

# Gender and Racial Discrimination in Hiring: A Pseudo-Audit Study for Three Selected Occupations in Metropolitan Lima

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## Abstract

In this paper, we adapt the audit studies methodology to analyze gender and racial differences in hiring for a particular segment of the market of three selected occupations in Metropolitan Lima: accounting and administrative assistants, salespersons and secretaries. The adapted pseudo-audit study methodology allows us to considerably reduce the existence of statistical discrimination. The results suggest that no significant differences in hiring rates for different gender-race groups exist, however, there are some significant systematic differences in the aimed wages of the individuals in their job search processes.

**Keywords:** Field Experiments, Discrimination, Occupational Segregation.

**JEL Classification Codes:** C93, D63, J4, J7.

## 1 Introduction

Despite social advances and a movement towards modernization of labor markets, substantial differences in earnings and opportunities for individuals from different gender and racial groups persist. Casual

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observation of posted job openings in local newspapers reflects the existence of occupations for which employers request only male or female employees. In other postings, the euphemism "good presence" is used to refer to employers' specific racial preferences for particular job openings.

Occupational differences that are linked to racial differences among White, Indigenous and Mestizo individuals continue, due to the existence of stereotypes and prejudices. These biases are reinforced by differences in individuals' abilities to access education and other assets. Furthermore, cultural differences, which are observable through variations in behavior and speech, should be added to these differences that are based on phenotypic characteristics. At times employers make their decisions using these racial and ethnic differences as proxy measures for other characteristics that they desire but that are harder to observe in a job interview. As a result, some employers discriminate against individuals on the basis of their racial characteristics, but not because they have a "taste for discrimination". Instead, these employers discriminate because they use race as a signaling device, which is representative of statistical discrimination.

More specifically, in Peru, there are substantial differences in occupational structures among gender and racial groups. To some extent, these differences explain the wage differences that have been documented by Ñopo, Saavedra and Torero (2002). Additionally, occupational segregation is linked to differences in the individuals' asset ownership and that of their families. Blau and Ferber (2002) report that gender differences in occupational structures in Latin America, measured by the Duncan Index, are higher than those found in other regions of the world. Occupational segregation is the result of a sorting equilibrium that involves the existence of discrimination, either taste-based or statistical, from the employers or the applicants. Applicant discrimination can occur when individuals decide to apply only to those occupations for which they feel they have higher chances of being accepted. However, by only analyzing the figures of segregation, it is not possible to identify whether the result is caused by taste-based or statistical discrimination.

In this study, we isolate and explore the first reason, employers decisions.<sup>1</sup> We do this by analyzing the hiring processes for specific occupations, using information from the CIL-PROEMPLEO network, the job intermediation service of the Peruvian Ministry of Labor and Employment Promotion. For that purpose we followed males and females through the job seeking process. Specifically, we focused on individuals applying for salesperson, secretary and accounting and administrative assistant occupations. For each of these postings we acquired information about the applicants' gender and racial characteristics, as well as the attributes that would make them employable in the occupations for which they were applying. For every job posting, all the applicants had to fulfill the firms' requirements for age, schooling and occupational experience. Hence, by construction, our sample has a reduced variance in age, schooling

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<sup>1</sup>As we will explain later in the paper, the design of the experiment leaves little room for the existence of statistical discrimination.

and occupational experience as compared to the variance of those variables found at a national level. Nonetheless, a noticeable variance in family income, ownership of certain durable assets and access to private schools is present. Furthermore, with respect to the ethnic and racial differences of the individuals, there is considerable heterogeneity in the sample population even though it represents only a bounded portion of all the racial diversity that is found in Lima. It is also important to note that individuals who are generally regarded as part of the elite White did not seek employment through this intermediation service. Additionally, Indigenous individuals who have recently migrated to Lima also did not go to the intermediation service. Consequently, the sample population can be regarded as Mestizos with degrees of heterogeneity.

In this experiment we compare the performance of Mestizo individuals, with different degrees of "Mestizaje", that have similar characteristics in age, schooling and occupational experience. The heterogeneity of the racial characteristics allows us to form groups of individuals that, in terms of their comparable differences, can be labeled as Indigenous, Mestizo and White.

This study shares many of the characteristics present in traditional audit studies, but overcomes some of the critiques given by Heckman.<sup>2</sup> The paper begins by introducing the occupational segregation found in urban Peru and evaluates the study's methodology. Then we describe the characteristics of the sample, followed by the results obtained from the study. Finally we conclude by discussing the study's scope in the understanding of discrimination in the labor markets of Peru.

## 2 Occupational Segregation by Gender and Race in Peru

High occupational segregation in Peru, as measured by the Duncan Index,<sup>3</sup> occurs not only by gender, but also by race. In the same manner that previous literature has defined "male-dominated" and "female-dominated" occupations, recent data allows us to document the existence of "white-dominated" and "indigenous-dominated" occupations.

Using a classification of seven occupational groups,<sup>4</sup> the segregation index between males and females reaches 0.3265 for the year 2000; meaning that it would be necessary that at least 32.65% of the working females switch occupations to those that have higher male participation, or vice versa, in order to achieve a non-segregated work force.<sup>5</sup> These results are comparable to the estimated figures obtained by Deutsch,

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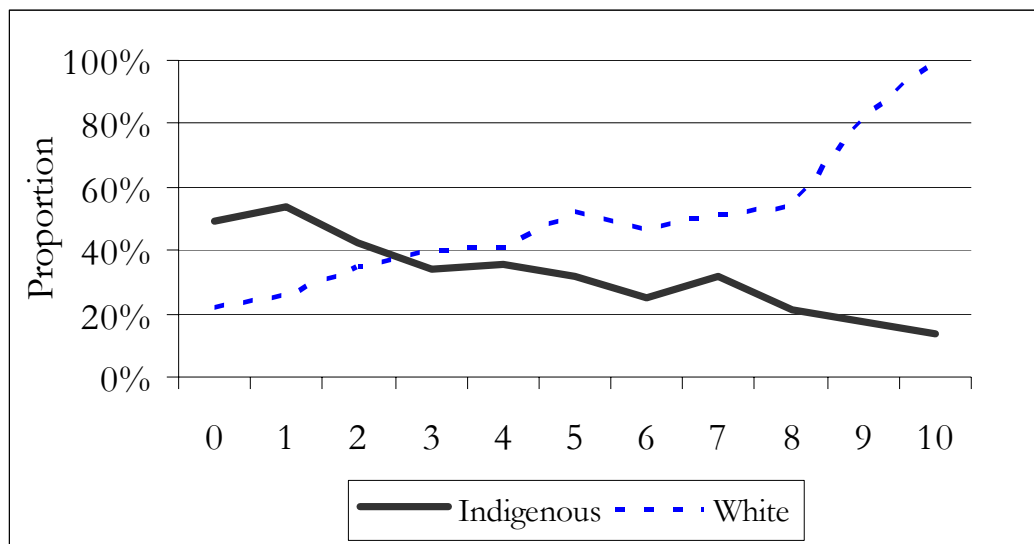
<sup>2</sup>Heckman (1998)

<sup>3</sup>This index is interpreted as the minimum percentage of individuals of one of the comparing groups that should change their occupations in order to equalize the distributions of individuals across occupations for both groups. See Fluckiger and Silber (1999) for a detailed description of the Duncan index as well as some other segregation measures.

<sup>4</sup>"Professionals and Technicians," "Managers," "Administrative Personnel," "Merchants and Salespersons," "Service Workers," "Agricultural Workers" and "Non-Agricultural Workers."

<sup>5</sup>In this case, a non-segregated work force is defined as a situation in which the distributions of males and females across occupations are the same.

Figure 1: Proportion of White Collars by Racial Intensities



Morrison, Piras and Ñopo (2001). For a selection of three Latin American countries (Costa Rica, Ecuador and Uruguay), they found a Duncan Index that lies in the range 0.32-0.42.<sup>6</sup>

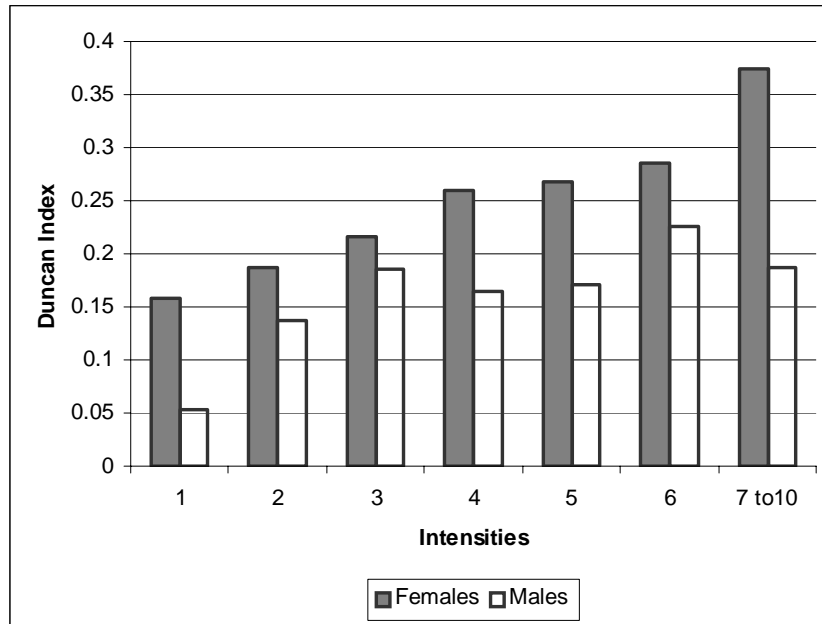
The distribution of the employed population by the blue-collar/white-collar categories shows some interesting results. Figure 1 illustrates the proportion of white-collar workers by racial intensity, from 0 to 10, for the White and Indigenous dimensions of the urban Peruvian population in 2000.<sup>7</sup> As individuals report higher intensities in the White dimension, the likelihood that they are employed in white-collar occupations rapidly increases. One out of five individuals with White intensity 0 work in white-collar occupations, while nearly 100% of individuals with White intensity 10 are employed in such occupations. The relationship is the opposite on the Indigenous dimension, the higher the intensity the lower the proportion of white-collar workers.

