Female Labor Market Conditions in Urban Bolivia

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Abstract

Labor market conditions 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 and for women. However, discrimination and segregation problems as well as personal choices related to tastes and family conditions also can determine the quality if female labor market insertion 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 no-indigenous people, this feature is also considered in the research.

Key words: Women in the Labor Market; Labor Conditions; Human Capital; Gender segregation; Occupational Choice; Labor Productivity

JEL Codes: J01; J21; J24; J31; J71

Contents

I. Introduction

Labor market conditions 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 the quality of female labor market insertion 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 in the research.

Some empirical studies have been developed in Bolivia on this issue. Indeed, in terms of employment, Ramírez (2003), using segregation indicators, identifies the existence of occupational segregation problems by gender, principally for unskilled workers.

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 (2001*a*), 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 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, it is still 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 women probability of being in less segregated occupations. Second, the usual women home responsibilities are the most important factors that limit them 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 or minimizing costs.

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 analyzes the main personal characteristics by gender and ethnicity according to occupational category sectors and income. Here, it is developed three statistical analyses. The first one builds on occupational segregation indexes: Duncan & Duncan, Karmel & Maclachlan and Borghans & Groot (1999). The second, 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

II.1. 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 women 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 flexible schedules and less responsibility. Because of these female

[1] See Banker (1997) and Preston (1999) for a survey of occupational segregation theories against women.

population "preferences", women could face constraints for doing training courses.

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.

II.2. 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.

[2]Anker (1997) lists the characteristics usually attributed to women and their impact over occupational segregation by gender (see Table 1 of this paper).

It is possible 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 "efficiency wages".[3] Considering that labor force can be disaggregated according to skill levels (usually measured by years of schooling), intensive skilled sectors could 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

[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.

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.

II.3. Human capital and labor market

It is possible to find a double causality between the labor problems and human capital. As Altonji and Blank (1999) stated that 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 market conditions. Using available official data of Bolivia, in this section it is discussed empirically the relevance of these characteristics as determinants of occupations and labor incomes by gender.

III.1. Labor characteristics by gender

Table 3.1 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.

Within male population, 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 the 48.41%. The second category in importance is other unskilled workers that group the 19.53% of women. Gathering the two categories, 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).[5] 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 13.52%. For unskilled workers the contrary happens, women work in a higher proportion in these tasks compared to men, with a gap of 12.55%. Notice 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.

TABLE 3.1
URBAN WORKERS OF 19 TO 65 YEARS OLD BY GENDER AND ETHNICITY, ACCORDING TO OCUPATION 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

Two additional comparisons arise from Table 3.1: the differences by gender within each ethnic group and the disparities by ethnicity for female population. Among indigenous people, 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

[5] This division responds to the educational differences and to the categorization of the occupations.

semi skilled men in comparison to the 20.61% of women. Finally, 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 3.2 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.

TABLE 3.2
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

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 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 sectarian 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.

III.2. Statistical methods

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 model.

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,[6]

$$(3.1) \quad OS_{DD} = \frac{1}{2}\sum_{j=1}^{J}\left|\frac{F_j}{F} - \frac{M_j}{M}\right|$$

where the sub index j makes reference to the j^{th} ($= 1, 2,.., J$) 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 measuring 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

[6] See, for example, Borghans and Groot (1999), Oliveira (2001) and Ramirez (2003) for a discussion of occupational segregation indexes.

occupational distribution is unaffected. This index is measured in the following way:

$$(3.2) \quad OS = \varphi \sum_{j=1}^{J} \left| \frac{F_j}{F} - \frac{M_j}{M} \right|$$

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, $i = 1, 2,..., I$; so a variation of (3.2) can be used,

$$(3.3) \quad ES = \varphi \sum_{i=1}^{I} \left| \frac{F_i}{F} - \frac{M_i}{M} \right|$$

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 (3.2) and (3.3), the authors determine the total segregation index as

$$(3.4) \quad TS = \varphi \sum_{i=1}^{I} \sum_{j=1}^{J} \left| \frac{F_{ij}}{F} - \frac{M_{ij}}{M} \right|$$

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

$$(3.5) \quad AS = \sum_{i=1}^{I} AS_i = \sum_{i=1}^{I}\sum_{j=1}^{J}\left|\frac{F_{ij}}{T} - \frac{F_{ij}^{educ}}{T}\right| = \sum_{i=1}^{I}\sum_{j=1}^{J}\left|\frac{F_{ij}}{T} - \frac{\frac{F_i}{T_i}T_{ij}}{T}\right|$$

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,

$$(3.6) \quad TSF_j = \varphi\sum_{i=1}^{I}\max\left\{\frac{F_{ij}}{F} - \frac{F_{ij}^{equal}}{F}, 0\right\}$$

$$(3.7) \quad TSF_j = \varphi\sum_{i=1}^{I}\max\left\{\frac{M_{ij}}{M} - \frac{M_{ij}^{equal}}{M}, 0\right\}$$

Equations (3.6) measures the overrepresentation of women compared to men for occupation *j* considering all levels of education, and (3.7) measures the overrepresentation of men compared to women. Using these expressions, the authors find the factor of reintegration

$$(3.8) \quad R = \sum_{j=1}^{J} R_j = 2\sum_{j=1}^{J}\sum_{i=1}^{I}\min\left\{TSF_j, TSM_j\right\}$$

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.

Binary choice models

The potential factors that could explain occupational segregations problems 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 ($k = 1, 2, 3, \ldots, K$) has a given characteristic and $y = 0$ otherwise. The explanatory factors are collected in a vector $\boldsymbol{x}$ and related with y through the following probabilities,

$$(3.9) \quad \text{Prob}\,(y = 1) = F(\boldsymbol{\beta}'\boldsymbol{x})$$
$$\text{Prob}\,(y = 0) = 1 - F(\boldsymbol{\beta}'\boldsymbol{x})$$

The vector of coefficients $\boldsymbol{\beta}$ resume the $\boldsymbol{x}$ 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

$$(3.10)\quad \frac{\partial E(y)}{\partial \boldsymbol{x}} = \left(\frac{dF(\boldsymbol{\beta}'\boldsymbol{x})}{d(\boldsymbol{\beta}'\boldsymbol{x})} \right) \boldsymbol{\beta} = f(\boldsymbol{\beta}'\boldsymbol{x})\boldsymbol{\beta}$$

where $f(\cdot)$ is the density function that corresponds to the cumulative distribution $F(\cdot)$. Here it is worked with the Probit model, which assume that $f(\cdot)$ is a normal distribution function.

III.3. Empiric results from the segregation indexes

Table 3.3 shows the results of previously described segregation indexes. In these calculi occupied population in the army forces was excluded since, according to law, this occupation is essentially composed by male people.

