Working Within Confines:

Occupational Segregation by Gender in Three Latin American Countries

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Foreword

Gender-based occupational segregation is one of the most important factors contributing to inequality between men and women in labor markets around the world. Despite the importance of occupational segregation as a barrier to improved equity and efficiency in labor markets, there has been relatively little research done on the topic for Latin America and the Caribbean. What makes this study particularly relevant is that Latin America has the dubious distinction of being the region with the highest level of occupational segregation in the world.

In this context, this study poses four important questions. Has occupational segregation by sex decreased in the 1990s? Can we expect occupational segregation to decline as economic development occurs? To what extent does gender segregation explain the male-female wage gap? Are gender differences in employment opportunities especially injurious to poorly educated women, or are all women equally affected? By analyzing each of these questions, this study of gender-based occupational segregation in three countries of Latin America – Costa Rica, Ecuador and Uruguay – constitutes valuable reference material for policy-makers, researchers and activists interested in the advancement of equality between men and women.

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Introduction

The concept of occupational segregation is easy to understand: occupational segregation occurs when a group—women, men, ethnic minorities, youth—is overrepresented in some occupations and underrepresented in others. Methodological debates in the literature center around the criteria for defining "overrepresentation" (relative to what norm?). The vast majority of studies on occupational segregation have examined segregation by sex, documenting the concentration of women in certain occupations such as clerical jobs, sales positions and domestic service.

Is occupational segregation of women just another form of labor market discrimination against them? In other words, is the observed concentration of women in certain occupations the result of overt discrimination that prevents their entry into male-dominated professions? Or is the process subtler, resulting from boys' and girls' distinct experiences in schools?

In this context, it is useful to distinguish between choices and opportunities made while still in school and those made after leaving school, as suggested by Borghans and Groot (1999). Boys and girls may make different educational choices that will result in future occupational segregation; some of these choices, of course, may be influenced by social norms and conventions about "appropriate" careers for women and men, as well as by market returns received by men and women in different careers. Boys and girls may also face distinct educational opportunities, due to gender biases in parental support for education and/or in teachers' behavior. Similarly, men and women may make different choices or have different opportunities once they have begun their careers.

Thus, the answer to the question of whether or not occupational segregation is caused by discrimination is nuanced: while observed occupational segregation is worsened by labor market discrimination against women, discrimination is not the only source of segregation. Voluntary choice (which could be influenced by historical patterns of discrimination) may be responsible for some degree of segregation. Similarly, differing educational backgrounds (which also may be influenced by historical discrimination, as well as pressures from teachers and peers) may preclude women from entering traditionally male-dominated occupations.

Occupational segregation has significant costs to the region's economies. These costs might include more rigidities in labor markets, reducing the market's ability to respond to change, higher male-female wage gaps, underutilization of women's labor (allocative inefficiency), and lower levels of output and lower future growth rates, as a result of lower than optimal investments in female education (Tzannatos, 1999; Anker, 1998).

In addition, as female labor force participation rates rise over time in the region, an increasing share of the labor force is affected by occupational segregation, and the efficiency losses from segregation mount (Tzannatos, 1999).

Despite the importance of occupational segregation as a barrier to improved equity and efficiency in labor markets, there has been relatively little research done on the topic for Latin America and the Caribbean. In large part, this is the result of data limitations: sample surveys have typically not used standard definitions of occupational categories over time, making it difficult to examine time trends in segregation. This technical paper fills that void by constructing comparable data sets for Costa Rica, Ecuador and Uruguay over the 1989-1997 period. These countries and years were selected because comparable measures of occupational categories were available for these countries over an extended period, and because they represent countries at very different levels of economic development.

The second section of this paper describes the data sets that were used in the analysis. The data come from both national and urban household

surveys, but our analysis is limited to households living in urban areas. This section also provides descriptive statistics for each country on women's labor force participation, occupations most heavily female and heavily male, and other essential information. The next section discusses the economic context in each of the three countries, including the structure of employment, unemployment rates, and female educational levels and fertility trends.

The fourth section introduces several measures of occupational segregation, along with a brief methodological discussion of the advantages and disadvantages of each. The values of the most commonly used of these measures—the Duncan index, also known as the Index of Dissimilarity—are presented at the two-digit occupational levels for three years between 1989 and 1997.[1] We test for statistically significant changes in the index over time. We also test for differences in the value of the index across countries. In an important contribution to the literature, the Duncan index is also calculated for different years of schooling to test the hypothesis that occupational segregation is more severe among the less educated than among the more educated.

The fifth section goes beyond a simple description of levels and changes in occupational segregation. First, we conduct a counterfactual experiment in which actual changes in the Duncan index over time are compared to the changes that would have been registered if all new hiring had been random with regard to sex (Blau and Hendricks, 1979). This experiment provides a yardstick by which to measure progress in eliminating occupational segregation. A second analysis measures the importance of occupational segregation in the overall male-female wage gap, comparing the explanatory power of occupational segregation to that of labor market discrimination and human capital explanations (Fluckinger and Silber, 1999). The final section highlights the most important empirical results and explores promising policy options to reduce occupational segregation.

[1] Estimates of other, less commonly used measures are presented in the Data Appendix. The Methodological Appendix provides the derivation of the mathematical formulas used for the calculation of each measure.

The Data

Data for this study are from the household surveys conducted by the governmental statistics agencies of Costa Rica, Ecuador and Uruguay.[2] We use three annual surveys for each country. For Costa Rica and Ecuador we examine data for 1989, 1993 and 1997. For Uruguay we use the same years, except we substitute 1992 for 1993, due to data availability.

Ecuador and Uruguay surveys are urban. Since Costa Rica's survey has a national coverage, we restrict the sample to urban areas to make it comparable to the other two countries. In all cases, analysis is restricted to a sub-sample of occupied workers. The unweighted sample size is presented in Table 1. For computation of the wage gaps, only those workers reporting a positive income are included, reducing the sample size by 5 to 10 percent.

Tables 2 (Structure of the Employed Female Labor Force by Occupational Category)[3] and 3 (Females as a Percent of the Employed Labor Force by Occupational Category), present the evolution of employed female labor force from 1989 to 1997 by occupational category. During the period under study, the total employed female labor force increased very little in Ecuador and Uruguay, while it slightly diminished in Costa Rica. In the three countries studied the majority of women are employees, one sixth to one third are self-employed and less than 10 percent are nonpaid workers. Costa Rica and Uruguay are very similar, with almost the same distribution in 1997 and three fourth of its workingwomen categorized as employees. In Ecuador, self-employment is more prevalent than in the other two countries, accounting for one third of women in the labor force.

Although nonpaid workers is not a major occupational category, Table 3 shows that in every country and across time women represent more than 50 percent of nonpaid workers. As employees, women have increased their participation over time in Ecuador and Uruguay and slightly reduced their share in Costa Rica.

During the last decade women's share among self-employed has barely increased in Costa Rica and dropped almost three percentage points in Ecuador and Uruguay.

Table 4 presents the five most male-dominated and female-dominated occupations in 1997 in the three countries studied.[4] The occupations were selected by choosing for each of the three countries the ten occupations where the female participation was highest and lowest respectively. From that subset we chose the five occupations that were common in all three countries.

As Table 4 shows, women are concentrated in the medical profession, teaching, secretarial work, textiles, and restaurant and housekeeping services.

Table 5 presents the hourly wage gaps for the three countries studied in 1989, 1992 and 1997. It is quite clear that the gender wage gap, measured as the relative hourly wage of women to men, is closing over time, at least for Costa Rica and Uruguay, where we have time series data. Another interesting finding is that, for the most recent year, female occupations are getting paid as much as male occupations, on an hourly basis.

[2] Costa Rica's household survey is called Encuesta de Hogares de Propósitos Múltiples and is carried out by the Instituto Nacional de Estadística y Censos (INEC). Ecuador's survey is known as Encuesta Periódica sobre Empleo y Desempleo, carried out by the Instituto Nacional de Estadística y Censos (INEC). Uruguay's household survey is called Encuesta Continua de Hogares and the executing agency is the Instituto Nacional de Estadística (INE).

[3] Female owners are included among the "self-employed" since not all the surveys have "owners" as a separate occupational category.

[4] Occupations are classified according to an occupational code known as COTA.

Table 1
Sample Size of Surveys

Country	Year	Male	Female	Total
Costa Rica	1989	3,815	2,262	6,077
	1993	3,701	1,989	5,690
	1997	4,006	2,276	6,282
Ecuador	1989	11,072	6,114	17,186
	1993	5,276	3,117	8,393
	1997	8,998	5,437	14,435
Uruguay	1989	7,733	5,191	12,924
	1992	7,277	5,168	12,445
	1997	15,151	10,790	25,941

Table 2
Structure of the Employed Female Labor Force by Occupational Category
(%)

Occupational Category	Costa Rica			Ecuador			Uruguay		
	1989	1993	1997	1989	1993	1997	1989	1992	1997
Self-employed	16.7	20.4	21.2	34.9		33.5	21.6	21.3	20.5
Employees	80.6	76.8	76.1	60.1		56.8	74.4	74.5	76.0
Non paid workers	2.7	2.8	2.6	5.0		9.7	4.0	4.1	3.4
Total	100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0

Table 3
Females as a Percent of the Employed Labor Force by Occupational Category
(%)

Occupational Category	Costa Rica			Ecuador			Uruguay		
	1989	1993	1997	1989	1993	1997	1989	1992	1997
Self-employed	28.9	29.8	30.3	37.5		34.7	37.7	35.5	33.3
Employees	39.0	36.0	37.8	33.7		36.5	41.6	42.5	43.7
Non paid workers	50.0	62.2	60.0	60.1		72.8	74.6	74.5	70.2
Total	37.2	35.0	36.2	35.6		37.7	40.2	41.5	41.6

Table 4
The Five Most Male -Dominated and Female -Dominated Occupations in Costa Rica, Ecuador and Uruguay, 1997

Female-Dominated Occupation Code at 2 Digits	Description
3	Medical, dental and related workers
6	Teachers
22	Secretaries
60	Textile workers
91	Cooks, waiters, bartenders, maids and related housekeeping workers
Male-Dominated Occupation Code at 2 Digits	**Description**
24	Employees in the control of transportation and communications
42	Agricultural workers
50	Drivers
67	Electric and electronic workers
68	Mechanics

Table 5
Hourly Wage Ratios
(%)

	Costa Rica			Ecuador	Uruguay		
	1989	1993	1997	1997	1989	1992	1997
Female/Male Hourly Wage Ratio	85	84	94	83	75	85	90
Female Occup./Male Occup. H. W. Ratio	88	80	99	94	79	96	101

Economic Context

In this section we briefly describe the economic conditions of Costa Rica, Ecuador and Uruguay during the period under study to better understand the context of the labor market in which the occupational segregation is taking place. We would expect to see a lower level of occupational segregation and a decreasing trend in a growing economy where female labor force participation is increasing and there are more opportunities for hiring. Rising income levels are usually associated with improved female education levels and reduced birth rates, as well as a decline in traditional family-based roles for women. On those grounds, our main focus in this section is to look at the macro conditions in general, levels of unemployment, structure of employment, an assessment of poverty changes and education and fertility trends.

