geographical context only for the case of Lima).

**LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Hourly Wage Gap by Gender
before and after Matching**

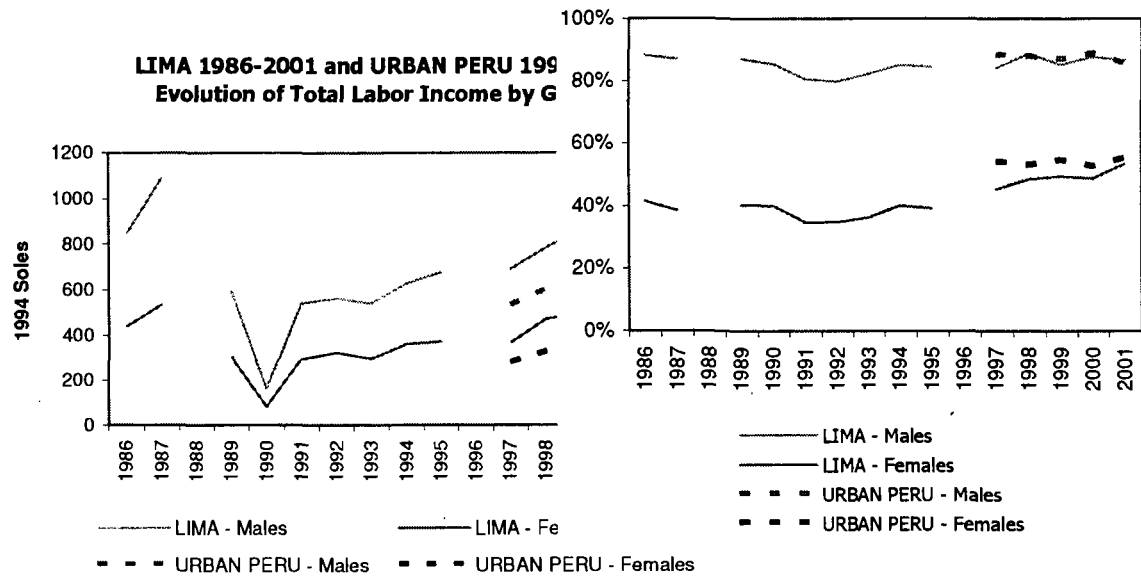


It is important to note that the surveys that we are using do not ask hourly wages to the individuals. That variable is computed from the information about monthly or weekly earnings and the number of hours worked, combining main and secondary activities. In that sense, the measure of labor earnings that we use in the next section does not require any arithmetic combination of different variables, leaving us with a measure of labor earnings that is expected to have smaller measurement errors.

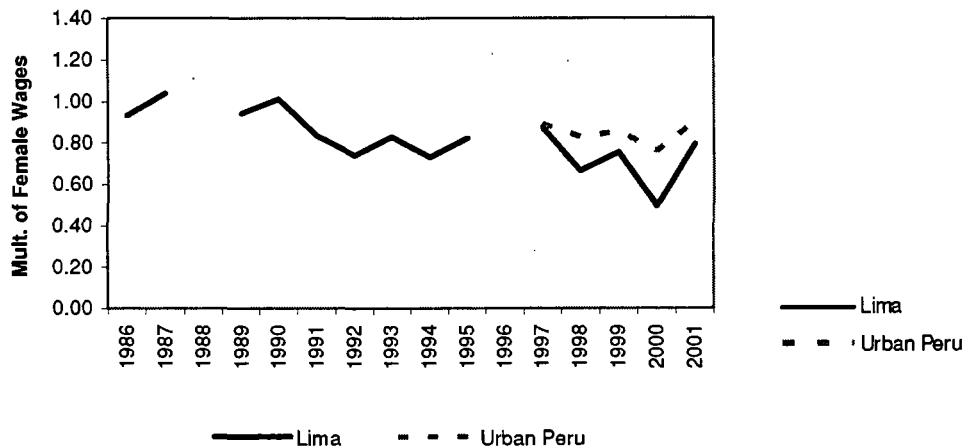
b. Average Monthly Labor Income

The evolution of average labor earnings is reported next. The recovery of real monthly earnings after the hyperinflation period seemed to be faster than the analogous recovery for hourly wages. This is explained by the increase in average number of hours worked per week. Then, the monthly earnings gender gap shows a decreasing evolution for the last fifteen years, with slight fluctuations. For the years in which the comparison is possible, the gender gap is smaller in Lima than in the rest of Urban Peru.

Between 46 and 65 years old



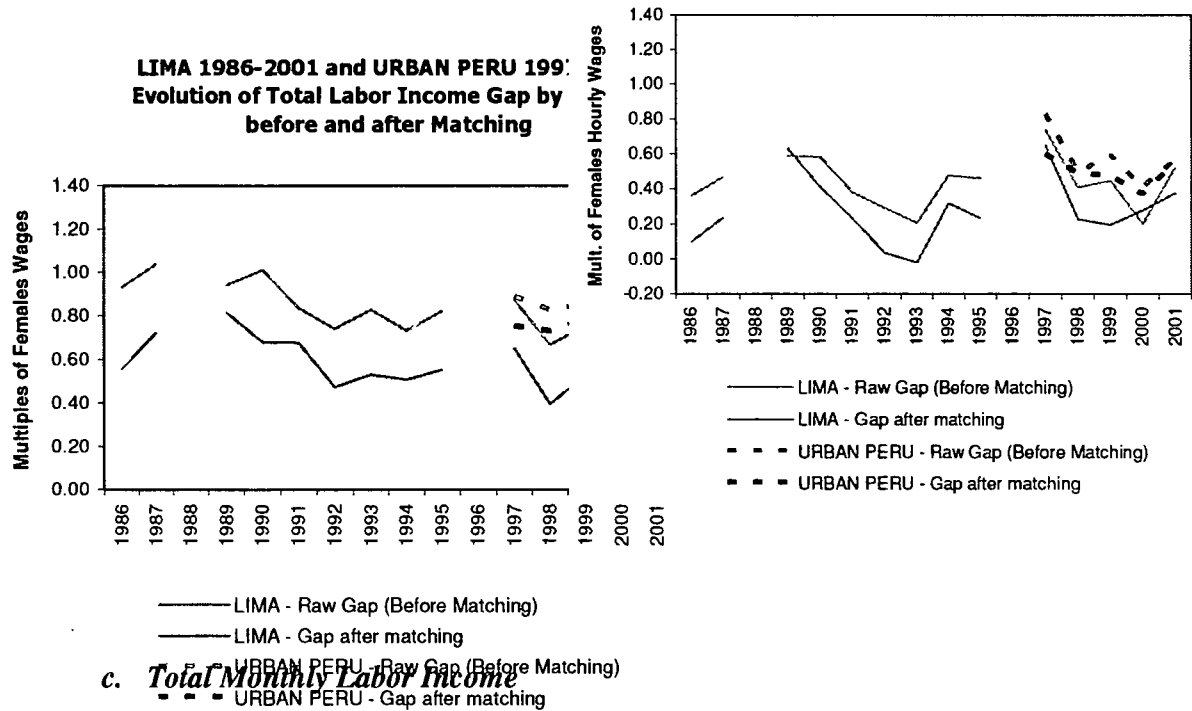
LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Total Labor Income Gap by Gender



Males, on average, work more hours per week than females, so the gender gap in monthly labor income is even bigger than the gender gap in hourly wages. There is a clear tendency towards a reduction of the gap. By the late eighties such gap in monthly labor earning was around 100%, by 2001 such gap reduced in almost 20 base points. The gap is slightly higher in Urban Peru than in Metropolitan Lima.

The counterfactual exercise that corresponds to the question “What would be the gender monthly earnings gap in case males and females exhibit the same distribution of observable human capital characteristics in the labor markets?” can be addressed here with the next graph. Based on these results we can report that the expected earnings gap in a hypothetical situation like the one outlined before would be 20 base points below the one actually observed. That is, it would have attained 80% during the late eighties and slightly less than 60% by the early 2000’s.

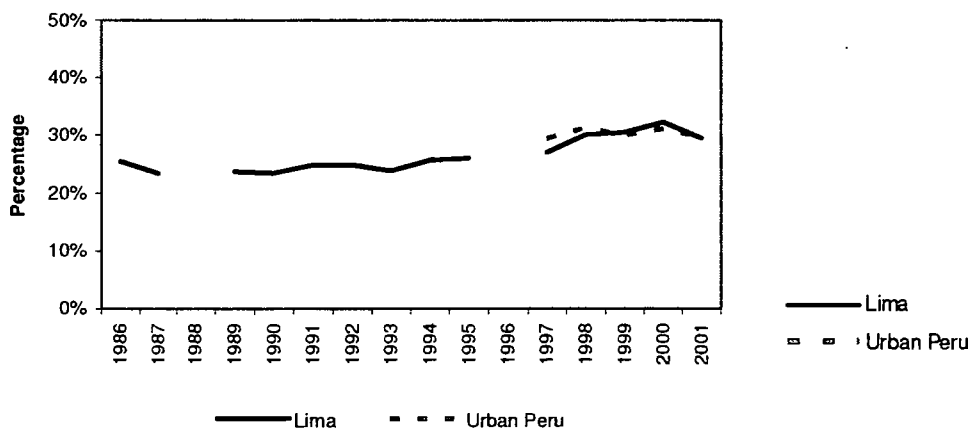
LIMA 1986-2001 and URBAN PERU 1997-2001
Evolution of Hourly Wage Gap by Gender
before and after Matching



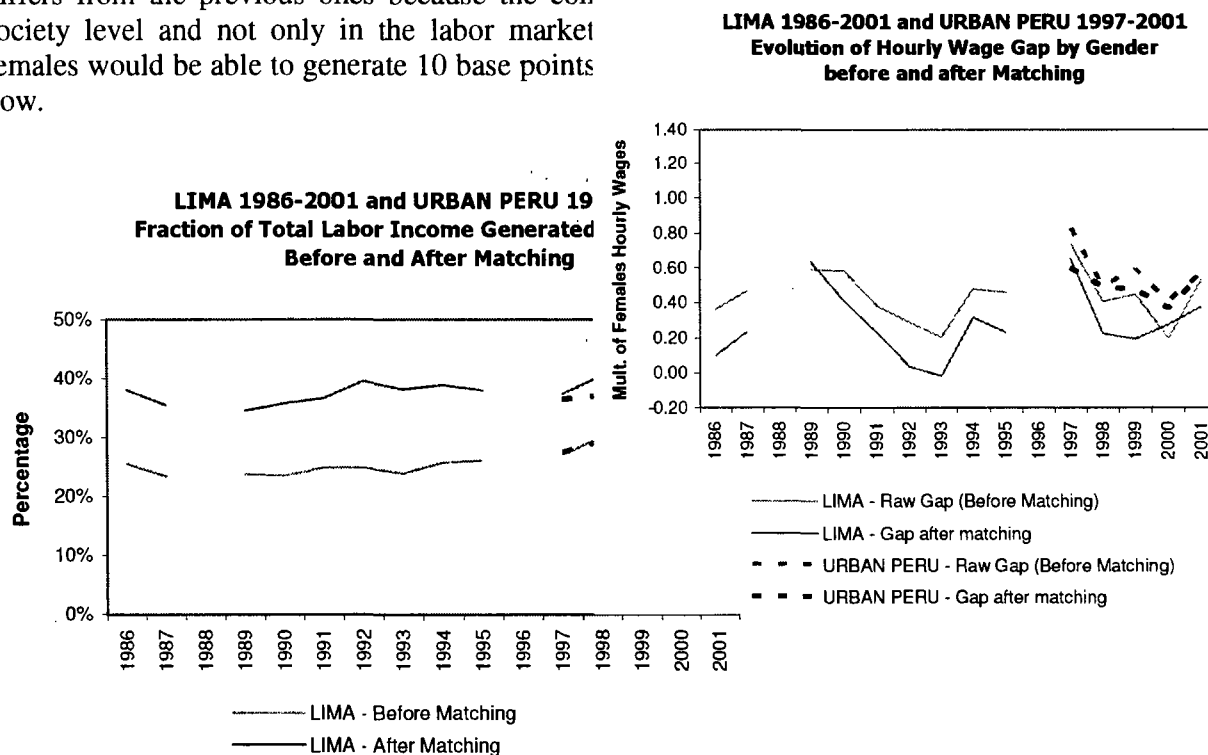
The third measure of labor earnings that we would like to report in this section is one that incorporates not only effects of hourly wages and number of hours worked, but also employment effects. For that purpose we measure the percentage of total labor income generated for the Peruvian (or Limenian) labor force that can be accounted as generated by females. In such a way, female participation in the generation of income in the society increased remarkably during the period. This is the result of a combination of the increase in participation in the labor markets, a reduction in unemployment, an increase in the number of hours worked and the fluctuations of the hourly wage pay.

While by the end of the eighties females were responsible for the generation of approximately 20% of total labor income of the population, by the early 2000's they were responsible for almost 30%, as we can see next.

LIMA 1986-2001 and URBAN PERU 1997-2001
Fraction of Total Labor Income Generated by Females



The next graph shows the evolution of the fraction of total labor income generated by females under another hypothetical situation: one in which males and females in the population share the same distribution of human capital characteristics. This counterfactual differs from the previous ones because the comparison of characteristics is made at the society level and not only in the labor market. Under this counterfactual, females would be able to generate 10 base points now.



The data show that we are still far away from the ideal situation of seeing females generating just as much as males in the labor markets (meaning, the 50%). But the tendency points towards that goal. Under the counterfactual situation outlined above, females would be able to generate 40% of total labor income now.

7. Trying to Detect Discrimination in Hiring Practices.

In Moreno et al. (2003), a group of researchers at GRADE designed a natural experiment, inspired by the audit studies methodology, in order to detect discriminatory behaviors on potential employers. Scrutinizing the job openings posted at the ProEmpleo Network of the Peruvian Ministry of Labor, the study compared the performance of job applicants with similar credentials (education, migratory condition, unemployment spell, occupational experience and marital status among others). This study focused on the job opening posted at the intermediation center between September 2, 2002 and March 2, 2003 in three particular occupations: secretaries, salespersons and (administrative and accountant) assistants.

The study reports two interesting (and to a great extent, surprising) findings. First, the employers show no evidence of making their decisions with a “taste for discrimination” a-la-Becker. That is, when they evaluate individuals with comparable human capital

credentials, the racial and gender characteristics of the applicants do not play a role in their decision-making. There is only a slight evidence of female employers favoring female applicants (reverse/positive discrimination). Second, when males and females face the job search process, they do it with different expectations. To the question, "How much would you like to earn at the job for which you are applying?" Females replied with aimed wages that were between 7% and 8% below than that for comparable males. This wage penalty, which is the result of the estimation of a Mincer-type equation with controls for the relevant human capital characteristics,¹² is statistically significant.

The second finding of this study motivated us to explore deeper the role of expectations in the labor markets. For that purpose we re-interviewed the applicants and employers who participated in the study of Moreno et al. (2003). In this second round we asked them explicitly regarding their perceptions about the advantages/disadvantages of males and females at the workplace. The next section summarizes our findings.

8. The Role of Expectations. Discrimination or Self-fulfilling Prophecies?

The second round of interviews was applied in August 2004, both to the job seekers who got hired and the employers of our study. Because of the nature of our audit study, in the first round of interviews the surveyed individuals did not need to know that they were part of a study aimed to detect discriminatory practices. So, in this second round we did not attempt to link the interview to the previous study. The surveyed individuals could not infer that this was a "second round" for our study. So we kept to a minimum the potential bias that arises whenever the individuals are aware of the studies' purposes.

One problem that we had to face was the attrition. Not all the individuals and firms that participated in our first study were available. Some of them disappeared, others migrated and some others declined to answer our questions due to time constraints. This implied a reduction of our sample size of job seekers to a total of 217 individuals.¹³ In the case of firms the reduction was similar, so we were able to re-interview 141 managers. We complemented this information with a random sample of comparable firms, extracted from the files of the ProEmpleo Network to achieve a total of 214 managers/firms interviewed.

¹² These control include gender and racial characteristics (and their interactions), occupational experience (last 3 occupations), its square, a set of dummies for educational attainment, age, age squared, marital status, an indicator for those who were head of the household, a set of dummies for mother's education, the unemployment spell (top-coded at 12 months), a set of indicators for the reason for which the applicant left the last job, an indicator if the applicant had a job at the moment of the application, an indicator if the applicant worked as a dependant during the last 12 months and controls for the occupation at which they were applying.

¹³ Also, it is important to note here that the interview to the job seekers was done telephonically. The typical disclaimers with respect to this type of interviews apply. Even though, we found some interesting empirical regularities that are worth to note.

a. Expectations of the Hired Job Seekers

When exploring the expectations of the hired job seekers we had three sets of questions:

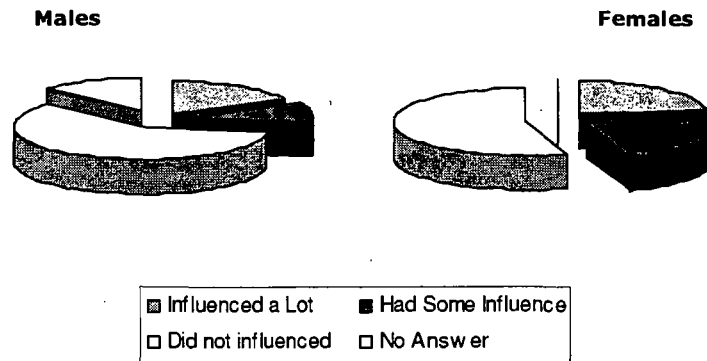
Do you think gender had an influence in the hiring process?

Do you think gender has an influence in the performance?

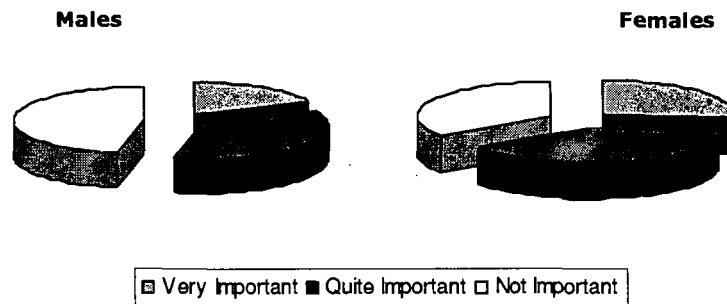
Do you think gender has an influence in the promotions?

The results for these questions, by gender are reported next.

Graph 35a and 35b
Being a Male/Female Influenced in the Hiring?

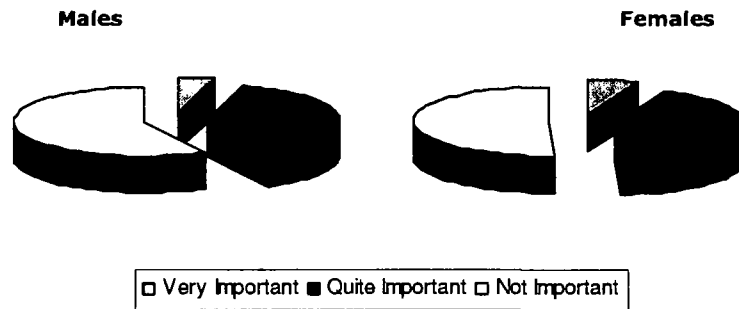


Graph 36a and 36b
Being a Male/Female Has an Influence in the Performance?



Graph 37a and 37b

Being a Male/Female Has an Influence in the Promotion?



A first thing to note is the decreasing importance that the individuals give to gender in these three questions, from hiring to performance to promotions 21.5% of the surveyed individual responded that gender had an influence in the hiring decision, 24.3% revealed that they think that gender is a very important determinant of performance, but only 5.6% of the individuals think that gender is very important for the promotions decisions. Males and females do not differ on their appreciations for the three questions; they tend to agree on the importance of gender in these three aspects.

In order to analyze further these answers the data was coded in a binary way. We created a set of three indicator variables to distinguish those individuals who thought that gender had a very important influence on the outcomes from those who did not. An analysis of the correlations among these three encoded variables is also interesting. The answer to the question about hiring seems to be not correlated with the other two, but the answer to the influence of gender on performance seems to be highly correlated to the answer to the influence on promotions, especially for males.

Table 1
Correlations among Perceptions of the Role of Gender in the workplace

Females	Thinks that Gender Influenced a Lot on the Hiring Decision	Thinks That the Gender Influence on Performance is Very Important	Thinks That the Gender Influence on Promotions is Very Important
Thinks that Gender Influenced a Lot on the Hiring Decision	1		
Thinks That the Gender Influence on Performance is Very Important	-0.089	1	
Thinks That the Gender Influence on Promotions is Very Important	-0.033	0.366	1
Males	Thinks that Gender Influenced a Lot on the Hiring Decision	Thinks That the Gender Influence on Performance is Very Important	Thinks That the Gender Influence on Promotions is Very Important
Thinks that Gender Influenced a Lot on the Hiring Decision	1		
Thinks That the Gender Influence on Performance is Very Important	0.259	1	
Thinks That the Gender Influence on Promotions is Very Important	0.191	0.468	1

An analysis of the determinants of those perceptions is next. For that purpose we run logit regressions for these three newly created binary variables on the following regressors: age, its square, gender, an indicator if they have children and an indicator for whether they are still at the job or not. The results corresponding to the marginal effects of these regressions are shown next.

Table 2
Descriptive Statistics of the Variables Included in the Regressions

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent Variables					
Gender influences Hiring	118	0.19	0.40	0	1
Gender influences Performance	118	0.18	0.38	0	1
Gender influences Promotion	118	0.08	0.27	0	1
Independent Variables					
Age	97	28.96	4.02	22	42
Squared Age	97	854.59	243.56	484	1764
Sex (1=male)	118	0.24	0.43	0	1
Marital Status (1=married)	118	0.10	0.30	0	1
Number of children	118	0.15	0.36	0	1
Hold Position (1=yes)	118	0.24	0.43	0	1

Table 3
Results of the Regressions
(Marginal Effects)

	Thinks Gender Influences Hiring	Thinks Gender Influences Performance	Thinks Gender Influences Promotion
Age	-0.131 [1.31]	-0.127 [1.32]	0.048 [0.59]
Squared Age	0.002 [1.19]	0.002 [1.42]	-0.001 [0.51]
Sex (1= male)	-0.054 [0.53]	-0.018 [0.18]	0.0165 [0.21]
Marital Status (1= married)	0.235 [1.35]	-0.094 [0.66]	
Number of children	0.049 [0.35]	-0.036 [0.27]	0.089 [0.83]
Hold Position (1=yes)	-0.018 [0.19]	0.214 [2.15]**	0.095 [1.26]
Observations	97	97	85
loglikelihood	-50.65	-46.79	-26.86
LR chi2	0.05	0.08	0.06

Absolute value of z-statistics in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

The results show evidence of quadratic effects of age on hiring and performance, with the shape of an upward parabola. Gender has only a noticeable effect on hiring. Males tend to think less than females that gender had an impact on hiring. Marital status also seems to have an impact on individuals' perceptions about the role of gender only in hiring. Married individuals are more likely to realize about such impact. Having controlled for marital status, it seems that the presence of children has no additional impact on those perceptions, for any of the three relevant questions. Interestingly, those who are still working at the job

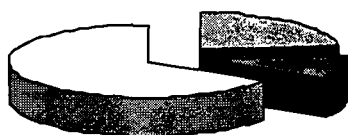
for which they were hired in our previous study have a stronger perception about the role of gender on performance. Next we turn to the perception of the employers.

b. Expectations of the Employers

The relevant question we would like to analyze for the employers in this section is “For occupation _____, who has a better performance? A male, a female or anybody?” We collected information for the following occupations: managers, professionals, administrative employees, salespersons, supervisors, interns, qualified blue collars, unqualified blue collars, cleaning workers and security employees. Pie charts for the distribution of such preferences for all these occupations are shown next.

Graphs 38a, 38b, 38c, 38d, 38e, 38f, 38g, 38h, 38i and 38j
¿Who has a better performance?