Analyzing the seven occupational categories with a racial perspective, will shed light on the segregation that exists in urban Peruvian labor markets. For that purpose, we compute the Duncan Indices that result from the comparison of those individuals that report intensity zero with different groups of higher intensities, separating the comparison by gender. The results of the comparison in the indigenous dimension

<sup>6</sup>This study, which covers the period of the nineties, used a classification that considered ten occupational groups. According to those figures the segregation in Peru would not be relatively high as compared to the rest of the region. However, taking into consideration that the Duncan Index depends positively on the number of occupational groups (See Fluckiger and Silber (1999)) it is safe to conclude that the segregation in Peru is comparable to the rest of the region.

<sup>7</sup>This information comes from module of ethnic and racial characteristics of the National Household Survey 2000. In accordance to Ñopo, Saavedra y Torero (2002), individuals' race is categorized by intensities in four dimensions (White, Indigineous, Black and Asian).

Figure 2: Duncan Index of Occupational Segregation by Intensities in the Indigenous Dimension (Base Group= Intensity 0)

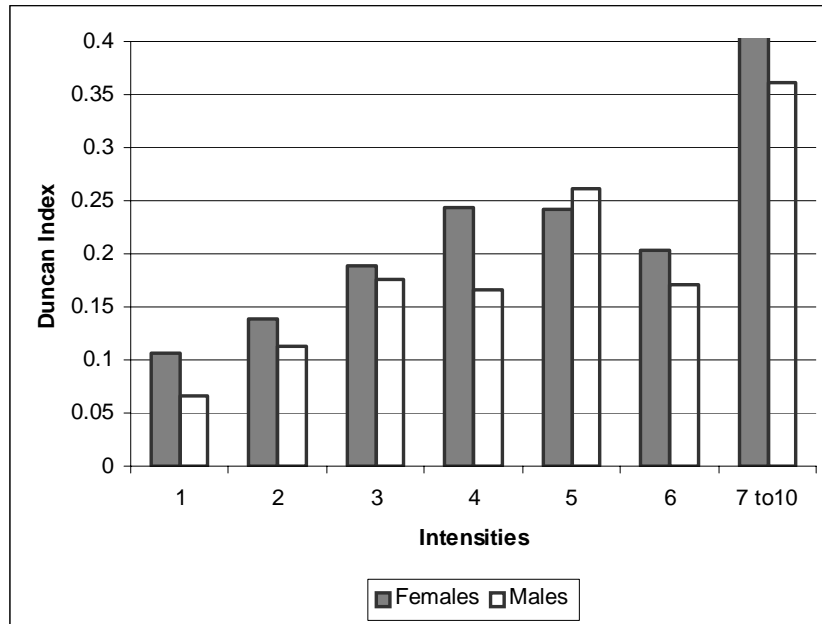


are reported in Figure ??.

Differences in individuals' racial characteristics and occupations increase simultaneously. Moreover, this result is more pronounced among the females than the males. It is necessary that at least 16% of females reporting Indigenous intensity 1 switch occupations with the group that has Indigenous intensity 0. The analogous figure for males is 6%. The equivalent White dimension analysis produces results that show that the levels of occupational segregation increase relatively more as we compared individuals that report characteristics that would make them be perceived as indisputably White. These results are reported in Figure 3.

In summary, national statistics report that Peruvian labor markets are segregated, by both gender and race. From the information we have shown thus far it is not possible to distinguish whether these results are the outcome of a series of individual decisions, self-segregation, or the result of the employers discriminatory practices, either statistically or taste-based.

Figure 3: Duncan Index of Occupational Segregation by Intensities in the White Dimension (Base Group= Intensity 0)



### 3 Methodology of the Pseudo-Audit Study

#### 3.1 Design of the study

This study is inspired by the audit studies proposed and then improved on by the researchers at the Urban Institute.<sup>8</sup> These studies try to verify the hypothesis of discriminatory behavior by a decision-maker, the interviewer, by simulating the arrival of a group of observably similar applicants, called auditors. The simulation is repeated for many decision makers, and in the event that the outcome statistically favors, or hurts, individuals with a particular set of characteristics the conclusion is that the individuals who show that particular set of characteristics are discriminated in favor, or against. Since this audit study methodology has received some criticisms,<sup>9</sup> the specific methodology for this study represents a substantial improvement in the approach of verifying such discriminatory hypotheses in the setup of hiring processes.

Generally the auditors are individuals specially hired for the purposes of the study, generally college students that view their participation as a source of income. They arrive at the job interviews with similar

<sup>8</sup>Cross et al. (1990); Turner et al. (1991).

<sup>9</sup>Heckman pointed out that the results obtained from audit studies are, in general, unclear and unconvincing. See Heckman (1993, 1998) and Heckman and Siegelman (1993) for a critical description of the results from a detail analysis of the identification assumptions behind the audit study model.

resumes that are specifically tailored for the study in a way that the auditors that apply for the same position present comparable information to decision makers. They are trained to show up to the interviews and pretend to be interested in getting a job. In addition, they are required to act as if they have the education and experience that their resumes claim. Interestingly enough, the occupations for which these studies are made, typically require minimal skills. This is done in order to keep to a minimum the possible differences in observable characteristics. Finally, the designers of the study find the job openings in newspapers.

These characteristics of the audit studies imply the following problems:

1. An auditor does not necessarily put in the same level of effort to get a job that a real job-seeker would. Also, it is not possible to assure that the auditor will experience the same pressure and anxiety that would be present in a real job interview.

2. The auditor knows the purpose of the study and, as it is documented in experimental psychology literature,<sup>10</sup> this may generate incentives, conscious or not, to bias the results towards the desired results of the researchers.

3. Descriptions of job requirements that appear in newspapers are rarely exhaustive. Therefore, the role of unobservable characteristics, which would be the characteristics that the employers look for during the interviews but the designers of the audit study do not take into account when forming the groups of auditors, can be important.

4. A college student who applies to a low-skill position will, involuntarily, show personal characteristics that eventually could make her/him be seen as an over-qualified applicant. As a consequence, the employers may decide not to hire the applicant because they may fear that she/he would not continue in the position.

For these reasons, one has to be suspicious about the results that come from the audit studies, as there are many sources of statistical noise that could invalidate the results.

We overcame some of these critiques by designing a pseudo-audit study in which, instead of hiring auditors to go to the job interviews, we selected them from a pool of applicants at the intermediation service of the Ministry of Labor and Employment Promotion job intermediation service in Lima, Peru, the CIL-PROEMPLEO network. As a result:

1. As opposed to taking the demand side of the labor market as given and simulating the supply side with auditors, we monitored both sides of the market without simulating any behavior among the agents. This is crucial for alleviating the problems related to issues 1 and 2 above.

2. Since the CIL-PROEMPLEO network has direct contact with the firms that post the job openings, they have near perfect information of the requirements attached to each job posting; the information related to the observable characteristics that firms require is more complete than the information that one could

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<sup>10</sup>See Lindzey and Aronson (1975) and Rosenthal (1976).

obtain from reading a job posting in the newspaper. By having a richer set of information about observable characteristics, the room for those that are unobservable, in the sense enunciated in point 3, is substantially smaller. Hence, PROEMPLEO can send homogeneous groups of applicants to the interviews, more than what we could expect from a traditional audit study. This alleviates the potential problems from points 3 and 4 in the previous list.

Given these considerations, the figures obtained from the data set of this pseudo-audit study would have less room for noise than those reported in the previous literature. As a result, their validity is more certain than the figures that were previously reported using traditional audit studies. This study also has the advantage that it is not based upon simulated behaviors of the individuals. We did not need to hire a pool of auditors, only a pool of monitors. The monitors were responsible for collecting information about job postings, applicants and interviewers (at each firm). Consequently, we were able to afford to do fieldwork that captured information for job openings, applicants and interviewers, in numbers that are substantially greater than those that the previous literature uses for studies of discrimination in hiring.<sup>11</sup>

### **3.2 Description of the fieldwork**

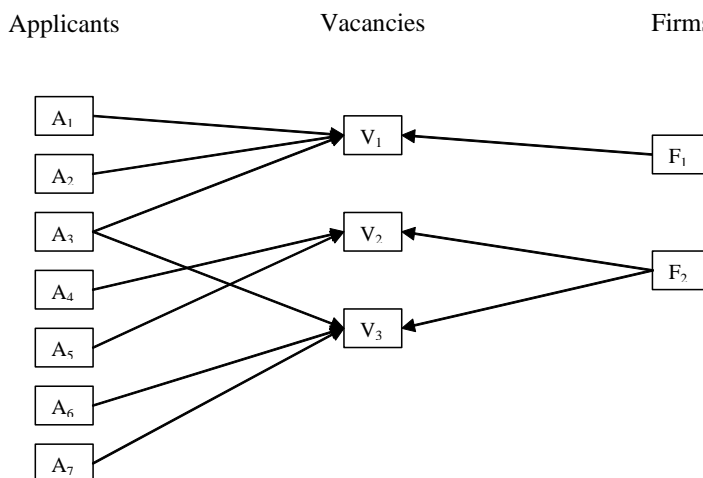
Most of the applicants' information about their occupations of interest was taken at the headquarters of PROEMPLEO through the following process. First, the intermediation specialists received the job postings from the firms while simultaneously applicants that showed up to the offices of PROEMPLEO were interviewed by the intermediation specialists. These specialists were also responsible for matching the individual characteristics of the applicants with the requirements of the job postings available at the time of the applicant's arrival. The applicants were then sent to a firm for a job interview only when they satisfied the minimum set of requirements for a posting. Furthermore, the intermediation specialists were prohibited, by law, from using age, race or gender as characteristics that define a match between applicants and postings. Even more, the application forms that the firms filled out in order to post their vacancies did not have official space for these data. However, informally, many firms asked for applicants of a determined sex and the intermediation specialists used this information.