Costa Rica

GDP per capita in Costa Rica increased slightly during the period, from US$1,906 in 1989 to US$2,081 in 1997. The adjustment process that Costa Rica went through beginning in the second half of the eighties can be characterized as more gradual than most other countries in Latin America and the Caribbean. In accordance with the development model followed during the last 50 years, Costa Rica opted to implement reforms at a slower pace. This strategy seems to have produced a more modest growth rate than in other countries in the region, but with lower social costs in terms of levels of unemployment and drastic drops in real salaries. During the nineties, GDP per capita growth was slow and declined in 1995 and 1996. Nevertheless, unemployment in urban areas continued to be low compared with the regional average, fluctuating between 4 and 6.6 percent. Unemployment of women was well above the rates for men, as is the case in most of the countries of the region. Women's employment by sector shifted towards services, increasing by 7 percent at the expense of the tradable sector.

Although there have been temporary fluctuations over the 1987 - 1996 period, there is a clear tendency towards a reduction in poverty levels. The percentage of households living in poverty in urban areas decreased from 22 percent in 1990 to 17 percent in 1997, while those in extreme poverty fell from 7 to 5 percent over the same period.

The educational attainment of women shows a continuous increase over the period, going from an average of 9.35 years of schooling for women between 15 and 64 years old in 1989, to 9.94 years in 1993, and 10.03 years in 1997. During the same period, the number of children per household dropped from 2.39 to 2.01.

Ecuador

Between 1990 and 1997, the economy of Ecuador fared worse than the overall regional average. GDP per capita in 1989 was US$1,254, rising to US$1,392 in 1997. The rate of growth of per capita GDP has been modest, fluctuating between –1.2 and 1.8 percent. Unemployment in urban areas is very similar to the regional levels, with an upward trend going from 6.1 percent in 1990 to 9.3 percent in 1997. When disaggregated by gender, urban unemployment is almost twice as high for women than for men. There was also an increase in the wage gap between the modern and informal sector. From 1990 to 1998, the percentage of women in the service sector increased by 3.2 percent.

Given the high levels of poverty it is encouraging to see that even with meager growth rates the percentage of households in poverty in urban areas dropped by 6 points, from 56 to 50 percent over the 1990-1997 period, and that 4 percent of households were able to get out of extreme poverty.

Levels of education for women have consistently increased from 10.57 years of schooling in 1989 for women 15 to 64 years old to 11.22 in 1997.

Uruguay

Of the three countries studied, Uruguay is clearly the best economic performer during the period in question. GDP per capita at the beginning of the period was US$2,692 and climbed to US$3,437 in 1997. With the exception of 1995 (when it fell by 2.7 percent), per capita GDP growth has been well above the regional average, fluctuating between 0.3 and 4.7 percent. However, urban unemployment is slightly higher than the regional average, with an upward trend during the second half of the nineties. Mirroring experiences in the other two countries, female unemployment is 4 to 5 percentage points higher than male unemployment during the period. In terms of sectoral allocation, women increased their employment in the service sector by 7.1 percent from 1990 to 1998, reducing their participation in the manufacturing and construction sectors.

Although poverty levels are fairly low compared with the rest of the region, over the 1990-1997 period there is still a clear tendency towards a significant reduction in poverty levels. The percentage of urban households living in poverty decreased from 12 percent in 1990 to 6 percent in 1997, while the ratio of those living in extreme poverty went from 2 to 1 percent.

Women's education has risen from 8.6 mean years of schooling for women 15 to 64 years old in 1989 to 10.38 years in 1997. During the same period, the number of children per household dropped from 1.96 to 1.82 among women aged 30 to 45 years.

Thus, there are several important differences in the economic context for the three countries in our sample. These include differences in GDP trends, as well as divergent relationships between growth and unemployment (and strikingly different starting places in terms of levels of GDP and poverty). However, there are also important similarities across all three countries; namely, there was a shift in female employment to the service sector, poverty rates decreased unemployment rates were higher for women than for men, female education levels increased and average family size fell.

Measures of Occupational Segregation

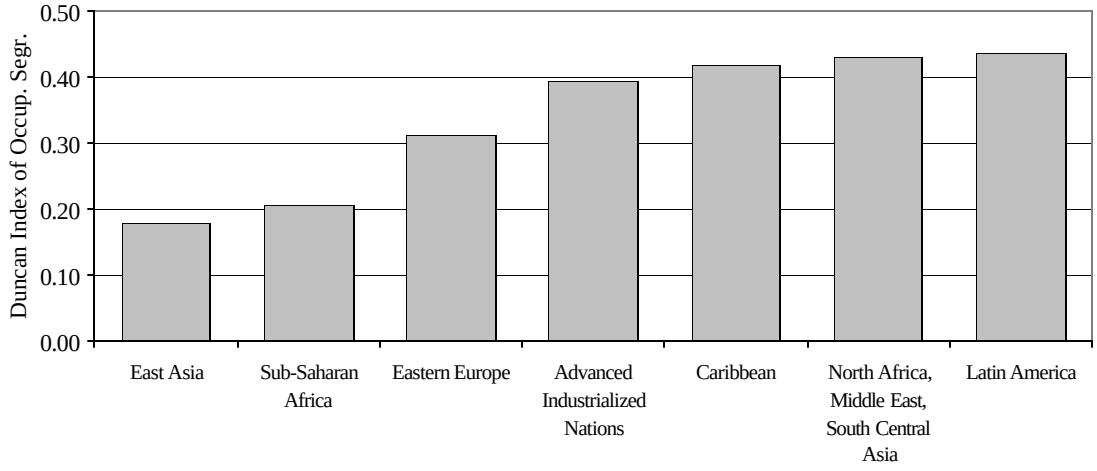
Literature Review

Although occupational segregation by gender is an area that has been thoroughly studied, particularly its impact on male-female pay differentials, this paper makes several methodological and empirical contributions to the current literature.

Table 6 is a modified version of a table presented by Anker (1998). It summarizes previous empirical work (selected by virtue of including at least one case from the region) that looked at occupational segregation by gender. The table presents the authors, data sources used, years surveyed, geographic coverage, occupational segregation measures and statistics used, as well as each study's major findings. It is apparent from the table that the vast majority of the previous research on this topic for Latin America and the Caribbean (all except the Costa Rica 1991 case studied by Anker) relies on data from the ILO Yearbook of Labor Statistics, which imposes significant constraints in terms of the level of desegregations of occupational data (it is only available at one-digit).

Most cross-country studies conclude that occupational segregation is very extensive worldwide, both in industrialized and developing countries. This finding is quite important, since it shows that this phenomenon cuts across national boundaries, religious beliefs, social norms, traditions and development levels. Another common finding among those studies that include several Latin American and Caribbean countries are that occupational segregation by gender is greatest in the region. Both Boulding (1976) and Psacharopoulos and Tzannatos (1992) report an approximate value for the Duncan index of 0.49. Based on 1980 data, Blau and Ferber (1992) data found the Duncan index to be 0.435 in Latin America and 0.417 in the Caribbean. Figure 1 shows comparative levels of occupational segregation by region.[5]

Figure 1
Occupational Segregation by World Region



[5] The value of the Duncan index will in general be lower the more aggregated the data. Therefore, in order to compare the values of the Duncan index in his paper with previous calculations we report the one-digit values in footnote 10.