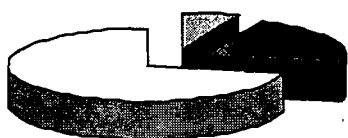
Managers



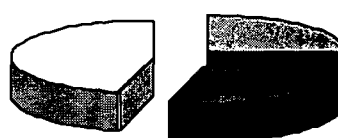
Professionals

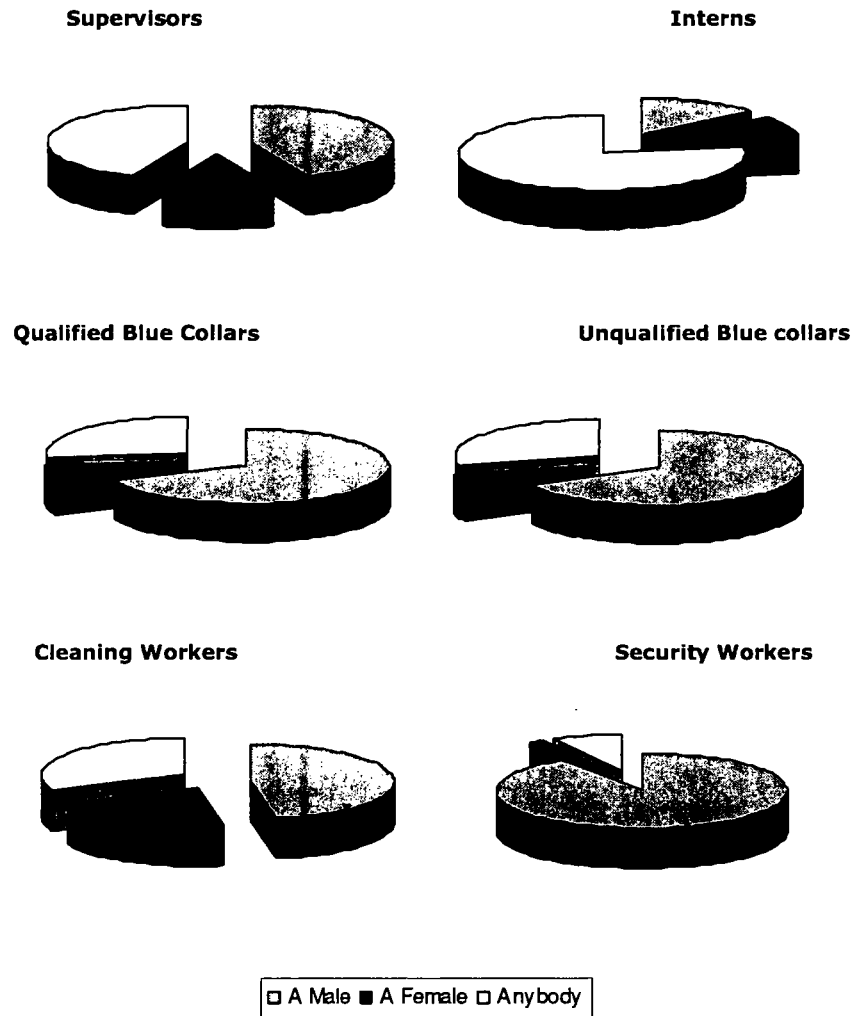


Administrative Employees



Salespersons





From these charts we can distinguish three types of occupations: those with clear predominance of the answer “Anybody” (managers, professionals, administrative employees and interns), those with no clear predominance of any answer (salespersons, supervisors and cleaning workers) and those with clear predominance of the answer “Males” (qualified blue collars, unqualified blue collars and security employees).

Furthermore, we asked the employers to elaborate on the advantages and disadvantages that males and females have for the occupations of our analysis. The results are shown in the four tables included in Appendix 1. The highlighted cells correspond to those that received more than 10% of the responses.

The most interesting elements to highlight are that females’ disadvantages have to do with their family commitments across all the occupations and their lack of strength for the blue-collar occupations. Their lack of disposition to travel is also a prevalent disadvantage for females who want to be salespersons. As compensation it seems that the employers perceive them as better communicators and being more easy-going, also their appearance may constitute a plus in such occupation. Their organization skills and the fact that they care more about the details seem to be an important plus in the blue-collar occupations.

The reasons why males are preferred in some occupations have to do with the fact that they seem to have more ability to work under pressure and have a disposition to work more hours (especially among the administrative employees). Training and experience play important advantages for males at the white-collar occupations (managers, professionals and administrative assistants). Physical strength appears to have a prevalent role for the blue-collars (qualified and unqualified, as well as for the cleaning and security workers). The most highlighted disadvantages for males have to do with the fact that they are not so disciplined, do not follow the rules or they tend to be late.

Furthermore we explored the role that firms' and employers' characteristics have on shaping these preferences for males in determined occupations. We found no relevant effects for age of the employer (neither age nor its square), gender, education, tenure, and firm size. The preferences for males in certain occupations are homogenous across all these characteristics.

9. Conclusions

Female participation in the Urban Peruvian labor markets has changed during the last fifteen years. Nowadays more females participate actively into the markets; they have lower unemployment rates and work more hours per week. The gender composition of the labor force reveals a slight increase in favor females, especially among the younger cohorts. The gender differences in unemployment do not seem to be noticeable.

The quality of these additional jobs that females got during the period was also analyzed in this paper. For that purpose, we explored formality, occupational segregation and unpaid family workers. The statistics reveal mixed results in favor of females. The gap in formality that existed by the end of the eighties is now vanished. The percentage of females and males in the labor force who work at informal jobs is roughly the same (around 40%).

The gender occupational segregation, measured by the Duncan index reveals a slight increase in segregation, especially among the self-employed. A counterfactual exercise performed through matching techniques reveals that the occupational segregation would be reduced by two or three base points in case males and females exhibit the same observable human capital characteristics in the labor markets. One of the variables for which the evolution is most clear (and monotonic) is the number of hours worked. For that variable both males and females exhibit an interesting increase, but it is higher among medium-age females with higher education.

An analysis of wages, performed both in per-hour and monthly terms revealed interesting results. The gender gap in hourly wages fluctuated with the economic cycle for the last fifteen years, on average it was around 45%, but after controlling for differences in observable characteristics it was around 25%. The gender gap in monthly wages was slightly higher, but monotonically decreasing. It started around 100% by the end of the eighties and reached an almost 80% by the beginning of the 2000's. After controlling for gender differences in observable human capital characteristics, we can report that it decreased from 80% to 60% during the period of analysis. The fraction of total labor income generated by females is still far away from the ideal 50% but the gender differences

are being reduced. In a hypothetical situation in which males and females have the same observable human capital characteristics in the society, females would generate almost 40% of the total labor income by 2001.

The econometric techniques that allow us to explain only a fraction of these gender differences at the national level leave the room for a couple of traditional explanations. Either there are other human capital characteristics that the labor market rewards and we do not observe in the surveys, or there is discrimination in the labor markets. Here we want to raise a third possible explanation; there are important gender differences in expectations.

The results of the natural experiment of Moreno et al. (2004) shed initial lights on the issue. In a job-seeking environment, females tend to ask for wages that were 7% less than those that their male competitors would ask. That wage penalty that females self-imposed on their aimed wages was obtained after controlling for a rich set of observable characteristics of the individuals and their jobs. In an attempt to explore further these differences in expectations, we re-interviewed the individuals who participated in the study previously mentioned. We re-visited both employers and job seekers and asked them several questions about the role of gender in the workplace.

For the job seekers there are interesting differences in their perceptions of the role of gender in hiring, when compared to respect to the role of gender in performance or promotions. The interviewed individuals perceived that gender matters substantially for the hiring decisions but not so much for the promotion decisions or the performance of the individuals in the workplace. The perceptions of males and females about those issues did not differ substantially between them. On the other hand, the employers seem to have homogenous perceptions about the advantages and disadvantages of males and females, but these perceptions differ across occupations. These perceptions are aligned with the occupational segregation by gender that we observe in the labor market, but do not help us to explain gender disparities in pay within occupations. This results call for future research in the area.

It is important to note that the exploration of the role of gender on employers and job seekers was done with surveys, asking the interviewed individuals about their perceptions. The questions of our surveys did not imply any behavioral response. On that sense, it seems that experimentalist researchers can play an interesting role here exploring deeper (and in a behavioral way) the role of expectations.

The female labor force is opening some doors for their entrance into the labor markets, but there is room for improvement in many areas. Such improvement would require some changes in attitude, from both sides of the labor markets. Just to cite a couple of examples: A change in the employers' perceptions about the desired characteristics per occupations would help to reduce the high levels of occupational segregation. A change in job-seekers' expectations about wages would help to reduce the gender wage gaps.

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Appendix 1 **Advantages of hiring women**

		a. Managers/ administrators/ staff members	b. Professionals	c. Administrative employees	d. Salespersons / customer's attention	e. Supervisors	f. Interns	g. Qualified blue collar workers	h. Unqualified blue collar workers	i. Cleaning workers	j. Security workers
Knowledge/ Training / Experience											
They are more trained/ better qualified/ have more knowledge	1	a	b	c	d	e	f	g	h	i	j
They learn more (fast) / are more intelligent	2	a	b	c	d	e	f	g	h	i	j
They have more experience (laboral) / in that kind of business	3	a	b	c	d	e	f	g	h	i	j
Gender Characteristics											
They know the business because of his/her gender itself	4	a	b	c	d	e	f	g	h	i	j
It is a job appropriate for a female/ male	5	a	b	c	d	e	f	g	h	i	j
Performance at work/ Wish of Improvement											
They look for training or learn more/ improve his/herself	6	a	b	c	d	e	f	g	h	i	j
They have more ability for the job/ to work under pressure	7	a	b	c	d	e	f	g	h	i	j
They have disposition to work more hours	8	a	b	c	d	e	f	g	h	i	j
Their performance is good in the job	9	a	b	c	d	e	f	g	h	i	j
Communication											
They are better salespersons/ communicate better with the client	10	a	b	c	d	e	f	g	h	i	j
They communicate better/ are more easygoing (have better relationships with other areas)	11	a	b	c	d	e	f	g	h	i	j
Virtues/ Skills											
They have more "character"/ ability to give instructions	12	a	b	c	d	e	f	g	h	i	j
They are more loyal/ more reliable	13	a	b	c	d	e	f	g	h	i	j
They are honest with the money	14	a	b	c	d	e	f	g	h	i	j
They have more sensibility/ intuition	15	a	b	c	d	e	f	g	h	i	j
They are more tidy/ organized	16	a	b	c	d	e	f	g	h	i	j
They are more disciplined / follow the rules	17	a	b	c	d	e	f	g	h	i	j
They are more neat (clean)	18	a	b	c	d	e	f	g	h	i	j
They have better/ more skills with their hands	19	a	b	c	d	e	f	g	h	i	j
They worry about the details/ quality	20	a	b	c	d	e	f	g	h	i	j
They are more patient	21	a	b	c	d	e	f	g	h	i	j
They are stronger (physically)/ appropriate for work	22	a	b	c	d	e	f	g	h	i	j
They are beautiful/ better looking	23	a	b	c	d	e	f	g	h	i	j
Wages											
They do not ask for high wages or benefits	24	a	b	c	d	e	f	g	h	i	j
Other	25	a	b	c	d	e	f	g	h	i	j

Disadvantages of hiring women

		a. Managers/ administrators/ staff members	b. Professionals	c. Administrative employees	d. Salespersons / customer's attention	e. Supervisors	f. Interns	g. Qualified blue collar workers	h. Unqualified blue collar workers	i. Cleaning workers	j. Security workers
Knowledge/ Training / Experience											
They lack of training / knowledge / qualifications _____	1	a	b	c	d	e	f	g	h	i	j
They do not learn fast / are less intelligent _____	2	a	b	c	d	e	f	g	h	i	j
They don't have experience (laboral) / in that kind of business _____	3	a	b	c	d	e	f	g	h	i	j
Gender Characteristics											
They don't know the business because of his/her gender itself _____	4	a	b	c	d	e	f	g	h	i	j
Their priority is his/her family/ their priorities change after they get married (they do not train themselves) _____	5	a	b	c	d	e	f	g	h	i	j
It is a job is not appropriate for a female/ male _____	6	a	b	c	d	e	f	g	h	i	j
Performance at work/ Wish of Improvement											
They aren't good salespersons/ employees _____	7	a	b	c	d	e	f	g	h	i	j
They don't work well/ don't work under pressure _____	8	a	b	c	d	e	f	g	h	i	j
They lack of disposition to travel _____	9	a	b	c	d	e	f	g	h	i	j
They usually don't assist/ usually get sick _____	10	a	b	c	d	e	f	g	h	i	j
They don't show wishes of improvement / don't look for training _____	11	a	b	c	d	e	f	g	h	i	j
Communication											
They are not easygoing _____	12	a	b	c	d	e	f	g	h	i	j
They don't communicate well/ aren't easygoing (relationships with other areas) _____	13	a	b	c	d	e	f	g	h	i	j
Virtues/ Skills											
They are more responsables/ they are neglected _____	14	a	b	c	d	e	f	g	h	i	j
They don't have "character"/ ability to give instructions _____	15	a	b	c	d	e	f	g	h	i	j
They are not loyal/ reliable _____	16	a	b	c	d	e	f	g	h	i	j
They are not honest with the money/ they steal _____	17	a	b	c	d	e	f	g	h	i	j
They don't have skills with their hands/ aren't delicate _____	18	a	b	c	d	e	f	g	h	i	j
They don't worry about the details/ quality _____	19	a	b	c	d	e	f	g	h	i	j
They aren't neat (clean) _____	20	a	b	c	d	e	f	g	h	i	j
They are not strong (physically)/ they aren't appropriate for work _____	21	a	b	c	d	e	f	g	h	i	j
They are not disciplined / do not follow the rules/ they arrive late _____	22	a	b	c	d	e	f	g	h	i	j
They like alcoholical drinks _____	23	a	b	c	d	e	f	g	h	i	j
Wages											
They ask for high wages or benefits _____	24	a	b	c	d	e	f	g	h	i	j
Other _____	25	a	b	c	d	e	f	g	h	i	j

Advantages of hiring men

		a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
		Managers/ administrators/ staff members	Professionals	Administrative employees	Salespersons / customer's attention	Supervisors	Interns	Qualified blue collar workers	Unqualified blue collar workers	Cleaning workers	Security workers
Knowledge/ Training / Experience											
They are more trained/ better qualified/ have more knowledge	1	a	b	c	d	e	f	g	h	i	j
They learn more (fast) / are more intelligent	2	a	b	c	d	e	f	g	h	i	j
They have more experience (laboral) / in that kind of business	3	a	b	c	d	e	f	g	h	i	j
Gender Characteristics											
They know the business because of his/her gender itself	4	a	b	c	d	e	f	g	h	i	j
It is a job appropriate for a female/ male	5	a	b	c	d	e	f	g	h	i	j
Performance at work/ Wish of Improvement											
They look for training or learn more/ improve his/herself	6	a	b	c	d	e	f	g	h	i	j
They have more ability for the job/ to work under pressure	7	a	b	c	d	e	f	g	h	i	j
They have disposition to work more hours	8	a	b	c	d	e	f	g	h	i	j
Their performance is good in the job	9	a	b	c	d	e	f	g	h	i	j
Communication											
They are better salespersons/ communicate better with the client	10	a	b	c	d	e	f	g	h	i	j
They communicate better/ are more easygoing (have better relationships with other areas)	11	a	b	c	d	e	f	g	h	i	j
Virtues/ Skills											
They have more "character"/ ability to give instructions	12	a	b	c	d	e	f	g	h	i	j
They are more loyal/ more reliable	13	a	b	c	d	e	f	g	h	i	j
They are honest with the money	14	a	b	c	d	e	f	g	h	i	j
They have more sensibility/ intuition	15	a	b	c	d	e	f	g	h	i	j
They are more tidy/ organized	16	a	b	c	d	e	f	g	h	i	j
They are more disciplined / follow the rules	17	a	b	c	d	e	f	g	h	i	j
They are more neat (clean)	18	a	b	c	d	e	f	g	h	i	j
They have better/ more skills with their hands	19	a	b	c	d	e	f	g	h	i	j
They worry about the details/ quality	20	a	b	c	d	e	f	g	h	i	j
They are more patient	21	a	b	c	d	e	f	g	h	i	j
They are stronger (physically)/ appropriate for work	22	a	b	c	d	e	f	g	h	i	j
They are beautiful/ better looking	23	a	b	c	d	e	f	g	h	i	j
Wages											
They do not ask for high wages or benefits	24	a	b	c	d	e	f	g	h	i	j
Other	25	a	b	c	d	e	f	g	h	i	j

Disadvantages of hiring men

		a. Managers / administrators / staff members	b. Professionals	c. Administrative employees	d. Salespersons / customer's attention	e. Supervisors	f. Interns	g. Qualified blue collar workers	h. Unqualified blue collar workers	i. Cleaning workers	j. Security workers
Knowledge/ Training / Experience											
They lack of training / knowledge / qualifications _____	1	a	b	c	d	e	f	g	h	i	j
They do not learn fast / are less intelligent _____	2	a	b	c	d	e	f	g	h	i	j
They don't have experience (laboral) / in that kind of business _____	3	a	b	c	d	e	f	g	h	i	j
Gender Characteristics											
They don't know the business because of his/her gender itself _____	4	a	b	c	d	e	f	g	h	i	j
Their priority is his/her family/ their priorities change after they get married (they do not train themselves) _____	5	a	b	c	d	e	f	g	h	i	j
It is a job is not appropriate for a female/ male _____	6	a	b	c	d	e	f	g	h	i	j
Performance at work/ Wish of Improvement											
They aren't good salespersons/ employees _____	7	a	b	c	d	e	f	g	h	i	j
They don't work well/ don't work under pressure _____	8	a	b	c	d	e	f	g	h	i	j
They lack of disposition to travel _____	9	a	b	c	d	e	f	g	h	i	j
They usually don't assist/ usually get sick _____	10	a	b	c	d	e	f	g	h	i	j
They don't show wishes of improvement / don't look for training _____	11	a	b	c	d	e	f	g	h	i	j
Communication											
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They don't have "character"/ ability to give instructions _____	15	a	b	c	d	e	f	g	h	i	j
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They are not hones with the money/ they steal _____	17	a	b	c	d	e	f	g	h	i	j
They don't have skills with their hands/ aren't delicate _____	18	a	b	c	d	e	f	g	h	i	j
They don't worry about the details/ quality _____	19	a	b	c	d	e	f	g	h	i	j
They aren't neat (clean) _____	20	a	b	c	d	e	f	g	h	i	j
They are not strong (physically)/ they aren't appropriate for work _____	21	a	b	c	d	e	f	g	h	i	j
They are not disciplined / do not follow the rules/ they arrive late _____	22	a	b	c	d	e	f	g	h	i	j
They like alcoholical drinks _____	23	a	b	c	d	e	f	g	h	i	j
Wages											
They ask for high wages or benefits _____	24	a	b	c	d	e	f	g	h	i	j
Other _____	25	a	b	c	d	e	f	g	h	i	j

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URBAN FEMALE EMPLOYMENT IN ARGENTINA

Final Report
June, 2005

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I- Introduction

How have youth's economic participation and employment evolved in Argentina? Which have been the more relevant changes occurred since the mid 70's that have impacted the country's current situation? Have the trends been equal for men and women? Such questions are our starting point for studying both youth's employment and economic participation in Argentina.

It is well known that in comparison to other Latin-American countries, Argentina's school achievements are high. However, several indicators related to the country's living conditions have had a negative performance, especially during the 90's. In particular, the unemployment rate for the population over 25 years increased from 1.4% in October 1974 to 18% in the same month of 2001. This huge unemployment expansion resumes a long period of reducing labor opportunities and diminishing salaries, all factors closely linked to the increasing violence and criminality Argentina has been experiencing for several years (Cerro and Meloni, 1999).

What role has education played in this situation? Argentina not only shows a significant level of school accomplishments, such level is in clear expansion. Hence, how does education relate to the labor market? This last question triggers the analyses carried out in this study. Therefore, its principal objectives can be divided as follows: a) Diagnose the current situation of female employment in Argentina; b) Understand how the level and content of secondary education in urban areas and career counseling affect female employment; c) Diagnose employment problems related to employers' labor demand in urban areas of the Argentina.

This paper has been divided into five major sections. Each section presents the current state of the urban juvenile labor market from a gender perspective. Section III investigates the determinants of three labor market outcomes: participation in the labor market, participation in a particular sector of the economy, and earnings. Section IV looks at labor demand, with special focus on the factors that may result in discrimination against female employment. Section V considers the current situation of secondary schools, considering internal efficiency to complete each educational level; the curricula proposed and taught to students, as well as their expectations regarding their future education and employment. Section VI presents our conclusions.

II- Education, gender, youth and the labor market

The main goal of this section is to show, in general terms, the importance of secondary education in the results of Argentine youth in the labor market, both empirically and with existing data, differentiating impacts by gender. The labor market "results" of youth were operationalized by means of the indicators of participation in remunerated economic activity, employment, unemployment and remunerations. Education was assessed in its two traditional dimensions – school attendance and achievement.

We analyzed this relationship between education and youth employment over a period of profound economic and social transformations in Argentina - 1974-2002. During this period, there were important crises and diverse institutional changes, such as hyperinflation and periods of stability, de facto and democratic governments, low unemployment periods and others of unprecedented growth for open unemployment¹. In the education field specifically, this period

¹ "This phenomenon is likely to have introduced important changes in the social or economic structure of household, mainly due to the increasing participation of women in the labor force" (Sosa Escudero and Marchionni, 1999).

includes the launch of the Federal Education Law (1993), which represented an important transformation after Law 1420, which organized the Argentine educational system since 1884 and had been in force for over a century².

Without losing sight of these macro aspects of Argentina's economic and social reality, we have concentrated on the micro relationship between education and labor. According to the vast literature on the subject, a higher educational level increases the probability of employment, reducing the probability to be unemployed, and it raises the current value of the remuneration flow for employees throughout their life cycles. All these empirical observations are theoretically based on the economic analysis of labor, and are at the same time intertwined - higher education levels lead to higher salaries when productivity increases (Becker, 1965 and 1981). This is a factor that individuals take into account when they assess the benefits and costs of participating in the labor market. For simplicity, if we suppose that the reserve salary does not change, higher salaries will generate a greater tendency to participate, and inactive people will leave that state to find a remunerated job.

If we do not consider the reserve salary that is invariable among people, we must include the time value of the alternative to remunerated employment in our reasoning. This is clear, for example, in the decision to participate of married women. The cost of participating in the labor market is for them the value of the domestic production that they have to sacrifice in order to work. *Ceteris paribus*, the lower the level of the domestic production is, the lower the reserve salary will be. For youth, the situation is more complicated. In their case, time can be distributed among human capital accumulation, work (including work in domestic units), and idle time (or time not dedicated to work or human capital accumulation). This indicates that the decision to participate in the labor market is not independent of the decision to accumulate human capital and that both processes are correlated.

By "youth" we mean individuals between 18 and 29 years of age. The lowest age was chosen under the supposition that the individual has had enough time to complete secondary school. The current structure of the Argentine educational system provides general basic education (EGB), which comprises nine years of mandatory schooling, and three more years of Polimodal education (secondary level for us here). In very general terms, before 1993, when the transformation took place, and under Law 1420, the educational system was structured with 7 years of primary school and a secondary level of 5 years for the bachelor and the business orientation tracks, and of 6 years for the technical track. This institutional configuration does not affect our analysis as the data source used matches "primary" education with "general basic" education and "secondary" with "Polimodal."

II.1- Methodology and Data

Our methodology consists of two clearly differentiated parts: one is descriptive (unconditional) and the other is explanatory (conditional). In the first part, we propose following the evolution of three dimensions of the labor market, and two of education. For the labor market, we will examine population participation in the labor force, the probability of getting a job, and last but not least, the remunerations earned by employed workers. In the case of education, we are

² The importance on the role of government on the trends in education levels in developing countries it is analyzed, among others, by King and Lillard (1987) and Deininger (2003).

particularly interested in aspects related to school attendance on the one hand, and educational achievement on the other.

Our database includes the labor, educational and socio-demographic situation of youth between 18 and 29 years of age interviewed in the urban area of the Greater Buenos Aires in the month of October every year from 1974 to 2002³. Our data source is the Permanent Household Survey (EPH), conducted by the National Institute for Statistics and Census (INDEC), the main socio-demographic data production organism in the country.

Our pooled database contains data from years 1974, 1980, 1986 and 1991 to 2002. Thus, we are covering almost 30 years of Argentine history in topics relevant to our research. Please note that this database includes individuals from a wide range of generations: from people born in 1944, who were 29 years old in the 1974 wave, to those born in 1984, who were 18 in the 2002 wave. Therefore, the number of five-year births (or cohorts, or generations) covered surpasses the number of years considered in this study by almost one decade⁴.

The dependent variables of the explanatory analysis are three: a) the probability of being active, b) the probability of being employed, and c) the monthly remuneration earned by youth. Among all the independent variables included, special attention is given to those related to education – school attendance in the first place, and then the educational achievement of youth. The latter variable has been treated with a battery of dummies according to the maximum level reached. The reference category always was having completed basic education. For secondary school, two situations were also differentiated according to whether the youth had completed the level or not. This is justified by the theoretical suspicion that a certain inflation of credentials could have occurred recently.

Given the need to control other factors that could impact on the results of youth in the labor market, several control variables were included. They can be grouped in the following dimensions: a) individual: age and marital status of youth; b) family: demographic charge of households, education, gender and labor market status household heads, to assess the situation of youth reported as “children” (son or daughter) in the survey; and c) contextual: diverse unemployment rates for each survey date: of the groups 18-24, 25-29, 30-54, both for men, women and for the total population.

