5

Evolution of Salary Differences between Men and Women in Six Latin American Countries

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This study investigates the evolution of salary differences and other aspects related to the labor activities of men and women in Latin America. The analysis compares six countries—Argentina, Brazil, Colombia, Costa Rica, Honduras, and Uruguay—which were selected based on the information available during the study period. Each country, with the exception of Honduras, was observed three times: 1) the early 1980s, 2) the late 1980s, and 3) the late 1990s.[1]

The data used were derived from household surveys, which offer ample opportunities for analyzing important aspects of how labor markets function in these countries; at the same time, they restricted the possibility of comparing countries because of differences in methodologies and coverage.

[1] Honduras was observed during the late 1980s and late 1990s.

Literature review of wage differences by gender

An exhaustive review of discrimination literature can be found in Cain (1986) and Altonji and Blank (1999). This section summarizes key aspects of wage discrimination theories that are relevant to the empirical analysis presented further on.

When wage differences are observed between men and women, one obvious possible cause is discrimination in the labor market (see the theories of Becker, Phelps, and Arrow further on). Not all wage differences, however, are the result of discrimination, nor do all discriminatory practices result in wage differences between men and women. The following factors could also play a role in gender wage gaps:

- Productivity gaps from differences in investment in human capital (education and experience).
- Productivity differences from discriminatory practices at other levels of society, such as access to education or the existence of education systems of differing quality for men and women.
- Labor supply and preferences (compensation differences), which can be endogenous through processes of education and socialization.

Theories of discrimination

Although various theories of wage discrimination exist, this study concentrates on the two that appear most relevant: the preference-based discrimination theory of Gary Becker (1971) and the statistical discrimination theory of Kenneth Arrow (1972) and Edmund Phelps (1972).

For the effects of the analysis, presented below, Joseph Stiglitz's (1973) definition of discrimination is adopted: "There is wage discrimination when individuals with the same economic characteristics receive different wages and these differences are systematically correlated with certain non-economic characteristics of the individuals in question (race, religion, gender)." In the literature on this theme, the group discriminated against is generally designated as a "minority" (or minority group), while the remaining population is designated as the "majority."

Preference-based discrimination

Preference-based discrimination refers people finding it disagreeable to work with, contract, or share workspace with those from minority groups and being prepared to pay to avoid doing so. This is the focus of the traditional economic theory on wage discrimination, which is based on the contributions of Gary Becker and has been complemented by other research.

Discrimination can originate from employers, employees or workers, and consumers. The first source has received the most attention. Some employers are prepared to pay men higher wages than women with equal productivity. Employers who discriminate have higher costs than those who do not and, therefore, smaller profits, other things being equal.

Under ideal competition conditions (free-market entry, multiple producers and consumers, complete information, constant returns to scale, etc.), wage differences based on this type of discrimination are temporary because competition pushes employers who discriminate out of the market and produces an equalization of wages.

Discrimination by workers or consumers generally results in labor segregation, but not necessarily in wage differences.

When markets are not competitive—for example, when there are barriers to market entry—the potential for long-term discrimination exists. For example, a monopoly can sacrifice a portion of its profits in exchange for hiring men, who cost more even though their productivity is equal to that of women. Nevertheless, this faces limits because, if the labor force is competitive, the monopoly is required to pay the men above-market wages. In the long run, these higher costs result in a less valuable company,[2] weakening its position on the stock markets.

Something else happens when the producer has sufficient monopoly power in the labor market to discriminate among groups bidding on work. In this case, depending on the relative elasticity of the labor supply of male and female workers, it is possible that one group will receive higher wages than the other. If both labor supplies have positive slopes, the group with a higher elasticity will receive a higher wage. Two things must be said regarding this point: first, this definition of discrimination is not the one used by Gary Becker, and is not based on negative biases toward any group; rather, it results from the employer having information on individual preferences and marginal wages and using this information to maximize profits. Second, if the elasticity of women's labor supply is higher—as a good portion of the international literature shows[3]—they should receive higher wages than men, which is inconsistent with the discrimination concept of Becker.

[2] Defined as the capitalized value of future profits.