In the second column of the Table it is observed the differences between men and women. According to Duncan & Duncan, the 37.78% of workers should change occupation in order to equal gender distributions. Nevertheless, with the Karmel & Maclachlan index the estimated occupational segregation (*OS*) is relatively minor. Analyzing the *OS* components per occupational category (relative *OS*),[7] 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 the data of Table 3.1). These workers have, at the same time, high educational levels, which suggest that segregation problems by gender for more educated population are, on average, lower. However, there is an exception found in agriculture, cattle and fishing sector, which have low *OS* index as well as low years of education. Finally, machineries and installations operators are mainly composed by men, which can mark a "male type" occupation.

Analyzing the educational segregation (*ES*) index in the same column, it is observed that it is quite minor compared to the *OS*. The major value falls upon between the analphabets, when regarding *ES* components by educational category,[8] which is mainly explained by analphabet indigenous women participation.

The Total Segregation (*TS*) index is a little bit higher than the Karmel & Maclachlan index, showing a reintegration process that allows men and women from different education levels to be in the same occupational category (given that $OS = TS - R$).

[7] 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.

[8] 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.

Finally, the presorting and postsorting indexes show similar magnitudes, revealing that segregation problems are the result of educational gap, as well as the occupational choices and opportunities. It is interesting to notice that the postsorting index is relatively higher for primary and secondary education, showing a relative importance of occupational segregation as a consequence of differences in opportunities and choices in the mentioned educational levels.

TABLE 3.3

SEGREGATION INDEXES, 2001

INDEXES	Total: women - men	Indigenous Women - men	Non-indigenous: Women - men	Women: indigenous – non-indigenous
***OS* - 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%
***ES* - 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%
***TS* - TOTAL SEGREGATION**	20.34%	20.84%	20.53%	26.98%
PRESORTING	18.66%	2 3.04%	17.06%	97.24%
POSTSORTING (occupational segregation given educational status)				
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%
REINTEGRATION	2.30%	5.92%	0.04%	8.53%
RATIO: *ES* / *OS*	31.43%	62.70%	17.24%	143.48%

Source: Own elaboration based on CENSUS 2001 data –National Institute of Statistics

In the columns three and four 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 those found in column two. For non-indigenous population the results are divergent: *OS* and *ES* are, respectively, major and minor.

The above-mentioned results are corroborated by comparing the presorting and postsorting indexes. The presorting index is higher for indigenous population than for non-indigenous one, showing that educational segregation is higher in the first case. On the other hand, the postsorting index is higher for non-indigenous workers, showing that segregation, related with preferences and employment opportunities, is higher for them.

Table 3.3 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.

The last column of the Table analyzes the occupational differences by ethnicity for women. The occupational segregation index seems to be explained by education 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, showing that some women with different ethnicities and education levels are likely to be positioned in similar activities.

III.4. Empiric results from the 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 relevant question 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 with 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 legal restrictions over their participation. Finally, office employees and service and sale workers occupations are biased toward major female population, suggesting that stereotypes around women – docility, better personal relationships, more honesty, more attractive physical appearance, etc. – can facilitate women's participation in these activities.

Additional characteristics that define occupational segregation problems are studied through a Probit model; where the dependent variable *y* equals one when the individual belongs to occupations with the less segregation index and zero otherwise. Considering the information of Table 3.3, three activities are grouped - directives in public administration and firms; professionals, scientific and intellectuals and technicians and other supporting professionals – as the ones with

the lowest segregation levels.[9] The model has been estimated for the occupied population between 19 and 65 years old. The explanatory variables 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) a dummy equal to one for single people and zero for married population (or who live as a couple) and for widow, divorced or separated; 7) the ratio of children per adult as a proxy variable of caring for children at home; [10] 8) immigrant dummy; and 9) home headship dummy. The results are shown in Table 3.4.

TABLE 3.4
Probit model: Probability of being in the less segregated occupation, 2002

Variables	**(1)**	**(1*a*)**	**(2)**	**(2*a*)**
Years of schooling	0.2664	0.0215	0.2636	0.0210
	(0.0117)*		(0.0118)*	
Experience	0.0488	0.0039	0.0349	0.0028
	(0.0082)*		(0.0094)*	
Experience squared	-0.0006	-4.5E-05	-0.0004	0.0000
	(0.0002)**		(0.0002)***	
Women indigenous dummy	-0.2480	-0.0173	-0.1226	-0.0091
	(0.1276)**		(0.1323)	
Women non-indigenous dummy	-0.2203	-0.0169	-0.1053	-0.0082
	(0.0490)*		(0.0596)***	
Single dummy			-0.1383	-0.0103
			(0.0730)***	
Ratio: children_adults			-0.0622	-0.0049
			(0.0725)	
Immigrant dummy			0.0849	0.0072
			(0.0742)	
Home headship dummy			0.2458	0.0203
			(0.0652)*	
Constant	-4.7878		-4.7189	
	(0.1822)*		(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) (3*a*) and (4*a*) describe de marginal effects; e) the database used is the MECOVI – 2002.

[9] 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.

[10] The ratio of children per adult has been constructed attributing the characteristic of the house 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.

The third regression (7) considers additional explanatory variables: a dummy variable of whether the individual lives in the main cities of Bolivia (La Paz, Santa Cruz and Cochabamba); a dummy for single; years of education; the ratio of children per adult for women as a proxy variable of caring for children at home.

In the basic regression – (1) y (1*a*) – 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 has 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 (2) and (2*a*) include additional explanatory variables. In this case the indigenous women dummy is not anymore statistically significant, showing that the new variables explains the initial segregation problems found against these women. On the other hand, the non-indigenous women 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.

The single dummy people shows a negative coefficient. In principle it was expected a positive sign reflecting a direct relationship between family responsibilities (associated with people that are married or widow, divorced or separated) and segregation problems. Because women and men are included in the analysis, this idea has been refined considering a dummy only for married women, but the variable did not result statistically significant (not included in the Table). It suggests that women responsibilities within their home are not factors that influence over some kind of (self) occupational segregation, unless not in a significant way.

The above-mentioned conclusion is corroborated observing the insignificant coefficient of the children per adult ratio. Additional regressions were also made separating this ratio by gender but the variable continued being statistically irrelevant (these results are not included).

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.[11] This is because single people are usually younger.

To finish, Table 3.4 shows that household heads have a higher 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.

[11] Remember that the less segregated occupations are the ones that have higher labor income levels.