Table 6
Cross-national Studies of Occupational Segregation by Gender

Author	Data source	Data years	Total and LAC countries covered	Detail in occup. data	Inequality measures	Findings
Anker (1998)	Censuses and labor force surveys	1970s, 1980s, 1990s.	41 countries (1 LAC)	2 - 3 digits	Representation ratios, inequality indices, % workers in male-dominated and female-dominated occup.	Male-dom. occupations are more common than female-dom. occupations. Levels of occup. segregation by gender differ greatly across regions and is not related to socio-economic development. Women tend to work in a small set of occupations, which coincide with typical female stereotypes.
Anker and Hein (1985,1986)	ILO Yearbook, national surveys and censuses	1960s, 1970s, 1980s.	52 developing countries (21 LAC)	1 digit	Duncan Index, Representation ratio, % labor force in gender-dom. occupations	Women overrepresented in professional/technical and services. Women underrepresented in administrative/managerial and production. Many male-dom. occup. but few female-dom occup. Largest fem-dom. occup. are highly gender stereotyped.
Blau and Ferber (1992)	ILO Yearbook	1988-1990	94 countries (15 LA and 18 in the Caribbean)	1 digit	Duncan Index	Duncan Index highest in LA (0.44) and Middle East.
Boserup (1970)	ILO Yearbook, UN Demographic Yearbook, national data	1960s.	34 developing countries (13 LAC)	1 digit	% female by employment status	
Boulding (1976)	ILO Yearbook, UN Demographic Yearbook.	1950-1971	86 countries (24 LAC)	1 digit	Duncan Index, Representation ratio.	Duncan Index highest in LA (approx. 0.49) and lowest in Africa and Asia (approx. 0.30). Duncan Index similar in Europe and North America/MDuncan Indexdle East (approx. 0.38).
Jacobs and Lim (1992)	ILO Yearbook	1960 to 1980.	39 countries (10 LAC)	1 digit	Duncan Index, size-stand. Duncan Index.	Duncan Index declined in 7 of 10 LAC countries. Size-stand. Duncan Index is consistently decreasing around the world.
Psacharopoulos and Tzannatos (1992)	ILO Yearbook	1950s/1960s to 1970s/1980s.	20 countries (15 LAC)	1 digit	Duncan Index, representation ratio.	Duncan Index higher among employees than among self-employed or unpaid family workers. Duncan Index at 0.49 on average. Duncan Index decreased in 7 countries and increased in 6. Duncan Index decreased due more to changes in occup. structure than to changes in sex composition of occup.
World Bank (1994)	ILO Yearbook	1950s/1960s to 1970s/1980s.	45 countries (11 Americas)	1 digit	Duncan Index	No consistent change over time. Duncan Index highest in North Africa (aprox. 0.55) and lowest in West Africa (aprox. 0.20).

Source: Anker (1998) and authors' additions.

In terms of the degree of change over time, Jacobs and Lim (1992) found that the Duncan index declined in 7 of 10 Latin American and Caribbean countries from 1960 to 1980. To the contrary, Psacharopoulos and Tzannatos (1992) found mixed results; they found that occupational segregation by gender had decreased in seven countries of the region and increased in six others.

In several ways, this paper goes beyond previous empirical studies of occupational segregation by gender. First, it is based on unusually detailed data. For most of the analysis we use a two-digit classification of occupations, which amounts to 83 occupations. As Table 6 shows, prior work on Latin America and the Caribbean relies on crude occupational data at the one-digit level, which yields only 7 occupations. Aggregated one-digit data can be misleading when used to research cross-national differences and trends over time.[6]

Second, we calculate the Duncan index for different years of schooling to test the hypothesis that occupational segregation is more severe among the less educated than among the more educated. By looking at educational levels we find a very different story than the aggregate levels of occupational segregation for the total sample of employed urban workers.

Third, we conduct the random hiring exercise developed by Blau and Hendricks (1979), which has not been previously applied to Latin America. This simulation, which tests for the differences in actual changes observed in occupational segregation to those that would have resulted from "sex-blind" hiring, allows us to make important policy recommendations for the region.

Fourth, we go beyond the simple calculation of the estimates of occupational segregation indexes and compute confidence intervals based on a bootstrapping technique.[7]

Fifth and last, we explore to what extent occupational segregation is responsible for the male-female wage gaps in the countries studied. For that purpose we decompose the wage gap into three components: human capital differences, wage discrimination and occupational segregation. We also present the more traditional Oaxaca decomposition of the gender wage gap for comparison.

A Note on Measuring Occupational Segregation

Measures of occupational segregation are typically based on constructed indices that determine the extent of differences in the distributions of male and female workers across occupational categories in the economy. In constructing such measures, there are choices to be made in the type of index, as well as in the degree of detail used to define occupational categories. For any segregation index, if the distribution of males and females across the selected occupational categories is the same, then the index will have a minimum value (which typically is zero). On the other hand, if males and females are completely segregated (i.e. there are no occupational categories shared by both men and women) then the index will reach its maximum value (which usually is one).

The literature proposes many alternative indices to compute occupational segregation. As detailed in the methodological appendix, the indices we used can be classified into two distinct types: the "absolute differences" type and the "labeling of occupations" type.[8]

As noted by Anker (1998), all indices have the advantage of simplicity, condensing into one number all variation in the distribution of jobs between men and women. At the same time, this simplicity is also a disadvantage, potentially masking important underlying variations and limiting possibilities for discussion of many practical and policy-related aspects. The Duncan index, or index of dissimilarity, is by far the most commonly used measure of occupational segregation in the literature. The Duncan index

[6] For a thorough discussion of this problem see Anker (1998), chapter 6.

[7] A more detailed explanation of the technique is presented in the Methodological Appendix.

[8] Note that there are other types of indices, such as entropy measures, but we did not work with them.

falls into the category of absolute difference indices. Generally speaking, absolute difference indices attempt to measure the distance between the distributions of men and women across occupations, as measured by differences in the relative participation of men and women in each occupational category.

The most frequently noted weakness of the Duncan index is the fact that changes over time in estimated values can result from both changes in the occupational structure of the labor force, and changes in the sex composition of occupations. Therefore, additional decomposition analyses are required to understand the causes of changes in the Duncan index.

Other indices have been developed, in large part to overcome this weakness in the Duncan index. Measures such as the Marginal Matching index (described in detail in the methodological appendix), fall into the second category of "labeling occupation types" indices, and are not affected by shifts in the occupational structure over time. However, such indices have been found to present unrealistically low levels of occupational segregation in countries with very low rates of female labor force participation.

Our results presented below are for the Duncan index, calculated for two-digit occupational categories. While we recognize the limitations of this measure, for our purposes, it is the most tractable as well as easily comparable to other results available for the region. A complete discussion of the derivation of the Duncan index, as well as that of other common segregation indices, is provided in the methodological appendix. We also present estimates of other segregation measures in the data appendix.

Presentation of Measures of Occupational Segregation by Gender

Aggregate Measures

Table 7 presents our estimates, reported at the two-digit level,[9] of the Duncan indices for Costa Rica, Ecuador, and Uruguay for the three surveyed years.

While a comparison of the point estimates suggests a slight decline in measures of occupational segregation over time, the results are actually striking in their uniformity across countries and across time. Using a bootstrap methodology, we estimated a series of point estimates for the Duncan index and based on that series we obtained bootstrap estimators for the variance. With these results, we were able to construct confidence intervals for each estimate, and statistically compare results across time periods.[10]

Table 7
Two-Digit Duncan Indices

Year	Costa Rica	Ecuador	Uruguay
1989	0.57	0.58	0.56
1993[a]	0.56	0.54	0.57
1997	0.54	0.54	0.55

[a] 1992 for Uruguay

[9] For the purpose of comparison, we also calculated Duncan indices using the broader single-digit classification occupational categories with the following results for 1989, 1992/3, and 1997 respectively Costa Rica (0.32, 0.35, and 0.37); Ecuador (0.38, 0.38, and 0.38); and Uruguay (0.37, 0.39, and 0.42). These are lower than results reported by Psacharopoulos and Tzannatos (1992) who, using the ILO Yearbook ID-7 occupational categories found Duncan Indices of 0.498 (Costa Rica 1984), 0.465 (Ecuador 1982) and 0.433 (Uruguay 1985). However, our two-digit estimates are similar to results found by Anker (1998) who for Costa Rica, 1991, using the ILO ID-75 non-agricultural two-digit classification found a Duncan Index for Costa Rica of 0.598 in 1991. Estimates using three-digit classification of occupational categories are available from the authors upon request.

[10] The details of the bootstrapping methodology, as well as the derivation of the means test used to test differences, are described in the methodological appendix.

Table 8 presents the 95 percent confidence intervals for the Duncan estimates:

Table 8
Confidence Intervals for Duncan Indices

Country/Year	Lower Bound	Upper Bound
Costa Rica		
1989	0.5388	0.6013
1993	0.5254	0.5947
1997	0.5081	0.5720
Ecuador		
1989	0.5459	0.6141
1993	0.5086	0.5714
1997	0.5072	0.5728
Uruguay		
1989	0.5153	0.6047
1992	0.5348	0.6053
1997	0.5176	0.5825

A similar analysis was done to test for differences across countries (results presented in the data appendix). Despite the differences in levels of economic development, there were no significant differences observed in occupational segregation across the three countries in our sample. In sum, our measures of occupational segregation prove to be doggedly entrenched, across time, and across countries in the sample. At least for the countries, and the time period studied, it appears that differences in both the starting levels of economic development and macroeconomic performance do not result in differences in observed levels of occupational segregation by gender.[11]

We find no significant changes in the levels of occupational segregation (as measured by the Duncan index) over time, as can be seen from the data presented in Table 9. Despite the many economic changes faced by each of the three countries sampled during the period 1989–1997, there was no change in the degree to which women remained segregated within occupational categories.

Table 9
Tests of Differences Across Time for Two-Digit Duncan Indices

Country/Year	t – statistics	
Costa Rica		
89-93	-0.0802	Not significant
93-97	-0.7059	Not significant
89-97	-0.8287	Not significant
Ecuador		
89-93	-1.1921	Not significant
93-97	0.0597	Not significant
89-97	-1.1099	Not significant
Uruguay		
89-93	-0.2571	Not significant
93-97	-0.5527	Not significant
89-97	-0.7447	Not significant

Also of note is that our results, which are based on the use of an innovative bootstrapping methodology to compute confidence intervals and test for differences, point strongly towards the need for such careful comparative analyses of measures of occupational segregation when working with household survey data. It is not sufficient to make statements based upon a comparison of point estimates because the conclusions are likely to be misleading.

[11] Anker (1998) carries out OLS multiple regression analysis to look at the socioeconomic, labor market, and regional determinants of occupational segregation by gender. He finds that differences in the ID-75 are not significantly related to socioeconomic variables. Furthermore, Anker concludes that regional variables –which account for over one-half of the variation in the ID-75—imply that cultural, social, legal, and historical factors are probably the most important determinants of occupational segregation by gender worldwide.