[3] If women provide a family's second income, their labor supply is probably more elastic than that of men, who are usually the primary income providers.

When one departs from the ideal competition model, it is possible to encounter instances in which wage differences are based on longer-term biases (à la Becker). For example, when labor market data are costly, wage differences may be generated against minorities. The case in question was analyzed by Black (1995) and can be summarized as follows. Suppose that workers (men and women) are equally productive and have equal preferences. However, an important group of employers in the labor market is prejudiced against women to the degree that it will not hire them. The workers who enter the market do not know who those employers are and, therefore, their job search is distributed between the two types of employers. This increases the cost of the women's searches because they lose time and resources researching jobs to which they lack access. The cost of the job search is higher for women than for men, and their expected benefits are less. Other things being equal, women end up establishing lower reservation wages than do men, which results in their expected wages (once the job has been obtained) also being lower.

Statistical discrimination

The statistical discrimination explanation of wage differences, based on the works of Kenneth Arrow and Edmund Phelps, explicitly recognizes the difficulty in obtaining information on levels of worker productivity, which are needed to determine wages. According this theory, employers cannot observe a worker's potential productivity. If they can observe indicators of that productivity, they are clearly contaminated by different levels of statistical noise. Starting from those indicators and their original (prior) beliefs, the employer must predict the worker's productivity, with the aim of deciding on the wage to be offered. The result of this process is that each worker's potential is estimated based not only on his or her own information, but also on data on the whole group.

Other explanations for wage differences by gender

Beyond discriminatory practices, wage differences can be caused by other factors. For instance, people from different groups have varying productivities, and the market may simply reflect these productive characteristics.[4] However, depending on the circumstances, variations in

[4] One should keep in mind that, even in this case, a portion of the wage differential can also be caused by discriminatory practices.

productivity can be associated with discriminatory practices. For example, it is possible that wage differences favor men because they have higher levels of investment in human capital; but differences in stocks of human capital can reflect discrimination against women's access to the education system or result from wage discrimination in previous periods, which made it less profitable for the group of women currently in the labor market to invest in human capital than for the corresponding group of men.

On the other hand, it is also possible to have wage differences, even between people with the same productive characteristics, that cannot be associated with discriminatory practices. For example, wage gaps can be associated with worker preferences and bidding decisions related to certain characteristics of the same jobs. These wage differences are generally known as compensatory differences. For example, if jobs involve risk or disagreeable labor conditions (long hours, late hours, unhealthy working environment, frequent travel, risk of accidents, low social status, etc.), it is possible that their remuneration includes a premium to compensate workers. In a free market, the offer for such jobs would go to workers who are least averse to such conditions (for example, workers with less aversion to risk, those more willing to fly, etc.), while the offer for other jobs would go to workers who would reject such conditions. On balance, wages in the sector with disagreeable conditions will be higher than in other sectors, and the wage difference will be compensatory—that is, the minimum necessary to compensate the marginal worker for the disability implicit in accepting work with undesirable conditions. If men are generally less averse than women to working under undesirable conditions, then such compensatory differences would be associated with gender differences, but would not result from discrimination.

Some have argued that preferences have an endogenous component due to processes of education, socialization, and acculturation. According to this view, gender differences related to such factors as risk tolerance, aversion to nighttime work, etc. in some way reflect differences in the socialization processes of women and men and therefore are not completely neutral.

Empirical and econometric aspects

As one can deduce from the previous theoretical considerations, the empirical study of the nature of wage differences is neither simple nor straightforward. The basic question researchers have asked is if, and in what way, the gender wage gaps observed reflect discrimination against women. In order to isolate discrimination effects, factors related to productivity and market-related wage determinants (what sector the job is in, for example) must be controlled for. Wage differences that remain when economic factors have been controlled for indicate discrimination.

Although many research techniques have been used to achieve this aim, we limit ourselves to the most common ones: the estimate of income equations (Mincer) and certain types of decompositions resulting from such equations.