III.5. Stylized facts of 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 3.1 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 3.1*a* 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 there is a positive relationship between labor income and years of schooling. 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 3.1
URBAN WORKERS OF OVER 19 YEARS OLD: INCOME PER HOUR (IN LOGARITHMS) VERSUS YEARS OF EDUCATION, 2002

Figure 3.1*a*

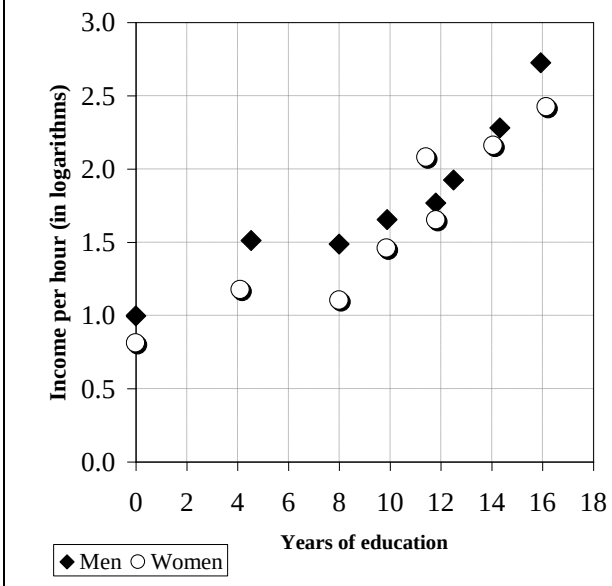
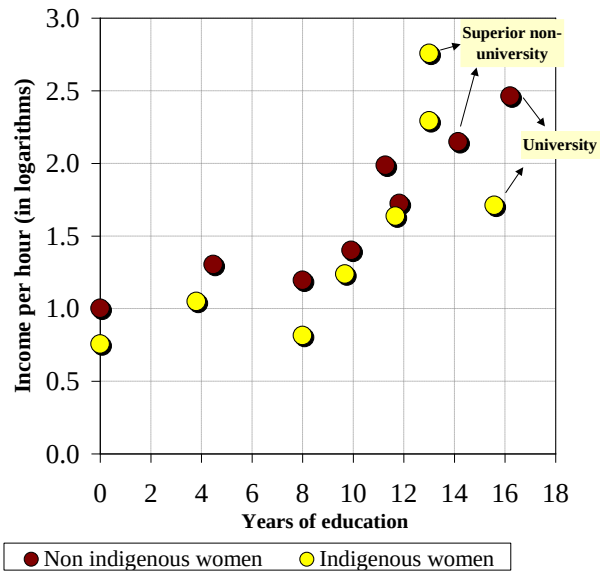


Figure 3.1*b*



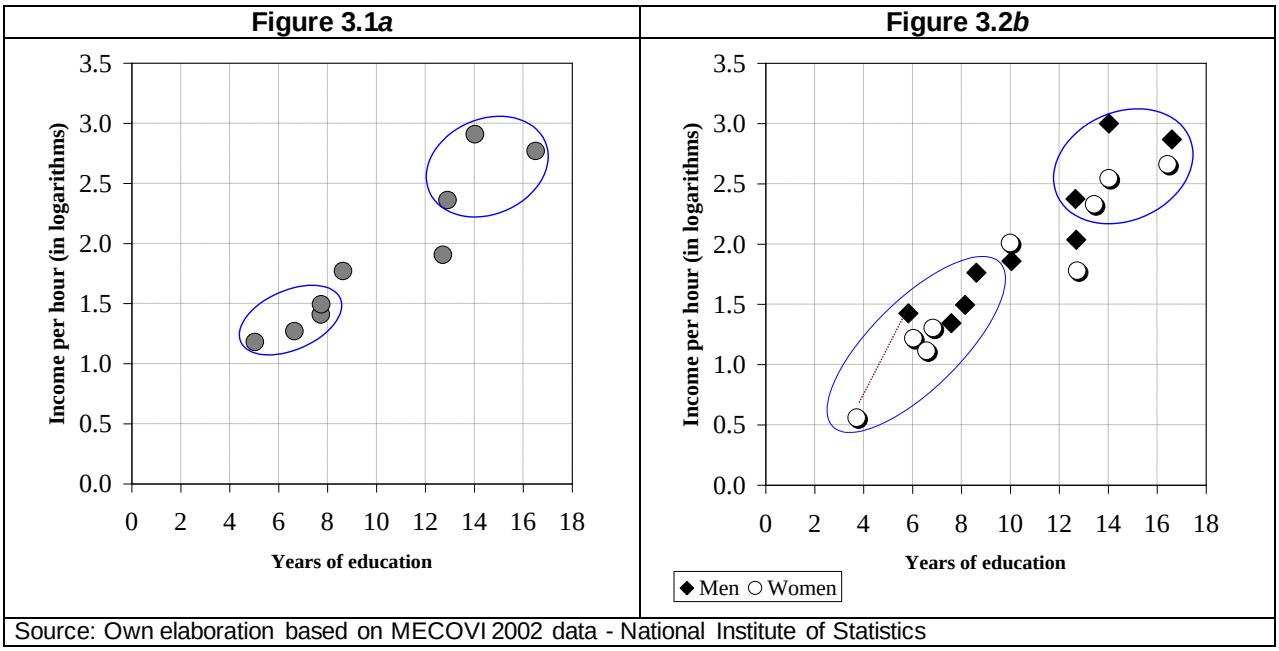
Source: Own elaboration based on MECOVI 2002 data - National Institute of Statistics

Figure 3.1*b* 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 3.2 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 3.2*a* 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 3.1
URBAN WORKERS OCCUPATION OF OVER 19 YEARS OLD: INCOME PER HOUR (IN LOGARITHMS) VERSUS YEARS OF EDUCATION, 2002



Source: Own elaboration based on MECOVI 2002 data - National Institute of Statistics

Figure 3.2*b* 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 3.3 shows the relationship between income and education by economic sectors. At the aggregate level, Figure 3.3*a* 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 3.3
URBAN WORKERS OVER 19 YEARS OLD BY ECONOMIC SECTOR: INCOME PER HOUR (IN LOGARITHMS) VERSUS YEAR OF EDUCATION, 2002

Figure 3.3*a*

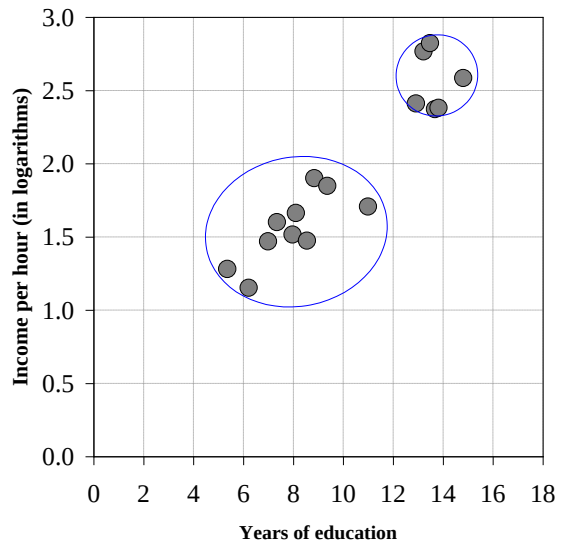
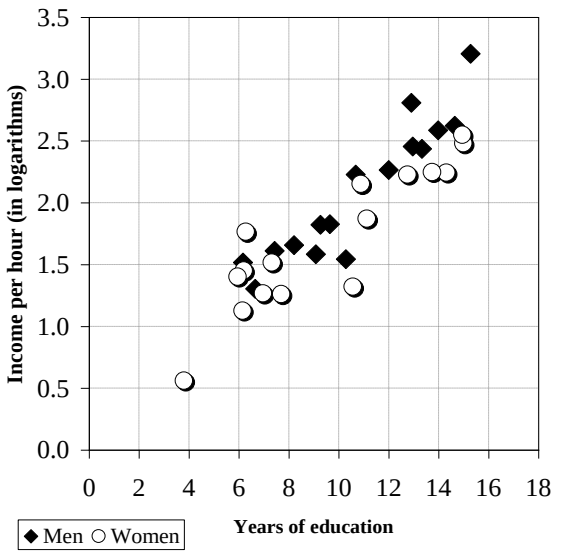


Figure 3.3*b*



Source: Own elaboration based on MECOVI 2002 data - National Institute of Statistics

Figure 3.3*b* 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 3.3*a*, since most women are concentrated in low pay sectors.