Measures of Occupational Segregation by Educational Levels

While aggregate measures of occupational segregation by gender for the entire sample appear to show little variance, such aggregate measures mask important differences. Table 10 shows Duncan indices according to different educational levels, in each country and in each sample year. In all but two of the nine cases observed, occupational segregation is significantly higher for the lowest income quintile than for the most wealthy. An analysis by educational levels disolves the seeming homogeneity of our measures of occupational segregation. The divide in degree of occupational segregation between more and less educated women, in other words, is greater than it is for women overall across time, or across countries. In sum, less educated women are significantly less likely to be mobile across occupational categories than are women in the higher educational levels. It seems that gender differences in employment opportunities are exacerbated by educational levels.[12]

Table 10
Duncan Indices According to Educational Levels

Year/Quintile	Costa Rica	Ecuador	Uruguay
1989			
Primary School	0.6890	0.7347	0.6354
Secondary School	0.5362	0.6261	0.5313
Tertiary School	0.4877	0.3917	0.4964
1993[a]			
Primary School	0.6470	0.6655	0.7067
Secondary School	0.5358	0.6343	0.5338
Tertiary School	0.5029	0.3935	0.4867
1997			
Primary School	0.6599	0.7147	0.7007
Secondary School	0.5205	0.6228	0.5515
Tertiary School	0.4415	0.3745	0.4369

[a]1992 for Uruguay

[12] We also estimated Duncan indices for occupational segregation by gender across categories of employment (self-employed, employed, and unremunerated family workers) and by family income quintile. Consistent with other findings in the literature (Tzannatos and Psacharopolus, 1992), our findings indicated that occupational segregation by gender is less prevalent among unpaid family workers (for eight of the nine cases, all except Costa Rica 1989). However, there were no conclusive findings on differences in degrees of occupational segregation between employed and self-employed workers. In all but two of the nine cases observed, occupational segregation is significantly higher for the lowest income quintile than for the most wealthy.

Analysis of Results

A Random Hiring Experiment

Using the bootstrap estimations of the confidence intervals for the Duncan indices for the three countries, we concluded that the observed changes over the 1989-1997 period were not statistically significant. Using a decomposition pioneered by Blau and Hendricks (1979), we now analyze how this lack of change compares to the reduction that might have been achieved had all new job openings been allocated randomly between men and women, in proportion to the sex ratio of job seekers.

Changes in the sex composition of occupations can arise from two sources. First, replacement of workers leaving the labor force within an occupation may change the sex ratio if the sex ratio of the replacement workers differs from that which originally characterized the occupation. Second, changes in the share of total employment accounted for by different occupations can change the sex ratio, since different occupations have distinct sex ratios.

Following Blau and Hendricks, we assume that replacement hiring is neutral, i.e., that men replace and women replace women. This assumption is driven by data limitations, since we have no firm-level panel data that allows us to determine what type of replacement actually occurred.

Thus, we focus in the change in the Duncan index that would have occurred if all new job vacancies were filled in the same sex ratio prevalent in the hiring pool, where the hiring pool is composed of net labor force entrants[13] and individuals released from declining occupations. To the degree to which this predicted change in the Duncan index ignores opportunities for more egalitarian sex ratios via the replacement effect, it may underestimate potential changes. On the other hand, to the degree that it does not include human capital and other barriers to entry in occupations, it may overestimate potential changes in the Duncan index (Blau and Hendricks, 1979: 207). The net effect of these biases is impossible to ascertain.

Table 11 reports the actual and predicted changes in the Duncan index for the 1989-1997 period for the three countries in our study. The actual change in the Duncan index represents at most 30 percent of the change that would have been predicted had all job vacancies been filled in the same sex proportions as that characterizing the hiring pool, in the case of Costa Rica. For Uruguay and Ecuador, the percentage of the predicted change that actually occurred was even lower, at 14 percent and 20 percent, respectively. Thus, in none of the three countries did the Duncan index change to the degree that would be predicted by a random hiring counterfactual.

Table 11
Actual and Predicted Changes in the Duncan Index, 1989-1997

Country	Actual Change in Duncan Index (%)	Predicted Change in Duncan Index (%) with Random Hiring	Percentage of Predicted Change Realized (%)
Costa Rica	-2.49	-8.37	29.81
Ecuador	-3.30	-16.46	20.07
Uruguay	-0.86	-6.01	14.27

[13] Net labor force entrants is the difference between the number of labor force entrants and the number of workers leaving the labor force.

It is interesting to note that all the predicted changes in the Duncan index with random hiring lie outside a 95 percent confidence interval for no change in the Duncan indices in the three countries. In the case of Costa Rica, the maximum change without leaving this 95 percent confidence interval would have been –3.6 percent; if random hiring had occurred, the change in the Duncan index would have been –8.4 percent. For Ecuador, the corresponding numbers were –4.8 percent and –16.5 percent, and for Uruguay they were –3.4 percent and –6.0 percent. In sum, had hiring been random during the 1989-1997 period in the three countries studied, we would have observed statistically significant changes in the Duncan index. The fact that no such statistically significant change was observed in any of the three countries is evidence that hiring during this period was far from random, and that occupational segregation remains an enduring feature of the landscape in these labor markets.

Occupational Segregation versus Discrimination and Human Capital Explanations: How Important is Segregation in Overall Male-Female Wage Gaps?

Economists typically perform wage gap analysis to arrive at an understanding of discrimination in the labor market; that is, differences in earnings between genders (or ethnic groups or different aged workers, etc.) that are not explained by differences in human capital or other observable characteristics. In this section, building upon the methodology of Flukinger and Silber (1999), we combine the analysis of wage discrimination with occupational segregation. In other words, we are able to decompose the earnings gap and separate out the effects of human capital endowments, occupational segregation, and unexplained differences. The methodology is described in detail in the methodological appendix. In summary, we estimate the usual earnings equations $\ln y = bx + e$ but instead of working with two sub-populations (female and male), we estimate separate earnings equations (females in "female" occupations, females in "male" occupations, males in "female" occupations and males in "male" occupations). For each type of occupation (female and male) we can compute the wage gap and the typical Oaxaca decomposition. As detailed in the appendix, we are able to decompose the wage gap into three components:

- *Occupational Segregation*. The difference between the wage gap and the weighted average of the wage gaps for both female and male of occupations.
- *Human Capital Differences*. The weighted average of human capital differences for both types of occupations.
- *Wage Discrimination*. The weighted average of "unexplained" wage differences for both types of occupations.

Table 12 gives the results of the decomposition of the overall wage differential into three components for the three countries studied. Results are available for each of the three surveyed years for Costa Rica and Uruguay, but only for 1997 for Ecuador, given the availability of data needed for estimation of earnings functions. Estimation results for the four earnings functions underlying these decomposition results (corresponding respectively to the sets of female workers in "male" and "female" occupations and of male workers in "male" and "female" occupations) are presented in Table A.3 in the data appendix.

Several features are noteworthy from the above results: first, the influence of occupational segregation on the wage gap is not uniform across countries, or across time periods. In four of the seven cases observed the higher the degree of segregation, the higher the wage gap. However, in the remaining three cases (Costa Rica 1997, Uruguay 1992, and Uruguay 1997–the three cases where the wage gap is the smallest), a greater degree of occupational segregation actually contributes to reducing the wage gap. Second, in all cases observed, human capital endowments serve to reduce the gap between male and female earnings. In other words, women's human capital endowments are greater than

those of their male counterparts— the problem is not in the stock of human capital, but rather in the returns to that human capital. Third, and finally, we see that in all but one case (Costa Rica 1993), discrimination, or more literally, "unexplained" differences in wages, accounts for the largest share of the wage gap. In sum, occupational segregation has varying effects on the wage gap, depending upon the country and the year, and in all but one of the cases, the effects of human capital endowments and discrimination outweigh the effects of the occupational segregation. For purposes of comparison, Table 13 presents the results of the traditional Oaxaca decomposition. As would be expected, the contributions of human capital and discrimination to the wage gap are similar (but stronger) to those observed in the previous table. In other words, including measures of occupational segregation in the decomposition dampens, but does not overrule, the results of the more basic decomposition. Two-way decomposition overstates the effects of the included elements. While the effect of occupational segregation in and of itself may not be straightforward, including it in the decomposition allows for a more accurate understanding of the effects of the traditional Oaxaca components when analyzing the wage gap.

Table 13
Traditional Wage Gap Decomposition into Two Components

Country/Year	*Wage Gap*	*%*	*Human Capital*		*Discrimination*	
Costa Rica 89	0.160	100	-0.1258	- 78,6%	0.2867	179.2%
Costa Rica 93	0.174	100	-0.1456	-83.7%	0.3265	187.6%
Costa Rica 97	0.060	100	-0.1901	-316.8%	0.2492	415.3%
Ecuador 97	0.186	100	-0.1052	-56.6%	0.2931	157.6%
Uruguay 89	0.289	100	-0.0810	-28.0%	0.3696	127.9%
Uruguay 92	0.157	100	-0.0850	-51.0%	0.2421	154.2%
Uruguay 97	0.109	100	-0.1338	-122.8%	0.2446	224.4%

Conclusions and Policy Options

In the three countries examined in this paper, it is quite clear that occupational segregation did not decrease during the 1989-1997 period. This is not tremendously surprising given the relative stagnancy of female labor force participation during the same period. Nonetheless, there were important shifts in occupational structure and macro circumstances during the period studied, neither of which contributed to breaking down the barriers of occupational segregation. Two possible—and quite distinct—conclusions can be drawn from this evidence. The first is that occupational segregation is not easily eliminated, and that consequently more activist policies are needed to break down segregation. The second hypothesis, alluded to in the introductory section, is that some degree of segregation results from voluntary choices made by women who find certain occupations more attractive than do men.

While it is not possible to definitively discard this second hypothesis without the econometric estimation of sophisticated models of occupational choice, many studies have documented that women are crowded into low-paying occupations with few benefits such as written contracts or social security coverage. In other words, while some portion of observed occupational segregation may be voluntary, it is difficult to believe that all segmentation is the result of voluntary choice.