The basic model of analysis is one in which the logarithm of hourly income can be expressed as a linear combination of a vector of variables that average the level of human capital and a series of associated parameters.

$$\ln Y_i = X\beta + \upsilon_i \qquad (1)$$

where Y equals the hourly income of worker i, X equals a vector of variables that average the levels of human capital (usually years of education and measures of experience); β equals a vector of associated parameters, and υ equals a random error with the usual characteristics (independence, expected value of zero, constant variance, normal distribution). The estimates of β are interpreted as returns to the different types of human capital expressed in vector X.

Within the context of analyzing salary differences by gender, this equation is used for a great variety of purposes. One obvious application of this model in such a context is that of estimating Mincerian equations for samples of men and women separately and using the results as an instrument for analyzing the differences.

Mincer's model has not been free from criticism. One of the more frequent complaints is its inability to measure skills and quality of education. The already lengthy discussion about measuring returns to education has shown that excluding such variables generates biased (optimistic) estimates of the parameters of education and experience. Unfortunately, the only solution to such a problem is to include in the regression data on these variables—which are virtually unavailable. In those few cases in which it has been possible to obtain measurements of worker skills, the returns to education were found to have been overvalued by one or two percentage points.[5]

[5] See Tenjo (1993). In this study, the socioeconomic characteristics of a group of 2,000 workers in Bogotá were analyzed, and a test was applied for general skills (Raven

A second criticism is the fact that measurements of both education and experience (especially the latter) are generally subject to error. Most available databases lack good measures of relevant experience; often, the only measurement one can obtain is that of *potential experience* (age minus years of education, minus 5). This problem is especially serious for women, whose participation in the labor force is frequently interrupted because of childrearing. Having a measurement of experience that contains measurement errors violates the assumption of independence in the regression model and biases the estimates of the model's coefficients.

Another necessary aspect to bear in mind is the well-known selection bias and its possible solutions. The selection bias consists of the inability to include data on the hourly wage of those who are not working, causing the estimates of the coefficients to possibly result in biases. For example, people with above-market reservation wages are excluded from the estimates. Because having reservation wages higher than market is not necessarily a random phenomenon, excluding such people prevents the sample from fulfilling the required random conditions of the econometric models. According to Heckman (1979), ignoring this process of self-selection can introduce biases into the estimates of the parameters of the income equation similar to those generated by omitting relevant variables in the model (specification bias). The commonly used solution in this case is the Heckman correction, which requires the estimate of an equation (usually probit), which allows one to predict the probability that a person will report income.

The correction of selection bias is not free of criticism, either. According to Lewis (1986), in most cases there is no theoretical model to explain the process of specific selectivity and to indicate the variables that explain it.[6] What is generally done is to include instrumental variables that are believed to be related to this process. This approach can introduce more problems into the income equations than it solves. In the

Progressive Matrices) and for general knowledge. Based on the results of that test, skill indicators were constructed and included in the income equations, with the outcome mentioned in the text.

[6] If the only reason for not reporting income is that people are not participating, one might consider applying the Heckman correction, starting from the labor participation equation, the theoretical basis of which is rather solid. However, in practice, not reporting income can have other causes, such as broad unemployment or employment in domestic occupations without defined remuneration. This causes additional complications, the effect of which is not clearly discernible.

majority of cases, one does not know whether the process is capturing the nature of individuals' decisions or the non-linear effect of the variables included in the selectivity equation.[7]

One of the more popular methods for measuring discrimination is the Oaxaca decomposition. It is based on the previous Mincerian equation, and takes the following form:

$$\ln\left(W_m\right) - \ln\left(W_w\right) = \left(X_m - X_w\right)\boldsymbol{\beta}_m + X_w\left(\boldsymbol{\beta}_m - \boldsymbol{\beta}_w\right) \quad (2)$$

where the subscripts *m* and *w* stand for men and women, respectively. The term to the left of the equals sign can be interpreted as a percentage salary difference between men and women, and the terms to the right reflect the two components of the decomposition: the first corresponds to differences in workers' productive characteristics and the second (the remainder) reflects the difference in coefficients.[8]

Frequently, this last component, the difference in coefficients, has been interpreted as a salary discrimination measurement. The argument is that the "betas" are a summary of the rules that the market uses to assess the amount of human capital of workers. If the rules differ for men and women, one can speak of discriminatory treatment.