The general structure of the estimated models is the following:

$$Y_i = Y(EM_i, Z_j) \quad \forall i = 1, 2, K, n \quad \forall j = i, f, c. \quad [\text{II.1}]$$

Where Y_i is the output of the labor market that is being studied (activity, employment and remunerations) for individual i , and which depends on EM_i (a binary variable that indicates whether the young individual has (=1) or does not have (=0) secondary education) and Z_j , a matrix that has the control characteristics used and includes representative variables of individual factors (i), family factors (f) and contextual factors (c). Whatever the specification of the model described is, our null hypothesis establishes that the parameter EM_i is equal to zero and that it is

³ Up to year 2002, the EPH was conducted twice a year. Since May 2003, the on-going EPH was finally put in place, presenting some changes in data capture instruments as well as in survey methodology.

⁴ With the exception of year 1990, our database contains almost every year in the decade of the nineties, which was crucial for the economic and social development of Argentina. In these years, the labor market shows traits that will define its current situation – high and persistent unemployment and an uncontrolled increase in labor precariousness. From the point of view of education, in 1993 the Federal Education Law becomes effective. It is the first major structural transformation of the educational system, and substitutes Law 1420, from 1884.

independent of the gender of youth. With this we try to imply that secondary education – compared to basic education – does not have an impact on the results achieved by youth in the labor market once the other factors included in the analysis are controlled.

In all cases we have estimated models for the whole group of youth irrespective of their gender and position in the household. The next step was to work with boys and girls separately, and then with those who are reported as “children” (sons or daughters) when the survey was conducted. The latter step was taken because we are convinced that this category (sons or daughters of the household head) more clearly reflects the particular characteristics of the “youth” we want to capture for the analysis – a young individual who has already become a head of household or a spouse will show behaviors that are more linked to adulthood than youth.

The models estimated are related to: a) Determinants of economic participation (participation equations); b) determinants of employment (employment equations); and c) determinants of remunerations (modified Mincer equations). In the first two cases we worked with a probit specification, while for c) we estimated a Heckit model because we believe that the problem of sample selection can be important among youth.

II.2- Results

We present the results in two subsections. In subsection II.2.1, we discuss general and descriptive findings. We analyze the evolution of activity, employment and unemployment, and monthly remunerations earned by youth throughout the period examined. Results also include the analysis of school attendance and the structure of educational achievement. This subsection concludes with an analysis based on the typologies of activities performed by young people: only study, study and work, only work and neither work nor study. Subsection II.2.2 presents the results of the explanatory analysis to assess the impact of secondary education on the labor market.

II.2.1- Descriptive Analysis

There are two important observations to be made on the discussion that follows. In the first place, for the descriptive analysis we have differentiated two age groups among youth: young people between 18 and 24 years of age, and young adults aged between 25 and 29. Some different behaviors are observed between these two groups, probably originating in the dynamics of the life cycle, which includes getting married, making a new household, having children and becoming economically independent from their parents⁵. In the second place, to follow the temporal evolution of some of the indicators, we preferred to work with youth births in five-year periods instead of calendar years, as this allows us to approximate to the probability concept implicit in the calculation of any rate more closely.

In very general terms, it could be said that the economic participation of both male and female youth decreased noticeably along the period and that participation of the group aged 25 to 29 does not reflect a homogeneous gender behavior: while boys maintained their participation over the generations, girls experienced a relatively marked increase. As a consequence of this trend, the gender gap in the participation of young adults ostensibly decreased. In fact, while among youth born in the period 1950-54 there were 2.1 males per every active female, among those born in the 1975-79 period the proportion was 1.3 males per every active female.

⁵ Some evidence supports this hypothesis: while the proportion of household heads among youth is approximately 7%, among young adults it rises to 27%. Something similar occurs with those who report to be spouses - 9% for the former group and 28% for the latter.

This temporal activity profile is observed in any social development process. Education advances and demands more time from youth. The training requirements of employers contribute to expand the demand for higher educational levels, whether these requirements are generated by a technological change or the inflation of credentials. On the other hand, the expansion of female participation in the young adults group is part of a larger movement - the growing introduction of women into the labor force, which has been recorded in every country in the world.

The changes observed in economic participation were accompanied by similar changes in the probabilities of employment. The employment probability of both girls and boys has decreased, while among young adults, we observed a decrease for males and an increase for females. The gap between genders decreased irrespective of the age group. Among youth, the employment probabilities of males are, on average, 50% higher than those recorded for females. Among young adults, those born in the 1950-1954 period had a probability to get a remunerated job which was 2.2 times higher than that of youth of identical age and birth cohort. For those born in the 1980-1984 period instead, that gap had decreased to 1.6, although male primacy in employment remained.

Over the years analyzed, unemployment rates reveal the most impressive changes. In the first place, it stands out that in all cases included in the analysis female unemployment is higher than male unemployment. In the second place, the probability of being unemployed sharply increased for both genders and for both age groups, but it did not rise at a similar pace – the highest increase was recorded among youth and it became overtly higher among individuals born in the 1965-69 period. Individuals in the 25-29 age group also had higher unemployment probabilities, but the rising trend was broken among those born in 1980-1984, for whom a clear fall in the unemployment probability is observed. The data also reveal another very interesting phenomenon: for this age group there is an increase of female unemployment among young women born between 1960-64 and 1975-79, which is recorded in a context of increasing participation and employment. In this case, it is clear that the expansion of female labor supply (expressed in activity rates) widely surpassed the expansion of demand (expressed in employment rates).

The evolution of remunerations earned by youth in the period under study remains to be analyzed. Between 1974 and 2002, a strong retraction of the total remuneration level is observed for both genders and for both age groups considered - youth (18-24) and young adults (25-29). The global reduction was of around 65% without marked differences between genders. The demographic group with the lowest reduction in remunerations was that of females between 25 and 29 years of age. Nevertheless, towards the end of the period, the abrupt contraction experienced between 2001 and 2002 tended to equate the incomes of the groups.

The evolution of remunerations followed the course of aggregate economic activity. At the beginning of the nineties, and to a good extent due to the effects of the 1989 hyperinflation, incomes were on average 50% below the level reached in 1974. In the mid-nineties, price stability generated a recovery of the income level. From then on, income decreased until the end of the period under study. Given its short length and its effect on remunerations, the fall observed as a consequence of the convertibility crisis was the hardest.

It had been said before that at least part of the decrease in the economic participation of youth could be explained by a greater demand for education. If we follow the evolution of school attendance over the years analyzed, some evidence on this topic can be gathered. School attendance among youth has increased dramatically over time and this expansion is observed both

among boys and girls: 1 out of 4 boys 18 - 24 born in the 1950-54 period were attending a school; the ratio was 1 out of 2 among those born in the 1980-84 period. For women the change was even more dramatic- among female youth born between 1950 and 1954, 15 out of 100 were attending school, and among young women born between 1980 and 1984, the ratio was 55 out of 100.

Although the youth group is the one that has shown the highest increase in school attendance, the young adults group has also been influenced by this expansion process, being women again those who showed a stronger advancement in the period analyzed. Although the data used did not allow us to discriminate the school level that these people were attending, the trend described for young adults suggests a rising demand for university education.

Neither can we in this case risk a hypothesis on whether this phenomenon was produced mainly by the lower employment opportunities observed in the country or by the increasing training requirements for the positions to be filled in the labor market. The fact that we were not able to discriminate between these two major and possible causes of the rise in the demand for education does not mean that we should give less importance to this task, which in our view is crucial to design policies oriented towards the labor market and the education sector. Nevertheless, trend break of school attendance towards the end of the period under study is striking. If we recall what was analyzed about unemployment, we can suspect some type of relation between unemployment and school attendance, especially among women and men from more recent generations.

Over time, higher school attendance generates a gradual improvement of the educational achievement of the population. Over the period, it is observed that in both genders there is an uninterrupted decrease in the percentage of young people (from both groups, very young or youth and young adults) with less than primary school complete as the highest educational level reached, and an equally monotonous increase in the percentage of those who completed the secondary education level⁶.

A way to combine the previous results is to look at the evolution of alternative indicators to traditional ones over time. In this respect, we considered it convenient to assess how youth are grouped around the alternative uses of time between attending school and having a remunerated job. This implies combining information about labor market situations with data about school attendance situations. This effort led to the typology shown on Table II.1.

The first feature that stands out when we assess the results for Argentina is the strong differential between genders in both youth groups - 18-24 and 25-29 years of age. Compared with boys, there are more girls who only study or neither study nor work. The clearest differences are found in the latter quadrant. This result may respond to the greater likelihood of women performing or collaborating in tasks related to domestic production. The literature on this topic generally calls this phenomenon “juvenile exclusion” meaning the weakness or inexistence of sociability ties generated by work or study⁷. Nevertheless, to use this denomination for those placed in this quadrant of the typology, we should have evidence related to the voluntary or involuntary nature of the “neither study nor work” situation.

⁶ Although it is not directly related with our specific research topic, it is worth noting the clear increase in the proportion of young women aged between 25 and 29 who report to have concluded higher studies. The steadily rising trend of female educational achievement draws a contrast with the erratic behavior of this indicator among male individuals of the same age group. This result is coherent with the trend observed for school attendance among the 25-29 year group. The higher attendance of young women is clearly reflected in the higher educational achievement of this demographic segment.

⁷ See, for example, Filmus et al. (2003) and ILO (2004).

Table II.1: School attendance and status in the labor market

Status in the Labor Market	School attendance	
	Attending	No attending
Employment	Study and work	Only work
Unemployment		
Not in the labor force	Only study	Neither study nor work

Evolution over time shows an increase in the proportion of youth aged between 18 and 24 from both genders who dedicate time not just to study, and a slight increase in the proportion of youth who study and work. On the other hand, we observe that the proportion of youth placed in the other two quadrants has decreased. These trends are particularly visible for women.

II.2.2- Determinants

The coefficients estimated for the variables included in the participation models yielded the expected signs and practically all variables were different from zero at less than 1% significance. Although it would be interesting and instructive to analyze the complete model, we are only going to discuss what is directly related to the main object of our research – **the effect of secondary education on labor market results**.

The first six univariate probit regressions enable us to examine the effect of secondary education on the decision to enter the labor force: a) for the youth group, b) for male and female youth individually, and c) for the group reported as “children of household head”. In almost all of the situations analyzed, we see that secondary education affects the probability to be active in a significant and positive way, more so after completing the level. Likewise, we observe that there are marked differentials between genders, the impact being clearly higher among women. Moreover, when we estimate separate equations by gender, we can see that having incomplete secondary studies is not different from having complete primary school only among men.

School attendance is one the variables included in the participation models. Such attribute reduces the probability of participation significantly and noticeably. Unlike the previous cases, the impact of school attendance is higher for boys, although it is also significant and strong for girls. This finding suggests that the latter are more likely than boys to combine study with work or with job searches.

Participation equations were also estimated for those reported as “children” (sons and daughters) in our database. Results are similar to those mentioned in the previous paragraphs but the impact of educational variables is greater. For youth who live with a head of household, it is doubtless that secondary education increases the probability to be active more than for youth as a whole. For sons however, lack of completion of secondary school continues yielding no significance at the usual levels. Conversely, daughters with partially completed secondary school show high sensitivity to participation compared with other young women of equal characteristics who have completed only the primary level. Completion of the secondary level also yields ostensible increases in the probability of participation. School attendance discourages the participation of “sons and daughters” too. Besides, as for the whole youth group, it discourages participation more among boys than among girls, although the economic participation of daughters is more

sensitive to school attendance than the economic participation recorded for the whole youth group.

Secondary education also increases the probability to be employed against being unemployed or inactive. The impact of secondary school achievement is higher among girls than among boys but unlike participation, the coefficient estimated for the variable "complete secondary studies" becomes significantly different from zero also for boys. This finding is important and suggests the following hypothesis: although the participation expectations of male youth who have attended secondary school but have not completed it do not differ from the expectations of those who have completed primary school, the labor market seems to value the additional human capital acquired by these people, increasing employment opportunities for them. School attendance also decreases the probabilities to be employed, and as we found out for economic participation, probabilities decrease more for boys than for girls.

For young sons and daughters of household heads, the results mentioned in the preceding paragraphs remain true, with the exception of the significance of the coefficient estimated for the variable "incomplete secondary studies." Therefore, we cannot reject the equality hypothesis with respect to those who have completed primary school. Employment opportunities for young daughters are remarkably higher than for their peers who did not complete basic studies. School attendance among sons and daughters has a negative impact on the probability of employment.

Secondary education is also important for the positive impact that it has on the remunerations earned by youth. The effect is relatively low but significantly higher than zero for those who have not completed the level; and it is significant and strong for those who did. Unlike the other results (participation and employment), the differences of the coefficients between genders are scarce or do not exist. This finding is particularly noticeable among the children of household heads. For daughters, having attended secondary school but not having completed it does not generate differences in income with respect to another girl of equal characteristics who has only completed primary school. Even for the girls who have completed the basic education cycle, although the income rise is significant, it is noticeably lower than the one earned by sons.

The considerations made in the preceding paragraphs can be widened and quantified with greater accuracy if instead of looking at estimated coefficients, their significance and signs, we focus on the marginal effect that education variables have on the previously analyzed labor market results. As it is known, these elasticities depend not only on the estimated value of the coefficient but also on the particular characteristics of a group and the original values of the variables explained. By calculating them, we are able to examine not only differences between genders but also intra-gender differences, among other things. The computation of elasticities was performed by taking the group defined by sample means as the base group (Table II.2).

Among the main findings, the following can be mentioned. In the first place, the greatest inequalities between genders are found in economic participation. Education encourages girls to participate in remunerated economic activity more than boys. But this apparent inequality is an inequality of impact that tends to become equal on the plane of levels. Female economic participation is low and to the extent that higher levels encourage higher participation among them than among boys, there is a tendency towards a convergence of levels as educational achievement grows.

Table II.2: Marginal effects

Dimension/Achievement	All		Son/Doughter	
	Men	Women	Men	Women
A- Participation				
Incomplete secondary	0.011	0.052	Ns/	0.075
Complete secondary	0.074	0.243	0.108	0.304
Complete superior	0.068	0.400	0.125	0.333
B- Employment				
Incomplete secondary	Ns/	0.050	Ns/	0.059
Complete secondary	0.111	0.176	0.138	0.218
Complete superior	0.181	0.173	0.171	0.203
C- Earnings				
Incomplete secondary	0.081	0.063	0.068	ns
Complete secondary	0.352	0.384	0.343	0.326
Complete superior	0.811	0.634	0.709	0.557

Note: Ns/ Is not statistically significant to the usual levels (.01, .05, .1).

Source: Own computation.

Concerning participation in employment, we notice a greater equality of impact between genders but a differential effect of education for both genders. For men, education has a greater effect on employment than on participation; the opposite occurs with girls. This could explain female overunemployment as discussed in the previous paragraph of this section.

On the plane of incomes, inequalities of impact always favor men, but it becomes more notorious for the highest educational level (Table II.2). In this case, education tends to equate the income disparity observed and clearly favors male youth. Besides, although the passage from the secondary level to higher education raises the income of the youth population, it does it much less with women than with men. Although our income equations controlled a series of important factors that have an incidence on their level, the type of occupation performed is still to be included. This might reveal part of the reasons for the disparities found.

III- Labor Participation and Earnings for Young Women

This section is aimed at studying the determinants of labor market performance of young women in Argentina, concentrating on three particular results: employment chances, job quality, and earnings. Many factors contribute to determine the degree of success or failure of women in the labor market. Using data from the Permanent Household Survey (EPH) and the Special Module on Education 1998 (SME) –both with nation-wide coverage– we explore the effects of different individual's characteristics such as age, educational attainment, attendance situation, and marital status.

Besides those traditional factors explaining labor market results, we are particularly interested in assessing the role of secondary school education and family environment. Concerning the former, secondary school characteristics may be important determinants of performance at the labor market. On the one hand, it is possible to think of a self-selection mechanism that assigns individuals with different characteristics to different types of school. For example, women participation in technical schools is very low, even though there is no admission process and schools are free –most technical schools are public. Here the type of school is in fact revealing the type of individual. On the other hand, schools with different characteristics imply, in general,

differences in the quality and orientation of education. So, the type of school indicates the “amount” or “quality” of human capital acquired by the individual over the educational process.

But secondary education cannot be simplified to school characteristics. There are also many situations related to the educational process that are certainly expected to contribute to future labor market performance. Dropping out of school, delaying entry to the following educational level, failing schooling years, etc. are signs of either poor educational performance or low attachment to the educational process, which could end up on poor labor market results.

From the SME we have information on high school characteristics and past educational performance for year 1998 and for the same individuals covered by the EPH. As for high school characteristics we know the type of school –public or private–, school orientation –humanistic, technical, commercial, or other orientation–, and if standard or special program for adults was given. Unfortunately, the SME lacks information on other school attributes that could have been interesting to analyze, such as gender composition of school –only boys-only girls-mixed–, particular contents of curricula besides school orientation –idioms, sports, etc.–, and religious or not religious education. As for past educational performance, the SME also provides information on school abandonment and years failed, but not on grades.

As for the second group of factors we are interested in, family environment is also expected to influence individuals’ educational and labor performance. Family educational background, birth order of children, family size, and household structure, among others, are likely to reflect the way roles are assigned between parents and children, and among children of different characteristics, determining educational and labor decisions within the household. Other family and social attitudes towards education are unfortunately not available from the EPH or the SME.

The methodological approach adopted consists on estimating probit models for the probability of being employed or having a particular type of job, and Mincer equations to study the determinants of hourly earnings. Since our interest is focused on women, the obvious comparison group is composed by men. Therefore, we estimate separate models by gender, and then test the hypothesis that there is no statistically significant difference between them.

III.1- Data description and preliminary evidence

This subsection describes the data to be used and discusses some of its main features by means of an unconditional analysis. Therefore, the preliminary evidence presented here should help us understand and interpret the results that will come from the multivariate analysis performed in later subsections.

The information we use comes from two complementary sources. One is the EPH, which contains information on educational attainment, current school or college attendance situation, and high school orientation for those with at least some secondary education but who had never attended college. In May 1998 a Special Module on Education (SME) was added to the regular EPH to gather additional information concerning formal and informal education. The SME presents two main features. First, like the EPH, it has nation-wide coverage, and second, it can be matched to the May 1998 regular EPH.

The SME contains three types of questionnaires according to the attendance situation of the individual surveyed: “she/he is currently attending school”, “she/he has attended” or “she/he has never attended”. For those individuals with at least some secondary education, the data base contains information on the type of secondary school –private or public. For each individual with secondary education –complete or incomplete– as her/his maximum educational level we also

know about her/his educational history: years failed and high school abandonment, and primary education performance –repetition, abandonment, and delayed entry to high school. Finally, the survey gathered information on informal education as training courses, and reasons for taking these additional courses –need to increase the chances of finding a job or to improve the productivity at work.

We focus our analysis on those youngsters (15–24 years old) living with their parents. Although this group represents 76% of individuals between ages 15 and 24, it is important to point out that this choice could introduce selectivity issues into our sample. It is likely that youngsters living out of their parents' households be economically independent. Therefore, they have probably more chances to be employed and to earn higher wages than those still living with their parents. Taking this into account, the results coming from this section should not be interpreted as representing average 15 to 24-year-olds but only those who have not yet moved out from their parents' home.

We define two samples according to data availability. The first one –*sample 1*– only includes individuals with incomplete or complete secondary education, but who had never attended college. This sample contains valid information of 7,668 individuals –3,654 females and 4,014 males– from the 29 main Argentinean cities. It is important to point out that this sample includes very diverse individual types from an educational and labor perspective. For example, there are youngsters attending high school who plan to continue studying at the university and with no perspectives to participate in the labor market until they graduate; there are other youngsters who have dropped out of high school and who have no plans to go back.

To build the second sample –*sample 2*– we add to sample 1 individuals with at least some college education, increasing the sample size to 10,646 –5,376 females and 5,270 males. Unfortunately, we lack information on secondary school orientation and educational history for the new group, and this is the reason to keep two separate samples.

The 28% of the individuals in sample 1 are employed, 59% are out of the labor market (inactive), and 12% are unemployed. As expected, inactivity is much frequent among women. 68% of women are neither employed nor looking for a job, while the percentage is 52% for men. Unemployment rate –the share of unemployed individuals on total active individuals– is considerably higher for females than for males (35% and 28% respectively). Figures are almost the same for males in sample 2, but the percentage of employed females is higher (25%) and the unemployment rate lower (30%). For both samples, employment and activity rates differ significantly by gender.

For those who are employed, there is information on various job characteristics. One of those job attributes is formality. Following Gasparini (2003), we use two alternative definitions of formality. The first definition considers that workers (only wage earners) with retirement benefits are formal workers. The second definition applies to all workers, and considers as formal workers entrepreneurs, salaried workers in large firms and in the public sector, and self-employed professionals. For both definitions, formality is more frequent for males than for females when considering sample 1. Only 33% of female salaried workers have retirement benefits while the corresponding percentage for males is 43%. According to the later definition, 42% of female workers and 49% of male workers have a job in the formal sector. When sample 2 is considered, the share of formal workers is larger but does not vary significantly between genders.

Concerning sector of activity, employed women seem to be more likely to have a job in a leading sector –financial sector, public administration, defense, education, health, and professional and

personal services. Here, leading sectors are defined as those having the highest wages. In sample 2, for instance, mean hourly wages for individuals working in a leading sector are \$3.74 against \$2.63 for workers from other sectors. The gap considerably shrinks in sample 1, where the corresponding figures are \$2.53 and \$2.28.

As for full-time jobs, they are more frequent among working males and present, on average, lower hourly wages than part-time jobs. Again, mean-wage gap is narrower in sample 1.

Mean hourly wages are 13% higher for men than for women in sample 1. At the time of the survey (1998) Argentina was under the Convertibility monetary regime, where one Argentinean peso was equivalent to one U.S. dollar. Therefore, an employed female between ages 15 and 24 earned 2.15 dollars per hour on average, while an average male from the same age group earned 2.4 dollars per hour, being the difference statistically significant. Hourly wages are higher for the second sample –almost 3 dollars per hour–, which is natural because of the higher educational level of this group, and there is no difference on average wages between genders when other relevant characteristics are not considered.

As for attendance rates, they are higher in sample 2 where 67% of individuals were attending school (or college), while the corresponding figure for sample 1 is almost 10 percentage points lower. For both samples school attendance is more frequent among females, though the difference is not significant in the first sample.

For sample 1, 84% of individuals have not completed yet or have already dropped out of high school. For the second sample, educational attainment is higher for women than for men. There are two important facts to point out here. First, only individuals with incomplete educational levels report to be attending school (or college). Second, given the age range being considered –maximum age is 24–, we have to think of college graduates in our sample as the best students from their cohort. Although the only thing we know for sure is that they are the firsts in graduating, other sources indicate that they are in general the ones with the highest grades too.⁸

Regarding school type, 77% of the first sample and 70% of the second one come from public high schools. Public education is free in Argentina, which explains why average students from public schools usually come from lower socio-economic strata than average students from private ones: private secondary education is more frequent among richer individuals. Similar patterns are found when considering other characteristics of the family that indicate its socio-economic status.⁹

From the EPH it is possible to distinguish among four main school orientations: humanistic, commercial, technical and other orientations. An important fact to point out is that enrollment in technical schools is mostly composed by men –for our samples only 17% of technical students are women.¹⁰

There are special programs designed for students who had not started secondary education at the age of 18. Since enrollment in such schools is composed mostly by adults, this educational mode is usually referred to as *adult education*. Students from these programs are generally characterized by a poor educational performance –drop out, failure– but they still make the effort to obtain a high-school diploma. From the SME we know that only 7% of individuals in sample 1

⁸ See for instance Di Gresia *et al.* (2002)

⁹ For more on this see Section V.

¹⁰ Again, for more on this topic see Section V.

have attended such schools and that this educational alternative is more common among males, who are in turn more likely to fail during their educational process.

To reflect educational history at the secondary school level we consider indicators of repetition and abandonment available from the SME for individuals in sample 1. The first indicator equals one if the individual failed at least one high-school year –and equals zero otherwise–, while the other one equals one if she/he abandoned at least for one year his/her secondary education and then returned to school. Repetition appears to be much more common than drop out –30% and 9% respectively–, and both phenomena are more frequent among males.

It is well documented in the literature that family environment is expected to affect children's education and labor participation decisions. From an economic perspective, household characteristics such as family structure, family size, and parental and other children's educational attainment are likely to influence education and labor participation by altering the cost-benefit scheme where these decisions are taken. From a sociological perspective, there are many ways in which families affect children's decisions. For instance, Nock (1988) and Weiss (1979) stress the rôle of the family in providing a hierarchical structure of authority needed to succeed in institutions characterized by such structures, like the educational system or the labor market. Other views focus on the importance of family in providing role models for children –Hess and Camera (1979)– or in controlling stress and conflict –Loh (1996).

As a proxy to family educational environment we choose to define a parental-education variable as the maximum between household head's and his/her spouse's educational attainment. Family educational environment could be also captured by the educational level attained by sisters and brothers of the individual in the sample. Here we define a dummy variable equal to one if there is another son or daughter of the household head with a higher educational level than the individual in the sample. 27% of individuals in sample 1 and 21% of those in sample 2 have at least one sibling who is ahead in her/his studies. Besides family educational environment, other children's education could be an important determinant of the roles played by each household member – particularly those related to the labor market–, and so does the age of the child relative to those of his/her siblings: more than half of the individuals in our samples are the eldest children living in their household.