Before the applicants were sent to the firms for their interviews, they were interviewed by our pool of monitors. During the interview they were asked about some additional labor and socio-demographic characteristics, e.g. duration of the unemployment spell and family income, a picture was taken and their racial characteristics were registered in our database. This interview also provided the basis upon which monitors assigned the applicants racial intensities. In the cases in which the applicant was sent to a job

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<sup>11</sup>The cost of each "observation", a job posting with all its applicants, in the typical audit studies is substantially higher than the cost of each observation in this pseudo-audit study. That cost reduction per observation allowed us to manage a bigger data set.

Figure 4: Relationships Among Applicants, Vacancies and Firms



interview from an office other than the headquarters, our pool of monitors visited the applicant at home. Some of the monitors were also sent to the firms in order to distribute a questionnaire to the job interviewers. Under the guise of conducting a survey about the quality of the services of PROEMPLEO, our monitors obtained information about personal characteristics of the interviewers such as schooling, tenure, and age. The emphasis of this process, however, was on observing their gender and racial characteristics.

It is also important to note that one firm may post more than one vacancy on the system, simultaneously or not. Additionally, one applicant may apply to more than one posting, as long as she/he satisfies the requirements of each posting.

According to the scheme in Figure 4, we have a hypothetical case in which firm 1 (F1) posts a vacancy (V1) and three applicants go for the job interviews (A1,A2 and A3). For a second vacancy (V2), offered by another firm (F2), there are two applicants (A4 and A5). In a more complex situation, the same firm (F2) posts another vacancy (V3) and three individuals apply (A6, A7 and A3, being the case that this last applicant also applied to other vacancy).

With all the information collected through field work, there are three possible units for analysis in this study: the applicants, the postings and the interviewers. Since our primary goal is to quantify to what extent an individual's chances of getting hired are affected by their gender and racial characteristics, after controlling for a set of observable covariants, we chose to analyze the job postings and all its applicants.

Figure 5: The Sample

**Sample Size**

	Total Sample <sup>a/</sup>	Valid Sample <sup>b/</sup>	Constrained Sample <sup>c/</sup>
Applicants	2650	1713	760
Individuals	1557	882	565
Postings	435	292	113
Firms	202	146	91

a/ Includes applicants sent to postings that were cancelled by the firm or to postings with only one applicant

b/ Includes postings for which we have information about all the applicants sent

c/ Includes postings for which we have all the information about the applicants and the interviewers

## 4 Characteristics of the Sample

With the purpose of seeking the largest possible number of observations, we selected three occupations with high levels of intermediation through PROEMPLEO: accounting and administrative assistants, secretaries and salespersons.<sup>12</sup> We interviewed 1557 applicants between September 2002 and March 2003 and they represented 2650 different applications to the 435 job postings offered by 202 different firms.

In 43% of the cases the observations were not used because the initial postings were cancelled by the firm, either due to the fact that the firm hired someone from outside of the system or because the opening was closed without any hiring. Also, for some other postings, PROEMPLEO sent only one applicant to the firm, either by request of the firm or because there were no other applicants satisfying the requirements at the moment of the posting. These observations were also left out because it is not possible to detect discrimination when an applicant has no competitors. For those reasons, the number of observations was reduced to 882 applicants, 1713 applications and 292 postings.

An additional 55 of the 202 firms surveyed were left unused because of missing observations for one or more of the applicants. Finally, combining the restrictions imposed on the data, we were left with 91 firms, 113 postings, 565 applicants and 760 applications, as seen in Figure 5.

<sup>12</sup>Initially we also considered data-entry assistants, but the number of posted job openings into the system was too small to be considered.

Figure 6: The Sample by Occupations

**Distribution of Applicants by Occupations**

	Frequency	%	Accumulated
SALESPERSONS	227	29.87	29.87
ACCOUNTING ASSISTANT/ ADMINISTRATIVE ASSISTANT	183	24.08	53.95
SECRETARY	350	46.05	100
Total Applicants	760	100	

#### 4.1 The sample of applicants

The sample of individuals for this study was composed of technicians and professionals from the middle and lower income classes of metropolitan Lima. They were relatively young and generally had more than a high-school education. The average number of years of schooling was 13.6, with a standard deviation of 1.9. Only 20% of the individuals did not study after high-school while 23% graduated from a private high-school. Their parents' education was on average less than their own. A majority of the parents only finished high-school.

Almost all the applicants had some labor experience, 87% worked during the last twelve months as a dependant and 50% were self-employed.<sup>13</sup> Among those who worked as dependants, the average monthly earnings in their last occupation exceeded the minimum wage by 50% and was close to the average monthly earnings in metropolitan Lima. The average unemployment spell of the applicants was 3.5 months. Of all the applicants, 36% reported having the required on-the-job experience for the position and those figures were substantially higher among secretaries and accounting assistants. Finally, only 17% of the applicants were hired.

Two thirds of the applicants were females. Females in the sample, on average, were one year younger than males and came from families with a higher average income, although this difference is not significant. The percentage of females with unemployment periods during the last 12 months was smaller than the analogous percentage of males.

Family and per-capita income were generally higher for those individuals who attended high-school at a private institution, had done some technical or professional studies at a university and whose parents had achieved post-high-school diplomas, either at universities or vocational institutions. The individuals who

<sup>13</sup>This overlapping reveals the presence of individuals with secondary occupations.

Figure 7: Average per-capita household income by characteristics of the applicant (in S/.)

	Per-Capita Income		
	Average	Standard Deviation	N
<i>Attended High School:</i>			
Private Institucion	348.4	201.1	173
Public Institucion	280.5	205.2	566
<i>Attended Profesional or Technical studies:</i>			
Private Institucion	317.0	204.5	242
Public Institucion	297.5	233.9	285
<i>Attended Profesional or Technical studies:</i>			
Superior Technological Institi	268.7	167.3	233
University	336.8	243.1	329
<i>Applicant's father maximum achievement:</i>			
High School	269.5	188.4	503
College and higher	353.6	229.6	236
<i>Applicant's mother maximum achievement:</i>			
High School	284.3	203.7	595
College and higher	346.1	209.1	144

attended private institutions for their technical or professional degrees had earnings that, on average, were not substantially above the earnings of those who had attended public institutions for the same degree.<sup>14</sup>

With regard to asset ownership, we found that the higher the monthly family income quintile, the higher the asset ownership in the household. There was a small dispersion of ownership of stoves and color TV's, but it was larger for the rest of the assets. The sample of applicants for our study was drawn from a specific segment of the Limenian population that had relatively homogeneous schooling, experience and age. Nonetheless, we found a high dispersion in earnings for both the applicants and their families. This dispersion had a correlation with asset ownership, as can be seen in Figure 8.

## 4.2 The sample of interviewers

The main demographic, academic and labor characteristics of the interviewers that were surveyed, made them a relatively homogeneous group. However, some differences in these characteristics were linked to

<sup>14</sup>This is related to the fact that the private institutions that this segment of the population typically attends are not of better quality than the public institutions. Graduates from the elite Limenian universities do not use the services of PROEMPLEO in their job search processes.

Figure 8: Selected assets of the applicant's household by monthly household income quintile

Assets	Total	Applicant's Family Income Quintile				
		I	II	III	IV	V
Stove	94%	85%	96%	93%	98%	99%
Color TV	88%	78%	83%	93%	96%	99%
Dryer	61%	47%	50%	63%	70%	86%
Boiler	42%	20%	32%	41%	51%	81%
Cable	34%	19%	23%	26%	49%	56%
Phone line	27%	10%	23%	24%	35%	52%
Washing machine	19%	7%	18%	13%	28%	30%
Savings	16%	10%	9%	15%	18%	32%
Car	16%	4%	8%	11%	24%	36%
Microwave oven	2%	0%	1%	2%	3%	7%

the size of the firm for which they worked. Overall, interviewers were equally split by gender. However, as the firm size increased, the prevalence of males increased as well (60% in large firms as compared to 40% in small firms). The average age showed a similar pattern. The average for the sample was 40, however the average age of males was above that of females, 42 and 35 respectively. In small firms the average age of interviewers was higher than the average age of those in medium and large firms.

Furthermore, 80% of the interviewers achieved a college degree. Among the large firms, this percentage was higher, as was the percentage of individuals with post-graduate studies. The distribution of professional degrees varied by firm size. In small firms the interviewers' area of expertise coincided with areas for which they required applicants: accounting, administration, economics or engineering. Meanwhile, in large firms, the interviewers' area of expertise was related to positions that were typically in charge of selection of personnel processes: psychologist or industrial relations professionals. Finally, males had longer tenure, 7 years, and experience, 5 years, than females, 5 and 4 years respectively.