III.6. 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

$$(3.11) \qquad log(w_k) = \alpha_0 + \rho_s S_k + \beta_0 z_k + \beta_1 z_k^2 + \varepsilon_0$$

where the sub index k makes reference to the k^{th} (= *1, 2,.., 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. 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

$$(3.11a) \qquad log(w_k) = \alpha_0 + \rho_s S_k + \beta_0 z_k + \beta_1 z_k^2 + \boldsymbol{\delta' d_k} + \boldsymbol{\lambda' x}_k + \varepsilon_1$$

where $\boldsymbol{d}_k$ 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 $\boldsymbol{x}_k$ 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)[12] and Miller (1987) methodology. Taking into account the segregation indexes calculi described in Table 3.3, three segregation levels are defined: a) high segregation occupations (armed forces,[13] 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 occupational segregation level is specified here as

$$(3.12) \quad \text{Prob } (y = 0) = F(-\boldsymbol{\beta'x})$$
$$\text{Prob } (y = 1) = F(\mu_1 - \boldsymbol{\beta'x}) - F(-\boldsymbol{\beta'x})$$

[12] See Miller (1987).

[13] 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.

$$\text{Prob}\ (y = 2) = F(\mu_2 - \beta' x) - F(\mu_1 - \beta' x)$$

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 (3.11*a*).

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: years of education, experience, experience squared and years of working in the firm. The econometric estimates are shown in Table 3.5.

Table 3.5
Ordered Probit Model: Probability of Being in Less Segregated Occupations, 2002
(from 19 to 65 years of age and with positive main labor income)

	(1)	(2)
Years of education	0.1182	0.1184
	(0.0048)***	(0.0047)***
Experience	-0.0012	
	(0.0046)	
Experience squared	0.0002	0.0002
	(0.0001) ***	(0.0000)***
Years of working in the firm	0.0163	0.0162
	(0.0026)***	(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.

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 3.5 it is observed that the coefficients are positive, having the mentioned interpretation. The exception is experience, but this variable is not significant.

Based on regression (2), the probabilities for all 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 3.6.

Table 3.6
Mincer's Regression: The Dependent Variable is the Main Job Income per Hour, 2002
(from 19 to 65 years of age)

	(1)	(2)	(3)	(4)	(5)	(6)
Years of education	0.0940	0.0201	0.0150	-0.0247	-0.0287	-0.0285
	(0.0037)***	(0.0097)**	(0.0097)	(0.0223)	(0.0221)	(0.0220)
Years of education × secondary education dummy		0.0188	0.0193	0.0135	0.0131	0.0134
		(0.0060)***	(0.0060)***	(0.0077)	(0.0075)	(0.0076)
Years of education × superior education dummy		0.0610	0.0625	0.0414	0.0408	0.0414
		(0.0069)***	(0.0069)***	(0.0099)***	(0.0097)***	(0.0096)***
Experience	0.0323	0.0344	0.0266	0.0192	0.0200	0.0199
	(0.0038)***	(0.0038)***	(0.0041)***	(0.0054)***	(0.0058)***	(0.0057)***
Experience squared	-0.0004	-0.0006	-0.0005	-0.0004	-0.0004	-0.0004
	(0.0001)***	(0.0001)***	(0.0001)***	(0.0001)***	(0.0001)***	(0.0001)***
Women dummy	-0.1742	-0.2371	-0.1876	-0.2287	-0.1123	
	(0.0291)***	(0.0290)***	(0.0339)***	(0.0582)***	(0.0516)***	
Indigenous dummy	-0.2021	-0.2328	-0.2514	-0.2518	-0.2477	-0.2491
	(0.0335)***	(0.0328)***	(0.0327)***	(0.0501)***	(0.0499)***	(0.0497)***
Dummy for principal cities			0.0808	0.0965	0.0936	0.0938
			(0.0283)***	(0.0296)***	(0.0286)***	(0.0288)***
Single dummy			-0.2037	-0.2095	-0.2215	-0.2167
			(0.0385)***	(0.0244)***	(0.0240)***	(0.0238)***
Ratio children/adults × women dummy			-0.1374	-0.1569	-0.1441	-0.1291
			(0.0508)***	(0.0589)**	(0.0511)**	(0.0547)**
Probability of being in a less segregated occupation				1.2160	1.2937	1.2691
				(0.6068)*	(0.6065)*	(0.6013)*
Firm size (number of workers)				0.0042	0.0038	0.0039
				(0.0009)***	(0.0008)***	(0.0009)***
Labor productivity				0.0046	0.0042	0.0041
				(0.0015)**	(0.0015)**	(0.0015)**
Agriculture and fishing dummy				-0.5255	-0.5518	-0.5557
				(0.0229)***	(0.0252)***	(0.0254)***
Mining dummy				-0.3991	-0.3772	-0.3873
				(0.0597)***	(0.0536)***	(0.0571)***
Construction dummy				0.1625	0.1378	0.1336
				(0.0234)***	(0.0308)***	(0.0310)***

Table 3.11 Continued

	(1)	(2)	(3)	(4)	(5)	(6)
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 (1) 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 that 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, 2001*a*; and Andersen and Muriel, 2002).

Because (looking at the previous Figures) 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 (2) 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 considers additional explanatory variables: a dummy variable of whether the individual lives in the main cities of Bolivia (La Paz, Santa Cruz and Cochabamba); the single dummy and the ratio children/adults×women dummy. The positive coefficient of the principal cities dummy 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.[14]

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 (4) 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 × secondary education dummy coefficient is not longer significant, and the years of education × 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 (4) are associated with the "efficiency wages" hypothesis: the firm size, measured by the number of workers, and labor productivity by economic sector.[15] 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 (5) and (6) 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 (5); 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

[14] The immigrant dummy is also considered, but it is also not significant.

[15] 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 and index equal to 100 for the highest labor productivity sector.

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 (5). 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 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 home responsibilities 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 chefs of the firms, having all of them superior levels of education. The interviews were conducted privately.[16]

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.

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, 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.

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

[16] See annex for the description of the sample design.

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.