Family structure could also affect the way roles are assigned between parents and children, and among children with different characteristics. Here, we consider two types of families according to the gender of the household head. Female headed families have gained participation over the years in Argentina. Marchionni (2004) reports that the share of this group of households in the Greater Buenos Aires almost doubled in the last three decades, from 7.5% in 1974 to 14% in 2000. During the nineties, the expansion of this type of household coincided with that of the share of poor people living in such families. A possible explanation is that female headed families face more restrictions –compared to other household types, for instance two parent families– to alleviate the effects of the increasing unemployment that has characterized Argentina over the last years.

As for other factors that could affect participation decision, we consider parents' employment situation since it is expected to affect the way roles are assigned among household members. 82% of individuals in our samples live in households headed by an employed father or mother, and there are no differences in proportions by gender. Regarding resources available to the family, we consider total income of the other family members.

The standard economic approach sees participation in the labor market as a time consuming activity that competes with other uses of time, particularly school attendance. Labor participation, schooling and the timing of both activities arise as the result of a utility maximization problem whose solution is a function of the household production function and the family investment function.¹¹ In Argentina, labor participation and employment are strongly and negatively related to school attendance, especially for males. Most youngsters in sample 1 are both inactive and attending school or college –55% of the females and 45% of the males–, while 23% are working but not attending school –this situation is much more common for males (28%) than for females (16%). The same pattern is present in sample 2 but with lower inactivity rates and higher employment rates.

Before we proceed to the multivariate analysis, it is relevant to explore the relationship between labor participation, employment, and each of the variables we have described so far. Considering educational level, individuals with incomplete high school present the lowest chances to participate in the labor market or to be employed, maybe because they are still attending school. Both for incomplete and complete high school, employment and participation are higher for males.

For sample 2 it is also possible to explore employment and participation situation for higher educational levels. Chances to be active or employed are higher for individuals with a diploma, both from high school or college. Again, inactivity appears to be much more frequent among individuals who have not yet completed the corresponding educational level, probably because they are still attending school or college.

Except for college graduates, employment is higher for males. Almost every college graduate is active, but unemployment is higher for males than for females in this group –33% and 16% respectively– which makes women with a college degree more likely to be employed than men with the same education.

Concerning type of secondary school, individuals from public ones are more likely to participate in the labor market than those coming from private schools. Despite of this, employment rates for the two groups are similar in sample 2, indicating higher unemployment among people from public secondary schools. Of course, this kind of evidence does not mean that the public or private nature of school has an effect on employment by itself since we are not yet controlling for many other factors –such as educational attainment or socio-economic characteristics of the family– potentially correlated with the type of school, participation decision, and employment situation.

Next, we consider the relationship between secondary school orientation and employment. As we noted above, from the EPH it is possible to distinguish among four orientation types: humanistic, commercial, technical and other orientations. Individuals from technical schools are the most likely to get a job, which is not surprising when we take into account that 83% of the students enrolled in these schools are males, that males are more likely to be employed than females, and that technical education qualifies students in very specific areas with many job opportunities –electricity, electronics, construction, computing, etc. To a lesser extent, the same argument holds for commercial schools.

¹¹ This approach relies heavily on Becker's (1965) and (1981) works.

As expected, we find higher employment rates among people from adult schools. Despite of having failed at some point in their educational process, people in adult programs persevere, which is probably what makes them more likely to be employed.

As for educational history and performance at the secondary educational level, repetition does not seem to affect the chances to be working, but females who drop out of high school are much more likely to be employed than those who never quit school. Those who interrupted the educational process delaying entrance to secondary school are also more likely to be employed than those who started high school right after finishing primary education.

Parental education appears to have a negative effect on employment, particularly for men in sample 1. We have to wait to the conditional analysis in later sections to see whether there is still an effect of parental education on employment once we control for family income, children educational level and other individual characteristics potentially correlated to parental education. Having a sibling with a higher educational level also appears to decrease the chances to be employed, especially for females. This could be associated either to peer-group effects among siblings or to the fact that children can be considered as substitutive factors in the household production function. Reinforcing the idea of substitution among children, and between children and their parents, the evidence suggests that being the eldest child living in the household increases the chances to be employed –particularly for males–, and that there is a positive effect on employment of belonging to a family headed by a woman. Finally, sons and daughters from families with employed household head appear to have less chances of being working, especially if they are still attending school. But again, given the unconditional nature of this analysis we should not put too much emphasis in this kind of results.

III.2- Employment situation and job characteristics. Estimation of probability models

This subsection is aimed at studying the determinants of employment situation of young females in Argentina, particularly those related to family environment and secondary education characteristics such as school characteristics and past educational performance. The methodological approach consists on estimating reduced-form models for the probability of being employed against the alternative of being unemployed or out of the labor force. Therefore, the dependent variable is a binary choice indicator taking on the value one when the individual is employed and zero otherwise.

Another possibility would be to study the determinants of labor participation and then, conditional on that, to explore what influences the probability of being employed versus being unemployed. However, there are several arguments to believe that the distinction between inactivity and unemployment is far from obvious, especially for youngsters who have a low attachment to the labor market –Flinn and Heckman (1983).¹² Because of this and given the goals of this section, we concentrate the study on employment probability though we also estimate models of the determinants of participation in the labor market.

As for the exogenous explanatory variables, we consider characteristics that could affect participation decision and employment opportunities: age in years and its squared, marital status, school attendance situation, educational attainment, high school characteristics, educational history –failure, abandonment, delayed entry–, variables that proxy family educational

¹² Nevertheless, we also performed the analysis of employment probability using sequential models, first to explain participation and then employment among active individuals. The results are markedly similar to those reported here, and they are available upon request.

environment and attitudes –parental education, siblings’ education, birth order, household structure, family size–, economic variables –family income and employment situation of the household head–, and geographic controls. By means of this analysis, it is possible to estimate the effect of changes in any of these exogenous characteristics on employment probability, keeping constant all the other variables included in the model.

Besides studying the determinants of employment, we are also interested in exploring what may influence –and to what extent– some job characteristics: formal or informal, and belonging or not to a leading economic sector. To allow for the possibility that effects differ by gender, we estimate separate models for females and males, and then we test the statistical significance of the difference.

III.2.1- The probability of being employed

The binary choice model for the employment situation is represented by equation [III.1] below. Equation [III.1] means that the probability of individual i being employed given her/his characteristics, summarized by vector x_i of dimensions $K \times 1$, is equal to the value of function $F(.)$ evaluated at point $x_i' \eta$, where η is also a $K \times 1$ vector of unknown parameters. In the Probit specification, function $F(.)$ is the c.d.f of a standard normal random variable, i.e. $F(.) \equiv \Phi(.)$.¹³ Vector of parameters η is estimated by the Maximum Likelihood procedure using standard econometric software.¹⁴

$$\Pr(\text{employment}_i = 1 \mid X = x_i) = F(x_i' \eta) \quad \text{for } i = 1, \dots, N \quad [\text{III.1}]$$

The expression for the change in employment probability caused by a marginal increase in variable x_k , for $k = 1, \dots, K$, is given by equation [III.2], and it is obtained by differentiating equation [III.1] for that particular variable.

$$\frac{\partial \Pr(\text{employment} = 1 \mid X = x_0)}{\partial x_k} = \eta_k f(x_0' \eta) \quad [\text{III.2}]$$

Where $f(.)$ is the standard normal p.d.f., i.e. $f(.) \equiv \phi(.)$. Equation (III.2) is known as the marginal effect of variable x_k on employment probability. From the sign of the estimated coefficients it is possible to predict whether the chances to be employed increase or decrease when any of the independent variables increases, while keeping all other characteristics constant.

Table III.1 in the Appendix to Section III presents the results of estimating Probit models for the probability of being employed for females and males and for each sample. The table also includes estimates for the difference in coefficients between genders.

We also estimated binary choice models for the probability of being economically active using the same set of covariates as in the employment probability model. Despite the magnitude of the coefficients differ from one model to the other, the signs are the same. Moreover, when a factor is found to significantly affect employment chances, generally it is also significant to explain activity, and vice versa. Interestingly, the only exception appears for family income and

¹³ When the unobservable factors affecting utility are assumed to follow a logistic distribution, the resulting model is called *Logit*. It can be shown that there is an equivalence between models Probit and Logit. Throughout these chapter we concentrate in the Probit specification. For more on binary choice models see for instance Long (1997) and Wooldridge (2002).

¹⁴ Actually, identification of vector η in the Probit specification relies on the assumption that the variance of unobservable factors for observation i equals 1. See, for example, Long (1997) and Wooldridge (2002).

household head's employment situation. Therefore, we concentrate on the employment probability model, and refer to the participation model only when it contributes to a better understanding of the point being discussed.¹⁵

In the relevant range, employment chances increase with age. Despite women's coefficients are larger, age effect does not differ significantly between genders. We can think of two forces acting in opposite directions on employment probability as the individual ages. On the one hand, opportunity costs of not working –i.e. potential wages– are usually higher for older people. This would push participation and employment probability up as individuals get older. On the other hand, there might be an inertial behavior related to school attendance not captured by the educational dummy variables. For youngsters still attending school, age reflects time spent in formal education. More time invested in education may induce individuals to complete the degree, keeping them out of the labor market, and thus reducing their employment chances. The estimated positive effect of age suggests that the first effect prevails.¹⁶

Just a few youngsters in our samples are legally married or in a *de facto* cohabitation, but this is a strongly significant attribute decreasing employment chances of women while increasing those of men. It is possible that being married also captures the fact of having children, but from the EPH we cannot match children with their parents when none of the latter is the household head. Of course, there can be individuals with children in our sample –especially women– who are single. Our model does not control for this situation.

As expected, attending school decreases the chances to be employed, especially for men, and the effect is reinforced –though not significantly– for individuals living in a household whose head is employed. Men's employment probability is much higher than that of women when considering individuals who are not currently at school. But for the group who attends school, chances to be employed do not differ by gender.¹⁷ Figure III.1 illustrates these results.

Concerning educational attainment, it explains females' chances of being employed but not males'. Beyond attendance situation, having graduated from high school or from college increases the relative probability of females to be employed. As shown in Figure III. 2, the gender gap in employment probability is narrower among high school graduates.

The only high-school characteristic available for the two samples is type of school –public or private. The fact of having attended a public instead of a private secondary school appears to be significant only for males and in sample 1. For that group, the estimated chances to be employed increase when high school is public given all the other characteristics included in the model. Instead, when considering estimated results for sample 2 we find no significant difference between public and private schools. To understand why the results differ from one sample to another, it is important to distinguish between changes in model specification and changes in sample composition. When controlling for the former we find that for less educated men, public school has again a significant and positive effect on employment. In contrast, the effect is

¹⁵ Estimation results corresponding to the labor participation model are available upon request.

¹⁶ Sosa Escudero and Marchionni (2000) find evidence consistent with our results when studying school attendance decisions in Argentina for children between 13 and 19 years old.

¹⁷ There is a possibility that attendance effect on employment differs as individual ages. To evaluate this hypothesis, new probability models including an interaction variable between age and attendance situation were estimated. The interaction was significant only for sample 2 suggesting that the detrimental effect of attendance on employment chances attenuates with age. The new variable is highly correlated with educational attainment, capturing much of its effect and making interpretation cumbersome. Therefore, and according to the main goals of this chapter, we chose to discuss a model specification that excludes this interaction variable.

strongly negative for men with at least some college education –i.e. those in sample 2 but not in sample 1.

Figure III.1
Effect of school attendance on employment probability

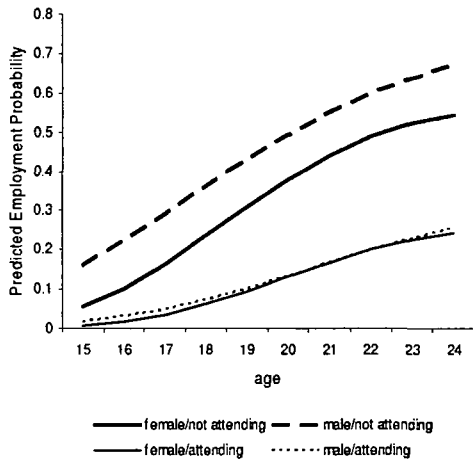
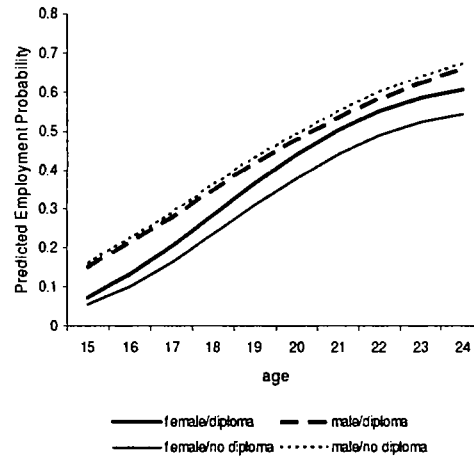


Figure III.2
Effect of high school completion on employment probability



Source: author's calculations based on EPH and SME, 1998.

Note: predicted probabilities are computed using estimates for sample 1, considering men and women from a public high school but who are not currently attending school. Maximum parental education is complete college, and family size and income are fixed at the sample means. All other dummy variables are set equal to zero.

Individuals in sample 2 belong, on average, to families from higher socio-economic strata than those in sample 1. Of course, contrast is stronger when comparing individuals from the first sample against those who belong to sample 2 but not to sample 1. It is expected that participation in the labor market for youngsters like the ones we are considering –i.e. living with their parents and still in schooling age– be higher in sample 2 than in sample 1 once controlled for age. Even though some dimensions of socio-economic status are controlled for in our models, others might not. If those omitted dimensions were correlated with the type of school, the effect on employment situation would be captured by the public-private dummy variable. In fact, there is evidence suggesting that this correlation could be strong. Only 23% of individuals in sample 1 come from private schools, while the figure corresponding to the second sample is 30%, and 44% when considering individuals in sample 2 but not in sample 1. This evidence, though not conclusive, suggests that the effect on employment of the type of school might not have to do with the school characteristics by themselves but with unobserved factors –probably characterizing the whole family– that determine both high school choice and the likelihood to continue studying beyond secondary level.

Concerning high school orientation, it is surprising that it appears to have no effect on the probability of being employed once controlled for all other factors. In contrast, people with adult secondary education have higher employment chances than others from schools with standard programs. Despite of having failed at some point in their educational process, people in adult programs persevere. Perseverance or maybe a hard working attitude is what probably makes them more likely to be employed.

Educational history seems to be relevant to explain employment situation for females but not for males. To delay high school entrance and to abandon secondary education for at least one year increase employment probability of females in a magnitude that goes from 32% to 135%, depending on the age considered. This effect may be capturing the detrimental impact on employment of a higher educational commitment beyond current attendance situation. The effect is so strong for women that it makes them more likely to be employed than men of similar characteristics.

Repetition significantly reduces employment chances only for females. Failing a high-school year indicates bad performance and maybe less employment opportunities available. In fact, repetition does not explain participation decision though it influences employment situation.

Concerning family educational environment, once controlling for school characteristics and educational history no room is left for parental education to significantly affect children's employment. When concentrating in sample 2, instead, we find that more educated parents imply, in general, lower chances of their daughters to be employed. Also, having at least one parent graduated from college lowers the probability of finding an employed son, and the effect does not differ significantly by gender.

Given all the other variables, individuals with siblings who are more advanced in their studies have less chances to be employed, being the effect for men and women statistically equivalent. There are at least two complementary explanations consistent with this evidence. On the one hand, role assignment among siblings could determine that the one with the highest education is the one who goes to work in the first place, maybe because he/she has the highest opportunity cost of not working –potentially higher wage– or the lowest opportunity cost of working –in terms of human capital not yet accumulated. On the other hand, there could be peer-group effects among siblings encouraging, for example, educational commitment of the less educated brothers and sisters.

Being the eldest child living in the household decreases females' employment probability, both in absolute terms –at least in sample 1– and relative to men. It could be the case that eldest daughters stay inactive to help with home tasks. The chances to be employed for a male are not significantly affected by birth order.

Concerning household structure, living in a family headed by a woman increases males' chances to be employed as it does living in a larger family. Both situations potentially indicate the need for more resources –possible not fully captured by current family income– and a particular way to assign roles between children and parents, and among children with different attributes. For some reason, sons go to work instead of their sisters –or before them. This result is consistent with evidence presented in Sosa Escudero and Marchionni (2000), where it is found that as family gets larger it becomes more likely to take boys out of the school system than girls –possibly to “send” them to work.

As for economic variables, sons and daughters of employed household heads are more likely to be employed. Nevertheless, employment of household head has an extra effect for men attending school that almost compensates the former, though the interaction variable is significant only at 15% for sample 1. Household head's employment is not a relevant factor at 10% significance level in the participation model.

Concerning family income, once household head's employment situation is controlled for, current income of the other members of the household appears to significantly decrease

participation probability while is found irrelevant to explain employment chances. This suggests that current resources available to the household affect labor supply but not demand.

III.2.2- The probability of having a job in the formal sector

In this part we estimate models for the probability of having a formal job adopting a Probit specification. The goal is to explore whether secondary education and family environment variables contribute to determine the fact of being in the formal or informal sector, and how the effects may differ between genders.

We use the two alternative definitions of formality discussed in subsection III.1. Of the 1,847 employees in sample 1, we have 1,562 salaried workers for whom we have data on retirement benefits. The share of formal workers in total salaried workers is almost 40% when formality is proxied by retirement benefits. Instead, when considering as informal those salaried workers in small firms, self employed or family workers, formality represents 47% of total workers in sample 1. For the second sample the share reaches 54%.

According to Gasparini (2004) and using the first definition, formality in the labor market has dramatically fallen over the years. The share of salaried workers with social security rights dropped 6 points in the 1990s and 7 points since 1998. In contrast, formal employment has not significantly changed in the last decade if the second definition is considered.

The first three columns of Table III.2 in the Appendix to Section III report the results of estimating Probit models for the probability of having a formal job considering the first definition of formality and using sample 1.¹⁸

As for participation and employment probability, age significantly increases the chances of being formal irrespectively of the gender, sample and definition of formality considered. Even though attendance situation and marital status were strongly significant factors explaining participation and employment situation, they do not affect the probability of having a formal job.

More educated individuals are more likely to have formal jobs. Coefficients for females are larger than those for males, indicating a stronger effect of educational attainment on females' chances of being in the formal labor market. Among individuals with incomplete secondary education, men are more likely than women to have a formal job. However, when making the same comparison among college graduates, females have higher probability of being in the formal labor market (see Figure III.3).

As for high school orientation, salaried women from technical schools seem more likely to have a formal job compared to similar women from other schools, but given that women represent a negligible share of enrollment in such schools this result is somehow irrelevant. Adult education significantly decreases the chances of having a formal job for women and for both definitions of formality. Neither type of school nor individual's educational history appear to be relevant in determining formality, though they explain participation and employment chances.

¹⁸ Estimation results for sample 2 as for the other definition of formality are available upon request.

Figure III.3
Effect of educational attainment on formality

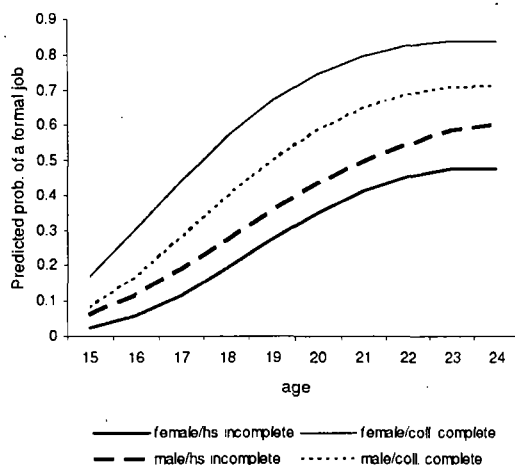
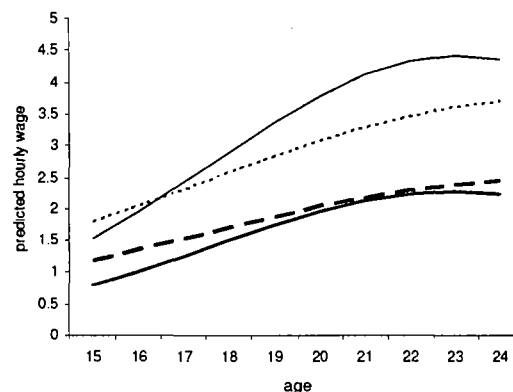


Figure III.4
Effect of educational attainment on hourly wages*



Source: Author's calculations based on EPH and SME, 1998. Predictions are computed using estimates for sample 2, considering men and women from a public high school but who are not currently attending school. Maximum parental education is complete secondary, household head is employed, and family size and income are fixed at the sample means. All other dummy variables are set equal to zero. * Considers individuals with full time jobs.

Concerning parental education, it significantly affects chances of having a formal job, especially for women and when the first definition of formality is considered. In general, children's chances to have a formal job are higher when parents have at least a primary school diploma, but no other clear pattern appears to be present.¹⁹

The larger the family the smaller the probability of being a formal salaried worker, but family size is not a significant variable when the second definition of formality is considered. Neither are other family characteristics such as birth order, siblings' education, and family structure, nor economic variables such as employment situation of household head and family income.

III.2.3- The probability of having a job in a leading sector

Here we study the determinants of the probability of having a job in a leading sector given that the individual is employed. As in the Probit models estimated before, our main goal is to explore in what extent secondary education and family environment help to explain this particular job characteristic. Dependent variable is defined as a binary indicator equal to one for individuals working at the financial sector, public administration, defense, education, health, or professional and personal services. The set of covariates is the same as for employment, participation and formality models estimated earlier in this section.²⁰ Estimation results for sample 1 are reported in the last three columns of Table III.2 in the Appendix to Section III.²¹

¹⁹ Unlike the specification for employment probability models, here the omitted category for parental education is "no schooling or primary incomplete".

²⁰ The dummy variable indicating "other high school orientations" –besides humanistic, commercial and technical– perfectly predicts having a job in a leading sector. Therefore we do not include this variable and we take out of the sample individuals for whom this indicator equals one, losing 140 observations approximately.

²¹ Those for sample 2 are available upon request.

In general, age appears to have a non significant effect on the probability of having a job in a leading sector. The exception is for women in sample 1 where the effect is positive and significant. Males attending school are considerably more likely to be employed in a leading sector than those who are not currently attending school, while attendance situation is not significant for females from either sample. Thus, keeping all other things constant, attending school decreases chances of women relative to men to be employed in a leading sector.

Besides attendance situation, higher educational attainment is associated not only to higher employment probability but also to better jobs in terms of formality and sector of activity, and once again the effect is stronger for females. From the estimates for the second sample, a woman with at least some college education has twice the chances to find a job in a leading sector than a similar woman with no college education. But when this woman finally graduates from college, her chances to have such a job are even higher, increasing more than three times.

Unlike the evidence found for formality where type of school appears to have no effect, women from private high schools are more likely to get jobs in leading sectors than those coming from public ones. This might be suggesting that private schools deliver a higher quality education than public ones, and that this is perceived by employers. Even though coefficients for men are also negative, they are not statistically significant.

Concerning secondary school orientation, men from technical schools have lower probability of working in a leading sector than men from other schools. It is to expect that males with technical degrees work as non-professional self employees –electricians, constructors, etc. Therefore, school orientation appears to affect the type of job obtained once employed, but not the chances of getting a job.

As for family environment, parental education significantly affects men's probability of having a job in a leading sector but not women's. On the contrary, siblings' education significantly increases women's chances of having such jobs –both in absolute terms and relative to men's, and so does being the eldest child, but the effect is significant only when considering sample 2. Total income of other members of the family has a positive and significant effect on the probability of having a leading-sector job.

III.3- Determinants of hourly wages. Estimation of Mincer Equations

This subsection is aimed at studying and discussing the main determinants of earnings for youngsters in Argentina, focusing on differences by gender and the role played by secondary education and family environment. Earnings equations, usually known as Mincer equations after Mincer (1974), are reduced form equations where the dependent variable is some measure of labor earnings –typically log of hourly wages–, while the set of exogenous variables includes age and squared age –as a proxy to potential labor market experience–, educational attainment, gender, and other controls such as a binary indicator of full-time job.

One problem concerning estimation of Mincer equations is that wages are only observed for working individuals. Ordinary least-squares (OLS) estimation would produce biased estimators if, as expected, the mechanism that selects individuals in and out of the sample were correlated with potential earnings. Therefore, we use Heckman's (1979) two-step procedure –also known as Heckit– to obtain consistent estimators when sample selection is present. Of the 3614 women in sample 1, we observe the wage offer for only 582 working women (16%). As for the second

sample, we observe wages for 984 out of 5314 women (18%). Censored observations are less common among men –29% in the two samples.²²

The covariates included in the selection equation estimated in the first step are the same as in the employment probability model in subsection III.2, previously. As for the second step –the Mincer equation itself– we define the dependent variable as the log of labor income per hour perceived in the main job. Wages are measured in Argentinean pesos of 1998. At that time 1 peso was equivalent to 1 U.S. dollar. Among the covariates we include age and its squared, educational attainment, a set of dummy variables indicating type of school –public or private–, school orientation, special adult programs, and educational history. Also, a dummy variable indicating if full-time or part-time job and five geographic controls are added. Table III.3 in the Appendix to Section III reports the results of these estimations.