## 5 An Analysis of Racial Differences

### 5.1 Criterion for a partition of the sample

As in Ñopo, Saavedra and Torero (2002), it is necessary to define a criterion to classify the population according its racial characteristics. The criterion has to take into account the number of observations in the total sample and the resulting numbers of observations in each of the newly defined groups. In this paper, considering that the population under study is a particular segment of the national population, we decided to use a relative cut-off criterion. The cut-off is defined using the distribution of racial characteristics of the sample. In Ñopo et al. (2002) the cut-off criterion is:

1. If an individual’s Indigenous intensity variable is greater than or equal to a cut-off “c” and her/his White intensity variable is smaller than the same cut-off “c”, she/he will be considered Indigenous.
2. Analogously, if an individual’s White intensity variable is greater than or equal to a cut-off “c” and her/his Indigenous intensity variable is smaller than the same cut-off “c”, she/he will be considered White.
3. An individual that is considered neither Indigenous nor White will be considered Mestizo.

First, we use the median of the distributions in the White and Indigenous dimensions intensities respectively as a cut-off point. In order to analyze the sensitivity of the results, we will also use the 75th percentile as a cut-off.

## 5.2 Characterization of the applicants by racial groups

In our sample, individuals categorized as Indigenous are prevalent. The distribution of racial intensities along the Indigenous dimension is concentrated around 5 and 6. On the other hand, the distribution of racial intensities along the White dimension is concentrated around 3. Figure 9 illustrates the distribution of the applicants’ racial intensities.

Due to the lack of observations for the Black and Asian dimension, we focus our study on the White and Indigenous dimension. We defined racial groups following the criterion described above for two different cutoffs: the median (the 50th percentile) and the 75th percentile. Using the median cut-off, 45% of the population can be classified as Indigenous, 10% as Mestizo and 45% as White. With the cut-off in the 75th percentile the resulting percentages are 21%, 56% and 23% respectively. With both cut-offs we found a prevalence of Indigenous applicants among the accounting and administrative assistant positions and a prevalence of White individuals among the salespersons and secretaries positions.

In Table 11 we report a set of individual and family characteristics for the three racial groups defined according to the cut-off of the medians. For most of the variables, a comparison of the applicants from different racial groups does not denote the existence of clearly defined patterns. However, we find some differences in the asset ownership of the households, the applicants’ type of education (public/private) and the parents’ schooling for different racial groups.

## 5.3 Characterization of the interviewers by racial groups

The interviewers’ racial intensities in the Indigenous dimension are focused around 6, while in the White dimension they are around 3. As with the applicants, the number of interviewers with intensities above zero in the Black and Asian dimension were low (Figure 12).

Figure 9: Racial Intensity Distributions of the Applicants

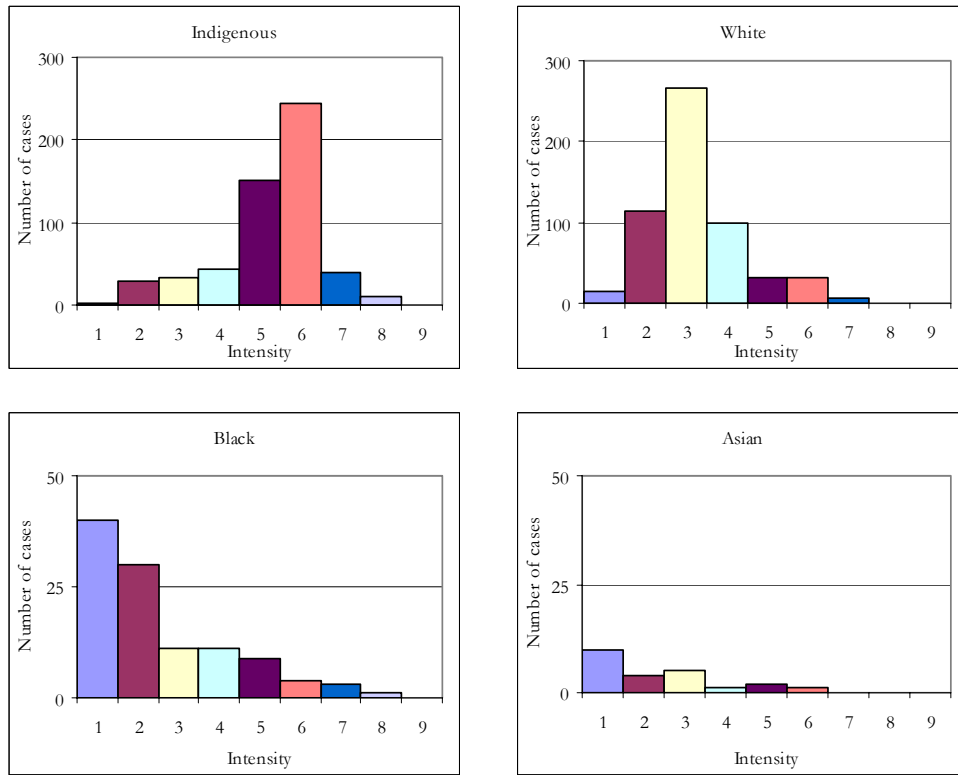


Figure 10: Number of Applications and Individuals by Definition of Race

<b>Percentile 50</b>				
	Total Applications			
	Total	Salespersons	Secretaries	Assistants
Indigenous	344	90	62	192
Mestizo	77	13	24	40
White	339	124	97	118
<b>Total</b>	<b>760</b>	<b>227</b>	<b>183</b>	<b>350</b>

<b>Percentile 75</b>				
	Total Applications			
	Total	Salespersons	Secretaries	Assistants
Indigenous	160	40	27	93
Mestizo	424	120	100	204
White	176	67	56	53
<b>Total</b>	<b>760</b>	<b>227</b>	<b>183</b>	<b>350</b>

Total Individuals				
Total	Salespersons	Secretaries	Assistants	
255	86	43	126	
45	12	15	18	
265	107	75	83	
<b>565</b>	<b>205</b>	<b>133</b>	<b>227</b>	

Total Individuals				
Total	Salespersons	Secretaries	Assistants	
105	38	17	50	
327	110	75	142	
133	57	41	35	
<b>565</b>	<b>205</b>	<b>133</b>	<b>227</b>	

Figure 11: Household and Individual Characteristics of the Applicants by Race

	Race of the Applicant (Percentile 50)			
	Total	Indigenous	Mestizo	White
<i>Demographic characteristics</i>				
Females	73%	63%	77%	82%
Age (in years)	28.13	28.26	29.23	27.75
<i>Migratory Experience</i>				
Born in Lima	77%	72%	94%	78%
Born in Lima and never migrated	70%	66%	81%	71%
<i>Socio-Economic Characteristics</i>				
Household size (persons)	5.08	5.08	5.17	5.05
Monthly household income (S/.)	1370.49	1308.57	1372.21	1432.75
Monthly household income, per-capita (S/.)	296.38	288.03	278.78	308.95
<i>Household Assets</i>				
Microwave oven	20%	19%	19%	21%
Washing machine	33%	30%	38%	35%
Dryer	4%	2%	3%	6%
Car	17%	17%	4%	19%
<i>Educational background (individual)</i>				
Years of education	13.63	13.99	13.09	13.40
<i>Attended High School in a:</i>				
Public Institution	77%	83%	71%	72%
Private Institution	23%	17%	29%	28%
<i>Pursued Superior Studies in:</i>				
Public University	19%	21%	29%	14%
Private University	16%	15%	13%	18%
Public Superior Technological Institute	14%	18%	12%	11%
Private Superior Technological Institute	26%	27%	18%	27%
Others	6%	4%	13%	5%
Without superior studies	19%	15%	16%	24%
<i>Educational background (family)</i>				
<i>Father's Educational Level</i>				
Elementary	23%	25%	26%	20%
High School	45%	49%	32%	43%
College or higher	33%	26%	42%	37%
<i>Mother's Educational Level</i>				
Elementary	33%	42%	34%	24%
High School	47%	42%	53%	50%
College or higher	20%	16%	13%	26%
<i>Labor History</i>				
Has worked once in his life	99%	100%	100%	99%
Labor Experience (in years)	3.86	3.81	4.15	3.85
Worked as a dependent during the last 12 months	87%	87%	91%	86%
Monthly Earnings in their last dependent occupation	654.13	639.20	726.31	653.52
Last employment spell (years)	12.74	12.23	10.57	13.77
Self-employed in the last 12 months	50%	56%	47%	44%
<i>Job search</i>				
Unemployment spell (months)	3.47	3.31	3.25	3.69
Months looking for a job	2.11	2.09	1.89	2.18
Applications sent to PROEMPLEO	1.88	1.87	3.16	1.60
Has prior experience at the job	36%	39%	40%	32%
Hired (%)	17%	15%	16%	19%
<hr/>				
Number of Applicants	760	344	77	339