TABLE 4.1
DID YOU RECEIVE SOME TRAINIG (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

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 4.1*a*). 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 4.1*a*

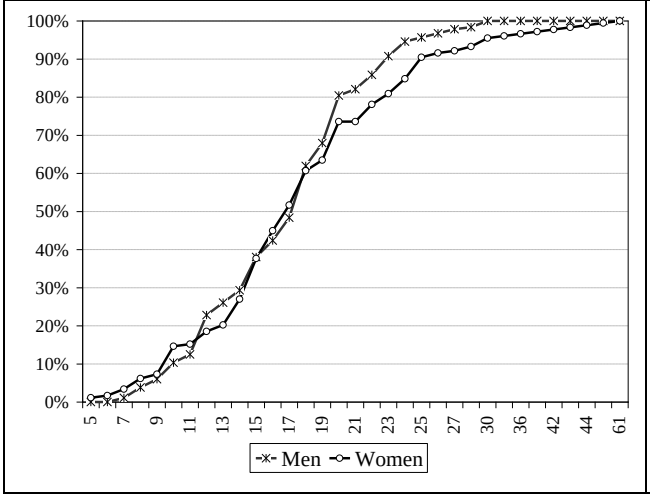


FIGURE 4.1*b*

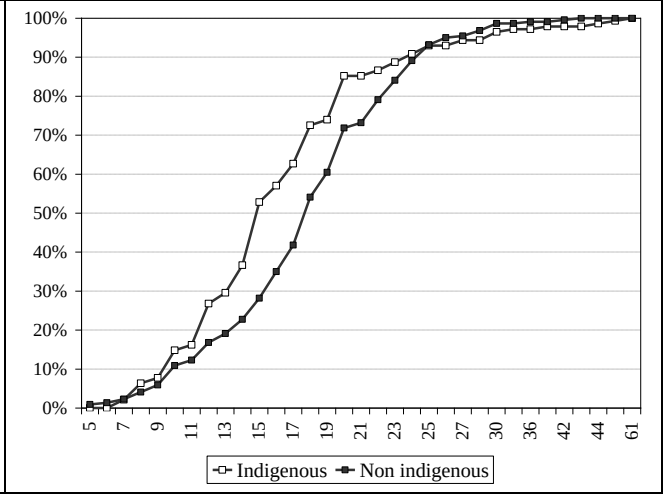


Figure 4.2 shows the age of the first job of the present occupation. Comparing this information with the previous figure, it is interesting to note that 90% of the sampled persons had their first job at under the age of 25; however, only 60 percent began working in their present occupation. Furthermore, 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 4.2*a* 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)

FIGURE 4.2*a*

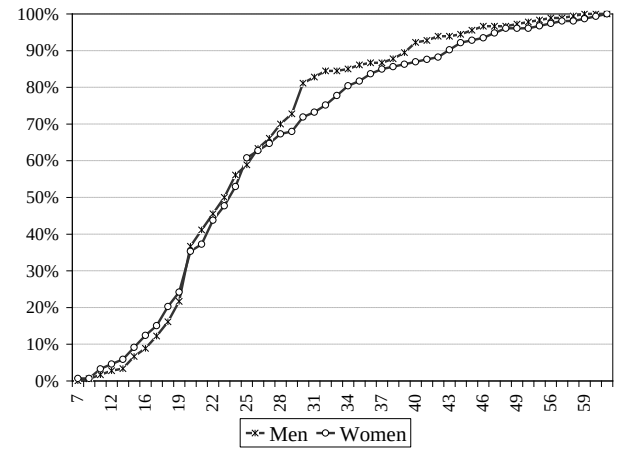
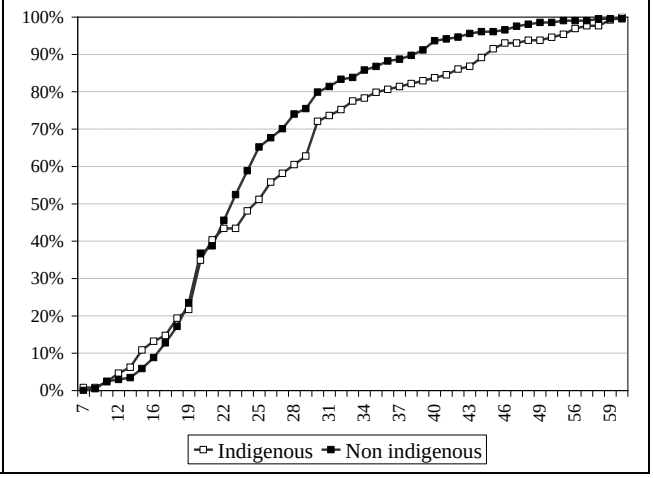


FIGURE 4.2*b*



Analyzing the differences by ethnicity (see Figure 4.2*b*), 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.

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.

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.

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 4.3*a* 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 4.3*b*) 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)

FIGURE 4.3*a*

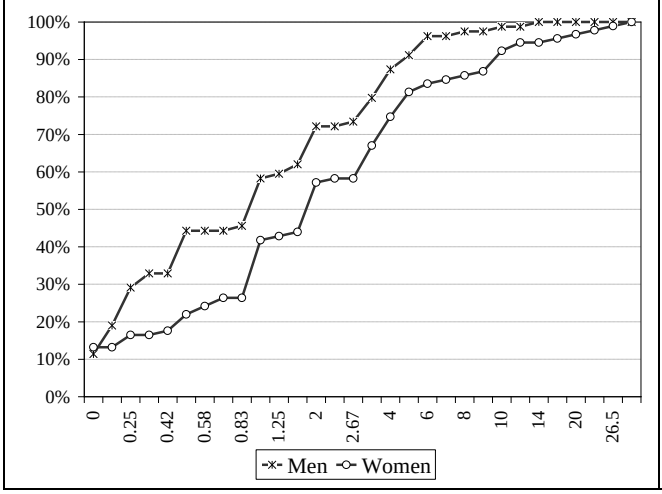
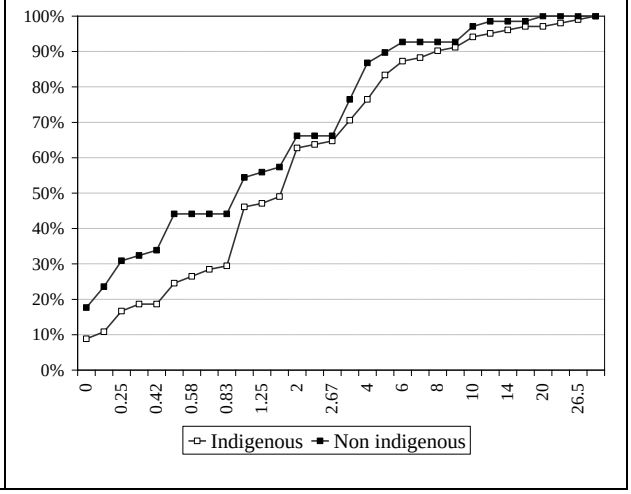


FIGURE 4.3*b*



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.