A second important result of this paper is the finding—robust across all three countries—that occupational segregation is much more severe among the less educated than among the more educated. As in many other policy areas, less educated women are more constrained in their options than are their more educated counterparts. If activist policies are designed to combat segregation, these policies should target less educated women in priority fashion.

A third interesting result of this paper is that the degree of occupational segregation does not seem to vary according to either the level of economic development or macroeconomic conditions. The degree of occupational segmentation is not significantly different in Ecuador than it is in Uruguay or Costa Rica; it is not lower in countries which have experienced more rapid economic growth, and it does not seem to vary according to levels of female labor force participation. This result, especially when viewed together with the first result of time invariance, suggests that non economic factors such as culture and traditions may be as important or more so in determining occupational segregation than are economic factors. This conclusion is confirmed by cross-country analysis presented by Anker (1998)[14]

A fourth interesting conclusion emerged from the wage gap decomposition exercise: while in some countries and some years occupational segregation helps explain the presence of male-female wage gaps, it is certainly not the most important determinant of these gaps. In other words, eliminating occupational segregation will not eliminate male-female wage gaps. Discrimination (or, more cautiously, the "unexplained component" of the decomposition) still plays a crucial role. This conclusion was buttressed by the results from the random hiring counterfactual, which showed that even had hiring been random during the period under analysis, the changes in the Duncan index would have been relatively modest, ranging from 6 to 16 percent depending upon the country.

These last results suggest an interesting question. What should be the ultimate concern of policy? We argue that policy should target the elimination of all discrimination and of non-voluntary occupational segregation. There are numerous policy options available to promote these goals.[15] Interventions to reduce occupa-

[14] See note 12.

[15] There is a vast literature on the topic of discrimination in labor markets and appropriate policy and program interventions to combat it. This brief concluding section will not attempt to summarize this litera-

tional segregation should begin in elementary and secondary schools, since choices made by boys and girls at early ages affect their ability to enter different occupations later on. Teacher training is essential, so that teachers do not either intentionally or unintentionally channel boys toward male-dominated occupations and girls toward female-dominated ones. Another important step is the introduction of nonsexist school texts that do not present stereotyped images of women's work and careers. Girls can be encouraged to enter nontraditional occupations both by committed teachers and by creative programs.

Once women have completed their education, occupational segregation can be addressed by various program interventions. Options include improving the services provided to women by job training and placement centers, as well as by the establishment of mentoring programs in which successful men and women employees or entrepreneurs are paired with young women interested in exploring nontraditional careers. Social marketing campaigns can be designed to convince employers that "pigeon-holing" female employees is not only a loss for the employees involved, but also makes the firm less productive and competitive. Finally, the provision of quality daycare services for young children is an essential step to combat occupational segregation, for the simple reason that much segregation, which is seemingly "voluntary," actually occurs because a lack of childcare services impels women to choose sectors that permit combining work and childcare. This is especially the case for low-income women; the provision of childcare services to poor women would allow their choice of occupations to be truly voluntary. (See Deustch, 1998).

ture, but will instead focus on options for reducing occupational segregation. As mentioned above, however, any attempt to reduce *human capital-adjusted* wage gaps between men and women must necessarily address the discrimination issue, since our decomposition results document that the effect on wage gaps of discrimination is larger than that of occupational segregation.

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Methodological Appendix[16]

1. Segregation Measures

The general purpose of a segregation index is to measure how different distributions of different sub-populations are across the same set of categories. For our purposes, segregation indices are intended to measure the differences in the distributions of male and female workers across the occupational categories of the economy.

If the distributions for males and females across the occupational categories are identical we will say that there is no segregation at all and we will expect to have a zero value for any segregation index. If, on the other hand, there is complete segregation; that is, males and females are working in different occupations and they are not sharing workspaces, we will expect a maximum value for our segregation indices, this maximum value will be one.[17]

Among the many indices the literature proposes in order to measure segregation, we select four to describe in greater detail. These indices can be classified into two types: the "absolute differences" type and the "labeling of occupations" type. We examine two indices of each type.

Notation

n	Number of occupations.
i	Occupation i.
F_i	Number of female workers in occupation i.
M_i	Number of male workers in occupation i.
T_i	Total number of workers in occupation i. $T_i = F_i + M_i$
F	Total number of female workers. $F = \sum_{i=1}^{n} F_i$
M	Total number of male workers. $M = \sum_{i=1}^{n} M_i$
T	Total number of workers. $T = M + F$
a_i	Female participation in occupation i. $a_i = \frac{F_i}{T_i}$
a	Female participation in the economy. $a = \frac{F}{T}$
F_f	Number of female workers in "female" occupations.
T_f	Total number of workers in "female" occupations.
F_m	Number of female workers in "male" occupations.
T_m	Total number of workers in "male" occupations.

[16] The sole author of this appendix is Hugo Ñopo.
[17] The value of 1 is selected just for normalization purposes.

A. The "Absolute Differences" Indices

These indices are based upon the idea of distance between the distributions for males and females. For any occupational category, the difference between the relative participation of males and females will be a measure of segregation for that category. In order to compute the segregation index for the whole economy it is necessary simply to add the absolute values[18] of the measures obtained for each of those categories.

The two indices that we are using here differ in the way they compute these differences between the relative participation of males and females in each category.

A.1. The Duncan Index.

This is the most common index in the literature. The segregation component for each category is computed subtracting two ratios: the ratio of female participation in the category relative to the total female participation less the analogous ratio for males. With the notation defined above, we have the following formula for the Duncan index:

$$I_D = \frac{1}{2}\sum_{i=1}^{n}\left|\frac{F_i}{F} - \frac{M_i}{M}\right|$$

Note the coefficient ½ required for normalizing the index.

A.2. The Karmel & Maclachlan Index

For this index the segregation component is computed subtracting two weighted ratios: the male participation in each category relative to the total labor force weighted by the female participation in the whole labor force minus the analogous ratio. In this way:

$$I_{KM} = \sum_{i=1}^{n}\left|a\frac{M_i}{T} - (1-a)\frac{F_i}{T}\right|$$

This KM index improves on the Duncan index because it takes into account the fact that males and females have different participation in the overall economy.

Actually, there is an interesting and revealing relationship between these two indices: $I_{KM} = 2a(1-a)I_D$. In the light of this equation we can see the KM index as a two-component index with both components acting multiplicatively: the overall participation component $2a(1-a)$ and the "Duncan" component.

It is important to note that for any distribution of males and females across categories we will have $I_D > I_{KM}$ and for the case where males and females participate equally in the whole economy (a=½) the difference between the two indices will be minimized, or equal to: $I_{KM} = \frac{I_D}{2}$.

[18] The use of absolute values is to avoid "compensation effects" between occupational categories.

B. The "Labeling of Occupations" Indices

These indices recognize that there are occupations where males are predominant and occupations where females are predominant. We will call these "male" and "female" occupations respectively. Having too many females working in "female" occupations or too many males working in "male" occupations, and as a consequence, too few females in "male" occupations or too few males in "female" occupations, is an indication of segregation. One way to capture this segregation by means of an index is computing the difference of relative female participation in "male" and "female" occupations. With the notation previously introduced we can have:

$$I = \frac{F_f}{T_f} - \frac{F_m}{T_m}.$$

This is the general form of our "Labeling of Occupations" indices; differences between the different variants of this index arise with the definition of the rules that are necessary to apply in order to label the occupations.

B.1. The Hakim & Siltanen Index

This is the simplest criterion for labeling. An occupation is considered "female" if female participation in the occupation is higher than the female participation in the whole economy. That is, define an occupation as "female" if $a_i > a$ and define it as a "male" occupation otherwise.

B.2. The Marginal Matching Index

This index has a more elaborate criterion for labeling but it has an important advantage with respect to the previous one: with this method of labeling the number of males in "female" occupations will be the same as the number of females in "male" occupations. This symmetry plays an important role when we try to discuss segregation issues from both, a male and a female perspective. In order to proceed with this labeling it is necessary to order the occupations according to increasing female participation (that is, values of a_i). After this, select the first n_M such that $\sum_{i=1}^{n_M-1} T_i < M$ and $\sum_{i=1}^{n_M} T_i \geq M$. Define the occupations $1,2,...,(n_M - 1)$ as "male" and $(n_M + 1),...,n$ as "female," with the n_M occupation forming a proportional "male"/"female" distribution. That is, select the first n_M occupations such that the total number of persons in "male" occupations will be equal to the total number of males in the economy. As a consequence of this, the total number of persons in "female" occupations will be equal to the total number of females in the economy. And as a consequence of the two previous facts we will have the result that the number of males in "female" occupations is equal to the number of females in "male" occupations.

2. Bootstrapping Methodology to Construct Confidence Intervals for the Duncan Index

As we have seen, the Duncan index is computed as:

$$I_D = \frac{1}{2}\sum_{i=1}^{n}\left|\frac{F_i}{F} - \frac{M_i}{M}\right|$$

That is, it depends on the number of males and females at each occupational category and also on the total number of males and females in the population for which we want to compute the measure.

As long as we have information coming only from a representative sample we can obtain an estimator for the populational value of the Duncan index using the whole sample, but this will not provide us any information about the dispersion of such a measure. For this purpose, a resampling technique will be necessary.

The process of bootstrapping is one of the resampling techniques that have gained increasing popularity with the more widespread use of powerful computers. It consists of taking random subsets of the sample (that is, taking sub-samples) and computing the Duncan index estimator associated to each sub-sample. By means of this process we will obtain a series of Duncan index estimators. With this series we can compute new estimators for the mean and the variance of the Duncan index, those will be called the Bootstrap Estimators for the mean and the variance respectively.