Age has a significantly non-linear effect on log hourly wages, both for men and women, but the effect differs by gender. Educational attainment has also a significant positive effect on wages, and again there are differences by gender. Based on estimation results from sample 2, for instance, females with a high school degree earn 20% more per hour than females who did not complete that level. The effect for males, though significant, is weaker: high school graduation increases men's hourly wages by only 9%. Higher educational levels imply even higher wages, especially for females (see Figure III.4 above).²³

The fact of having attended to a public instead of a private secondary school significantly affects wages of men but not of women in both samples. Males from public schools in sample 1 earn 14% less than those from private ones. The corresponding figure for the other sample is 11%. Once again, private schools appear to improve labor conditions. They contribute to increase females' chances to get jobs in leading sectors while appear to be associated to higher wages for males.

Despite not having effects on employment probability, high school orientation appears to significantly affect wages. Given all the other characteristics, females from commercial schools obtain lower wages than those from the other school orientations, while males from technical schools make 13% more per hour than those who attended other schools.

As for educational history, only repetition has a significant effect on wages for females. A woman who had failed at least one high school year makes 13% less per hour compared to another similar woman who has never failed. This could indicate that the attributes that make her fail school also make her less productive in the labor market and less likely to find a job.

Full-time indicator is a highly significant variable across samples and genders. Full-time jobs imply lower hourly wages for both men and women. Compared to a female working on part-time basis and earning 2 pesos per hour, an employed female in a full-time job would earn only 1.56 pesos. Making the same comparison for a male, his hourly wage would decrease from 2 pesos to

²² Because of some individuals with missing wages, our samples loose observations when Mincer equations are estimated –134 in sample 1 and 182 in sample 2. Nevertheless, Probit estimates of the employment probability model do not differ significantly when considering full samples –as in Table 8– or incomplete samples –as in the first step of Heckman's procedure estimated in this section.

²³ A long standing discussion related to estimation of Mincer equations is the possibility that returns to education be biased due to omitted variables, particularly those linked to individuals' innate ability –see for example Card (1994). Unfortunately, as usual, we do not have information available to control for this potentially harmful omission. Nevertheless, if this problem had similar consequences for both genders, comparisons between males and females are still informative on relative returns to education.

1.24 pesos. Similarly when considering sample 2, but in this case the effects do not differ significantly between genders.

Heckman's two-step method estimates in the first step the nonselection hazard –what Heckman (1979) referred to as the inverse Mills' ratio– which is incorporated as an extra regressor in the model estimated in the second step. This new variable captures the variation on employment probability among individuals, avoiding the bias that self-selection behavior can cause on the OLS estimates using data for working individuals alone. The strong significance of the inverse Mills' ratio on females' earnings equations indicates that selection is present. Moreover, the positive value of the corresponding estimated coefficient indicates that women with higher employment chances are also those with higher wages. Therefore, the sample of observed wages is biased upward compared with what we would have observed if women decided whether to work randomly. On the other hand, sample selection is not present –at least not significantly– among men.

IV- Labor market insertion of Argentine's youth focusing on gender concentration and educational level

This section's main objective is to analyze labor demand with special focus on factors that may result in discrimination or segregation towards female employment. For such purpose we will try to answer two sets of questions: a) Employers, prefer hiring women or men? Why? Do employers hire a bigger proportion of men in comparison to women? And if so, why?; b) In male predominant activities, which are the job characteristics that could generate female sub-representation? Likewise, in female predominant activities, which are the job characteristics that could generate male sub-representation?

Studies regarding gender discrimination in the labor market have usually been carried out using household surveys' data. However, a significant portion of discrimination's theory centers its attention on employers' behavior and attitudes towards gender, race and religion, among others. In order to obtain a broader scope of the labor market we use two different kinds of analyses, a quantitative analysis and a qualitative analysis.

Quantitative analysis: to obtain the general features of the labor market we'll use a household survey, the Permanent Households Survey [Encuesta Permanente de Hogares (EPH)] carried out by the National Statistics and Census Institute [Instituto Nacional de Estadísticas y Censos, INDEC]. We'll consider two different samples for both men and women: young population (from 18 to 29 years) and adult population (30 years or more), to analyze labor concentration by gender for Argentine's youth and assess education's effect on industrial's employment structure. Also we'll estimate an econometric model for total population in working age (from 15 to 64 years of age) and for young men and women (from 18 to 29 years of age), to determine education's effect on young population's probabilities of working at gender neutral industries or occupations.

Qualitative analysis: a qualitative questionnaire was applied to a representative group of firms, to understand the behavioral and “emotional” aspects of the selection and hiring process related to young applicants or employees. Specifically, such questionnaire will help us to learn about the mechanisms used by a firm for searching and hiring personnel, promoting its employees or to provide them training. Also, it will allow us to find out which are the requirements demanded by employers in terms of education, experience, language and computer skills, as well as (if they exist) requirements in terms of sex, religion or race. Of course, the principal goal of this opinion

poll is to find out whether the female employees or applicants for an open position suffer from discrimination or segregation in any of the stages of the hiring and selection process.

IV.1- Empirical analysis of labor concentration by gender

This subsection analyzes empirically labor concentration by gender for Argentine's youth and evaluates the role played by education in industrial's employment structure, following the line of research of labor insertion and gender occupational segregation by Anker *et. al*, (2003).

The analysis of employed population by occupation and sector of activity is just one of the many ways of approaching labor demand. This approach has several limitations due to the fact that available data only shows in which sectors of activity are people actually working, but does not allow knowing if such equilibrium is a result of people's decisions or of employer's preferences. In this study we assume that employers' preferences give shape to the occupational structure, thus the available data will be an adequate indicator of labor demand. This is an extension of the principle that considers employment rate as a demand indicator and activity rate as a supply indicator.

Furthermore, the analysis of employed population's distribution by occupation and sector of activity has a significant advantage, since it allows the studying of gender occupational segregation and provides a precise outline of labor opportunities by gender. Studies regarding this issue show that women are mainly employed in jobs that can be considered as "feminine", while men –even though more equally distributed in most countries employment structure– are more concentrated in "masculine" jobs. An investigation carried out by Anker (1998) shows that approximately 60% of manufacturing and services' workers are employed in occupations in which at least 80% of employees are of the same sex.

Gender occupational segregation has a bigger negative impact on women: feminine jobs are usually less attractive in terms of income and career opportunities, as well. A considerable portion of the wage gap is explained by the kind of jobs women perform. Notwithstanding, concern about segregation has also increased among men, since the growth of employment verified in many countries has favored typically feminine occupations.

Given such state of affairs, our major interest is to answer the following set of questions:

First, are there any differences in occupational segregation between youth and adults? If gender occupational segregation depends on variables such as domestic duties and children's care, can it be stated that this segregation would have a greater effect on adult women? Reproduction is a less relevant factor for younger women and stereotypes frequently guiding entrepreneurs' decisions are closely related to adult women, specially married ones. Besides, young people are mostly working in sectors that are either feminine or gender neutral, while only a small proportion is employed in masculine sectors.²⁴

Second, does labor market give the same value to the education acquired by men and by women? In other terms, when male and female productivity are equalized does gender segregation tend to diminish? Of course, the gender concentration prevailing when choosing a career can affect students' future labor insertion (Joy, 2000). Among high school graduates with commercial and

²⁴ In Latin America between 80% and 90% percent of young people are employed in the services sector, while the rest works in manufacturing or construction. This situation is slightly different in other underdeveloped regions, like Africa and Asia (ILO, 2004).

humanistic orientations, concentration is weaker, hence a similar occupational structure should be observed for graduates of both sexes.

Besides the questions aforementioned, the issues approached in this section have great importance because of segregation impact on individual's decisions regarding education and professional training. When such decisions are related to labor market opportunities', occupational segregation has a negative effect on the quantity and quality of education received by girls and women and, therefore, can contribute to the increase of labor market's gender inequality.

IV.1.1- Metodology and data

This section's purpose is to analyze labor insertion of Argentine's youth and high school's impact on such insertion. This section's selected methodology can be divided in two parts: a descriptive one and a quantitative part devoted to analyze labor insertion's determinants. First part's objective is to identify in which occupations and sectors of activity are female and male workers occupied. On part two we intend to acknowledge the effect of education on certain occupations and sectors, controlling for other factors that may interfere in the labor insertion/education ratio. At the same time, descriptive analysis has been divided in two parts: one that contains the basic aspects of the analysis and a second part presents an aggregate indicator of segregation.

The basic description will be carried out taking into account the following steps: a) Analysis of the gender composition of occupations and industries'; b) quantification and evaluation of employed persons considering gender's dominance in occupations and industries; c) analysis of the aforementioned distribution tails; d) means' analysis of the abovementioned distributions.

All steps will be performed considering both the vertical and horizontal dimension of segregation. For the first dimension workers will be classified according to occupations' hierarchy and for the second, by industries and sectors of activity. Literature specialized in studying the differences between female and male labor insertion, shows that women tend to work in bad or regular jobs –quality of jobs is measured in terms of wage, responsibilities and promotion likelihood, among others. Also, those investigations reveal that a rather high portion of women are occupied in a few sectors of activity, while men are more evenly distributed among the sectors that integrate a country or a region employment's structure.

For comparison purposes we'll exclusively consider young people –between 18 and 29 years of age– and adults –30 or more years of age–, at the inside of both female and male samples. Data used is the latest available: May 2003²⁵; however, when possible, we'll compare results with those of prior years²⁶. At the second stage of this descriptive approach we'll obtain an aggregate segregation indicator that will permit us to evaluate differences between groups defined by age (young people vs. adults) and educational level (elementary, secondary and tertiary).

Regarding the latest issue, specialized literature suggests many different segregation measures²⁷. In this investigation we have chosen the Siltanen *et. al* (1995) procedure, called Marginal Matching (MM), which allows the calculation of a non-parametric association (tau-b statistic) that will serve as a segregation index. The construction of the index through MM procedure

²⁵ Strictly speaking the latest data available is for the first trimester of 2004. But, data collection's methodology used for our primary data source, the Permanent Households Survey [Encuesta Permanente de Hogares], changed in 2004.

²⁶ There were no difficulties for doing time comparisons between sectors of activity, but there were some problems when performing such comparisons for occupations, as we'll show later in this section.

²⁷ For further information see Blackburn *et. al* (1990), which presents a comparison for the available measures.

requires a contingency 2*2 table that relates occupied people's gender with occupations differentiated by gender. In other terms: the quantity of men and women employed in jobs defined as "masculine" or "feminine". Obviously, such distinction of occupations is arbitrary, but once undertaken provides the following segregation table:

Table IV.1

Occupation	Occupied people		
	Men	Women	Total
Female occupations	M_m	F_m	M
Male occupations	M_f	F_f	F
Total	M	F	N

If the table is symmetric, then M_f has to be equal to F and M_m to M. Hence $M_f = F_m$. Both proportion's differences match and are equal to the tau-b statistic. In mathematical terms the association statistic can be expressed as:

$$MM = (F_f \times M_m - F_m \times M_f) / FM \quad [IV.1]$$

This index ranges between 0 and 1. It will be equal to 0 if employment's structure does not show differences among men and women (no segregation). On the contrary, it will be equal to 1 if all men are employed in masculine occupations and, therefore, women are all working in feminine jobs (maximum segregation).

According to the comparison carried out by Siltanen *et. al* (1995), this symmetric measure is the only one –amongst all the available– that fulfills all seven criteria desired for any segregation measure²⁸: symmetry, upper limit constancy, inferior limit constancy, size invariance, occupation equivalence, gender composition invariance and occupation composition by gender dominance invariance.

In spite of allowing the differentiation by groups of age and educational level, the prior analysis does not permit to control for other factors that may be affecting the observed employment's structure, such as marital status, time dedicated to remunerated work, household position, etc. Therefore we'll have to examine the determinants of occupation through the definition of occupation types disaggregated by gender dominance as the dependent variable. In order to identify the dichotomy masculine occupations-feminine occupations, we'll estimate a Probit model.

Our primary data source is the Permanent Households Survey [EPH]. For the most part, this study is referred to May 2003; besides we'll perform a comparison between the latter and data of May 1998. When data allow it, we'll extend the comparison to other years.

The period was chosen according to information availability. Only in May 1998 entered into effect in all urban areas covered by the EPH the National Occupation Classification [CNO] of 1991's National Population Census.²⁹ To evaluate horizontal segregation we'll use the 22 sectors of activity defined by INDEC considering a three digits CIIU categorization. Vertical segregation will be studied with the first and third digits of the CNO. In fact, the occupation's hierarchy is fully captured by CNO's second digit, but such hierarchy changes according to the occupation

²⁸ The remaining measures are: Dissimilitude Duncan Index, Gender Ratio, Women and Employment and Gini Coefficient. For further details see Siltanen *et. al* (1995).

²⁹ Fortunately this inconvenient is absent in sectors of activity, since in all cases we could obtain industries' classification according to the third revision of the Uniform Industrial International Classification of All Economic Activities [Clasificación Internacional Industrial Uniforme de Todas las Actividades Económicas, CIIU – Rev. 3].

type indicated by the first digit. In this case the procedure will be the following: we'll detect those occupations with strong female predominance and examine its structure with the CNO's second digit.

For the differentiation between female and male occupations and MM application we work with the maximum disaggregating level that EPH data allows for horizontal and vertical segregation: in the first case, three digits of the CNO; in the second, three digits of the CIU.-Rev.3.

IV.1.2- Results

Labor market gender composition

In the first place we describe population's distribution by major occupational groups for Argentina in 2003. Considering CNO's first digit we notice women are concentrated in this major areas: "Commerce, Transportation, Storage and Telecommunications", "Various Services", and "Basic Social Services", as well as "Legal, Administrative, Planning and Informatics". Although those groups absorb the biggest proportion of employed people, regardless of gender, they are predominantly female: 8 of 10 women are working in those, against 6 of every 10 men. On the contrary, other groups are male oriented, especially "Digging, Energetic, Construction and Infrastructure Production" which is almost an entirely male occupation.

Differences among young people and adults occupations are not so noticeable, moreover, at first sight they appear to be equal. However, when focusing attention only at female population, a significant disparity arises between groups 3 –"Commerce, Transportation, Storage and Telecommunications"– and 4 –"Basic Social Services"– of the CNO's first digit classification. Considered together these groups concentrate 38% of total occupied female population, but while group 3 contains 23% of young female population it only absorbs 13% of female adult population. The opposite occurs with group 4: 13 of every 100 women are employed on it and 25 of every 100 female adults.

Therefore, it becomes interesting to look further into each occupational group in order to identify the hierarchical structure and the specific character of the tasks performed both in groups 3 and 4. This can be achieved by taking into account the second digit of CNO's classification used in the EPH. On occupational group 3 –that absorbs almost half of young female population–, women between 18 and 29 years are mostly employed at sales areas, while a smaller proportion of young men perform such tasks. Most men are occupied on "Transportation and Storage" and "Machinery Operation" areas. This clearly demonstrates how in the same occupational group, women and men are hired to undertake different jobs.

If gender concentration is highly significant, there can't be found hierarchical differences for young men and women, since both genders are performing execution duties instead of management and supervision ones. Nevertheless, among the few occupied in the top of the hierarchical scale, there is a disparity that favors male workers: 3.6% of young men are carrying out managerial tasks *versus* only 0.7% of total occupied young women.

When observing group 3's adult population there is a clear advantage –always compared to young population– in terms of their share in managerial duties, and gender differential tends to disappear. This fact suggests that for covering white collar vacancies, employers seek adult people without gender's considerations. Regarding the positions located in the lower bottom of the hierarchical scale, we observe that male adults are mainly working as machinery operators, whereas women are strongly concentrated in sales tasks. This means that men have access to jobs

that require more qualifications, especially those acquired through “on the job” training; women, on the other hand, seem to be confined to perform sales jobs.

At occupational group 4, young females are mainly developing educational tasks as blue-collar workers, while men are more concentrated on the “Surveillance and Prevention” sector and “Health Care and Education” sector, as well. In this group, young people are absent from the top of the hierarchical scale, most likely due to the fact that many of the vacancies may be filled with “inside personnel”, which could be reflecting the dynamics of this labor market: in order to become a school’s principal an educator needs to have several years of experience as a teacher. However, for adults there is an interesting finding: a bigger percentage of women –among all occupied females– than of men –among all occupied males– are employed in managerial positions. In addition, an increase can be noticed in adult’s involvement in the Health Care sector. This could be consequence of the need of a “credential” to have access to this kind of jobs. Yet, gender structure is very similar to that of young people.

In retrospective –considering years 1998 and 2003– there have not been relevant modifications in Argentina’s employment structure. Occupational groups 3, 4 and 5 employed in 1998, and still do in 2003, 2 of every 3 women. Also, in both years men are more equally distributed in the remaining groups. On the other hand, the proportion of employed men and women as well, has augmented in the “Goods Reparation” sector (group 8), an expected behavior according to economic activity’s decreasing level registered from 1998 to 2003.

Additionally, there are no significant changes in the hierarchical structure of the main occupational groups: 3, 4 and 5. Young females in 1998, 2001 and 2003 are developing sales duties, while young men are mostly performing transportation, storage and telecommunications tasks. At occupational group 4, women, regardless of age, are concentrated in Health Care and Educational services and men, in Surveillance and Prevention. It must be noted that this last occupation has gained participation in total employment between 1998 and 2002, which might be a sign of the insecurity level’s increase that took place in Argentina afterwards the 2001 crisis.

In relation to horizontal segregation –i.e. segregation in industries– we observe that 2 of every 3 women (66%) are employed in these sectors of activity: Retail Commerce, Public Administration and Defense, Education, Health Care and Domestic services. This occupational profile differs with males’ profile, since only 30% of them are employed in those fields. Female concentration in the mentioned fields is considerably lower for young women. There is also a difference in sectors of activity when we take into account women’s age: the younger ones are mostly working on Retail Commerce and female adults, on Educational services. However in order to enter an occupation in the Education sector a person, in most cases, must have a tertiary studies diploma³⁰. Attending tertiary studies retards the labor insertion process, so a huge proportion of employed persons in the Education field are over 30. The bigger share of young people in Retail Commerce activities shows no relation whatsoever to gender. Hence we can affirm that retail is an activity that segregates adults but does not have a gender bias.

The arrangement observed for 2003 is very similar to that of previous years. Predominantly female sectors of activity remain the same and still absorb two thirds of female occupied population. However, time analysis suggests a certain degree of “masculinization” for such fields, since there is an increasing participation of male in those. The occurred variations that can be associated with an evolution of labor demand are: a) an increase of male workers in services

³⁰ We say in general, because there are occupations of this area that require little or no qualification at all, that can be acquired through “on the job” training.

areas; b) a decrease in the proportion of male occupied in manufacturing. This behavior has been mainly determined by the economic contraction that took place in December 2001. Men occupied in sectors with higher qualifications expanded its participation in the market, probably due to an increase in less skilled workers' unemployment in manufacturing and commerce fields. Also, Domestic Services lost sharing –the most feminine of all jobs– possibly, because such services are mostly requested by middle and high income population, which was notoriously affected by 2001 crisis. The features outlined for population in general are also observed for young population. Perhaps, the most outstanding trait, given the objectives of this study, is both male and female's loss of participation at the Retail Commerce sector of activity, where the biggest proportion of high school graduates may be working.

The evaluation of employment's structure by industries and occupations, makes sense only if jobs dominated by men and those dominated by women have specific characteristics. Data used in this paper shows that individuals –independent of gender– employed in typically feminine jobs receive lower salaries and work less hours. Besides the salary gap by gender in typically feminine jobs is dramatically higher than the average gap. At the same time, the gap for per week hours of work in feminine jobs is notoriously lower. Both behaviors are also recorded for young population.

The mentioned gaps both in salaries and per week hours of work are characteristic of occupations. We observe that men employed in typically feminine occupations earn more income than women working in such occupations and, also, than men occupied in masculine jobs. These differences might be related to the kind of duties performed by individuals of each gender. For example, a man and a woman can be employed as retail workers in a Retail Commerce sector of activity, but is very likely that male workers will have supervision and controlling responsibilities, while women will be working "behind the counter". This constitutes only a hint, since the data available does not allow the inquiring of those issues.

However, we can analyze occupational concentration levels of young people simultaneously working and studying and those only working. Young people dividing their time between work and study are almost evenly distributed between occupations with different gender composition. Male's strong concentration in masculine occupations only takes place for those choosing to work only. Among women occurs the exact opposite: strong female concentration in feminine jobs is observed for women working and studying, while those exclusively devoted to working are more equally distributed in both feminine and masculine jobs. Therefore, even if there is some difference in the segregation index between those working and studying ($\tau\text{-}b=0.365$) and those working only ($\tau\text{-}b=0.412$) the discrepancy of almost five percentage points does not fully reflect the characteristic remarked in this paragraph.

Finally, we analyze occupational concentration levels by industry (horizontal) and by occupation (vertical) in order to estimate the impact of workers' age and educational achievements as well (Figure IV.1). Regarding the first variable we can affirm that both horizontal and vertical concentrations are bigger for adults than for young individuals. In relation to education, horizontal and vertical concentrations are reduced as workers' educational achievements increase. However, such reduction is not monotonous, which is particularly notorious for middle education levels. Gender concentration shows a greater sensibility for modifications in the educational level. The same effects can be found for younger workers. These outcomes suggest that education generates bigger workers' mobility among sectors of activity than between occupations. In particular, the acquisition of a middle level of education moves individuals towards the services

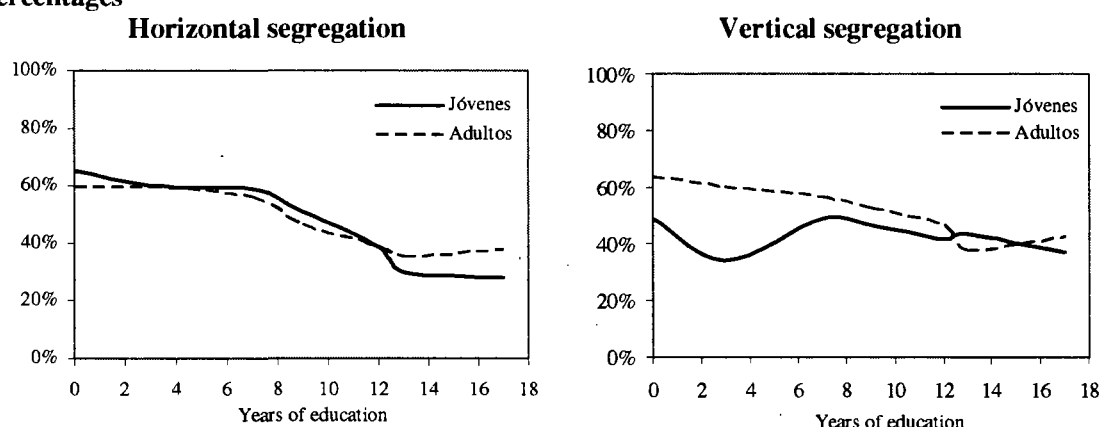
sectors –where gender discrimination is lower– but does not generate significant mobility in terms of hierarchy.

Education's effect on young people's likelihood of attaining a neutral gender employment

In this part we estimate education's effect on young people's probabilities of working at gender neutral industries or occupations. As we've said early, both industries and jobs with female predominance have lower salaries and shorter working days. However, we can't assess to what extent the likelihood of performing a gender neutral occupation is affected either by demand factors or by supply factors. Since our main interest is labor demand, we'll assume the aforesaid likelihood is equivalent to a person's probability of being hired at the industries and occupations studied in this paper.

Figure IV.1

**Horizontal segregation and vertical segregation
by educational achievements, Argentina may 2003
In percentages**



Source: author's estimations using data provided by INDEC

In order to do so, we have estimated a Probit model which dependent variable is 1 if a person is employed at a gender neutral occupation or industry and 0 otherwise. We have defined as gender neutral those industries and occupations where female participation ranges from 30% to 69%. We also take into account duties that are gender neutral both on industries and occupations.

To define the independent variables we have clustered the factors that can affect a person's probability of being hired. Due to information restrictions, we have chosen the following groups of factors: individuals, individuals' family members and individuals' jobs. Among the individual's features we include age and educational level required by industries and occupations. Educational level is measured through both the dimensions used in Chapter 1: school attendance and achievements. Given this study's objective, our primary variable is educational level, particularly, high school education. Also, we consider gender as an individual's characteristic since we estimate separate equations for men and women.

We expected to find a direct connection between a person's school accomplishments and the likelihood of being hired in industries or occupations neutral to gender. In jobs where physical force is not considered an asset, but a certain educational level is required, gender shouldn't be a relevant variable. Besides, school attendance should be closely related to an occupation's neutrality towards gender. If an employer knows that a young employee's main goal is study not

work, their labor relation will be less formal and, hence, some of the prejudices related to hiring women instead of men will become less relevant.