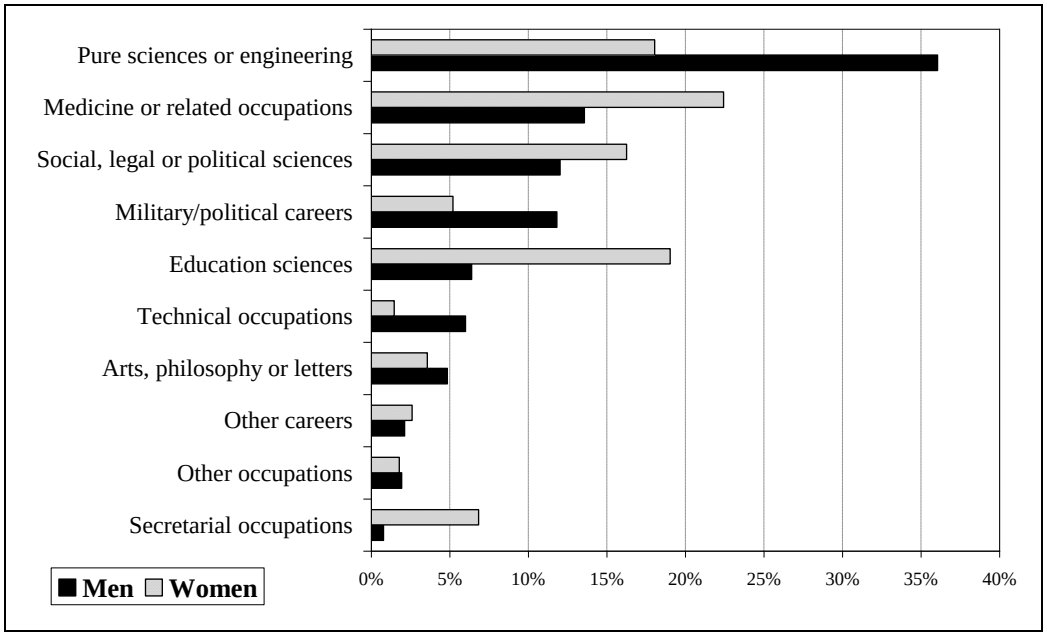
The additional years of education are slightly higher for men. On average, men wish to study 5.82 more years and women, 5.44 more years. The strong disparities between men and women are found in the election of professions or occupations, as shown in Figure 4.4.

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.

FIGURE 4.4
SELECTIONS OF PROFESSIONS OR OCCUPATIONS



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.

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.

FIGURE 4.5
INFLUENCES OF THE ENVIRONMENT ON THE PREFERENCES FOR PROFESSIONS

FIGURE 4.5*a*
Do you believe that your preference for this profession is influenced in some way because it has related to your sex?

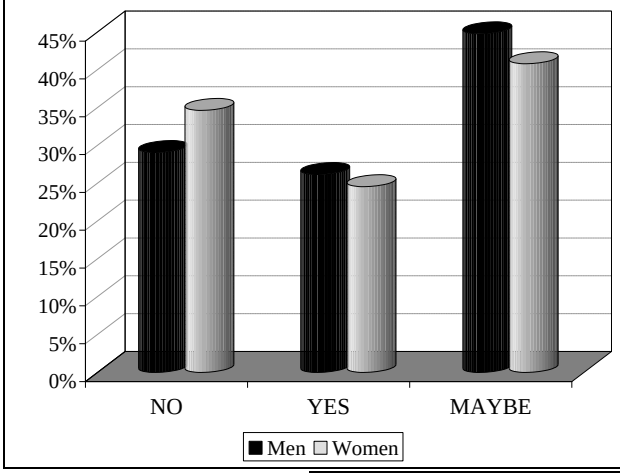


FIGURE 4.5*b*
Do you believe that (the profession you choose) may better adjust to your future household responsibilities?

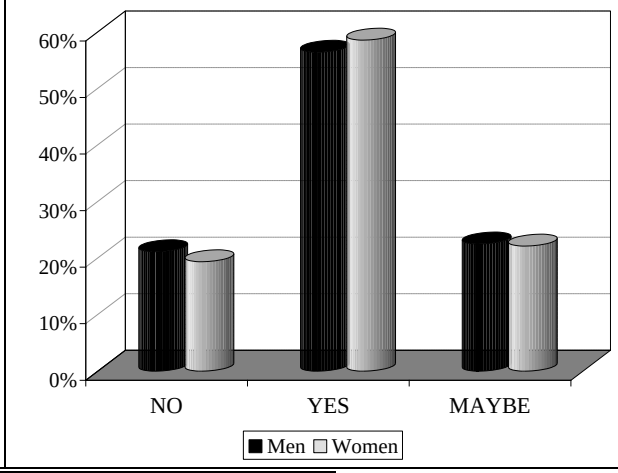
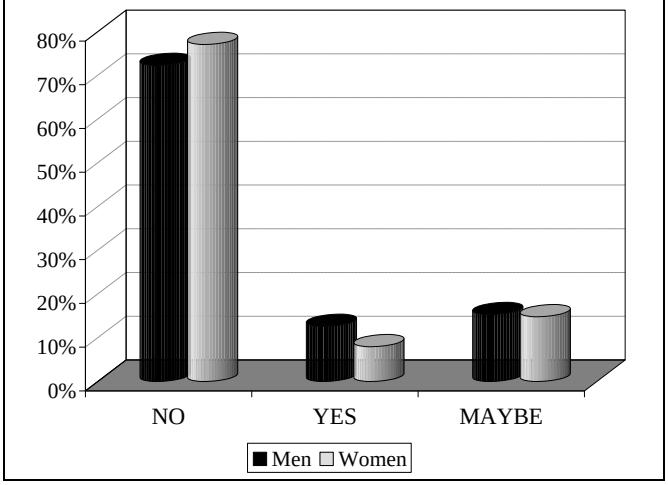


FIGURE 4.5*c*
Do you believe that your preference for this profession is influenced in some way by what your parents wish for you to study or by family tradition?



Lastly, Figure 4.6*c* 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,

$$\underset{}{\textit{Years of educaction}} = \underset{(1.48)}{0.02\ \textit{myeduc}} + \underset{(1.93)}{0.18\ \textit{sport}} - \underset{(-1.84)}{0.26\ \textit{dwork}} - \underset{(-2.45)}{0.33\ \textit{dwoman}}$$

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 trough 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 years of schooling gap by gender is, on average, around one year, which is highly compatible with Table 3.3 (where differences on education was 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 4.3*a* 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 4.3*a*
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 4.3*b* 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.