Figure 12: Racial Intensity Distributions of the Interviewers

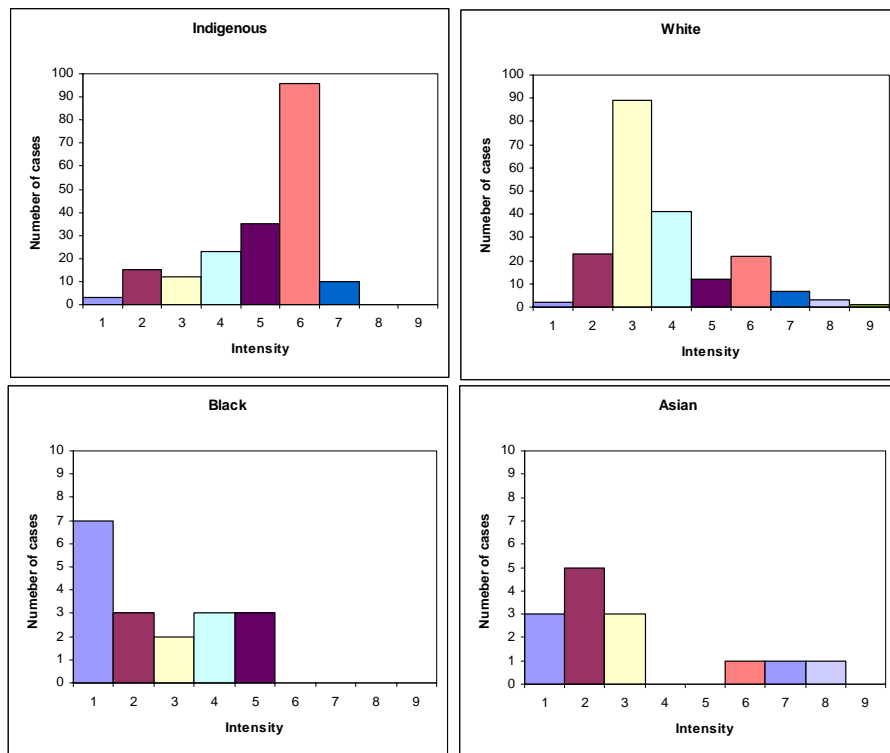


Figure 13: Number of Interviewers by Definitions of Race

<b>Percentile 50</b>				
	Total interviewers			
	Total	Salespersons	Secretaries	Assistants
Indigenous	83	22	26	31
Mestizo	26	7	5	13
White	93	32	25	33
<b>Total</b>	<b>202</b>	<b>61</b>	<b>56</b>	<b>77</b>

<b>Percentile 75</b>				
	Total interviewers			
	Total	Salespersons	Secretaries	Assistants
Indigenous	20	5	7	8
Mestizo	133	40	34	52
White	49	16	15	17
<b>Total</b>	<b>202</b>	<b>61</b>	<b>56</b>	<b>77</b>

Applying the same cut-off criterion that we used to classify the applicants, we partitioned the sample of interviewers in three groups. According to the criterion that uses the median as a cut-off, 13% of the interviewers were Mestizo, 46% White and 41% Indigenous. As seen in Figure 13.

## 6 Results of the Pseudo-Audit

### 6.1 Race, gender and aimed wages

In the hiring and job search processes, there is a complex relationship among the aimed wages, reservation wages, entry wages and gender and racial characteristics of the individuals. Aimed wages are defined as those that the individuals would like to get at their new job. Reservation wages are those that the individuals are willing to accept in order to work, while those at which the individuals start their new jobs are the entry wages.

In the Peruvian labor markets there are sorting mechanisms operating, the most prevalent of which is occupational segregation. According to a Mortensen-Pissarides type of search model, agents in this system —employers, employees and job seekers— make their decisions based on the assumption that there is, at least, some statistical discrimination in the market. Then, at the equilibrium, it would not be surprising to find differences in the distribution of wages offered and the distribution of the unemployment spells by gender and race. The individuals that belong to a discriminated group, anticipating differentiated treatment, adjust their beliefs and as a consequence go on their job search processes by choosing reservation wages that are below those of the non-discriminated group.

On the other side of the market, employers assume the same prior common beliefs, and know that

individuals from the discriminated groups are willing to accept lower wages. In such a way, an equilibrium is achieved and the beliefs of the individuals are confirmed ex-post, creating a self-fulfilling prophecy.

These theoretical predictions of the search models<sup>15</sup> are related to reservation wages but not aimed wages. Aimed wages capture the value (in monetary units) of a set of individual characteristics that are not observable by the econometrician and in many situations, not even by the employer. For this reason, aimed wages include the individuals' human capital as a component that is typically not captured by a Mincerian model.

The data obtained from this study allows us to explore, at least partially, the complex relationship that may involve wages, aimed wages and gender and racial characteristics of the individuals. We collected information about the individuals' wages in their previous jobs as well as their aimed wages for the jobs they are applying to. To analyze the relationship between these two variables, controlling for a set of individual characteristics (including gender and race) will shed some light on the processes of adjustment of beliefs and expectations of the individuals in the Peruvian labor market. For that purpose, in a simple linear model, we try to explain the logarithm of the aimed wages of the individuals from a set of individual characteristics, including gender, race and their wages in their last occupations.<sup>16</sup> Figure 14 shows the results.

The statistical relationship between the last wage and aimed wages is positive. The other controls we introduced in the regression show clear relationships with the aimed wages. First, the logarithm of the family income which has the purpose of controlling for the effects of family or social pressure that the individuals may experience in order to look for better paying jobs. Second, the schooling of the father which aims to capture "role model" effects as individuals with better educated parents would aspire for a better career. Third, the marital status of the individuals which serves as a proxy measure for the urgency that the applicants have to generate income.<sup>17</sup> Finally, we included the age of the individuals, two controls for the occupations to which the individuals were applying and the controls that are the object of our study: race and gender of the individuals.

All the proposed controls have statistically significant impacts in determining aimed wages. The role of family pressure, parent education and marital status are positive. Our estimation suggests that females adjust their aims by 7% to 8% below the average aimed wages of males. However there is no evidence of racial differences in aimed wages.

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<sup>15</sup>Mortensen and Pissarides (1994).

<sup>16</sup>With the purpose of minimizing some possible statistical noises, we restrict the analysis to those individuals with no more than 12 months unemployed who did not work as self-employed in their last job.

<sup>17</sup>We presume that an individual who is single has less pressure to find a job than somebody who is married, and for that reason, they can indulge to go to their job search processes with higher pretensions.

Figure 14: Determinants of the Aimed Wages for Different Cut-Offs of Race Intensity

	Percentile 50	Percentile 75
Ln earnings in the Last Occupation	0.143 (8.04)**	0.147 (8.25)**
Ln Family Monthly Income	0.033 (2.20)**	0.038 (2.50)**
Father's Schooling	0.032 (3.69)**	0.035 (3.99)**
Single	0.08 (2.79)**	0.074 (2.58)**
Age	0.011 (5.56)**	0.011 (5.63)**
Occupation (Salespersons)	-0.199 (9.01)**	-0.192 (8.70)**
Occupation (Secretaries)	-0.065 (3.01)**	-0.06 (2.81)**
Indigenous	-0.009 -0.49	0.043 -1.62
Mestizo	0.049 -1.71	-0.005 -0.24
Female	-0.079 (3.70)**	-0.065 (3.06)**
Constant	4.964 (32.42)**	4.89 (31.65)**

t-statistics in parenthesis.

(\*) Significant at 10%

(\*\*) Significant at 5%

## 6.2 Gender and racial differences in hiring

A comparison of the individual characteristics between the hired and non-hired applicants initially reveals a higher success rate for females than for males. The hired applicants are slightly older and belong to larger families with higher income. These results are shown in figure 15.

Out of 760 applications, 127 individuals who were sent to job interviews were hired. This is translated into a success rate of 16.71%.<sup>18</sup> Looking separately at the three occupations under consideration, we can report success rates of 14.54% for the salespersons positions, 20.22% for the secretaries and 16.29% for the assistants.<sup>19</sup> In this section, we will analyze the gender and racial differences that are present among the success rates of different sub-groups.

First, a gender approach to the success rates suggests the existence of some mechanisms in the hiring processes that may reinforce the gender occupational segregation found in the Peruvian labor market. Among the applicants for assistant positions, the success rate for males is 18% compared to the success rate for females which is 15.3%. However the result for the applicants for salesperson positions is the converse, the success rate for females is substantially above the same rate for males, 19.2% compared to 8.3%. It is interesting to note that the national percentage of female participation in assistant occupations is around 37.15% while the female participation among sales persons is around 53.35%.<sup>20</sup> In other words, the occupation for which we find a higher success rate for females in our audit study, salespersons, has a higher female participation rate on the national level.<sup>21</sup>

It is also interesting to note that these differences in success rates by gender show particular patterns after the incorporation of the interviewer's gender into the analysis. Among the salespersons, the highest success rate occurs when female interviewers evaluated female applicants, the reverse is true for the applicants for assistant positions. In this case the highest success rates are found when male interviewers evaluated male applicants, as illustrated in Table 16.<sup>22</sup>

Following the criterion of the median cut-off for a partition of the population into three racial groups, we can also report differences in success rates. While 13.3% of Indigenous applicants who applied to salesperson positions were hired, the success rate for White applicants in those occupations were 14.5%. Slightly larger differences are found in the success rates of the applicants to assistant positions. For these

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<sup>18</sup>The success rate is defined as the ratio of the applicants hired to the number of applicants.

<sup>19</sup>The standard errors for these success rates are 2.3%, 3.0% and 2.0% for salespersons, secretaries and assistants respectively.

<sup>20</sup>These figures were estimated from the National Household Survey for 2000.

<sup>21</sup>Given the nature of our audit study, which was not designed to be representative of the national statistics, we do not want to claim a direct statistical link between these two pieces of information. We present both pieces together here solely as an interesting empirical finding that, to some extent, suggests one of the possible mechanisms that operate towards the determination of an occupational segregation by gender in Peru.

<sup>22</sup>For this and the next tables reported in this section, we will report three basic statistics: the success rate (percentage of hired individuals), the standard error of such a percentage (in parenthesis) and finally the number of observations.