This type of interpretation has been the subject of profound controversy in recent literature. From an empirical point of view, the method's most serious problem is the way in which the estimates of the coefficients capture all biases generated from data problems, errors in the variables, and selectivity processes. Interpretation of the remainder as a measure of discrimination is debatable. However, the existence of such problems is not to say that the remainder does not capture any degree of discrimination.

Finally, it is noteworthy that no empirical work is without methodological problems and questions. The comments here are presented more as a call for caution in data analysis rather than as a disqualification of the techniques available.

[7] To the authors' knowledge, there are no statistical criteria for evaluating the quality of the Heckman correction. Some suggest using the degree of statistical significance of the lambda variable in the income equation as a criterion. The problem with this criterion is that a low level of significance does not necessarily mean that the variable in question is irrelevant to the equation.

[8] This decomposition is usually done with the average values of the samples used in the estimate, but it could also be done using other values.

General characteristics of women's and men's standing in the labor force

In this section, we examine some of the more general characteristics of women's and men's standing in the labor force and look in-depth at some related aspects to explain gender wage gaps.

As one can see from Table 5.1, Latin America's population is generally young. This is clearly reflected in the age structure of the countries studied. More than one third of the total population is under 20 years of age and, in some cases, such as Brazil and Honduras, this group comprises the highest percentage (in the case of Honduras, exceeding 50 percent). The group over 50 years of age represents a smaller proportion of the population (15 percent or less). Only in the case of Argentina and Uruguay does the proportion of those 50 years or older exceed 20 percent. There do not appear to be gender differences in age structure. During the study period, the proportion of young people fell slightly.

There are rather clear patterns in labor participation, as Table 5.2 shows. Over the last two decades, the level of male participation in the labor force has been statistically about 70 percent or higher, except in the case of Argentina, where it fluctuated between 62 and 69 percent with a downward tendency. Conversely, female participation was much lower, but showed a clear increase over the 20-year period that the data cover. The greatest increases in female participation occurred in Brazil, Colombia, and Uruguay, where levels rose from about 34 percent in the early 1980s to nearly 50 percent in the late 1990s. Toward the end of the twentieth century, female participation rates in Argentina (36 percent), Costa Rica (40 percent), and Honduras (35 percent) were lagging behind those of the other countries (50 percent).

The relationship between labor participation and age takes the form of an inverted U: it is lower for younger and older people, and higher for those in between. The highest levels are observed in the 30- to 40-year-olds, which is the general rule for both men and women (see Table 5.3). In countries with the highest levels of female participation (Brazil, Colombia, and Uruguay), participation of this age group exceeds 70 percent. There is no evidence to indicate that women interrupt their labor activity to bear and raise children and afterwards re-enter the market; that is, fluctuations in their level of participation are not observed.[9]

[9] If women left the labor force to bear and raise children and afterwards re-entered the market, one would expect their level of participation to fall during the years in

TABLE 5.1

Age Structure of the Population

Total Population	Argentina		Brazil		Colombia		Costa Rica		Honduras		Uruguay	
Age	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Under 20	42.2	38.4	42.6	39.5	41.4	36.9	40.7	37.5	56.1	50.7	34.6	30.0
20 to 29	16.0	15.8	16.9	16.9	17.6	18.5	17.5	16.1	14.8	16.5	14.6	13.7
30 to 39	12.7	13.1	14.6	15.3	15.6	16.6	14.4	14.6	10.4	11.9	13.1	12.6
40 to 49	11.3	11.6	11.3	11.6	10.9	11.8	11.1	12.4	8.0	8.6	11.9	12.2
50 and over	17.7	21.0	14.7	16.7	14.6	16.2	16.3	19.3	10.8	12.4	25.9	31.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Employed												
Age	Argentina		Brazil		Colombia		Costa Rica		Honduras		Uruguay	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Under 20	5.5	4.5	14.2	11.7	6.8	6.2	7.7	6.9	28.0	26.3	6.4	4.8
20 to 29	25.6	26.1	25.9	26.1	25.8	28.5	27.5	28.4	31.8	44.4	23.3	23.6
30 to 39	26.1	27.1	24.6	27.1	29.1	31.3	26.1	28.5	17.8	23.3	23.8	25.3
40 to 49	22.8	24.4	18.5	20.2	20.4	21.6	19.8	21.7	11.7	4.5	21.5	24.0
50 and over	20.0	17.9	16.8	14.9	18.0	12.4	18.8	14.6	10.6	1.5	25.0	22.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(continued on next page)