Among variables related to households, we are especially interested in young people's household position –whether they are or not heads of household– and if in youngsters' households are there minors or elders. These variables allow the analysis of statistic discrimination in employer's decisions regarding gender roles at the workplace and the household, as well. *Ceteris paribus*, we anticipate that young people's chances of performing a gender neutral duty is higher for those who are not heads of household and for those not having to be responsible for children or elders. Vacancies filled by these kinds of people are usually temporary and don't entail significant obligations for employers.

Between variables related to jobs we have selected the following: if the hiring firm belongs to the public sector, scale of the firm, number of hours required by the job and formality degree of the labor relation. Chances of being hired at a neutral gender position should be higher in the public sector and increase with the size of organisms, but should be lower in occupations with formal arrangements.

To answer those questions we've focused on parameters' statistic significance and its sign, projected for worker's school attendance and achievements. We have estimated regressions for the whole working population –from 15 to 64 years of age– with formal working arrangements, and for women and men between 18 and 29 years old. In both cases we introduced dummy variables to control for youth' effect for people ranging from 18 to 24 and from 25 to 29 years old. Furthermore, we've estimated a Probit model to obtain a neutrality variable for occupations, industries and for the joint consideration of industries and occupations.

In all estimations, high school education is positive and significantly related to the probability of being hired at neutral gender occupations. On the other hand, superior education is ambiguous: sometimes is negatively related to that likelihood, others positively related and others it has no statistic significance. High school has a bigger impact for male population if gender neutrality is related to the occupation; the opposite occurs –i.e. a bigger effect for female population– if gender neutrality is referred to industries. When examining the joint neutrality variable, high school education turns out to be more relevant for women than for men. In other terms: a high school diploma increases 12 percent points (pp) women's chances of filling a vacancy in a gender neutral occupation or industry, while for men the increase is of 9 pp. This differentiated impact has great relevance, because the starting point favors –if convergence happens– male population: 28.9% of men and 39.5% of women are employed in jobs and industries that are neutral to gender.

School attendance's effect on working population is not clear, since it doesn't show the robustness of the parameter estimated for those who have a high school diploma. When such parameter is significant, it is positively related to the probability of being employed in gender neutral occupations and industries. Again we observe the positive impact on male population, but it is not significant to explain the likelihood of women to find a gender neutral job.

So far, we've considered the effect a high school's degree can have on the chances of being employed in an occupation or sector of activity that are neutral to gender. We've also studied if human capital acquired in high school, whether finishing it or not, has some impact on the abovementioned chances. We've introduced variables referred to finishing an educational level, considering incomplete elementary education and lack of instruction as control variables. We find that just attending high school increases the possibilities of obtaining a gender neutral job, even if

there is a major difference between not having a high school diploma (9.6 pp) and having one (21.6pp). An equivalent result is obtained when exploring gender neutrality in industries and occupations and industries together, as well.

The estimations carried out for comparing men and women, show that attending high school without completing it, is relevant for women although not for men when industries and occupations aren't jointly considered. The result for both genders is valid when we define the likelihood of being employed in both a gender neutral occupation and industry. The difference between men and women becomes bigger when we exclusively take young population into account. Young females' probability of working in a gender neutral occupation increases in 18pp for those with incomplete high school and in almost 40pp for those who did complete secondary education. Among young males the first probability decreases while the second is not significant. The same results are reached for industries and for the joint consideration of occupations and industries.

IV.2- Effect of young people's educational level and gender on employers' decisions

In this sub-section we examine, through a qualitative analysis, the impact of young people's gender and educational level on employers' decisions. In particular, we focus on employers' attitudes and motivations when selecting and hiring personnel. The analysis of such attitudes and motivations will allow us to identify how those can feed the dynamics of segregation associated to gender and educational level, especially for women.

We assume as real the existing disparities between men's and women's labor insertion, which depend on gender imposed conditions that divide the labor market and generate different labor opportunities for women and men. Gender imposed conditions are based on stereotypes, which tend to assign certain characteristics to men and others to women. Thus, strength and independence are features usually attached to men, whereas passiveness and frailty are typically considered feminine traits. From early childhood, people –throughout their socialization process– are oriented into biased practices: men perform “outside the house” activities and women carry out domestic duties. These representations support the prevalence of “masculine jobs” and “feminine jobs”, due to the allegedly distinctive qualities of each sex.

Stereotypes underlie in both social behaviors and norms or rules guiding people's conduct. However, these are neither immutable nor fixed: we can't overlook women's improvement inside the labor market, particularly filling positions traditionally considered as masculine. Notwithstanding, in Argentina —as seen in sub-section IV.1— we still observe significant disparities between men and women, which impose restrictions on women's development and opportunities, as well.

Specifically considering the labor market, the gender factor is expressed by its effect on both inequality and social exclusion. Women have to sort larger obstacles to obtain a job and are particularly affected by unemployment. Therefore, some studies conclude that women and men aren't competing in the same labor market, but in two separate markets with differentiated structures (Silveira, 2000). However, to avoid analyzing gender from a unilateral perspective we have to take into account “the multiple features that constitutes us as people: race, religion, social class and educational level, among others. We can never observe gender in its pure form; we see it interacting with a person's family background, educational opportunities and socioeconomic level” (Burin, 1999).

Regarding educational level, we center our attention on educational accomplishments, *i.e.* having a diploma, in particular a high school one. For this variable, we analyze if having a diploma is a requisite related to the skills needed to perform a job or if it works as a generic indicator of socio-cultural level.

In addition, we take into consideration the major changes that took place in Argentina during the 90's, especially in the labor market –modification of labor laws, increase of unemployment and informal employment, amid others. Concerning this issue, it is important to keep in mind that our study is restricted to registered work. This could lead to a slight underestimation of our results, since many informal activities like domestic service duties, are predominantly performed by women, particularly young ones.

Understanding young people's job insertion dynamics has great relevance for the elaboration of public and private policies, capable of reversing the existent inequities and promoting egalitarian social and economic opportunities for both men and women.

For data collection we've carried out a qualitative strategy, which main tool is *in-depth interviews*.³¹ The focuses of such interviews were employers, represented by human resources or personnel selection managers. This approach's purpose is to control for the subjective aspects of the selection and hiring process, which very often entails unconscious issues, such as employer's or human resources managers' stereotypes or predispositions towards gender.

The questionnaire answered by the interviewees is a semi-structured data collection instrument, designed to capture employers' attitudes, motivations and imagery. Through the analysis of the obtained responses we've identified and assessed such attitudes and its implications. The questionnaire has the following structure:

Table IV.2
Questionnaire's structure

Section	Description
1. Firm characteristics	Scale, nationality, years in the market, etc
2. Personnel description	Workforce size and its classification by occupational hierarchy and sex.
3. Personnel hiring criteria and procedures	Exploration of criteria used for searching and hiring personnel, focusing on gender and educational level and
4. Personnel selection and gender	Exploration of gender differences –if they exist– in the selection process. Revelation of gender preferences for specific
5. Latest personnel incorporations	Comparison of formal selection criteria vs. the actual personnel selection process.
6. and 7. Examination of attitudes and gender imagery	Exploration, by means of projective exercises and games, of employer's ideal profile to fill a certain position. Revelation of employer's attitudes towards traditional stereotypes related to women's and men's skills and capacities.

The selection process of the firms' sample (24 in total) was deliberate, non-probabilistic and took into consideration both more important sectors of activity and firms' scale. We also interviewed 5 key informants, 2 human resources agencies, 1 industrial chamber training center's manager, and 2 board members of industrial chambers.

³¹ Interviews were designed, conducted and analysed by Martina Miravalles with the assistance of Luciana Miravalles.

Regarding sample composition, 58% of the interviewed firms belong to the Industry field; 29% to the Services sector and 13% to the Commerce sector. In terms of firms' scale, 21% can be considered as large firms –over 200 employees–; 50%, as medium –between 26 and 199 employees– and 29%, as small or micro businesses –less than 26 employees. In addition, medium firms were divided in two groups according to the size of its workforce: “medium+”: ranging from 50 to 199 employees (36%) and “medium-”: from 26 to 49 employees. Considering both sectors of activity and firms' scale, the sample can be disaggregated as follows:

Table IV.3
Interviewed firms' by scale, Argentina 2003
(In percentages)

Size /Activity Field	Industry	Services	Commerce
Large	13	13	-
Medium+	21	4	4
Medium-	8	4	-
Small or Micro	17	8	8

Finally, to classify firms in terms of its gender composition we've adopted Roldán (1993) criteria, based on male and female relative participation in a workforce:

Table IV.4
Gender composition criteria

Gender composition	Workforce composition
Female	96%-100% of female participation
Predominantly female	95%-76% of female participation
Mixed	75%-25% of female or male participation
Predominantly male	95%-76% of male participation
Male	96%-100% of male participation

Source: Roldán (1993)

IV.2.1- Results

Firms' sample general aspects

Regarding firms' gender composition, there are neither female nor predominantly female workforces, while almost half of firms (45%) have mixed workforces and 50% are predominantly male. Only 4% have an entirely male labor force. When classifying firms by sector of activity and gender composition we see –as we did in the previous section– that most of the firms belonging to the Services and Commerce sectors have mixed workforces (71% and 67% respectively), whereas the Industry field has a stronger male presence: 64% of Industry firms are predominantly male.

When classifying firms by its gender composition and occupational categories, we notice 65% have entirely male workforces performing technical and supervision duties. For blue-collar positions, firms also tend to favor men: 67% of firms only hire men for qualified blue-collar jobs; however, this percentage drops to 64% for non-qualified blue-collar positions. On the other hand, 20% of total administrative workforces are exclusively female. This particular occupational category seems to be the less gender biased: 60% of firms have mixed personnel carrying out administrative tasks; followed by sales/public attention, which firms also have mainly mixed workforces (50%).

According to employers' –represented by human resources managers– answers regarding their gender preferences for specific occupations, we detected for both the Industry and Services sectors³² that gender in theory seems to be irrelevant for technical or supervision positions as well as for administrative jobs. More than 85% of the Services employers' and 61% of the Industry sector employers' considered gender an irrelevant variable when hiring personnel for technical or supervision positions.³³

However, the actual gender composition shows that 83% of the Industry firms' only have male technicians and supervisors.³⁴ For administrative positions we find a different situation: 46% of Industry administrative workforce is mixed; 15%, predominantly female and 31%, exclusively female. On the other hand, at the Services sector 80% of total firms' have mixed workforces and 20% have exclusively male workers.

For qualified blue-collar positions we observe employers' strongest preferences towards a specific gender. Employers of the Industrial services revealed a certain bias towards men for covering qualified blue-collar jobs: 46% only selects men for filling such positions and 31% prefers men. However data shows that male participation is even higher: 71% of total qualified blue-collar industrial workforce is entirely male and only 14% of Industry firms have a mixed qualified blue-collar workforce.

Finally, at the non-qualified blue-collar occupational category, we also see fewer differences between preferences stated by employers' during interviews and actual gender composition of both Industry and Services sectors. Employers of the Industrial services revealed a certain bias towards men for covering qualified blue-collar jobs: 38% of Industry sector employers prefer to exclusively hire men and 31% favor male predominance. The actual gender composition of this occupation for the Industry sector confirms such statement: 58% of Industry sector firms' have an exclusively male workforce and 17%, a predominantly male one.

In general terms, we notice disparities between employers' opinions and actions. In spite of presenting themselves as gender unbiased, the firms' real gender composition proves that employers actually do have preconceived notions about each gender skills and capacities.

Differences between aggregate and classified by sector data reveal a strong male predominance at the Industry sector, while at the Services sector we observe a tendency towards more mixed workforces and higher female participation.

In particular, for occupational categories we notice a major influence in terms of traditional stereotypes associated with men and women, as well. Hence, men are hired for technical, supervision and machinery operation duties, while women are constricted to administrative tasks.

Analysis of employers' opinions and motivations

At the recruiting stage –in which the desired profile for a given position is communicated– we observe a tendency to request women for administrative jobs in general and particularly for secretary positions –exclusively occupied by women–; while men are requested for operational duties, except those habitually performed by females –i.e. seamstress tasks in the garment industries. In relation to technical positions there is a strong male predominance and a high

³² Due to sample under-representation, we've intentionally excluded the Commerce sector from this part of the analysis, since contrasting it with the remaining sectors wouldn't be accurate.

³³ Human resources responsables were asked the following question: "when searching for new personnel, gender is irrelevant or depends on the occupational category?"

³⁴ Human resources responsables were asked the actual personnel distribution by gender and occupational category.

demand of them to fill such positions as well; however due to a current scarcity of suitable male workers, gender has become less relevant in both the searching and hiring process.

Employers' expectations and notions about technical positions requirements *a priori* lead them to consider males as ideal candidates. When we explored the possibility of hiring women fulfilling such profiles, the response was "in general, women don't apply for technical vacancies". However, in most cases answers didn't reveal negative opinions towards hiring women for technical jobs.

Most big firms' vacancy announcements don't mention gender as a prerequisite. However, after comparing with the actual selection process, we notice a certain mismatch between firms' supposed standpoint and actual facts. From some of the answers given, we noticed that even if gender wasn't explicitly stated as a requirement, candidates' selection was biased towards a specific gender: women are being selected for secretarial duties and men for technical positions.

When firms hire personnel through its human resources departments, the selection process usually involves two stages. The first one is performed by the human resources department using standardized procedures such as: candidate profile definition, vacancy ad posting, applications' collection and pre-selection, interviewing and final candidates' selection process. On stage two the human resources department hands over the selected candidates to the requesting firm's department. However, we observed a "criteria break" between stages one and two. Such break occurs because in selection process' stage one, gender is considered in a positive way –i.e. preventing any bias–, but in stage two the final choice is made by the demanding area's manager, who might have preconceived notions about gender.

If firms select its personnel through the process above described, they may be reproducing traditional gender patterns, without explicitly incurring in gender discrimination or segregation. On one hand the searching process fulfills the "politically correct parameters" related to the firms' public image; on the other hand, selection process may be influenced by stereotypes and patterns underlying beneath gender discrimination. The reasons argued for the existence of masculine and feminine jobs were predictable: women are thought of paying more attention to details and being kind and thoughtful when dealing with people, while men are considered as physically powerful and suitable for working in unclean environments.

In spite of data showing the long-established gender distribution of the labor market and the abovementioned depiction, interviewees strongly denied having preconceived notions, both as personal statements and firms' policies, about one gender or the other –particularly women. However, we perceived the interviewees had major concerns on being considered as discriminatory against women. In general, we can say that political correction has pervaded entrepreneurial viewpoints. Anyway, it is necessary to distinguish between international corporations and smaller or family firms; since for international companies guidelines and institutional policies regarding gender and personnel selection derive from headquarters' directives.

Firms' sector of activity turned out to be of great relevance both for its personnel's gender composition and selection process. In particular, at the Services sector we found that workforces are either gender mixed or have female predominance. This sector heavily increased its participation in Argentine's economy during the 90's, due to considerable foreign investments carried out by international corporations, which have explicit non-discriminatory gender policies. Besides, strong female presence could be related to the skills required for administrative and public attention tasks, which respond to stereotypes usually associated with women's abilities.

V- Factors affecting students' performance

In this section we characterise the recent evolution of the current education system and its internal efficiency in the completion of the secondary level, to analyse and identify factors which affect students' performance, with special emphasis on poor girls, and to obtain a prototype of young people regarding their school achievements and future labour opportunities. The sources of data used to explore these questions are the Census Population data, a data base from the Annual Review of Enrolment and School Jobs (*Relevamientos Anuales de Matrícula y Cargos*) and the EPH.

We built an integrated database using the National Assessment Scheme (ONE) and the Annual Enrolment and School Jobs Review. While the former contains all the students in the last year of secondary school with their scores obtained on the annual standardized tests, the latter has the information about the schools where these students are attending. This integrated database offers the possibility to get better measures associated with school characteristics than those measures commonly used in other studies, in which school characteristics are derived from qualitative assessments provided by the principals.

Taking into account that since 1993 an in-depth redefinition in the curriculum took place, including the Common Basic Contents (*Contenidos Basicos Comunes*) applied along the country, we try to determine if there are differences between the prescribed and the taught curriculum applied in the schools, if so, which is the gap between the taught and the learned curriculum, and how are the learned curricula linked with the labour market demands. This analysis is based on a qualitative study carried out in 12 schools by specialists who interacted with teachers, students and principals.

V.1- The big picture

V.1.1- Structure of the education system: A general framework

At the beginning of the 90's, the federal Government launched an ambitious reform program under the Education Decentralisation Law (1992), the Federal Education Law (1993), and the Higher Education Law (1995). This reform program has five main areas: (i) the transfer to the provinces of responsibilities for secondary and technical education, and teacher training institutions; (ii) the extension of mandatory education from 7 to 10 years; (iii) a curricular reform that establishes one year of pre-school, nine years of Basic Education (EGB) and three years of Polymodal; (iv) an administrative reform; and (v) a higher education reform. Provinces signed an agreement with the federal Government on the phasing of the education reform and on the federal financing to be allocated to each province (Federal Education Pact)³⁵. The reforms set forth in these laws were prepared by different sectors of the society which participated in the National Pedagogical Congress in 1984 and 1987. The main guidelines for the reform were presented by the political party that won the 1989 election. The current structure of the education system established by the Federal Law includes the following levels:

- Pre-school (EI – *Educacion Inicial*): the last level is mandatory (5 year-olds).
- Basic Education (EGB – *Educacion General Basica*): 9 years, it is mandatory and is divided into three cycles EGB 1, EGB2 (formerly primary school) and EGB3 - 7th to 9th grade.

³⁵ World Bank (1998)

- Polymodal (*Educacion Polimodal*): a minimum of 3 years
- University and Non-University level

According to the new law, the functions assigned to the Ministry of Education are related to the re-definition of the curriculum, the application of an educational statistic system and the design and application of different kinds of programs to reduce social and geographical inequalities in education. All these new functions were developed under the oversight of the Federal Education Council.

The strengthening of the Federal Education Council and the signature of the Federal Education Agreement are signals of the federal treatment of policies and programs. The Federal Educational Law was not regulated by a presidential decree. On the contrary, all regulations were set forth in a framework of agreements established by the Plenary Assembly of the Ministries of Education of each provinces and the Federal Education Council. In this context, 24 agreements were signed between 1993 and 2003, related to different educational issues, such as information systems and in-service teacher training, among others.

As occurred in other countries of Latin America, a stressed opposition to the educational reform was pushed by teacher trade unions, despite the political decision of maintaining and increasing all teacher positions.

The current situation is as follows: in 18 out of 24 provinces the reform was completed during 2003. Other 4 provinces have applied the reform incompletely, while in the rest 2 provinces the application did not take place at all. The current Government (2003/2007) has been emphasizing internal works at school level. Regarding the general structure system, a special concern is given to the technical and professional reform.

V.1.2- The evolution of the population from 1980 to 2001

Compared to the rest of Latin America, Argentina is a country with high literacy rates and attendance rates as well as a solid education system. However, it lags behind in the ability to retain students. The population growth rates between two censuses for different school-age groups and their attendance rates clearly show that despite the significant growth of the population, the enrolment for children and young groups was high during 1980 and 1991.

An examination of the second period (1991 – 2001) indicates that the enrolment growth was again higher than population growth rate, and the latter was slightly lower compared with the previous decade. For instance, for the 15-17 group (secondary level), the enrolment rate was 33 points higher than the population rates. This figure reflects the significant inclusion process occurred during the last two decades in the system. As we will show along the analyses, among the new students incorporated, the participation of the poorest was important.

Looking at the attendance by gender (Figure V.1 and V.2), an increase for all age-groups over the decade is observed. The most significant difference is recorded for the group of 15-17 years of age. In the case of girls, attendance rates are slightly higher than those for boys. While in 2001 81,6% of girls in this age group were attending school, only 77,3% of boys were doing so.³⁶

Girls are more likely to attend secondary school than boys (13 to 17 years-old group). According to EPH data, this gap has narrowed down over the last decade as attendance has significantly increased for this age group, reaching more than 90% in both gender groups. The rise in

³⁶ The above results observed with Census data are also revealed by the Permanent Household Survey (EPH) performed by the INDEC twice a year.

attendance for aged 18 to 23 is also noticeable, although it has taken place at somewhat slower pace. The schooling gap in favour of women has also shrunk in this age group.

Figure V.1: Girls Attendance Rates

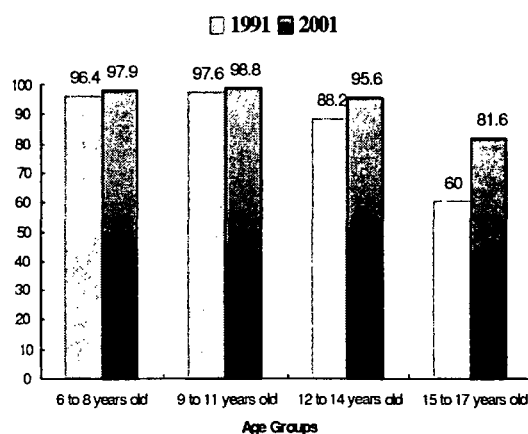
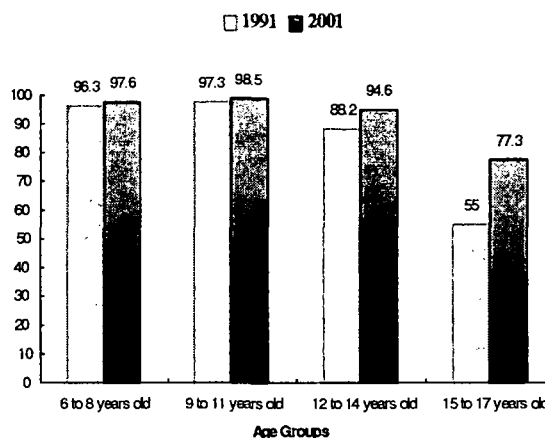


Figure V.2: Boys Attendance Rates



Source: Authors' calculation based on National Population Census, 1991 and 2001

Educational disparities in terms of school attendance have decreased in secondary school, but have substantially increased for college (see Figure 3b). While the attendance rate for aged 18 to 23 in the top quintile increased 23 points in the last decade, it actually decreased 1 point for those in the bottom quintile of the equivalized household income distribution (Gasparini, 2004).

A more informative indicator of attendance is the Overage Rate. This indicator is calculated as the percentage of population attending at school with 2 or more years of overage above the theoretical (right) age, in relation to the total population, by age group. It may reflect two different situations: (i) an accumulation of student's fails along his/her school path (repetitions); (ii) a signal of retention ability of the education system, in the sense that students remains in the system and do not drop-out definitely.

According with this, there is a higher proportion of girls than boys in all age-groups with the right age or only one year of overage. The difference between gender increases with the group-age. For instance, for 6 to 8 years old group in 2001, there is 96% of girls in the theoretical age and 95.2% for boys. These figures are 62% and 52.2% respectively for the age-group of 15-17. The comparison among overage rates (simple and severe) and the not attendance rates shows that while the latter decreased over the decade for girls as well as for boys, the overage rates increased for both groups.

Deriving from this section, we can conclude that during the 90's two important aspects emerged: a) for women as for men, there is a significant increase in education inclusion for 15-17 years of age group (around 20 points), specially for the poorest; b) the increase is partly explained by an increase in the enrolment growth rate for this group with the expected school age (or one year of overage) and partly by the increase in the enrolment rate for those with two or more years of over-age.

Although during this period an important reform in the system took place, it was not apparently enough to face both challenges: the new students and the improvement in the learning quality

process. These are the perceptions gathered through the media, universities teachers or firms, who usually demand skilled workers. However, these claims cannot be proved, as there is no available information to compare the current system to the previous one, with less coverage of poor population in secondary school. Complete information is only available since mid-90's when the education data system starts being developed.

V.1.3- The education system today– some figures

The historical performance of the system is a key issue to understand the current situation of the attendance rates of year 7th to 9th (EGB 3) and 10 to 12 (Polymodal). In this part, we examine some of the main indicators of the system, mainly focused on EGB3 and Polymodal level for years 1999 to 2002. The historical performance based on indicators constructed using the Federal Network of Education (REDFIED) database.

The *inter-annual drop-out rates* illustrate school inability to retain students. Important differences are registered between EGB3 and Polymodal level and between years. For instance, looking at year 2000, the inter-annual drop-out rates in Polymodal was 13.6, and it did not decrease in the following two years. However, a slight improvement is observed in the case of EGB3. A similar pattern is shown for *promotion rates*. While in 2000 period 82.6 % of the students finished EGB3, in 2002 this figure reached at 84.3%.

In the rest of this part we examine the following rates: i) girl's participation in total enrolment; ii) repetition rates and iii) graduation rates. These indicators are classified by gender, sectors (public or private schools) and by orientation³⁷. They refer to year 2000 and are based on information gathered by the National Ministry of Education (MECyT).