Figure 15: Characteristics of the Hired and Non-Hired Applicants

	Hired	
	No	Yes
Hired (%)	83	17
<i>Gender (%)</i>		
Male	88	12
Female	81	19
Age (years)	27.9	28.3
Household size (persons)	4.9	5.3
Monthly household income (S/.)	1308.7	1485.2
Rate: Hired/Number of Applications	0.9	0.9
Number of applications	1.4	1.3
<i>Attended High School (%):</i>		
Public Institution	83	17
Private Institution	84	16
<i>Pursued Superior Studies (%):</i>		
Public University	88	12
Private University	82	18
Public Technological Institute	81	19
<i>Monthly Household Income (S/.) (%)</i>		
Between 100-700	92	8
Between 701-1050	84	16
Between 1051-1400	77	23
Between 1750-+	80	20
<i>Father's Educational Level (%)</i>		
Elementary	84	16
High School	84	16
College or higher	82	18
<i>Mother's Educational Level (%)</i>		
Elementary	82	18
High School	86	14
College or higher	80	20

Figure 16: Success Rates by Occupation and Gender

		Salespersons					Secretaries					Assistants		
		Interviewer					Interviewer					Interviewer		
		Male	Female	Total			Male	Female	Total			Male	Female	Total
Applicant	Male	5.9% (4%) 34	9.5% (4%) 63	8.3% (3%) 97	Applicant	Male				Applicant	Male	20.4% (6%) 49	17.0% (5%) 59	18.5% (4%) 108
	Female	15.9% (5%) 63	22.4% (5%) 67	19.2% (3%) 130		Female	21.6% (5%) 74	19.3% (4%) 109	20.2% (3%) 183		Female	14.3% (3%) 119	16.3% (3%) 123	15.3% (2%) 242
Total		12.4% (3%) 97	16.2% (3%) 130	14.5% (2%) 227	Total		21.6% (5%) 74	19.3% (4%) 109	20.2% (3%) 183	Total		16.1% (3%) 168	16.5% (3%) 182	16.3% (2%) 350

occupations, 15.1% of Indigenous applicants were successful as compared to 18.6% of White applicants. The differences in success rates by race attain a maximum among the secretarial positions, for which there were only female applicants. While one out of six Indigenous applicants got a job, one out of four of their White competitors were hired.

The analysis of these success rates by the interviewers' racial characteristics also produces notable results, especially among the secretaries. For this occupation, the interviewer-applicant racial combination has a minimum success rate when the interviewer is Mestizo and the applicant is Indigenous, 10.0%. By comparison, when the interviewer is Mestizo and the applicant is White, the success rate is 33%, a maximum.

Combining applicant's gender and racial characteristics, reveals that among the salespersons (Table 18) the male applicants in general, and the Indigenous males in particular, have the lowest success rates, 6.4%. Among the accounting and administrative assistant applicants, White males have superior success rates while Indigenous females have the lowest rate of 14.2%.

These success rates have been computed without consideration of some observable characteristics, there is no perfect alignment of all the observable characteristics for all the applicants at each occupation. Since these differences in characteristics may have an impact on the success of the applicants, it is necessary to control for them. That will be the purpose of the next sub-section. For that reason we will use discrete models which will seek to explain the hiring outcomes in terms of individual and family characteristics of the individuals, occupations, firms and interviewers.

Figure 17: Success Rates by Race of the Applicant and the Interviewer

		Salespersons			
		Interviewer			Total
		Indigenous	Mestizo	White	
Applicant	Indigenous	16.7% (8%) 24	6.1% (4%) 33	18.2% (7%) 33	13.3% (4%) 90
	Mestizo	100.0% (0%) 1	0.0% (0%) 6	33.3% (19%) 6	23.1% (12%) 13
	White	17.4% (8%) 23	9.3% (4%) 43	17.2% (5%) 58	14.5% (3%) 124
Total		18.8% (6%) 48	7.3% (3%) 82	18.6% (4%) 97	14.5% (2%) 227

		Secretaries			
		Interviewer			Total
		Indigenous	Mestizo	White	
Applicant	Indigenous	17.9% (7%) 28	10.0% (9%) 10	16.7% (8%) 24	16.1% (5%) 62
	Mestizo	15.4% (10%) 13	0.0% (0%) 2	11.1% (10%) 9	12.5% (7%) 24
	White	19.5% (6%) 41	33.3% (10%) 21	25.7% (7%) 35	24.7% (4%) 97
Total		18.3% (4%) 82	24.2% (7%) 33	20.6% (5%) 68	20.2% (3%) 183

		Assistants			
		Interviewer			Total
		Indigenous	Mestizo	White	
Applicant	Indigenous	16.7% (4%) 90	13.3% (4%) 60	14.3% (5%) 42	15.1% (3%) 192
	Mestizo	18.8% (10%) 16	6.7% (6%) 15	22.2% (14%) 9	15.0% (6%) 40
	White	20.4% (6%) 49	20.9% (6%) 43	11.5% (6%) 26	18.6% (4%) 118
Total		18.1% (3%) 155	15.3% (3%) 118	14.3% (4%) 77	16.3% (2%) 350

Figure 18: Success Rates of Females and Males by Race

**Salespersons**

**Females**

		Interviewer			Total
		Indigenous	Mestizo	White	
Applicant	Indigenous	50.0% (18%) 8	7.7% (7%) 13	18.2% (8%) 22	20.9% (6%) 43
	Mestizo	100.0% (0%) 1	0.0% (0%) 1	25.0% (22%) 4	33.3% (19%) 6
	White	9.1% (9%) 11	15.8% (8%) 19	19.6% (6%) 51	17.3% (4%) 81
Total		30.0% (10%) 20	12.1% (6%) 33	19.5% (5%) 77	19.2% (3%) 130

**Males**

		Interviewer			Total
		Indigenous	Mestizo	White	
Applicant	Indigenous	0.0% (0%) 16	5.0% (5%) 20	18.2% (12%) 11	6.4% (4%) 47
	Mestizo		0.0% (0%) 5	50.0% (35%) 2	14.3% (13%) 7
	White	25.0% (13%) 12	4.2% (4%) 24	0.0% (0%) 7	9.3% (4%) 43
Total		10.7% (6%) 28	4.1% (3%) 49	15.0% (8%) 20	8.3% (3%) 97

**Secretaries**

		Interviewer			Total
		Indigenous	Mestizo	White	
Applicant	Indigenous	17.9% (7%) 28	10.0% (9%) 10	16.7% (8%) 24	16.1% (5%) 62
	Mestizo	15.4% (10%) 13	0.0% (0%) 2	11.1% (10%) 9	12.5% (7%) 24
	White	19.5% (6%) 41	33.3% (10%) 21	25.7% (7%) 35	24.7% (4%) 97
Total		18.3% (4%) 82	24.2% (7%) 33	20.6% (5%) 68	20.2% (3%) 183

**Assistants**

		Interviewer			Total
		Indigenous	Mestizo	White	
Applicant	Indigenous	18.2% (5%) 55	10.0% (5%) 40	11.1% (7%) 18	14.2% (3%) 113
	Mestizo	15.4% (10%) 13	9.1% (9%) 11	20.0% (18%) 5	13.8% (6%) 29
	White	20.0% (6%) 40	20.0% (6%) 40	5.0% (5%) 20	17.0% (4%) 100
Total		18.5% (4%) 108	14.3% (4%) 91	9.3% (4%) 43	15.3% (2%) 242

		Interviewer			Total
		Indigenous	Mestizo	White	
Applicant	Indigenous	14.3% (5%) 35	20.0% (9%) 20	16.7% (8%) 24	16.5% (4%) 79
	Mestizo	33.3% (27%) 3	0.0% (0%) 4	25.0% (22%) 4	18.2% (12%) 11
	White	22.2% (14%) 9	33.3% (27%) 3	33.3% (19%) 6	27.8% (11%) 18
Total		17.0% (5%) 47	18.5% (7%) 27	20.6% (7%) 34	18.5% (4%) 108

### 6.3 Controlling gender and racial differences in hiring by observable characteristics: logit estimates

The design of our pseudo-audit study requires that all applicants who are sent to the same job interview satisfy a minimum set of requirements, which are established by the posting firm and verified by PROEM-PLEO. But, we cannot assure that all the applicants that go to the same interview have exactly the same set of observable characteristics. By analyzing the data we have found that there are some small differences among applicants for the same position. If applicants for the same position differ in observable characteristics, it is necessary to explore to what extent the differences found in the success rates of gender and racial groups can be explained by other factors.

For that purpose, we estimate discrete choice models (logit) where the explained variable is whether the individual was hired or not. This hiring outcome is explained by a set of observable characteristics: sex and race of the applicant, sex and race of the interviewer, age of the applicant, schooling, marital status, a dummy indicating whether the applicant is chief of a household or not, migratory condition, unemployment spell, education of their parents, and a dummy indicating if the individual currently has a job by the time of the interview. In addition, we have two proxy measures of the ability of the applicants: the logarithm of their wages at their last job and the difference between the logarithm of the aimed wages and the logarithm of the wages in their last main occupation. The logarithm of the wages of the applicants works as a proxy variable for their human capital. It is expected that those individuals who had higher earnings in their last occupations are better trained than those who had lower earnings. The difference between the logarithm of the aimed wages and the logarithm of their wages at their last occupation captures the effect of characteristics that are observed by the individual but unobservable by the econometrician and the labor market.

These discrete models are estimated for different partitions of the sample: by occupations, firm size, interviewers' race and interviewers' sex. In order to control for the set of unobservable characteristics that are common to all the individuals that apply to the same job posting, we will include posting fixed effects. Due to the identification problem of these types of discrete models, we will report only partial derivatives of the estimated coefficients.

Tables 19, 20 and 21, show selected coefficients of the estimations: the coefficients related to the gender and race variables, as well as the coefficients associated with the earnings of the individuals in their last occupations and the difference between aimed wages and their last earnings.