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-

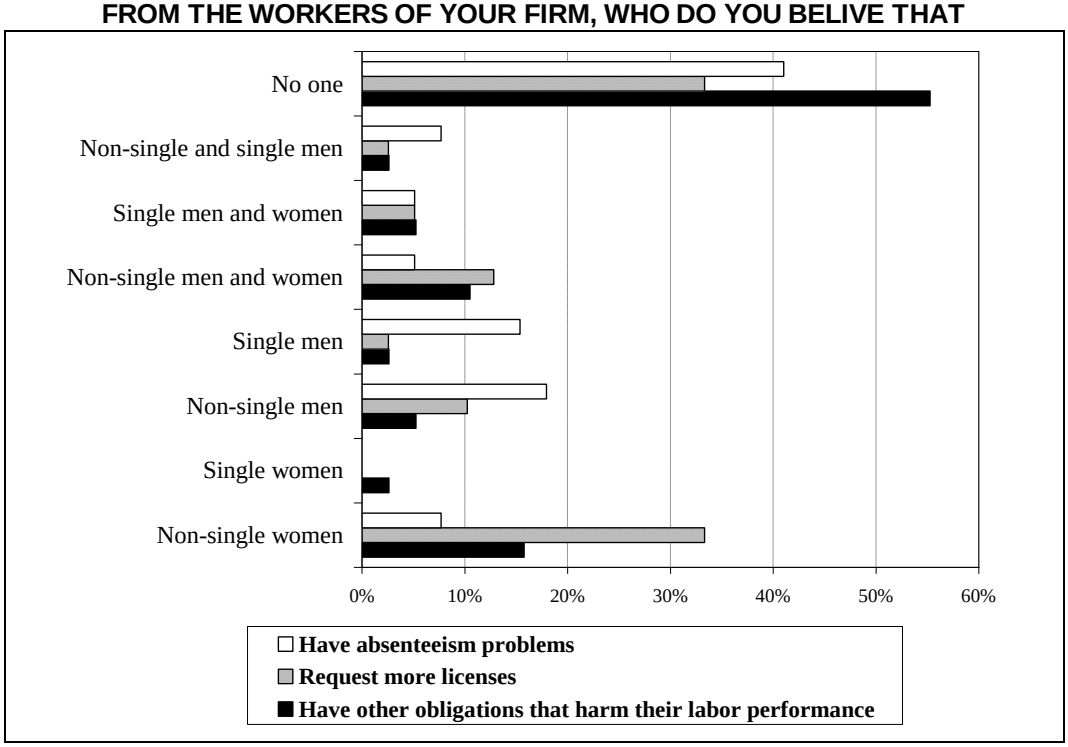
single men are more frequently absent of the work, which is consistent with the results exposed in Table 4.3*a*.

TABLE 4.3*b*
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%

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 BELIVE 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 3.1 and 3.3, 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.

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%

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 4.6 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 4.7*a* 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.

FIGURE 4.7
PERCEPTIONS SURROUNDING GREATER WORK OPPORTUNITIES OF THE OPPOSITE SEX, GIVEN THE SAME PROFESSION

FIGURE 4.7*a*
Better chance of finding work

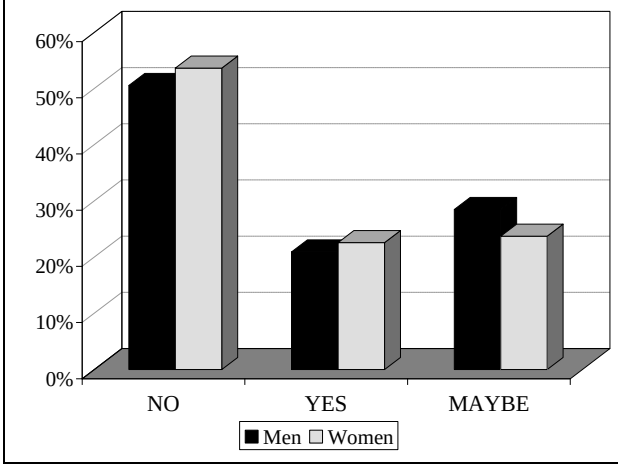


FIGURE 4.7*b*
Better chance of obtaining a position or being promoted

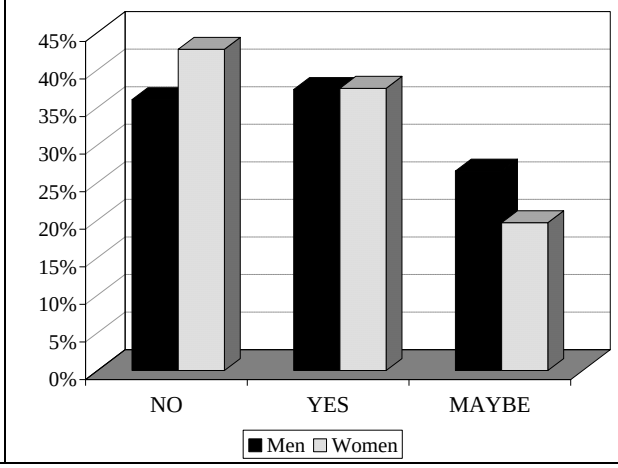
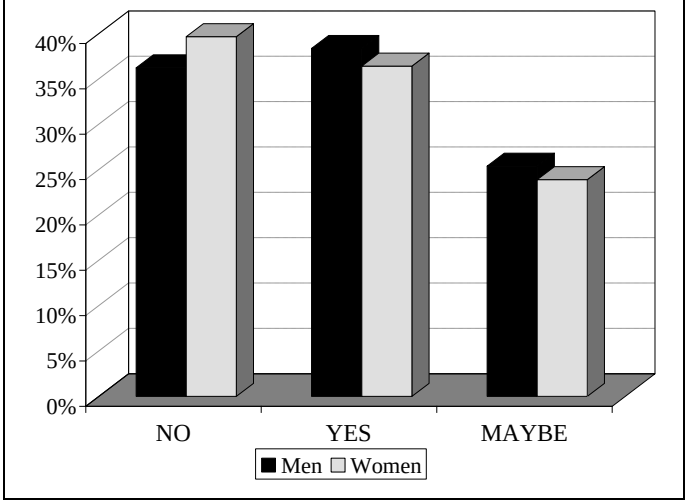


FIGURE 4.7*c*
Better chance of having a good salary



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 4.7*b*, 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 4.7*c* 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.

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

Figure 4.8*a*
Who has greater responsibility for generating income for the family?

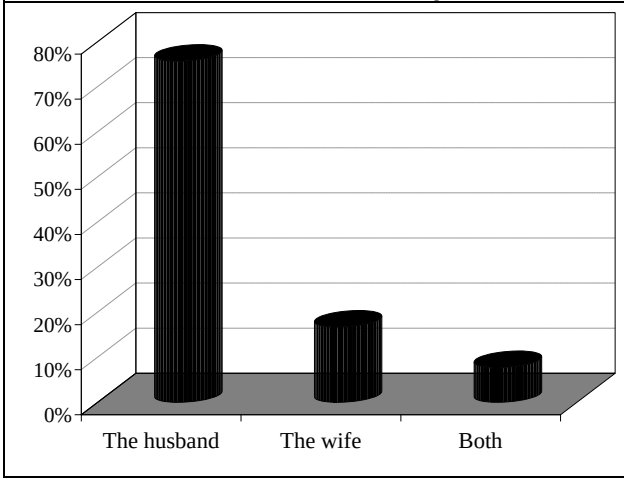
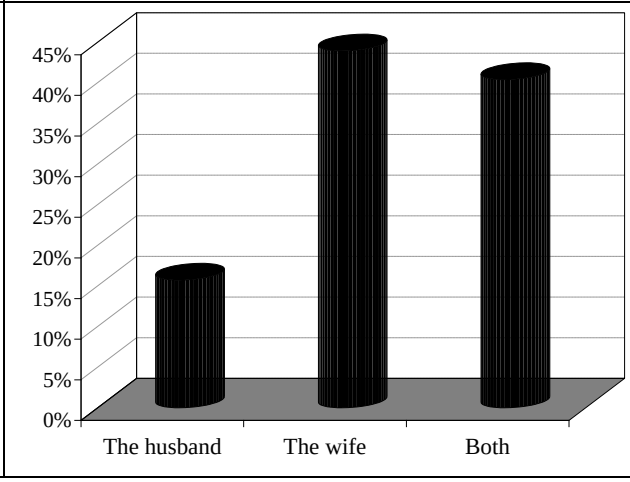


Figure 4.8*b*
Who has greater responsibility on family matters?