Girl participation rate in secondary school enrolment by sector and orientation

As we observed before using Population Census and Survey data, indicators of performance are better for girls than for boys. Now, the data of MECyT, confirms this feature: The participation rate in enrolment for secondary school is more than 50% for the girls. Classifying this rate by orientation school, it shows a favourable rate of participation for boys only in the case of technical schools, with greater participation rates for girls in all the other areas.

Comparing total net enrolment at initial year of Polymodal level (Year 10) with the total net enrolment at last year of Polymodal level (Year 12), classified by orientation schools, as we can see girls remain at school more time than boys, except for the case of technical orientation. Dividing these figures by public and private schools, there is evidence of lower retention ability in public schools. Again, technical schools are the exceptions. Technical and commercial schools, both with curricula more oriented to insert student into the labor market, show significant lower capacity to retain students in the system in comparison to humanistic orientation.

³⁷ Commercial/Administrative orientation includes basic theoretical and practical concepts about businesses administration and economic process. Humanistic orientation includes concepts about different areas, specially designed to continue tertiary/university levels (although all the orientation prepares to university levels, this orientation is aim at providing more theoretical concepts). Technical orientation is oriented to production process in different sector of the economy. The Basic Cycle refers to the first part of secondary education, without a specific orientation and is applied in the new educational framework described above.

Repetition rates by gender, sector and orientation

Repetition rates are almost three times higher in public schools than in private ones (8.2% vs. 2.6%). However, desegregating by gender, the gap between boys and girls is higher in private schools compared to public schools. Specifically, the percentage of boys who repeated at least one in public schools is 46% above the percentage of girls who experienced this failure (repetition rate is 9.7% for boys and 6.6% for girls.). In private schools, this gap is almost 65% higher. (Repetition rate is 3.5% for boys and 2% for girls.)

The examination of repetition rates by orientation and cycle of study (years 8 to 9 and 10 to 13) suggests that there are more students who fail in the 8 and 9 year for commercial/administration and humanistic schools in contrast to technical and basic cycle school orientations. The combination of these figures with those presented in the previous subsection, indicates higher problems of drop-out in technical than in humanistic schools, in which the stressed problem seems to be high repetition rates. Commercial/administration appears to be between these two situations. Finally, there is again a worse performance for boys in all orientations and sectors.

Graduation Rates by gender, sector and orientation schools

The evidence reveals that the highest graduation rate is registered in humanistic schools. As we already describe above, humanistic schools are less oriented to the labour market and more focused on preparing students for tertiary/university levels. 57 out of 100 graduated students attend humanistic schools. Additionally, 57 out of 100 graduated students are girls, and 37 of them graduated from humanistic schools.

Girls are concentrated on humanistic schools and represent 37% of the total students graduated in 2000. Girl enrolment participation increases with years of education, in contrast to the high rates of repetitions and drop-outs faced by boys, except in the case of technical schools. While the main problem in humanistic schools seems to be high repetition rates, in the case of commercial/administrative and technical schools, the drop-out appears to be an important issue. All the indicators of performance are worse for boys than for girls, except for the case of retention rates in technical schools. Although private schools show better indicators than public schools, the gap between performance of girls and boys is more stressed in the former than in the latter.

The examination of these indicators is suggestive of the high proportion of young boys and girls with failures in secondary schools. Each failure is translated into one year of overage, which is a clear indicator to detect those students who require additional support by the system.

These failures in the school faced by young people have several implications in the long run for the insertion into the labor market (as is well documented in the section III this paper). Specifically, those girls who drop-out are less likely to be employed in the formal sector of the economy. Additionally, these failures also influence negatively the future performance at university (Di Gresia *et al.*, 2002).

V.2- Quantitative approach

In the previous sub-section, data were presented under a non conditional framework, in the sense that each factor was analyzed separately. The objective follows in this section is to build a conditional model that allow us to isolate the marginal effects of specific variables on the student performance. Using these results, we made a comparative static analysis to see the effect of

specific school variables on poor girls. In the next subsection, we describe the data to be used, following by the methodology applied.

V.2.1- Data

This part of the study is based on an integrated database. On the one hand, the National Assessment Scheme (ONE) is used to capture the information about the scores obtained in the standardized tests on language and math for the students in the last year of secondary level. This Assessment is carried out by the National Ministry of Education, jointly with Provincial ministries. In the case of secondary school, it has been applied once a year since 1997 to 2000 as census data. Simultaneously with the ONE test, each student has to complete a questionnaire referring his/her socioeconomic characteristics, household composition and education level of their parents. Data about their performance in previous years at school are also gathered. For the purpose of our analysis, we used data for 2000- the latest year available.³⁸

Data from the Annual Review of Enrolment and School Jobs is also incorporated in our data base. This is a school census carried out every year by the Ministry of Education containing precise information about school performance, allowing us to compute repetition, drop-out, graduation rates, as well as retention school ability or student age conditions.

In the conditional analysis, we work with 6 provinces (Buenos Aires, Cordoba, Chaco, Jujuy, Misiones and Tucuman), which represent different typology of the education system and different socio-economic situations. These provinces are geographically distributed in 3 out of 5 regions of the country.³⁹ Cordoba and Buenos Aires implemented two different models of education reforms. Tucuman registers important levels of enrolment lost at secondary school, and Jujuy is a province with high levels of conflicts among teachers, especially during 1998/2000 period. The worse performance in the country is registered in Misiones and Chaco. The latter was one of the provinces that by 2000 had not applied any features of the reform.

V.2.2- Methodology

We use Ordinary Least Squares to analyze factors affecting achievement in the students in the last year of secondary school, measuring the achievement as the scores obtained in Math and Language standardized tests, as a function of household characteristics (whether books are available at home, education level of his/her parents, household size and whether the student lives in a poor family)⁴⁰, student personal characteristics (gender, age and age square, whether the student repeated in the previous years), school indicators such as institutional features and infrastructure school resources and gross product per capita in each province. The model is estimated for two groups: technical and non-technical schools⁴¹ (including commercial and

³⁸ Although our country suffered a deep crisis during the end of 2001, the education sector, as it is well documented in many papers, is one of the sector for which the impact of the crisis was less severe (see for example- Espana *et al.*, 2003).

³⁹ We were unable to work with the whole country is because of data limitations, as information provided by the Ministry of Education do not allow us to integrate ONE and Annual Enrolment with the School Jobs Review data bases.

⁴⁰ The importance of family factors on performance is highlighted in a pioneering study by Coleman *et al.* (1966).

⁴¹ The schools participating are reduced to those which have more than 75% of the students who sat for the ONE exam. Only 9.2% of the school does not fulfill this requisite. Estimated models were also done with the whole groups of school, and results do not vary. Cluster effects by school were considered.

humanistic), to analyze separately the effects of different variables on the student's scores. (See Appendix- section V for the list of variables used)

V.2.3- Results analysis

In order to analyze a stable and robust specification of the model, several alternatives were estimated⁴². In all cases, models are statistically satisfactory, as we can reject the null hypothesis that all estimated coefficients are jointly zero. The variables of interest introduced are based on a theoretical framework and hypotheses explained along this section, prioritizing the simplification of the model.

According to our results, there is a significant effect on test scores that can be attributed exclusively to gender. In the case of language scores, the difference in the expected value of the scores for girls with respect of boys is positive, holding other factors constant. The situation is reversed when math scores are analyzed, showing that the math score model for males is that of females with a higher intercept. These results are also found in national previous studies, such as Cervini (2002) and international ones such as Bravo and Contreras (2000) or in OECD-UNESCO (2003). The qualitative study also points out the better performance in math for men than for women.

The age coefficient can be interpreted as a partial derivative, giving the change in score that arises as a consequence of a marginal change in age, holding fixed all the other factors. While age does not have a significant effect on Language or Math scores in technical schools, in the case of humanistic/commercial schools, there is an overall negative effect on scores. As we developed in the last section of this section, the repetition is perceived as a second opportunity for the student, given that he/she would receive the same concepts twice. Thus, it can be expected that those who repeated at least one year of education would be at least at the same level of performance compared to those who did never repeat. In our model, repetition is captured as a binary variable that takes the value of 1 whether a student repeats at least once during his/her secondary school attendance. According to the coefficient estimated, there is a negative and significant effect in math as in language scores if the student repeated at least once.

The effect of the student books available at home is also incorporated in the model. To have all the books required to study is the base category for which the results must be interpreted. The negative sign on the coefficients show that not having student books produces a negative and significant effect on scores. As expected, variables associated with parents' education levels are highly significant in all models and the effects increase with parents' educational level. Consequently, student's performance is negative when they come from homes where parents are illiterate or they have primary incomplete level, comparing to those students whose parents reach university levels.

In the case of household size, an expected result is observed. Living in houses with more members has a negative and significant effect on the student performances. The result is consistent for the case of technical and non technical schools, as for math and language scores. The last socio-economic factor analysed is a binary variable that classifies students as poor or non poor according to the possession of physical assets available in their households as well as their

⁴² The alternatives models estimated are available upon request at the following email addresses: irenekit@yahoo.com or paulagiovagnoli@yahoo.com . Robust models were obtained in the case of Commercial/Humanistic schools, in which more observations were available.

cultural environment⁴³. The coefficient estimated for poor is significant and has a negative effect on the scores. An extensive literature shows that poverty is generally associated with lower performance - see Glewwe (2002).

Other variables such as work student status, expectations about the future and student perception of secondary school value were previously included, but have not been incorporated as introducing high endogeneity in the model.⁴⁴ A variable that captures brothers or sisters attendance status (i.e if they drop-out school) was discharged as the sample would have been reduced to those students who had at least one brother or sister. We tried to incorporate a variable to capture days of classes taken by the students, but many inconsistencies on the data as well as missing values were found.

Variables related to the school conditions and resources available

The coefficient for public is negative, students who attend to public schools get worse results comparing to those who attend at private schools, holding the rest of the factors constant. However, this result is significantly different from zero only for humanistic/commercial schools, as in the case of technical, the coefficient is not significant at a 95% of confidence. Similarly, to go to a rural school has a negative effect on performances in comparison to those students who attend at an urban school. In this case, the effect is significant, except for technical schools when language scores are analyzed.

In term of classroom size, our results show that academic achievement is positively affected by the classroom size, keeping all other factors constant⁴⁵. These results are against to the usual interpretation done by many researchers, for which big classrooms are a signal of bad quality supply of education. However, it could be possible that the biggest the classroom, the highest the demand to study in that school, given the good quality of education.

In order to capture human resources directly linked to teaching areas, we introduced a variable that measures the number of teachers per classroom. An interesting phenomenon is shown in the estimated coefficients. While for the case of technical schools a change in one unit of the number of teachers per classroom has a positive effect on the student performance, the inverse is found in the case of humanistic/commercial schools. The latter shows a negative effect of adding new teachers to the classrooms, holding the rest of the factors constant. The effects are significant, except for the language model in humanistic/commercial schools.

Different results are recorded for the case of other teachers per classroom. In all cases, the marginal effect of having "other teachers" per classroom is positive and significant. "Other teachers" refers to the existence of pedagogical professional team, librarians, general coordinators, and specific advisors. Introducing the availability of this kind of human resources in the model, allows us to capture the capacity of the school to support students in a wider range of issues, increasing the probability of retention, consequently decreasing the drop-out rates.

Finally, the number of non teachers per classroom is linked to the administrative human resources available in the school. It is expected that this kind of resources allow teachers to focus specifically on their activities, without worrying too much on administrative issues and general function of the school. An opposite behavior is observed in the case of technical schools versus

⁴³ Principal component methods were also used to rank poor students. As both indicators ranked the poorest similarly, we preferred working with the former as it is easy to interpret.

⁴⁴ For an excellent review of the strengths and weakness of this kind of analysis, see Glewwe (2002)

⁴⁵ We also included a square term and the effect was not significant.

non technical ones. While the effect of this variable is negative in the former case, a positive effect is estimated for the latter case. On the other hand, while these coefficients are significantly different from zero to the case of math, regarding the type of school, they are not significant for language scores. This analysis shows that human resources allocations have more significant effects on student performance than infrastructure and material availability.

Variables related to the student itineraries and general performance of the school

The last group of variables introduced in the model measures the global performance of the school, in terms of retention and teaching achievements. By introducing the percentage of graduated student in the 12th year of school in 2000 in relation to students in the year 10th in 1998, we measure the retention ability of the school, as is looking at the inter-annual enrollment. If all students enrollment in 1998 have experienced no problems in their school itineraries, they would have finished at the end of 2000. The estimated coefficients for all models show positive effects on the performance, showing that students who attend to schools with high graduation rates have better results than those who attend school with low graduation rates. However, this effect is only significant in the case of humanistic/commercial schools.

A second factor introduced to identify the degree of inequality of the scores within the class was a Gini coefficient.⁴⁶ High degree of inequality within the class affects negatively student performance. The model also controlled for the Geographic Gross Product (GGP) for each province to consider the economic differences among provinces where schools are located. As expected, performance is better in provinces with higher GGP.

V.2.4- Improvements to poor girls

In this part, we used the estimated coefficients of our model to predict the effect of specific explanatory variables on scores for poor girls. In particular, we look at school variables that may be used as instruments for public policy. We defined the poor girls as those who repeated at least once in secondary school, do not have books to study and attend to public schools. The estimated score for this group is 67 points.⁴⁷

Simulations of the model show that for a poor girl, the change of having at least some books to study (compared to her previous situation in which she did not have any book to study) increases her performance on language from 67.6 to 75.1. This means that keeping the other variables constant, to provide some books to poor girls would increase 11% their language performance. The effect of changing poor girls from public to private schools would improve their performance by around 5%.⁴⁸ Finally, to attend schools with higher graduation rates would improve poor girls' performance by around 9%. Schools with specific efforts to retain students achieve better graduation rates.

V.3- Qualitative approach

While quantitative methods are extremely valuable, they can be complemented by qualitative

⁴⁶ Alternatives measures of inequality were also tested, such as variation coefficient or standard errors, arriving to similar results.

⁴⁷ Scale scores are from 0 to 100. The predicted score for a hypothetical student with all these variables of our model in their means is 83.4 points, thus presenting our poor girls as a vulnerable group, for which there are a lot of room for improvements.

⁴⁸ Similar results can be obtained adding more "other teachers" in public schools.

methods, such as direct observation of social and educational phenomena. In this sub-section the main results of a qualitative analysis carried out by FUNDARED are presented.⁴⁹

V.2.1- General Description of the study

This study investigates two issues: a) Curriculum decisions and whether they respond to labor market demand and enhance young people's ability, particularly women, to obtain suitable employment; b) student learning process of these curriculum contents and expectations about their future jobs.

Two different instruments were applied to the students: an exam specifically designed by FUNDARED' specialist for this purpose and a short survey to capture socio-economic characteristics of these students. Additionally, there was a group interviewing to explore teachers' perceptions in which the instrument used was a general guide to the interviewers.

The study was done in 12 schools (8 public and 4 private schools) located in the *partido* of *San Martin* (it is part of the urban and industrial area of Buenos Aires province)⁵⁰. In these schools the instruments were applied to all current students present that day in the last year of Polymodal with commercial/administrative orientation. Students were not noticed in advance about the exercise. The exam was applied to 324 girls (60% of the whole grade) and 212 boys (around 40%); total students who attended at these schools (regardless the orientation or year of study) was 6072.

The exam was carefully designed in order to evaluate basic abilities of the students and the application of the contents included in the prescribed math and language curricula (official curricula in Buenos Aires province). This exercise was presented in a context of a potential job in a small textile firm⁵¹.

V.2.2- Results obtained in the exams

The examination of the results by subject shows a high concentration of failures in the case of math. As will be exposed in the next subsection, bad results are directly link to the perceptions of teachers, who revealed that "*students arrive at secondary school with the lack of minimum abilities that should have been taught in primary school*".⁵² The time allocated to repair this deficit leads to a delay or suppression of the contents of polymodal level.

⁴⁹ The complete document is available upon request at: fundared@fundared.org.ar

⁵⁰ One third of the Argentina's population is concentrated in Buenos Aires province, with more than 40% of the economics activities. Within the province, three different areas can be clearly identified, according to their socio-economic characteristics: a) *conurbano bonaerense*, (62.4 % of Buenos Aires province is in this conourban – and 23.4 % of the whole country) it has a high concentration of industries; b) cities spread along the province and semi-rural areas. In the Conurbano, there are 24 partidos; and San Martin is one of these partidos, representing almost 5% of the whole population in Conourbano.

⁵¹ The specific contents evaluated in math were the following: Functions. Continuity and limit. Graph and interpretation of Cartesian graph. Simulation of situations in the real world and other areas using functions. In the case of language, they evaluated the ability to select key information, coherence, cohesion, grammatical expressions and text. The results of these exams were ranked as: fail - F (0 – 25); pass -P (26-50); Good- G (51-75); Very Good - VG (76-100).

⁵² The scarce number of cases that record Good or Very Good results in this subject limits the possibility to cross with variables such as sex, failed subjects, etc. Therefore, crosses related to "learning results" will be performed in the Language area only.

As the design of the knowledge exam was based on the prescribed curricula, the math failure can be explained in the areas of the taught curricula and the learned one. Briefly, the prescribed curriculum is the one that appears as contents in the official documentation in effect for each level and orientation (modality), reflected in study plans approved by authorities in each corresponding case. The taught curriculum refers to the particular content selection that each institution and especially each teacher make to organize teaching time. This selection can totally coincide with the prescribed curriculum but generally certain topics are omitted, others are added. The learned curriculum refers to the contents mastered by students who have received a certain taught curriculum.

In order to analyze the link between the results obtained in the exams and the performance achieved during the educational path, the following variables have been selected: repetition, causes of repetition, and to fail a subject more than once.⁵³ Results shows that there are fewer girls who repeated one year than boys. Boys say that most of them had to repeat because they did not pass the exams. In the case of girls, they repeated as they are not able to attend to school during the whole year because of family problems.

V.2.3- Curriculum decisions of teachers

To consider the curriculum decisions applied, the following aspects were analyzed⁵⁴: a) The distance between the teaching contents contemplated by the prescribed curriculum and those selected in the taught curriculum; and b) Aspects relating to teachers' teaching strategies.

Selection of contents

Teachers' selection of contents is determined by two key aspects: (i) Their perception and evaluation of what has been learned by students in the General Basic Education level; and (ii) The perception of the potential labor insertion of youth and of the aspects that teachers believe should be taught to enable such insertion.

It is notorious that the knowledge of the subjects taught or to be taught was in general not specified by the teachers. The competencies linked to mathematics and language that they highlighted as necessary achievements were "to be able to read and write," "basic mathematical operations" – elemental notions inherent to the previous levels. Teachers argued that basic skills expected to be learned in the General Basic Education level are not acquired, and this leads to their decision to teach them in Polimodal. This situation indicates that there is an important distance between what should be taught according to the prescribed curriculum and what is effectively taught. This distance is confirmed by test results in general and to a greater extent by math tests, as they require specific contents and skills which are not complemented by approaches in other knowledge areas, as is the case of language competences⁵⁵.

Although all teachers interviewed belonged to the Economics and Business Management track⁵⁶, when they were asked to list the contents linked to the administration occupational field, they

⁵³ This means that the student had to sit for an additional exam at the end of the year. In Argentine system of education, a student will not be accepted in the next educational year if he/she has more than two fails of these additional exams. Otherwise, he/she has to repeat the level.

⁵⁴ All this point is based on collective interviews with teachers, analysed in the light of students' outcomes.

⁵⁵ Reading and writing competencies are practised in different subjects, which use them as a fundamental learning tool. Instead, mathematics and other exact sciences have less curricular weight in study plans.

⁵⁶ This track is equivalent at "commercial/administration" orientation we mentioned along the report.

tended to refer to contents related to *generic competences* (not linked to any occupation in particular) and *cross competences* (necessary in all types of jobs). In most schools, comments revealed that teachers value the need to develop certain attitudes more than subject contents in relation to labor insertion.

The following attitudes were especially mentioned: respect, willingness to learn, tidiness, effort, wish to grow, fulfillment of security norms, agreeable manner; understanding that there are personal interaction rules, responsibility at work, in terms of compliance with timetables and fulfillment of activities, commitment to the enterprise, personal values such as responsibility, propriety, discipline, good appearance. Teachers believe that these are the attitudes that employers value the most.

Content specifications are more related to elemental skills or general statements such as knowing how to solve problematic situations or specific knowledge on the task to be performed. Teachers assured that many contents are not necessary because the jobs available to the youth only demand very elemental competences, or other types of competencies, which are developed in the job and which do not have a way to be taught at school. All this could be indicating that teachers do not have a mid-term vision of people's performances but a very short-term view of their students' future prospects. Emphasis is placed on the requirements of entry-level jobs, which given the occupational situation in Argentina, will be low-qualification jobs, and in many cases non-formal. Teachers' curricular decisions are providing insufficient basis for a labor path of growing quality.

Teaching (didactic) strategies implemented

Concerning the teaching strategies implemented, teachers primarily resorted to an approach based on the possibility to learn theoretical concepts first and then apply them in practice. This approach was accompanied by strategies such as occasional conversations, offering the addresses of enterprises or organisms, role-playing or simulating a recruitment interview, showing films about the labor world to debate and suggest cultural expressions different from those of the students' in terms of music, books and magazines. The following elements are missing in this approach:

- The "problem-solving approach", which is included in the guidelines of the latest curricular reform and is taken into account for the preparation of the skills test.
- Specific strategies to apply with the students who have more learning difficulties, to be able to complement their possibilities to master core contents.

The implementation of internships in companies located in the area was presented as a prominent strategy for teachers as it is favorable for the learning processes. Anyway, references about the articulation of the internship with the classroom work were not found, and besides, several teachers said that "*internships are not for all students but only for those who have the best grades.*"

V.2.4- Elements of everyday life and future representation of youth

The survey applied to the youth provides data on their opinions about schooling, their present everyday life conditions as well as their expectations for their immediate future. The opinions of youth in relation to the instruction received – judgmental and generous – can be biased by the same fact that they have managed to finish secondary school. For example, most youth (over 85%) believe that all tests, or most of them, were on topics explained by the teacher, and opinions did not differ by gender or test results.

Nevertheless, there are interesting differences in the teaching perspective. Youth is divided between those who believe that all or most teachers explain topics until they are understood (46%) and those who believe that only some teachers or none of them do so (a little less than half of them). There were no considerable differences in these opinions when the gender variable was taken into account. Looking after sisters or brother, cousins, nephews or guiding them in school work is a task that 34% of the youth in the sample perform, women being in a three to one ratio with men (25.7 vs. 8.8). It is relevant to link this variable to the results of language tests. For women in particular, a higher proportion of bad results in language is recorded for those who look after relatives.

One third of the interviewed did a training course outside school in the last 5 years, mostly to have more chances to find a job; one fifth of the sample did so in the last year. A higher proportion is recorded among women. While half of the women in the sample once worked, so did 60% of the men. No differences in language results were found using this variable. Of all the people interviewed, 90% considers that, if they want to find a job, they will be able to do so in the next 12 months.

Almost three quarters of the youth plan to work and study when they finish secondary school, with a higher proportion among women. Among the youth who plan only to study when they finish Polimodal, who represent 15% of the sample, no substantial differences between men and women are found. Those who plan only to work represent 4% of the sample and more than half are men. When we crossed these variables by sex, slightly significant differences in favor of women were found in the study and work choice and in the only work option in the case of men.

Regarding gender it was found that girls repeated some year of Polimodal in a lower proportion than boys; a higher percentage repeats because they exceed the number of missed school days allowed, due to family problems, most likely looking after brother or sisters, and other relatives; a higher percentage took training courses in the last year; a lower percentage has once worked, and a higher percentage plans to study and work when they finish Polimodal. Gender differences were not found in the perception of youth on their opinion about the teaching received.

There is a strong distance between the prescribed, the taught and the learned curriculum, judging by the results of tests and teachers' opinions. Likewise, the math skills applied to the resolution of a typical administrative problem in a company were seriously insufficient. Although teachers believe that their students feel "*tired and without hope*" the expectations of youth are wide, and they seem to be satisfied with the teaching received in general.

VI- Conclusions

The main findings of this study were ordered in four big groups:

Firt group of conclusion

In the period 1974-2002, we observe a fall in the economic participation of the youngest. Employment and remunerations also dropped and unemployment rates abruptly rose in all age groups irrespective of gender. The exception to this rule was given by women between 25 and 29 years of age, for whom an increase in economic participation and a slight expansion in their employment probabilities were recorded. Nevertheless, their remunerations decreased as in the other demographic groups studied.

We observe a clear expansion of school attendance and, consequently, of educational achievement. In this process, girls rather than boys boosted the increase in the mean educational

level of the Argentine population. By combining educational data with labor market data, we were able to notice that there are increasingly higher numbers of youth who only study and who study and work. Therefore, the number of those who only work or who neither work nor study is increasingly lower.

Secondary education promotes greater participation in remunerated economic activity and it does so in a higher degree among young women than among young men. This result holds good both for the whole group of individuals and for those who are reported as children of a household head. Having completed the level is important in both cases. School attendance discourages participation, and it does so in a higher degree among boys than among girls and among those who report to be children of a household head.