For the racial classification that uses the 75th percentile, the coefficients for the Mestizo and White dummies are statistically significant in the aggregate. After disaggregating the estimations by occupations and race of the interviewer, no marginal effect is statistically significant. Only in the small firms is there

Figure 19: Marginal Effects on Hiring. Selected Coefficients (1)

By Occupation

**Percentile 50**

	Total	Salespersons	Secretaries	Assistants
Mestizo Applicant	0.002 (0.03)	0.049 (1.31)	-0.084 (0.70)	0.040 (0.57)
White Applicant	0.033 (1.10)	-0.003 (0.16)	0.009 (0.11)	0.060 (1.34)
Female Applicant	0.022 (0.61)	0.054 (1.53)		-0.034 (0.68)
Ln Last Earnings at the Main Occupation	0.170 (2.76)**	0.050 (0.87)	0.208 (1.42)	0.189 (2.09)*
Diff Ln(Aimed Wages)-Ln>Last Earnings)	0.131 (2.03)*	0.036 (0.66)	0.082 (0.50)	0.154 (1.73)

**Percentile 75**

	Total	Salespersons	Secretaries	Assistants
Mestizo Applicant	0.106 (2.60)**	0.017 (0.60)	0.186 (1.52)	0.093 (1.79)
White Applicant	0.105 (2.18)*	0.012 (0.38)	0.144 (1.11)	0.154 (2.23)*
Female Applicant	0.010 (0.28)	0.035 (1.22)		-0.047 (0.95)
Ln Last Earnings at the Main Occupation	0.180 (2.99)**	0.053 (0.90)	0.221 (1.56)	0.196 (2.18)*
Diff Ln(Aimed Wages)-Ln>Last Earnings)	0.143 (2.27)*	0.037 (0.68)	0.128 (0.80)	0.173 (1.92)

t-statistics in parenthesis.

(\*) Significant at 10%

(\*\*) Significant at 5%

Figure 20: Marginal Effects on Hiring. Selected Coefficients (2)

By Firm Size

**Percentile 50**

	Total	Small Firms	Medium Firms	Big Firms
Mestizo Applicant	0.002 (0.03)	0.006 (0.14)	-0.080 (0.69)	0.032 (0.61)
White Applicant	0.033 (1.10)	0.060 (1.92)	-0.043 (0.69)	0.028 (0.74)
Female Applicant	0.022 (0.61)	0.026 (0.60)	0.093 (1.00)	-0.021 (0.54)
Ln Last Earnings at the Main Occupation	0.170 (2.76)**	-0.025 (0.43)	0.237 (1.73)	0.114 (1.61)
Diff Ln(Aimed Wages)-Ln(Last Earnings)	0.131 (2.03)*	-0.032 (0.50)	0.187 (1.33)	0.071 (1.02)

**Percentile 75**

	Total	Small Firms	Medium Firms	Big Firms
Mestizo Applicant	0.106 (2.60)**		0.044 (0.54)	0.044 (1.02)
White Applicant	0.105 (2.18)*	0.027 (2.88)**	0.079 (0.77)	0.015 (0.28)
Female Applicant	0.010 (0.28)	0.001 (0.63)	0.045 (0.48)	-0.007 (0.17)
Ln Last Earnings at the Main Occupation	0.180 (2.99)**	0.001 (0.43)	0.247 (1.78)	0.131 (1.89)
Diff Ln(Aimed Wages)-Ln(Last Earnings)	0.143 (2.27)*	0.001 (0.43)	0.190 (1.33)	0.082 (1.19)

t-statistics in parenthesis.

(\*) Significant at 10%

(\*\*) Significant at 5%

Figure 21: Marginal Effects on Hiring. Selected Coefficients (3)

By Interviewer's Characteristics

**Percentile 50**

	Total	Indigenous Interviewer	Mestizo Interviewer	White Interviewer	Male Interviewer	Female Interviewer
Mestizo Applicant	0.002 (0.03)	-0.035 (0.43)		0.060 (0.97)	0.178 (2.30)*	-0.101 (1.53)
White Applicant	0.033 (1.10)	0.009 (0.16)	0.062 (1.17)	0.005 (0.12)	0.109 (2.19)*	-0.009 (0.23)
Female Applicant	0.022 (0.61)	0.072 (1.06)	0.053 (0.82)	0.004 (0.08)	-0.060 (0.97)	0.072 (1.50)
Ln Last Earnings at the Main Occupation	0.170 (2.76)**	0.177 (1.57)	0.192 (1.62)	0.081 (0.93)	0.158 (1.54)	0.206 (2.65)**
Diff Ln(Aimed Wages)-Ln(Last Earnings)	0.131 (2.03)*	0.122 (1.09)	0.233 (1.71)	0.017 (0.18)	0.076 (0.73)	0.198 (2.36)*

**Percentile 75**

	Total	Indigenous Interviewer	Mestizo Interviewer	White Interviewer	Male Interviewer	Female Interviewer
Mestizo Applicant	0.106 (2.60)**		0.058 (1.31)	0.020 (0.68)	0.197 (2.93)**	0.036 (0.70)
White Applicant	0.105 (2.18)*		0.069 (1.35)	0.020 (0.67)	0.121 (1.47)	0.084 (1.47)
Female Applicant	0.010 (0.28)		0.029 (0.72)	0.000 (0.08)	-0.062 (1.06)	0.056 (1.15)
Ln Last Earnings at the Main Occupation	0.180 (2.99)**		0.153 (2.10)*	0.003 (0.38)	0.140 (1.41)	0.204 (2.63)**
Diff Ln(Aimed Wages)-Ln(Last Earnings)	0.143 (2.27)*		0.125 (2.09)*	-0.001 (0.44)	0.083 (0.81)	0.202 (2.37)*

t-statistics in parenthesis.

(\*) Significant at 10%

(\*\*) Significant at 5%

some evidence that White individuals perform better. Whenever the interviewer is male, Mestizo and White individuals do better as well. Changing the cut-off from the 75th percentile to the median alters the results slightly, but the effect found on the Mestizo and White applicants facing male interviewers is robust.

Tables 22, 23 and 24, show a slightly different specification in which we interacted race and gender of the applicants. We found some evidence of significant differences in the likelihood of being hired only when the interviewer is male, in favor of male Mestizos, and among the salespersons, where evidence indicates Indigenous males perform poorly.

It is important to note the positive and statistically significant role of the earnings of the last occupation on hiring. This variable is likely to encompass the effect of some individual characteristics that are unobservable by the econometrician but observable by the interviewer.

## 7 Conclusions

In this study we explore the role that gender and race play in hiring decisions. We do so by using information of real applications and job interviews obtained from the CIL-PROEMPLEO network, the intermediation system of the Ministry of Labor and Employment Promotion. Improving on traditional audit studies, we designed a new methodology that considerably reduced the existence of statistical discrimination.

The experiment consists of analyzing the relative performance in the job seeking process of comparable individuals. We focused on studying applicants for accounting and administrative assistants, salespersons and secretaries. The racial heterogeneity of the sample allowed us to group individuals in the following categories: White, Mestizo and Indigenous. The construction of those groups depended on a cut-off criterion similar to that implemented in Ñopo, Saavedra and Torero (2002).

A comparison of the hiring rates among racial and gender groups suggests the existence of discriminatory patterns against females as well as in favor of Whites. Moreover, the results from the analysis of hiring rates by occupation are in accordance with the existing evidence of occupational segregation by gender in Peru. Among secretaries, an occupation for which there were only female applicants, the racial differences in success rates are higher than in any other occupation. Also, we found gender differences in expectations, measured by aimed wages. When we asked, "How much would you like to earn in this new position for which you are applying?" females responses were, on average, below those of males.

According to the experiments' design, the individuals sent to job interviews were expected to have comparable observable characteristics, however, some variations existed. Logit estimations that controlled for these differences in observable characteristics among the individuals, which may influence the hiring decision of the interviewers, offset some of the discriminatory evidence. The statistically significant differ-

Figure 22: Marginal Effects on Hiring. Race and Gender Interactions (1)

By Occupations

<b>Percentile 50</b>				
	Total	Salespersons	Secretaries	Assistants
Male and Indigenous Applicant	-0.023 (0.49)	-0.085 (2.35)*		0.041 (0.70)
Male and Mestizo Applicant	0.007 (0.08)	-0.012 (0.33)		0.013 (0.11)
Male and White Applicant	0.003 (0.04)	-0.052 (1.78)		0.115 (1.27)
Female and Mestizo Applicant	-0.007 (0.12)	0.022 (0.63)	-0.084 (0.70)	0.079 (0.93)
Female and White Applicant	0.035 (1.04)	-0.019 (1.03)	0.009 (0.11)	0.057 (1.11)
Ln Last Earnings at the Main Occupation	0.171 (2.78)**	0.055 (1.44)	0.208 (1.42)	0.190 (2.05)*
Diff Ln(Aimed Wages)-Ln>Last Earnings)	0.133 (2.06)*	0.040 (1.04)	0.082 (0.50)	0.147 (1.62)
<b>Percentile 75</b>				
	Total	Salespersons	Secretaries	Assistants
Male and Indigenous Applicant	-0.036 (0.48)			0.020 (0.22)
Male and Mestizo Applicant	0.093 (1.51)	-0.074 (1.40)		0.131 (1.57)
Male and White Applicant	0.075 (0.86)	-0.062 (1.27)		0.200 (1.40)
Female and Mestizo Applicant	0.092 (1.82)	-0.029 (0.87)	0.186 (1.52)	0.076 (1.09)
Female and White Applicant	0.095 (1.66)	-0.046 (1.21)	0.144 (1.11)	0.137 (1.67)
Ln Last Earnings at the Main Occupation	0.180 (2.99)**	0.075 (1.08)	0.221 (1.56)	0.195 (2.16)*
Diff Ln(Aimed Wages)-Ln>Last Earnings)	0.145 (2.29)*	0.049 (0.82)	0.128 (0.80)	0.175 (1.93)

t-statistics in parenthesis.