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 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 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 trough

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 no 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 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 is 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.

Bibliography

Ackerman, M., R. Cortés, L. Golbert, M. Mercado and L., C. Pautassi (2000), "Ley, Mercado y discriminación: El Género del Trabajo," Colección Identidad, Mujer y Derecho, CEADEL.

Andersen, L. E. (2001*a*), "Wage Differentials between Bolivian Cities" *Economía Política*, Vol. II (1): 48-62.

Andersen, L. E. (2001*b*) "Low Social Mobility in Bolivia: Causes and Consequences for Development." Working Paper No. 1046, Kiel Institute of World Economics, May

Andersen, L. E. and B. Muriel H. (2002), "Cantidad versus Calidad en Educación: Implicaciones para Pobreza," *Revista de Estudios Económicos y Sociales* #1 (INE).

Altonji, G. J. and R. M. Blank (1999), "Race and Gender in the Labor Market", en O.

Ashenfelter y D. Card (eds) *Handbook of Labor Economics* 3c: 3143-3259.

Anker, R. (1997), "Theories of occupational segregation by sex: An overview," International Labour Review, 136(3): 315-339.

Becker, Gary (1971), *The Economics of Discrimination*. The University of Chicago Press, Chicago, IL.

Bergmann, B. (1974), "Occupational segregation, wages and profits: when employers discriminate by race or sex," *Eastern Economic Journal* I(1-2): 561-573.

Berhman, J. et al (1999),"Women's schooling, home teaching and economic growth," The journal of political economy, 107 (4).

Borghans, L y L. Groot (1999), "Educational presorting and occupational segregation," *Labour Economics* 6:375-395.

De Almeida. M. (1982), *Análise da Participação feminina no mercado de trabalho no Brasil*, Tese de Mestrado, Departamento de Economia – Pontifícia Universidade Católica do Rio de Janeiro.

Deininger, K. (2003), "Does cost of schooling affect enrolment by the poor? Universal education in Uganda," Economics of education review 22 (2003) 291-305.

Doeringer, P. B. y M. J. Piore (1971), Internal labor market and Manpower Analysis, Lexington Mass D. C. Health and Co.

Escóbar, P., S. (w.d.) "El trabajo asalariado en Bolivia 1950 – 2000: Tendencias y dimensiones de género," Cuaderno de Trabajo #2. Red Latinoamericana Mujeres Transformando la Economía.

Fields, G. S., J. B. Leary, L. F. Lopez-Calva and E. Perez-de-Rada (1998) "Education's Crucial Role in Explaining Labor Income Inequality in Urban Bolivia." Development Discussion Paper No. 658. Harvard Institute for International Development, October.

Heckman, J. (1979), "Sample Selection Bias as a Specification Error", *Econometrica* vol. 47, no. 1.

Holmes, J. (2003), "Measuring the determinants of school completion in Pakistan: analysis of censoring and selection bias," *Economics of Education Review* 22(2003) 249-264.

Jimenez, Z., E. (2003) "Género versus Etnicidad: Un estudio de caso sobre migrantes rurales y mercados de trabajo en Bolivia," Cuaderno de Trabajo #5. Red Latinoamericana Mujeres Transformando la Economía.

King, E. and L. Lillard (1987), "Education policy and schooling attainment in Malaysia and Philippines," Economics of education review 6(2) 167- 81.

Krueger, B. A. and L. H. Summer, 1988, "Efficiency Wages and the Inter-Industry Wage Structure," *Econometric*a, 56(2): 259-93.

Mercado, A. , L. E. Andersen and B. Muriel H. (2003), "Discriminación étnica en el sistema educativo y en el mercado de trabajo de Bolivia," *Revista Latinoamericana de Desarrollo Económico* 1(sep): 69-98.

Miller, W. P. (1987)," The wage effect of the occupational segregation of women in Britain," *The economic Journal* 97(388): 885-896.

Mincer, J. (1974) *Schooling, Experience and Earnings*. New York: NBER Press.

Moensted, T. (2000) "Wage Differentials between the formal and the informal sector in Bolivia" IISEC Documento de Trabajo 2/2000. IISEC-UCB, La Paz.

Mookherjee, D., e A. Shorrocks. 1982. "A decomposition analysis of the trend in UK income inequality,"Economic Journal, 92(368):886-902.

Oaxaca, R. (1973), "Male-Female Wage Differentials in Urban Labor Markets", *International Economic Review,* vol. 14 no. 3.

Oliveira, A. M. (2001), "Occupational gender segregation and effects on wages in Brazil," CEDEPLAR/UFMG, Belo Horizonte – Brazil, mimeo.

Perez de Rada, E. (1997) "Discriminación Salarial por Género y Etnia en Ciudades Principales de Bolivia." UDAPSO Working Paper No. 47/97. UDAPSO, La Paz.

Preston, J. A. (1999), "Occupation gender segregation trends and explanations," *The Quarterly Review of Economics and Finance* 39(1999): 611-624.

Ramírez, R. (2003), Pobreza y Discriminación Laboral por Género, Tesis de Licenciatura en Economía, Universidad Católica Boliviana, La Paz-Bolivia.

Rivera, Q., S. (1991), *Trabajo de mujeres: Explotación capitalista y opresión colonial entre las mujeres aymaras de La Paz y El Alto*, editorial MAMA HUACU, La Paz - Bolivia.

Rivero, R. y W. Jiménez (1999) "Diferencias salariales en el mercado de trabajo urbano en Bolivia, 1981-1997" *Análisis Económico*, UDAPE, volumen 17.

United Nations (2003), *The State of the World's children 2004, Girls Education and Development*, United Nations Children's Fund.

Wanderley, F. (2002), *Inserción laboral y trabajo no mercantil. Una abordaje de género desde los hogares*, CIDES – UMSA, Plural, La Paz – Bolivia.

Wright, R.E. (1999). "The Rate of Return to Private Schooling." Department of Economics. University of Stirling. Stirling-Scotland.

Annex

A. Urban surveys: Sample design

Survey at home level[17]

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.1

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

[17] This part was extracted from the Xperta Report. Xperta was the consultant responsible of the design and elaboration of the surveys.

of 14 aleatorily schools in the city of La Paz and 13 in El Alto, between 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.