The accuracy of these Bootstrap Estimators will increase with the number of sub-samples drawn. Also, it should be noted that the size of each sub-sample should be big enough such that it is representative of the population for which we are estimating the measure. We choose a sub-sample size equal to the number of observations in the original sample.

Having computed Bootstrap Estimators for the mean and the variance we proceed to perform the computations for confidence intervals and test for differences in the standard way. That is, having estimators for the mean and variance of two different Duncan indices I_{D1}, s_{D1} and I_{D2}, s_{D2} respectively, the confidence intervals for each index are computed as:
$\left[I_{D1} - t * s_{D1}, I_{D1} + t * s_{D1}\right]$ where the statistic "t" has infinitely many degrees of freedom and a significance level of 5%.

In order to compute the t-statistic for the hypothesis testing of differences, we used:

$$t = \frac{I_{D1} - I_{D2}}{\sqrt{s_{D1}^2 + s_{D2}^2}}$$

And we contrasted this value with a "t" statistic with infinitely many degrees of freedom and a significance level of 5%.

3. Three-way Wage Gap Decomposition Including Occupational Segregation

We estimate the usual earnings equations $\ln y = bx + e$ but now instead of working with two sub-populations (female and male), we work with four (females in female occupations, females in male occupations, males in female occupations and males in male occupations).

Female occupations are denoted by 0 and male occupations by 1. Similarly let's denote females by F and males by M.

For each type of occupation (female and male) we can compute the wage gap and the typical Oaxaca's decomposition:

$$\overline{\ln y}_{0M} - \overline{\ln y}_{0F} = \hat{b}_{0M}\overline{x}_{0M} - \hat{b}_{0F}\overline{x}_{0F} = \hat{b}_{0M}\left(\overline{x}_{0M} - \overline{x}_{0F}\right) + \left(\hat{b}_{0M} - \hat{b}_{0F}\right)\overline{x}_{0F} = H_0 + D_0$$
$$\overline{\ln y}_{1M} - \overline{\ln y}_{1F} = \hat{b}_{1M}\overline{x}_{1M} - \hat{b}_{1F}\overline{x}_{1F} = \hat{b}_{1M}\left(\overline{x}_{1M} - \overline{x}_{1F}\right) + \left(\hat{b}_{1M} - \hat{b}_{1F}\right)\overline{x}_{1F} = H_1 + D_1$$

So, an expected value of the wage gap can be computed as a weighted average of the gaps[19]:

$$E = \frac{N_0}{N}\left(\overline{\ln y}_{0M} - \overline{\ln y}_{0F}\right) + \frac{N_1}{N}\left(\overline{\ln y}_{1M} - \overline{\ln y}_{1F}\right)$$

We can also compute $\overline{\ln y}_M$ and $\overline{\ln y}_F$ as weighted means:

$$\overline{\ln y}_M = \frac{N_{0M}}{N_M}\overline{\ln y}_{0M} + \frac{N_{1M}}{N_M}\overline{\ln y}_{1M}$$
$$\overline{\ln y}_F = \frac{N_{0F}}{N_F}\overline{\ln y}_{0F} + \frac{N_{1F}}{N_F}\overline{\ln y}_{1F}$$

And using these we can define the actual wage gap as simply $\Delta = \overline{\ln y}_M - \overline{\ln y}_F$

We are now ready to define the segregation component. It will be the difference between the actual wage gap and the expected wage gap: $S = \Delta - E$.

Now, E can be expressed as

$$E = \frac{N_0}{N}\left(\overline{\ln y}_{0M} - \overline{\ln y}_{0F}\right) + \frac{N_1}{N}\left(\overline{\ln y}_{1M} - \overline{\ln y}_{1F}\right) = \frac{N_0}{N}\left(H_0 + D_0\right) + \frac{N_1}{N}\left(H_1 + D_1\right)$$
$$E = \left(\frac{N_0}{N}H_0 + \frac{N_1}{N}H_1\right) + \left(\frac{N_0}{N}D_0 + \frac{N_1}{N}D_1\right) = H + D$$

In that way we will have $S = \Delta - H - D$ or equivalently $\Delta = S + H + D$

That is, we have a decomposition of the wage gap in three components:

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[19] We are denoting by N_{0F} the number of females in female occupations, by N_0 the number of persons in female occupations, by N_F the number of females and by N the total number of persons (analogous notation is used with males and male occupations).

- *Segregation*. The difference between the wage gap and the weighted average of the wage gaps for both female and male of occupations.
- *Human Capital Differences*. The weighted average of human capital differences for both types of occupations.
- *Wage Discrimination*. The weighted average of unexplained wage differences for both types of occupations.

DATA APPENDIX

Table A.1: Estimates of Different Measures for Occupational Segregation[20]

Country/Year	Duncan	Karmel/Maclachlan	Hakim/Siltanen	Marginal Margin
Costa Rica 89	0.5658	0.2644	0.5933	0. 5467
Costa Rica 93	0.5586	0.2540	0.5101	0.5336
Costa Rica 97	0.5408	0.2499	0.5047	0.5259
Ecuador 89	0.5768	0.2644	0.5925	0.5077
Ecuador 93	0.5423	0.2532	0.5100	0.4667
Ecuador 97	0.5437	0.2553	0.5126	0.4758
Uruguay 89	0.5601	0.2692	0.4626	0.5317
Uruguay 92	0.5659	0.2748	0.5443	0.5380
Uruguay 97	0.5515	0.2679	0.5359	0.5140

Table A.2: Tests of Differences across Countries for Two-Digit Duncan Indices

Country/Year	t – statistics	
1989		
Costa Rica-Ecuador	-0.2778	Not significant
Costa Rica-Uruguay	-0.3304	Not significant
Ecuador-Uruguay	-0.0921	Not significant
1992/1993		
Costa Rica-Ecuador	0.8261	Not significant
Costa Rica-Uruguay	-0.1439	Not significant
Ecuador-Uruguay	-0.9692	Not significant
1997		
Costa Rica-Ecuador	0.0575	Not significant
Costa Rica-Uruguay	-0.3062	Not significant
Ecuador-Uruguay	-0.3593	Not significant

[20] Derivation of these different indices is presented in the methodological appendix.

Table A.3: Results of Earnings Equations

COSTA RICA 1989

EARNING FUNCTIONS ESTIMATES

	MALES			FEMALES		
	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL
CONSTANT	3.6020 **	3.7460 **	3.7100 **	3.1480 **	3.3470 **	3.1660 **
	(0.1490)	(0.0860)	(0.0740)	(0.1140)	(0.2540)	(0.1050)
AGE	0.0047	0.0062 **	0.0063 **	0.0084 **	0.0015	0.0073 **
	(0.0030)	(0.0020)	(0.0020)	(0.0030)	(0.0050)	(0.0020)
YEARS OF EDUCATION	0.0941 **	0.0853 **	0.0861 **	0.1070 **	0.1150 **	0.1110 **
	(0.0070)	(0.0040)	(0.0030)	(0.0050)	(0.0110)	(0.0050)
NUMBER OF CHILDREN	-0.1110 **	-0.1250 **	-0.1200 **	-0.0899 **	-0.0370	-0.0768 **
	(0.0390)	(0.0250)	(0.0210)	(0.0300)	(0.0600)	(0.0270)
AGE*# OF CHILDREN	0.0032 **	0.0033 **	0.0033 **	0.0030 **	0.0016	0.0026 **
	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0020)	(0.0010)
DUMMY (1 IF PARTIME)	0.6300 **	0.7060 **	0.6930 **	0.3530 **	0.4530 **	0.3740 **
	(0.1400)	(0.0760)	(0.0670)	(0.0620)	(0.1280)	(0.0560)
DUMMY (1 IF OVERTIME)	-0.3110 **	-0.3060 **	-0.3000 **	-0.5240 **	-0.3120 **	-0.4720 **
	(0.0720)	(0.0340)	(0.0310)	(0.0580)	(0.1170)	(0.0530)
Number of Observations	457	1740	2197	973	295	1268
R2	0.392	0.301	0.319	0.428	0.327	0.398
R2 Adjusted	0.384	0.299	0.317	0.424	0.313	0.395

Std. Errors in parenthesis

(*) Significant at a 90% Confidence Level

(**) Significant at a 99% Confidence Level

DESCRIPTIVE STATISTICS OF THE VARIABLES (MEANS AND DEVIATIONS)

	MALES			FEMALES		
	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL
LOG OF THE HOURLY WAGE	4.5884	4.5880	4.5896	4.3905	4.5518	4.4280
	(0.7547)	(0.7347)	(0.7397)	(0.7764)	(0.8335)	(0.7926)
AGE	32.58	35.60	34.98	32.84	34.68	33.27
	(13.28)	(13.13)	(13.21)	(11.56)	(11.54)	(11.58)
YEARS OF EDUCATION	9.48	8.15	8.44	9.18	9.61	9.28
	(3.97)	(3.79)	(3.87)	(3.84)	(3.97)	(3.88)
NUMBER OF CHILDREN	2.37	2.39	2.38	2.45	2.19	2.39
	(1.72)	(1.61)	(1.63)	(1.77)	(1.66)	(1.75)
% OF PARTIME	4.16%	4.20%	4.18%	11.10%	12.20%	11.36%
% OF OVERTIME	18.60%	26.21%	24.64%	12.54%	14.58%	13.01%