(\*) Significant at 10%

(\*\*) Significant at 5%

Figure 23: Marginal Effects on Hiring. Race and Gender Interactions (2)

By Firm Size

**Percentile 50**

	Total	Small Firms	Medium Firms	Big Firms
Male and Indigenous Applicant	-0.023 (0.49)	-0.055 (0.97)	-0.131 (1.29)	0.072 (1.46)
Male and Mestizo Applicant	0.007 (0.08)	-0.006 (0.10)		0.055 (0.64)
Male and White Applicant	0.003 (0.04)	0.038 (0.56)	0.081 (0.41)	0.027 (0.42)
Female and Mestizo Applicant	-0.007 (0.12)	-0.020 (0.35)	-0.078 (0.68)	0.074 (1.11)
Female and White Applicant	0.035 (1.04)	0.046 (1.38)	-0.057 (0.91)	0.071 (1.53)
Ln Last Earnings at the Main Occupation	0.171 (2.78)**	-0.021 (0.36)	0.238 (1.76)	0.120 (1.72)
Diff Ln(Aimed Wages)-Ln>Last Earnings)	0.133 (2.06)*	-0.025 (0.40)	0.190 (1.37)	0.082 (1.17)

**Percentile 75**

	Total	Small Firms	Medium Firms	Big Firms
Male and Indigenous Applicant	-0.036 (0.48)		-0.103 (0.69)	0.046 (0.59)
Male and Mestizo Applicant	0.093 (1.51)	0.162 (1.73)	-0.040 (0.28)	0.071 (1.09)
Male and White Applicant	0.075 (0.86)	0.164 (1.68)	0.384 (1.40)	-0.008 (0.09)
Female and Mestizo Applicant	0.092 (1.82)	0.168 (1.70)	0.036 (0.41)	0.060 (1.03)
Female and White Applicant	0.095 (1.66)	0.167 (1.69)	0.049 (0.45)	0.051 (0.75)
Ln Last Earnings at the Main Occupation	0.180 (2.99)**	0.005 (0.31)	0.224 (1.64)	0.136 (1.95)
Diff Ln(Aimed Wages)-Ln>Last Earnings)	0.145 (2.29)*	0.006 (0.31)	0.173 (1.24)	0.090 (1.29)

t-statistics in parenthesis.

(\*) Significant at 10%

(\*\*) Significant at 5%

Figure 24: Marginal Effects on Hiring. Race and Gender Interactions (3)

By Interviewer's Characteristics

**Percentile 50**

	Total	Indigenous Interviewer	Mestizo Interviewer	White Interviewer	Male Interviewer	Female Interviewer
Male and Indigenous Applicant	-0.023 (0.49)	-0.148 (1.79)	-0.055 (0.66)	0.033 (0.57)	0.009 (0.12)	-0.053 (0.88)
Male and Mestizo Applicant	0.007 (0.08)	-0.023 (0.12)		0.089 (0.91)	0.280 (2.29)*	
Male and White Applicant	0.003 (0.04)	0.019 (0.18)	0.009 (0.11)	-0.089 (0.91)	0.211 (1.95)	-0.088 (1.10)
Female and Mestizo Applicant	-0.007 (0.12)	-0.068 (0.79)		0.066 (0.88)	0.144 (1.53)	-0.068 (0.93)
Female and White Applicant	0.035 (1.04)	-0.034 (0.58)	0.061 (0.90)	0.035 (0.75)	0.093 (1.74)	0.002 (0.06)
Ln Last Earnings at the Main Occupation	0.171 (2.78)**	0.142 (1.27)	0.191 (1.61)	0.072 (0.85)	0.155 (1.50)	0.216 (2.68)**
Diff Ln(Aimed Wages)-Ln>Last Earnings)	0.133 (2.06)*	0.100 (0.89)	0.233 (1.71)	0.009 (0.10)	0.082 (0.78)	0.204 (2.33)*

**Percentile 75**

	Total	Indigenous Interviewer	Mestizo Interviewer	White Interviewer	Male Interviewer	Female Interviewer
Male and Indigenous Applicant	-0.036 (0.48)		-0.052 (0.66)		0.063 (0.48)	-0.109 (1.21)
Male and Mestizo Applicant	0.093 (1.51)		0.028 (0.41)		0.272 (2.68)**	-0.028 (0.35)
Male and White Applicant	0.075 (0.86)		0.023 (0.25)		0.106 (0.57)	0.002 (0.02)
Female and Mestizo Applicant	0.092 (1.82)		0.045 (0.81)	0.063 (1.73)	0.199 (2.24)*	0.017 (0.27)
Female and White Applicant	0.095 (1.66)		0.061 (0.98)	0.065 (1.76)	0.130 (1.27)	0.066 (0.97)
Ln Last Earnings at the Main Occupation	0.180 (2.99)**		0.160 (2.31)*	0.013 (1.90)	0.161 (1.60)	0.198 (2.56)*
Diff Ln(Aimed Wages)-Ln>Last Earnings)	0.145 (2.29)*		0.155 (2.12)*	0.009 (1.33)	0.099 (0.98)	0.206 (2.42)*

t-statistics in parenthesis.

(\*) Significant at 10%

(\*\*) Significant at 5%

ences in hiring rates among racial groups are not robust to different specifications of the logit model or different partitions of the population. However, the gender differences in aimed wages persisted after the controlling for individual observable characteristics. On average, females aimed for wages that are between 7% and 8% less than what a male with comparable characteristics would ask for when applying to the same position.

In this study we have controlled for differences in observable characteristics in a detailed way, not only in the formation of the groups of applicants per posting but also in the econometric models. At the specific level of the occupations analyzed in metropolitan Lima there is no evidence of discrimination. Nevertheless, at the national level, there is high occupational segregation and substantial earnings' differences by gender and race.

Indeed, the results made apparent by our pseudo-audit study are puzzling, therefore we suggest two possible explanations. First, there are large discrepancies in access to education, asset ownership, and social networks according to the individuals' race and gender. Second, there may be some pre-sorting mechanisms operating in the Peruvian society that influence individuals of the traditionally dominated groups to "choose" to not even apply to certain occupations. In addition, some individuals of the traditionally discriminated groups find it less profitable to invest in education and human capital due to their poor expectations for the future. Later, because these individuals choose not to invest, they will find themselves in a poverty trap from which it is not easy to escape. These two explanations represent important research avenues towards the future understanding of the inequalities in the Peruvian labor market.

## References

- [1] Blau, Francine and Marianne Ferber (1992). "The Economics of Women, Men and Work." 2nd Ed. Englewood Cliffs, NJ: Prentice-Hall.
- [2] Blau, Francine and Lawrence Khan (1996). "International Differences in Male Wage Inequality: Institutions versus Market Forces." *Journal of Political Economy*, 104(4), 791-837.
- [3] Blau, Francine D. and Lawrence M. Khan; (1997). "Swimming Upstream: Trends in the Gender Wage Differential in 1980s." *Journal of Labor Economics*, January, 15:1 (Part 1), 1-42.
- [4] Chay, Kenneth (1998). "The Impact of Federal Civil Rights Policy on Black Economics Progress: Evidence From The Equal Employment Opportunity Act of 1972." *Industrial and Labor Relations Review*, 51(4), July 1998, pp. 608-632.

- [5] Cross, Harry, Ganevieve Kenney, Jane Mell and Wendy Zimmerman (1990). "Employer Hiring Practices: Differential Treatment of Hispanic and Anglo Job Seekers". The Urban Institute Press, Washington D.C.
- [6] Deutsch, Ruthanne, Andrew Morrison, Claudia Piras and Hugo Ñopo (2002). "Working Within Confines: Occupational Segregation by Gender in Three Latin American Countries." *Inter-American Development Bank. Sustainable Development Department. Technical Papers Series No. 126*. Washington D.C.
- [7] Fluckiger, Y. and Silber, J. (1999). "The measurement of segregation in the labor force." Heidelberg: Physica-Verlag.
- [8] Gottschalk, Peter; (1997). "Inequality, Income growth and Mortality: The Basic Facts" *Journal of Economic Perspectives*, Spring, 11:2, 21-40.
- [9] Heckman, James and Peter Siegelman (1993). "The Urban Institute Audit Studies: Their Methods and Findings". In: *Clear and Convincing Evidence: Measure of Discrimination in America*. Michael Fix and Raymond Struyk, editors. The Urban Institute Press, Washington D.C.
- [10] Heckman, James (1998). "Detecting Discrimination". *The Journal of Economic Perspectives*, Vol 12, Issue 2 (Spring 1998), 101-116.
- [11] Lindzey, G. and E. Aronson (1975). "The Handbook of Social Psychology" 2nd. Ed. Vol 2. Addison-Wesley. Reading Mass.
- [12] Mortensen Dale and C.A. Pissarides (1994), "Job Creation and Job Destruction in the Theory of Unemployment", *Review of Economic Studies*, 61, pp. 397-415.
- [13] Ñopo, Hugo, Jaime Saavedra and Maximo Torero (2002). "Ethnicity and Earnings in Urban Peru". Unpublished. GRADE.
- [14] Rosenthal, R. (1976). "Experimenter Effects in Behavioral Research" 2nd. Ed. Irvington Publishers. New York.
- [15] Turner, Margey, Michael Fix and Raymond Struyk (1991). "Opportunities Denied, Opportunities Diminished: Racial Discrimination in Hiring". UI Report 81-9. The Urban Institute Press, Washington D.C.
- [16] Waldfogel, Jane; (1998). "Understanding the 'Family Gap' in Pay for Women with Children." *Journal of Economic Perspectives*, Winter, 13:1,137-56.

- [17] Yinger, John, 1998. "Evidence on Discrimination in Consumer Markets," *Journal of Economic Perspectives*, Vol. 12 (2) pp. 23-40.