Compared with primary education, secondary school increases the employment opportunities of youth and it does so in a slightly higher degree among women than among men. School attendance reduces employment probabilities for both genders, but more among boys than among girls. There is evidence of a greater capacity of women to combine productive activities with those inherent to the human capital accumulation process. The results mentioned also hold good for those who are reported as children of a household head in the database.

Secondary education has a positive effect on remunerations for both genders, but the effect is more positive among boys than among girls. The effect becomes clear as they move forward in the educational structure. Higher education increases male income more than female income and the difference is higher than for secondary school. Unlike male youth, for women who live in a household as daughters, having attended secondary school but not having completed it does not affect incomes compared to those earned by other girls of similar characteristics in every respect but who have completed only the basic education level.

Second group of conclusions

Education increases employment probability and the chances to find better jobs in terms of formality, sector of activity and wages. Interestingly, education appears to have a significantly stronger effect for women. That is, education not only improves labor market performance of females in absolute terms but also relative to males.

Even though the type of school significantly affects employment chances for men, previously discussed evidence suggests that the effect might not have to do with the school characteristics by themselves but with unobserved factors affecting high school choice and educational decisions. Nevertheless, private schools seem to improve labor conditions. They contribute to increase females' chances to get jobs in leading sectors while appear to be associated to higher wages for males. This might be suggesting that private schools deliver a higher quality education than public ones, and that this is perceived by employers.

School orientation appears to affect the type of job obtained once employed, but not the chances of getting a job. Men from technical schools have lower probability of being working in a leading sector than men from other schools. It is to expect that males with technical degrees work as non-professional self employees –electricians, constructors, etc. Concerning hourly earnings, females from commercial schools obtain lower wages than those from the other school types, and males from technical schools make 13% more per hour than those who attended other school orientations.

Men and women from schools with special programs for adults have higher employment chances than others from schools with standard programs. Despite of having failed at some point in their

educational process, these individuals persevere, which probably makes them more likely to be employed. Generally, the effect of adult education on the type of job and wages is not significant, but the estimated coefficients are always negative.

Educational history is relevant to explain labor market results only for women, even though they are the ones with better educational performance. To delay high school entrance and to drop out of secondary school for at least one year increase employment probability of females both in absolute terms and relative to men. This effect may be capturing the detrimental effect on female employment of a higher educational commitment beyond current attendance situation. As for high-school failure, it reduces females' employment opportunities and wages, even though it does not explain participation. This might indicate that the same attributes that make them fail school also make them less productive in the labor market and less likely to find a job. Neither formality nor sector of activity seem to depend on past educational performance.

Family environment variables are meant to approximate family attitudes towards education and labor market choices, but also they are probably capturing economic resources available to the family that go beyond current family income.

Individuals with siblings who are more advanced in their studies are less likely to be employed, being the effect for men and women statistically equivalent. But for employed females, having such siblings significantly increases the chances of having a job in a leading sector. As for birth order, the effect for females of being the eldest child living in the household is to decrease employment probability –both in absolute terms and relative to men– and to increase the chances of working in a leading sector. Role assignment among siblings and peer-group effects can help explain these results.

Third group of conclusion

There is a significant gender concentration in Argentina's employed population, whether it involves men's and women's position at jobs or occupations –vertical concentration– or labor insertion at activity fields or industries –horizontal concentration–. Women are clustered in a relatively small number of occupations and industries. Men, on the other hand, are more evenly distributed through occupations and industries, even if some duties are almost exclusively performed by them.

Labor gender structure doesn't show major differences between young and adult population, but among young people there is less gender concentration. A large proportion of young women are employed in sales, while most of the men are working as machinery operators. These are tasks that call for a certain amount of qualification and for which experience is not as relevant as for other positions of the labor market. It is noteworthy the gender division observed for duties, but not inside the hierarchical scale: almost all young people are performing operative tasks instead of managerial and supervision ones.

Such gender structure and concentration seems to be highly related to stereotypes and preconceived notions employers have about women's and men's skills. As we've seen throughout qualitative analysis, there are significant discrepancies between employers' "formal standpoints" and their real recruiting and hiring decisions. In general –except for blue-collar vacancies, where we found a clear preference towards men– employers presented themselves as indifferent to gender. However, actual recruitment processes prove that young women are mostly requested for administrative jobs, particularly for secretary positions. Men, on the contrary, are recruited for technical jobs. Moreover, as many employers' stated, women don't usually apply for technical or

supervision positions, which could be associated with women's self-imposed restrictions, given the poor chances of obtaining technical or supervisory jobs.

Activity fields with strong female predominance are: Retail Commerce, Public Administration, Educational and Health Care services, and Domestic Service. Except for Domestic Service, the access to remaining activities requires some human capital stock, regardless of having a diploma. This is observed for female population, from which a huge portion are employed as teachers or nurses. Among young people the outcome is not so clear since a major share is still attending school. Qualitative analysis shows similar results: the Services sector is less male oriented than the Industry sector. Most of Services firms have mixed workforces and higher female participation. Once more, this fact can be associated with traditional stereotypes about women's capacities: in general they are considered thoughtful and amiable when dealing with people and also more meticulous than men. It is also important to highlight differences between small and big or international corporations. The latter showed more gender awareness, mostly derived from head offices' guiding principles about recruitment processes and gender policies.

Finally, to isolate education's effect on the occupational structure differentiated by gender, we've estimated a probit model to assess the probability of people in general, and youngsters in particular, to obtain a neutral gender job. Results indicate that high school has a strong, significant and positive impact in such probability. Even if this constitutes a robust finding, we couldn't accurately identify gender differences' impact on the likelihood of attaining a neutral gender employment. When we consider occupations, having a high school diploma turns out to be more important for young females; whereas for activity fields it is more relevant for adult women. Yet, this is a rather expected result, since high school allows women to access more desirable activity fields like Retail Commerce, instead of being constricted to perform housekeeping tasks. We've also analyzed high school's attendance effect on the chances of being employed in a neutral gender occupation or industry. The outcomes are robust for women in general and even more for young women: having attended high school enhances the likelihood of having a job that's neutral to gender, but having a high school diploma increases more than twice that probability for young females.

Policy recommendations and actions for the future

- Improving general results of the learning process throughout the prevention and resolution of the drop-out and repetition problems. It is necessary to develop specific strategies and to allocate human and material resources efficiently in order to diminish educational failure at the beginning of the secondary school, for both: boys- affected in a higher proportion and girls- for whom the failure situation seems to have a higher negative impact to access in the labor market.
- Paying special attention to poor students at the beginning of the school, allocating more technical resources and a permanent support throughout tutoring or mentoring until their graduation. To supply books and material within the school area, taking into account the particular problem of domestic work faced by girls. The current Government is intensifying these activities, specially providing books at secondary level.
- Closing the gender gap in results obtained in maths and language, throughout different channels: i) re-enforcement and permanent monitor of the learning process; ii) development of a simple instrument to systematically follow these differences in results by gender at school level; iii) creation of incentives to teachers in order to close the gender gap; iv) stimulation of

potentialities available in young people, encouraging girls to enjoy studying math and language in the case of boys.

- Promoting competence and skills formations in cognitive areas, which are the base of employment possibilities. It can be achieved throughout the development and improvement of the didactic contents in each area, with explicit and rigorous focused on this end.
- Intensifying opportunities to the students to interact with people who are working in the private labor market, formal and informal.

Issues to be debated within educational sector as well as in the community in general

- The interpretations of repetition as a signal of educational requirement of the school that “this school will not promote to everyone”, and as a second opportunity to students to learn the contents they were not able to do during the first time, are not supported by our results in which we show that students who repeated at least one year during secondary school compared to those who did not repeat get on average worse scores.
- Whether responsibilities assigned to secondary school in relation to prepare young people in employment and citizenship competencies are complements or substitutes. It is worth noting that employment competencies are needed to poor people who usually do not have extended social networks and possibility to continue their studies.

Additional issues to be addressed in the future

- To re-built educational paths of the students using longitudinal data and linking to the labor market, isolating individual and school factors affecting the student performance⁵⁷.
- To estimate the actual net benefits of the repetition and drop-out for the education system as a whole and to compare the net benefits of implementing prevention and supportive actions.
- To identify possible factors of educational failure between girls and boys and their performance by area (language and math) and the way in which girls and boys learn to practice the “student’s trade”.
- To examine in details the negative effects of the scores inequality on individual performance.
- To characterise and measure the private tutorial support used as a strategy to avoid the repetition by families who can afford it.

⁵⁷ The specific code to identify them has to be provided by the Ministry of Education. It is not available to the general public.

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Appendix to Section III

Table III.1
Probability of being employed – Probit estimates

	Sample 1			Sample 2		
	(1) Females	(2) Males	(3) Difference	(4) Females	(5) Males	(6) Difference
<i>Demographic variables</i>						
Age	0.851 [0.196]***	0.511 [0.155]**	0.34 [0.250]	0.865 [0.155]***	0.683 [0.132]***	0.182 [0.203]
Squared age	-0.017 [0.005]***	-0.009 [0.004]**	-0.008 [0.006]	-0.017 [0.004]***	-0.013 [0.003]***	-0.004 [0.005]
Married	-0.468 [0.137]***	0.254 [0.154]	-0.722 [0.206]***	-0.422 [0.119]***	0.244 [0.145]*	-0.666 [0.188]***
<i>Education</i>						
Attending school	-0.812 [0.146]***	-1.095 [0.123]***	0.283 [0.190]	-0.709 [0.105]***	-0.99 [0.099]***	0.282 [0.144]*
Complete High School	0.156 [0.081]*	-0.038 [0.073]	0.193 [0.109]*	0.093 [0.075]	-0.097 [0.070]	0.191 [0.103]*
Some College				0.072 [0.071]	-0.073 [0.068]	0.145 [0.099]
Complete College				0.393 [0.156]**	0.146 [0.250]	0.247 [0.294]
<i>School characteristics</i>						
Public High School	-0.008 [0.100]	0.149 [0.090]*	-0.156 [0.135]	-0.028 [0.063]	-0.037 [0.064]	0.008 [0.090]
Commercial	0.019 [0.064]	0.067 [0.060]	-0.048 [0.088]			
Technical	-0.098 [0.114]	0.062 [0.065]	-0.16 [0.131]			
Other orientations	0.229 [0.191]	-0.232 [0.215]	0.461 [0.288]			
Adult program	0.359 [0.121]***	0.588 [0.095]***	-0.229 [0.154]			
<i>Educational history</i>						
Started high school immediately	-0.23 [0.113]**	-0.131 [0.094]	-0.099 [0.147]			
Failed high school years	-0.125 [0.068]*	-0.018 [0.056]	-0.107 [0.088]			
Drop out high school and return	0.24 [0.098]**	-0.073 [0.082]	0.313 [0.127]**			
<i>Parental education</i>						
No schooling	0.24 [0.359]	-0.212 [0.366]	0.452 [0.512]	0.243 [0.321]	-0.138 [0.346]	0.381 [0.473]
Complete primary	-0.054 [0.094]	0.058 [0.089]	-0.112 [0.130]	-0.081 [0.083]	0.056 [0.083]	-0.137 [0.118]
Some secondary	-0.098 [0.104]	0.121 [0.094]	-0.219 [0.140]	-0.16 [0.089]*	0.103 [0.087]	-0.263 [0.124]**
Complete secondary	-0.079 [0.118]	0.028 [0.101]	-0.107 [0.155]	-0.19 [0.095]**	-0.001 [0.090]	-0.189 [0.131]
Some college	0.003 [0.167]	0.022 [0.138]	-0.019 [0.217]	-0.081 [0.118]	0.002 [0.113]	-0.084 [0.163]
Complete college	-0.238 [0.182]	-0.224 [0.141]	-0.014 [0.230]	-0.25 [0.115]**	-0.214 [0.110]*	-0.036 [0.159]
<i>Other family characteristics</i>						
Has a more educated sibling	-0.267 [0.085]***	-0.161 [0.068]**	-0.106 [0.109]	-0.251 [0.074]***	-0.161 [0.061]***	-0.09 [0.096]
Is the eldest child	-0.146 [0.073]**	0.056 [0.062]	-0.202 [0.096]**	-0.081 [0.054]	0.053 [0.052]	-0.134 [0.075]*
Female headed household	-0.004 [0.073]	0.094 [0.065]	-0.098 [0.098]	0.048 [0.058]	0.137 [0.056]**	-0.089 [0.080]
Family size	-0.005 [0.015]	0.022 [0.014]	-0.027 [0.020]	0.001 [0.013]	0.028 [0.012]**	-0.027 [0.018]
Employed household head	0.125 [0.088]	0.2 [0.079]**	-0.075 [0.118]	0.154 [0.079]**	0.175 [0.074]**	-0.021 [0.108]
Employed hh * attending school	-0.036 [0.150]	-0.183 [0.127]	0.147 [0.197]	-0.082 [0.109]	-0.126 [0.103]	0.044 [0.150]
Total income other family members	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]
Constant	-9.827 [1.929]***	-6.594 [1.522]***	-3.233 [2.457]	-10.344 [1.551]***	-8.262 [1.296]***	-2.082 [2.021]
Observations	3654	4014	7668	5376	5270	10646
Log. Lik.	-1149.32	-1613.24		-1963.85	-2263.54	
Pseudo R2	0.31	0.35		0.26	0.3	

Source: author's calculations based on EPH and SME, 1998.

Note: (a) Standard errors in brackets: * significant at 10%; ** significant at 5%; *** significant at 1%.
(b) Geographic controls omitted in the table.

Table III.2
Probability of formal and leading-sector job – Probit estimates

	Formal job (b)			Leading sector job (c)		
	(1) Females	(2) Males	(3) Difference	(4) Females	(5) Males	(6) Difference
<i>Demographic variables</i>						
Age	1.749 [0.659]***	0.832 [0.346]**	0.917 [0.744]	0.914 [0.481]*	0.123 [0.302]	0.791 [0.568]
Squared age	-0.038 [0.016]**	-0.016 [0.008]*	-0.022 [0.018]	-0.021 [0.012]*	-0.002 [0.007]	-0.019 [0.014]
Married	0.271 [0.315]	0.275 [0.177]	-0.004 [0.361]	0.271 [0.267]	-0.2 [0.208]	0.472 [0.338]
<i>Education</i>						
Attending school	0.164 [0.434]	0.16 [0.278]	0.004 [0.515]	-0.264 [0.463]	0.713 [0.243]***	-0.977 [0.522]*
Complete high school	0.498 [0.147]***	0.229 [0.100]**	0.27 [0.177]	0.127 [0.150]	0.133 [0.107]	-0.006 [0.185]
Some college						
Complete college						
<i>School characteristics</i>						
Public high school	-0.045 [0.209]	0.136 [0.164]	-0.181 [0.266]	-0.343 [0.196]*	-0.038 [0.168]	-0.305 [0.258]
Commercial	0.098 [0.135]	-0.081 [0.102]	0.179 [0.169]	-0.169 [0.132]	-0.131 [0.102]	-0.038 [0.167]
Technical	0.408 [0.245]*	-0.061 [0.110]	0.47 [0.269]*	-0.14 [0.239]	-0.364 [0.118]***	0.224 [0.266]
Other orientations	-0.114 [0.420]	-0.097 [0.395]	-0.017 [0.576]			
Adult program	-0.801 [0.304]**	-0.125 [0.183]	-0.476 [0.355]	-0.453 [0.285]	-0.019 [0.170]	-0.434 [0.332]
<i>Educational history</i>						
Started high school immediately	-0.04 [0.263]	-0.035 [0.168]	-0.006 [0.312]	0.181 [0.246]	0.037 [0.165]	0.144 [0.296]
Failed high school years	-0.212 [0.150]	0.014 [0.094]	-0.226 [0.177]	-0.019 [0.145]	0.004 [0.098]	-0.023 [0.175]
Drop out high school and return	-0.163 [0.236]	0.096 [0.142]	-0.259 [0.275]	-0.149 [0.217]	-0.094 [0.149]	-0.055 [0.263]
<i>Parental education</i>						
No schooling				-0.005 [0.659]	0.87 [0.618]	-0.875 [0.904]
Complete primary	0.456 [0.207]**	0.177 [0.142]	0.279 [0.251]	-0.289 [0.191]	0.413 [0.167]**	-0.703 [0.254]***
Some secondary	0.411 [0.231]*	0.34 [0.150]**	0.071 [0.276]	-0.04 [0.207]	0.378 [0.176]**	-0.418 [0.271]
Complete secondary	0.396 [0.257]	0.424 [0.162]***	-0.028 [0.304]	0.018 [0.239]	0.541 [0.184]***	-0.523 [0.301]*
Some college	0.869 [0.376]**	0.065 [0.244]	0.805 [0.448]*	0.465 [0.343]	0.753 [0.247]***	-0.288 [0.422]
Complete college	0.789 [0.385]**	0.228 [0.254]	0.561 [0.461]	-0.115 [0.379]	0.201 [0.285]	-0.317 [0.474]
<i>Other family characteristics</i>						
Has a more educated sibling	0.037 [0.184]	-0.03 [0.111]	0.067 [0.215]	0.469 [0.174]***	-0.156 [0.115]	0.625 [0.209]***
Is the eldest child	-0.044 [0.156]	-0.076 [0.103]	0.032 [0.167]	0.187 [0.153]	-0.024 [0.105]	0.211 [0.186]
Female headed household	0.035 [0.155]	-0.108 [0.111]	0.143 [0.191]	0.129 [0.148]	0.066 [0.115]	0.063 [0.187]
Family size	-0.077 [0.034]**	-0.061 [0.023]***	-0.016 [0.041]	0.023 [0.031]	-0.026 [0.025]	0.049 [0.040]
Employed household head	-0.039 [0.160]	0.102 [0.115]	-0.142 [0.197]	-0.126 [0.156]	-0.125 [0.120]	-0.001 [0.197]
Employed hh * attending school	0.089 [0.446]	-0.275 [0.291]	0.363 [0.533]	0.848 [0.469]*	-0.402 [0.255]	1.25 [0.534]**
Total income other family members	0 [0.000]	0 [0.000]	0 [0.000]	0 [0.000]	0.00013 [0.000]**	0 [0.000]
Constant	-20.445 [6.857]***	-10.437 [3.559]***	-10.007 [7.725]	-10.722 [4.948]**	-3.251 [3.060]	-7.471 [5.818]
Observations	556	1006	1562	603	1209	1812
Log Lik.	-278.44	-600.38	-878.82	-290.18	-527.67	
Pseudo R2	0.2	0.11	0.14	0.1	0.07	

Source: author's calculations based on EPH and SME, 1998.

Notes: (a) Standard errors in brackets: * significant at 10%; ** significant at 5%; *** significant at 1%.

(b) Wage earners with retirement benefits are formal workers

(c) Leading sectors: financial sector, public administration, defense, education, health, and professional and personal services.

(d) Estimations based in sample 1. Results for sample 2 available upon request.

(e) Geographic controls omitted in the table.

Table III.3
Earnings equations –Heckman’s two-step procedure

	Sample 1			Sample 2		
	(1) Females	(2) Males	(3) Difference	(4) Females	(5) Males	(6) Difference
<i>Demographic variables</i>						
Age	1.007 [0.204]***	0.386 [0.124]***	0.621 [0.231]***	0.752 [0.162]***	0.348 [0.112]***	0.404 [0.194]**
Squared age	-0.022 [0.005]***	-0.008 [0.003]***	-0.015 [0.006]***	-0.016 [0.004]***	-0.007 [0.003]**	-0.009 [0.005]**
<i>Education</i>						
Complete high school	0.191 [0.064]***	0.069 [0.040]*	0.121 [0.071]*	0.205 [0.055]***	0.087 [0.039]**	0.119 [0.065]*
Some college				0.264 [0.051]***	0.206 [0.048]***	0.058 [0.069]
Complete college				0.664	0.412	0.253
<i>School characteristics</i>						
Public high school	0.004 [0.085]	-0.137 [0.065]**	0.141 [0.102]	[0.095]*** -0.017 [0.050]	[0.121]*** -0.113 [0.047]**	[0.150]* 0.096 [0.067]
Commercial	-0.108 [0.055]**	0.01 [0.041]	-0.118 [0.065]*			
Technical	0.039 [0.098]	0.132 [0.044]***	-0.094 [0.102]			
Other orientations	-0.001 [0.157]	0.007 [0.176]	-0.008 [0.226]			
Adult program	-0.022 [0.102]	-0.027 [0.062]	0.005 [0.114]			
<i>Educational history</i>						
Started high school immediately	0.022 [0.098]	0.034 [0.063]	-0.012 [0.112]			
Failed high school years	-0.132 [0.060]**	-0.026 [0.038]	-0.105 [0.068]			
Drop out high school and return	-0.008 [0.083]	-0.011 [0.056]	0.003 [0.096]			
<i>Job characteristics</i>						
Full-time job	-0.22 [0.050]***	-0.376 [0.043]***	0.156 [0.067]**	-0.274 [0.037]***	-0.306 [0.036]***	0.032 [0.052]
<i>Geographic controls</i>						
Pampena	0.018 [0.085]	-0.097 [0.057]*	0.115 [0.097]	-0.17 [0.060]***	-0.174 [0.048]***	0.005 [0.075]
Cuyo	-0.193 [0.097]**	-0.199 [0.066]***	0.006 [0.111]	-0.316 [0.070]***	-0.226 [0.057]***	-0.091 [0.088]
NOA	-0.222 [0.090]**	-0.231 [0.061]***	0.009 [0.103]	-0.358 [0.067]***	-0.286 [0.053]***	-0.072 [0.083]
Patagonia	0.204 [0.100]**	0.159 [0.068]**	0.045 [0.114]	0.052 [0.072]	0.099 [0.059]*	-0.047 [0.090]
NEA	-0.388 [0.103]***	-0.19 [0.067]***	-0.198 [0.117]*	-0.516 [0.077]***	-0.305 [0.060]***	-0.212 [0.095]**
Inverse Mill's ratio	0.495 [0.105]***	0.072 [0.063]	0.424 [0.119]***	0.369 [0.080]***	0.08 [0.054]	0.289 [0.095]***
Constant	-10.851 [2.184]***	-3.544 [1.304]***	-7.308 [2.468]***	-7.954 [1.749]***	-3.165 [1.180]***	-4.789 [2.078]**
Observations	3614	3920	7534	5314	5150	10464
Censored observations	3032	2789	5821	4330	3667	7997
Wald Chi 2	378.64	516.17		769.51	847.94	

Source: author's calculations based on EPH and SME, 1998.

Notes: (a) Standard errors in brackets: * significant at 10%; ** significant at 5%; *** significant at 1%
(b) Selection equation not shown. See Table III.1

Appendix - Section V

Definitions variables related to:

1. Student variables

<i>Girl</i>	=1 If the student is a girl
<i>Age</i>	Student age
<i>Agesq</i>	Student age square
<i>Repetition</i>	If the student repeated
<i>test_mat</i>	score in math test
<i>test_len</i>	score in language test

2. Student environment at home

<i>books_no</i>	=1 if the student has no books at home to study, =0 otherwise
<i>books_some</i>	=1 if the student has only some books at home to study, =0 otherwise
<i>books_all</i>	=1 if the student has all the books at home to study, =0 otherwise
<i>Prii</i>	=1 if maximum parental education is incomplete primary or less, =0 otherwise
<i>Pric</i>	=1 if maximum parental education is complete primary, =0 otherwise
<i>Seci</i>	=1 if maximum parental education is incomplete secondary, =0 otherwise
<i>Secc</i>	=1 if maximum parental education is complete secondary, =0 otherwise
<i>Supi</i>	=1 if maximum parental education is incomplete college, =0 otherwise
<i>Supc</i>	=1 if maximum parental education is complete college, =0 otherwise
<i>hh_size</i>	number of members living in the house
<i>Poor</i>	=1 if the student's house is classified as poor, =0 otherwise

3. School characteristics

<i>s_infraes</i>	number of positive answers given by the principal about building's infrastructure condition
<i>s_material</i>	number of positive answers given by the principal about material to teachers available
<i>s_public</i>	=1 if school is public, =0 otherwise
<i>s_students</i>	number of students per classroom
<i>s_teachers</i>	number of teachers per classroom
<i>s_other_tea*</i>	number of other teachers per classroom
<i>s_no_teach **</i>	number of non teachers per classroom
<i>s_graduate***</i>	% of graduated student in the school
<i>gini_renlen</i>	Gini Coeficient of language scores in the class
<i>gini_renmat</i>	Gini Coeficient of math scores in the class
<i>rural</i>	=1 if the school is in a rural area, 0 otherwise

4. Province characteristics

<i>gdp_pc</i>	Per capita Gross Domestic Product (in thousands of \$-Year 2000) of the province where the school is located
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Clarifications

**Other teachers variable refers to the existence of pedagogical professional team, librarians, general coordinators, and specific advisors.*

***Non teachers variable refers to the administrative human resources available in the school*

**** This indicator can take values greater than 100 because the school can receive students from other schools in years 11, 12 or 13, increasing the numerator part of the ratio*