Std. Deviations in parenthesis

COSTA RICA 1993

EARNING FUNCTIONS ESTIMATES

	MALES			FEMALES		
	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL
CONSTANT	4.2160 **	4.8440 **	4.7100 **	4.0210 **	4.7260 **	4.1530 **
	(0.4280)	(0.2260)	(0.2000)	(0.3040)	(0.6080)	(0.2800)
AGE	0.0153	0.0101 *	0.0120 *	0.0099	0.0104	0.0120 *
	(0.0110)	(0.0050)	(0.0050)	(0.0070)	(0.0150)	(0.0070)
YEARS OF EDUCATION	0.1180 **	0.0968 **	0.0984 **	0.1190 **	0.1060 **	0.1140 **
	(0.0130)	(0.0080)	(0.0070)	(0.0100)	(0.0200)	(0.0090)
NUMBER OF CHILDREN	-0.0254	-0.0540	-0.0448	-0.0152	-0.1070	-0.0247
	(0.0780)	(0.0390)	(0.0350)	(0.0520)	(0.1030)	(0.0480)
AGE*NUMBER OF CHILDREN	0.0008	0.0016	0.0014	0.0014	0.0034	0.0014
	(0.0020)	(0.0010)	(0.0010)	(0.0010)	(0.0030)	(0.0010)
DUMMY (1 IF PARTIME)	1.3250 **	0.5000 **	0.6790 **	0.4850 **	0.6200 **	0.5740 **
	(0.2640)	(0.1530)	(0.1340)	(0.1300)	(0.2360)	(0.1160)
DUMMY (1 IF OVERTIME)	-0.3680 *	-0.2830 **	-0.2660 **	-0.3700 **	-0.3170 *	-0.3010 **
	(0.1420)	(0.0600)	(0.0550)	(0.1140)	(0.1840)	(0.0980)
Number of Observations	527	2420	2947	1151	458	1609
R2	0.226	0.097	0.112	0.160	0.124	0.134
R2 Adjusted	0.217	0.095	0.110	0.155	0.112	0.131

Std. Errors in parenthesis

(*) Significant at a 90% Confidence Level

(**) Significant at a 99% Confidence Level

DESCRIPTIVE STATISTICS OF THE VARIABLES (MEANS AND DEVIATIONS)

	MALES			FEMALES		
	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL
LOG OF THE HOURLY WAGE	5.9794	5.9861	5.9863	5.6941	6.1026	5.8104
	(1.3815)	(1.4617)	(1.4470)	(1.3744)	(1.6260)	(1.4616)
AGE	33.74	36.68	36.16	34.58	33.33	34.22
	(12.92)	(13.22)	(13.21)	(11.78)	(12.85)	(12.10)
YEARS OF EDUCATION	10.58	8.55	8.93	10.01	9.60	9.89
	(4.08)	(3.78)	(3.92)	(4.01)	(3.69)	(3.92)
NUMBER OF CHILDREN	4.61	4.72	4.69	4.59	4.74	4.63
	(1.84)	(1.98)	(1.95)	(2.06)	(2.14)	(2.08)
% OF PARTIME	4.36%	3.64%	3.76%	9.56%	11.57%	10.13%
% OF OVERTIME	17.46%	35.25%	32.13%	13.03%	20.31%	15.10%

Std. Deviations in parenthesis

COSTA RICA 1997

EARNING FUNCTIONS ESTIMATES

	MALES			FEMALES		
	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL
CONSTANT	5.2740 **	5.0820 **	5.1290 **	4.2130 **	5.1060 **	4.5280 **
	(0.2240)	(0.1200)	(0.1070)	(0.1890)	(0.2580)	(0.1520)
AGE	0.0006	0.0102 **	0.0089 **	0.0197 **	0.0031	0.0135 **
	(0.0050)	(0.0020)	(0.0020)	(0.0040)	(0.0060)	(0.0030)
YEARS OF EDUCATION	0.1150 **	0.1040 **	0.1030 **	0.1260 **	0.1040 **	0.1190 **
	(0.0100)	(0.0050)	(0.0050)	(0.0080)	(0.0110)	(0.0060)
NUMBER OF CHILDREN	-0.1650 *	-0.0896 *	-0.1030 **	0.1210 *	-0.2180 *	0.0002
	(0.0760)	(0.0370)	(0.0340)	(0.0670)	(0.0940)	(0.0550)
AGE*NUMBER OF CHILDREN	0.0039 *	0.0030 **	0.0032 **	-0.0027	0.0064 *	0.0006
	(0.0020)	(0.0010)	(0.0010)	(0.0020)	(0.0030)	(0.0010)
DUMMY (1 IF PARTIME)	0.3960 *	0.4830 **	0.4560 **	0.3770 **	0.6110 **	0.4380 **
	(0.2050)	(0.1060)	(0.0950)	(0.0920)	(0.1520)	(0.0790)
DUMMY (1 IF OVERTIME)	-0.3040 **	-0.3110 **	-0.3030 **	-0.2610 **	-0.2830 *	-0.2610 **
	(0.0970)	(0.0440)	(0.0400)	(0.0890)	(0.1090)	(0.0690)
Number of Observations	529	2776	3305	1261	611	1872
R2	0.252	0.174	0.181	0.203	0.187	0.193
R2 Adjusted	0.243	0.172	0.180	0.199	0.179	0.190

Std. Errors in parenthesis

(*) Significant at a 90% Confidence Level

(**) Significant at a 99% Confidence Level

DESCRIPTIVE STATISTICS OF THE VARIABLES (MEANS AND DEVIATIONS)

	MALES			FEMALES		
	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL
LOG OF THE HOURLY WAGE	6.3708	6.2920	6.3050	6.2355	6.2636	6.2472
	(1.0645)	(1.1914)	(1.1722)	(1.1697)	(1.1976)	(1.1806)
AGE	34.64	37.14	36.74	36.30	35.49	36.03
	(13.21)	(13.73)	(13.68)	(11.85)	(12.44)	(12.05)
YEARS OF EDUCATION	10.43	8.58	8.88	9.84	10.04	9.92
	(4.08)	(3.99)	(4.06)	(4.08)	(4.10)	(4.09)
NUMBER OF CHILDREN	2.04	2.15	2.13	1.99	2.01	2.00
	(1.43)	(1.48)	(1.48)	(1.40)	(1.38)	(1.39)
% OF PARTIME	4.35%	4.14%	4.17%	12.93%	9.98%	11.95%
% OF OVERTIME	23.44%	36.92%	34.79%	13.24%	22.26%	16.17%

Std. Deviations in parenthesis

ECUADOR 1997

EARNING FUNCTIONS ESTIMATES

	MALES			FEMALES		
	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL
CONSTANT	8.6320 **	8.6150 **	8.6570 **	8.0920 **	8.3440 **	8.1610 **
	(0.1440)	(0.0480)	(0.0450)	(0.0720)	(0.1380)	(0.0650)
AGE	0.0076 *	0.0101 **	0.0093 **	0.0096 **	0.0097 **	0.0090 **
	(0.0030)	(0.0010)	(0.0010)	(0.0020)	(0.0030)	(0.0020)
YEARS OF EDUCATION	0.0729 **	0.0804 **	0.0767 **	0.0952 **	0.0924 **	0.0965 **
	(0.0050)	(0.0020)	(0.0020)	(0.0030)	(0.0060)	(0.0030)
NUMBER OF CHILDREN	-0.1290 **	-0.1230 **	-0.1260 **	-0.1100 **	-0.1100 **	-0.1120 **
	(0.0440)	(0.0120)	(0.0120)	(0.0200)	(0.0390)	(0.0180)
AGE*NUMBER OF CHILDREN	0.0036 **	0.0029 **	0.0030 **	0.0029 **	0.0024 *	0.0028 **
	(0.0010)	0.0000	0.0000	(0.0010)	(0.0010)	(0.0010)
DUMMY (1 IF PARTIME)	0.9190 **	0.3880 **	0.4970 **	0.3640 **	0.8670 **	0.5500 **
	(0.1870)	(0.1050)	(0.0920)	(0.0850)	(0.1420)	(0.0750)
DUMMY (1 IF OVERTIME)	-0.4310 **	-0.3930 **	-0.3860 **	-0.6020 **	-0.5220 **	-0.5680 **
	(0.0730)	(0.0210)	(0.0200)	(0.0390)	(0.0660)	(0.0340)
Number of Observations	728	4385	5113	2037	871	2908
R2	0.380	0.375	0.389	0.542	0.365	0.480
R2 Adjusted	0.375	0.374	0.388	0.541	0.361	0.479

Std. Errors in parenthesis

(*) Significant at a 90% Confidence Level

(**) Significant at a 99% Confidence Level

DESCRIPTIVE STATISTICS OF THE VARIABLES (MEANS AND DEVIATIONS)

	MALES			FEMALES		
	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL
LOG OF THE HOURLY WAGE	9.8766	9.5296	9.5811	9.3258	9.5513	9.3937
	(0.7358)	(0.7559)	(0.7639)	(0.8480)	(0.8707)	(0.8609)
AGE	37.69	33.04	33.71	32.88	31.44	32.45
	(12.29)	(12.79)	(12.82)	(11.88)	(10.54)	(11.51)
YEARS OF EDUCATION	13.45	9.39	9.98	10.93	11.39	11.07
	(4.23)	(4.31)	(4.53)	(4.79)	(4.27)	(4.64)
NUMBER OF CHILDREN	2.30	2.59	2.55	2.42	2.43	2.43
	(1.47)	(1.87)	(1.82)	(1.70)	(1.75)	(1.71)
% OF PARTIME	1.37%	0.75%	0.84%	2.31%	2.87%	2.48%
% OF OVERTIME	10.58%	25.06%	22.95%	14.14%	15.84%	14.64%

Std. Deviations in parenthesis

URUGUAY 1989

EARNING FUNCTIONS ESTIMATES

	MALES			FEMALES		
	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL
CONSTANT	0.1970 *	-0.0714	0.0000	-0.4940 **	-0.1710	-0.4010 **
	(0.0970)	(0.0500)	(0.0440)	(0.0720)	(0.1180)	(0.0630)
AGE	0.0095 **	0.0153 **	0.0136 **	0.0096 **	0.0123 **	0.0095 **
	(0.0020)	(0.0010)	(0.0010)	(0.0010)	(0.0020)	(0.0010)
YEARS OF EDUCATION	0.0683 **	0.0745 **	0.0730 **	0.1020 **	0.0785 **	0.0983 **
	(0.0040)	(0.0020)	(0.0020)	(0.0030)	(0.0050)	(0.0030)
NUMBER OF CHILDREN	-0.1640 **	-0.1090 **	-0.1240 **	-0.1380 **	-0.0907 *	-0.1420 **
	(0.0310)	(0.0150)	(0.0140)	(0.0210)	(0.0450)	(0.0190)
AGE*NUMBER OF CHILDREN	0.0041 **	0.0029 **	0.0033 **	0.0033 **	0.0026 *	0.0034 **
	(0.0010)	0.0000	0.0000	(0.0010)	(0.0010)	(0.0010)
DUMMY (1 IF PARTIME)	0.4610 **	0.6440 **	0.5760 **	0.4960 **	0.7590 **	0.4680 **
	(0.1000)	(0.0750)	(0.0600)	(0.0400)	(0.1190)	(0.0380)
DUMMY (1 IF OVERTIME)	-0.4840 **	-0.2330 **	-0.2700 **	-0.6460 **	-0.3340 **	-0.5850 **
	(0.0480)	(0.0220)	(0.0200)	(0.0460)	(0.0760)	(0.0400)
Number of Observations	1186	3935	5121	2651	818	3469
R2	0.323	0.332	0.323	0.381	0.363	0.372
R2 Adjusted	0.320	0.331	0.322	0.379	0.359	0.371

Std. Errors in parenthesis

(*) Significant at a 90% Confidence Level

(**) Significant at a 99% Confidence Level

DESCRIPTIVE STATISTICS OF THE VARIABLES (MEANS AND DEVIATIONS)

	MALES			FEMALES		
	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL
LOG OF THE HOURLY WAGE	1.1245	1.1019	1.1071	0.7417	1.0676	0.8185
	(0.6928)	(0.6852)	(0.6870)	(0.8176)	(0.6915)	(0.8016)
AGE	40.20	37.58	38.18	37.00	35.63	36.68
	(14.65)	(13.54)	(13.85)	(12.97)	(11.76)	(12.71)
YEARS OF EDUCATION	9.17	8.80	8.88	9.12	10.33	9.41
	(3.99)	(4.02)	(4.01)	(4.08)	(4.37)	(4.18)
NUMBER OF CHILDREN	1.61	1.90	1.83	1.79	1.60	1.75
	(1.42)	(1.56)	(1.54)	(1.59)	(1.31)	(1.53)
% OF PARTIME	2.95%	1.47%	1.82%	10.94%	2.81%	9.02%
% OF OVERTIME	14.08%	21.75%	19.98%	8.22%	7.09%	7.96%

Std. Deviations in parenthesis

URUGUAY 1992

EARNING FUNCTIONS ESTIMATES

	MALES			FEMALES		
	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL
CONSTANT	0.9700 **	0.6300 **	0.6930 **	0.5190 **	0.4260 **	0.5070 **
	(0.1090)	(0.0560)	(0.0500)	(0.0680)	(0.1380)	(0.0610)
AGE	0.0030	0.0078 **	0.0068 **	0.0023 *	0.0073 *	0.0033 **
	(0.0020)	(0.0010)	(0.0010)	(0.0010)	(0.0030)	(0.0010)
YEARS OF EDUCATION	0.0671 **	0.0743 **	0.0735 **	0.0840 **	0.0868 **	0.0846 **
	(0.0050)	(0.0030)	(0.0020)	(0.0030)	(0.0060)	(0.0030)
YEARS OF EXPERIENCE	0.0124 **	0.0155 **	0.0150 **	0.0144 **	0.0177 **	0.0147 **
	(0.0020)	(0.0010)	(0.0010)	(0.0010)	(0.0030)	(0.0010)
NUMBER OF CHILDREN	-0.2490 **	-0.1410 **	-0.1600 **	-0.1420 **	-0.1450 **	-0.1460 **
	(0.0350)	(0.0160)	(0.0150)	(0.0200)	(0.0480)	(0.0190)
AGE*NUMBER OF CHILDREN	0.0064 **	0.0038 **	0.0042 **	0.0034 **	0.0034 **	0.0035 **
	(0.0010)	0.0000	0.0000	(0.0010)	(0.0010)	(0.0010)
DUMMY (1 IF PARTIME)	0.2670 *	0.3250 **	0.3110 **	0.2660 **	0.4300 **	0.2940 **
	(0.1380)	(0.0970)	(0.0790)	(0.0410)	(0.0880)	(0.0380)
DUMMY (1 IF OVERTIME)	-0.0579	-0.1160 **	-0.1080 **	-0.2120 **	-0.1260 *	-0.1880 **
	(0.0410)	(0.0210)	(0.0190)	(0.0350)	(0.0660)	(0.0310)
Number of Observations	1053	3766	4819	2728	802	3530
R2	0.278	0.308	0.309	0.332	0.324	0.321
R2 Adjusted	0.273	0.307	0.308	0.330	0.318	0.320

Std. Errors in parenthesis
(*) Significant at a 90% Confidence Level
(**) Significant at a 99% Confidence Level

DESCRIPTIVE STATISTICS OF THE VARIABLES (MEANS AND DEVIATIONS)

	MALES			FEMALES		
	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL
LOG OF THE HOURLY WAGE	1.8598	1.6510	1.6966	1.5109	1.6387	1.5399
	(0.6771)	(0.7112)	(0.7091)	(0.6994)	(0.7463)	(0.7122)
AGE	37.33	38.09	37.93	37.57	37.20	37.48
	(13.50)	(14.09)	(13.97)	(12.88)	(12.42)	(12.78)
YEARS OF EDUCATION	10.34	8.45	8.86	9.90	9.78	9.87
	(3.37)	(3.72)	(3.73)	(4.04)	(4.09)	(4.05)
YEARS OF EXPERIENCE	11.19	9.17	9.61	8.26	6.96	7.97
	(10.83)	(10.12)	(10.32)	(9.09)	(9.01)	(9.08)
NUMBER OF CHILDREN	1.70	1.91	1.87	1.71	1.70	1.71
	(1.37)	(1.55)	(1.52)	(1.44)	(1.41)	(1.43)
% OF PARTIME	1.71%	1.01%	1.16%	7.96%	6.48%	7.62%
% OF OVERTIME	24.12%	31.63%	29.99%	11.11%	12.47%	11.42%

Std. Deviations in parenthesis

URUGUAY 1997

EARNING FUNCTIONS ESTIMATES

	MALES			FEMALES		
	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL
CONSTANT	1.9020 **	1.8490 **	1.8350 **	1.6280 **	1.6650 **	1.6610 **
	(0.0810)	(0.0450)	(0.0390)	(0.0530)	(0.1030)	(0.0470)
AGE	0.0141 **	0.0159 **	0.0158 **	0.0113 **	0.0167 **	0.0120 **
	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0020)	(0.0010)
YEARS OF EDUCATION	-0.0001	-0.0005 *	-0.0004 *	-0.0003	0.0004	-0.0001
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
YEARS OF EXPERIENCE	0.0940 **	0.0889 **	0.0921 **	0.1040 **	0.0978 **	0.1020 **
	(0.0040)	(0.0020)	(0.0020)	(0.0020)	(0.0050)	(0.0020)
NUMBER OF CHILDREN	-0.1950 **	-0.1150 **	-0.1280 **	-0.1520 **	-0.1250 **	-0.1490 **
	(0.0270)	(0.0130)	(0.0120)	(0.0170)	(0.0330)	(0.0150)
AGE*NUMBER OF CHILDREN	0.0055 **	0.0030 **	0.0034 **	0.0035 **	0.0020 *	0.0033 **
	(0.0010)	0.0000	0.0000	0.0000	(0.0010)	0.0000
DUMMY (1 IF PARTIME)	0.0028	0.2060 **	0.1510 **	0.2470 **	0.2700 **	0.2390 **
	(0.0830)	(0.0520)	(0.0440)	(0.0280)	(0.0600)	(0.0260)
DUMMY (1 IF OVERTIME)	-0.2430 **	-0.1910 **	-0.2030 **	-0.3160 **	-0.2910 **	-0.3100 **
	(0.0310)	(0.0170)	(0.0150)	(0.0260)	(0.0490)	(0.0230)
Number of Observations	2345	7440	9785	5827	1648	7475
R2	0.341	0.275	0.302	0.329	0.293	0.314
R2 Adjusted	0.340	0.274	0.302	0.329	0.290	0.313

Std. Errors in parenthesis

(*) Significant at a 90% Confidence Level

(**) Significant at a 99% Confidence Level

DESCRIPTIVE STATISTICS OF THE VARIABLES (MEANS AND DEVIATIONS)

	MALES			FEMALES		
	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL	IN FEMALE OCCUPATIONS	IN MALE OCCUPATIONS	TOTAL
LOG OF THE HOURLY WAGE	3.3704	3.1294	3.1871	3.0540	3.1651	3.0785
	(0.7914)	(0.7527)	(0.7691)	(0.7806)	(0.7685)	(0.7793)
AGE	36.80	37.41	37.27	38.04	36.55	37.71
	(13.56)	(13.80)	(13.75)	(13.08)	(12.68)	(13.01)
YEARS OF EDUCATION	73.78	69.06	70.19	68.00	70.32	68.51
	(37.18)	(38.89)	(38.54)	(39.10)	(38.06)	(38.89)
YEARS OF EXPERIENCE	10.90	8.80	9.30	10.26	9.99	10.20
	(3.68)	(3.58)	(3.72)	(4.00)	(3.73)	(3.94)
NUMBER OF CHILDREN	1.63	1.91	1.84	1.67	1.71	1.68
	(1.34)	(1.55)	(1.51)	(1.35)	(1.38)	(1.36)
% OF PARTIME	2.69%	2.11%	2.25%	10.16%	7.89%	9.66%
% OF OVERTIME	25.50%	27.41%	26.95%	12.17%	12.50%	12.24%

Std. Deviations in parenthesis