TABLE 5.1

Age Structure of the Population (*from previous page*)

Unemployed												
Age	Argentina		Brazil		Colombia		Costa Rica		Honduras		Uruguay	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Under 20	18.44	16.46	32.66	28.85	19.82	17.02	28.30	33.50	20.14	13.76	32.15	20.92
20 to 29	33.8	39.64	33.15	37.26	38.25	43.01	37.30	36.10	26.62	27.83	34.18	37.31
30 to 39	15.79	19.76	15.71	20.42	19.24	25.74	17.00	20.90	20.23	24.8	12.18	17.92
40 to 49	13.78	15.32	10.51	9.90	11.39	10.77	10.20	5.70	15.46	18.47	9.31	14.54
50 and over	18.19	8.83	7.96	3.58	11.29	3.46	7.30	3.80	17.55	15.13	12.18	9.31
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Non-participants												
Age	Argentina		Brazil		Colombia		Costa Rica		Honduras		Uruguay	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Under 20	59.11	33.49	61.66	36.55	59.14	30.68	56.60	28.60	81.69	43.71	28.27	16.09
20 to 29	10.49	15.12	6.87	14.59	10.15	14.94	10.00	14.80	5.98	18.92	5.94	9.34
30 to 39	1.42	10.71	3.03	11.85	2.04	11.99	1.50	12.10	1.08	11.34	1.63	7.87
40 to 49	1.83	9.43	3.77	10.00	2.16	10.99	2.10	12.50	0.92	8.07	2.20	8.41
50 and over	27.14	31.25	24.68	27.02	26.5	31.4	29.80	31.90	10.33	17.95	61.96	58.29
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

TABLE 5.2

Levels of Participation and Unemployment (%)

		Participation Rate		Unemployment Rate	
Country	Year	Men	Women	Men	Women
Argentina	1980	66.43	28.07	1.89	3.57
	1989	68.26	34.83	6.79	6.84
	1998	62.48	35.89	10.00	11.82
Brazil	1981	73.08	33.10	4.57	4.61
	1989	75.02	38.91	3.34	3.09
	1998	73.14	47.78	7.60	12.08
Colombia	1981	69.86	36.46	6.40	9.55
	1989	74.26	41.91	9.07	15.19
	1998	73.98	50.87	17.29	24.04
Costa Rica	1981	71.77	31.06	9.21	10.30
	1989	72.28	35.08	3.86	4.54
	1998	72.31	40.57	4.66	6.66
Honduras	1989	71.14	28.58	4.54	4.75
	1998	71.94	35.30	3.27	3.05
Uruguay	1981	73.07	36.72	5.31	8.28
	1989	74.13	43.59	6.12	10.68
	1998	73.39	49.18	7.92	13.39

TABLE 5.3

Levels of Male and Female Participation by age (%) 1998

	Argentina		Brazil		Colombia	
Age	Men	Women	Men	Women	Men	Women
Under 20	15.93	8.91	40.72	25.63	30.28	22.84
20 to 29	80.76	50.65	91.30	63.26	88.68	68.94
30 to 39	96.70	57.85	95.56	67.03	97.44	72.12
40 to 49	95.22	58.05	92.83	63.38	96.11	64.14
50 and over	54.90	23.13	64.05	31.42	64.33	25.27
Total	62.48	35.88	73.14	47.78	73.98	50.87

	Costa Rica		Honduras		Uruguay	
Age	Men	Women	Men	Women	Men	Women
Under 20	28.60	17.08	39.04	15.00	45.26	29.56
20 to 29	88.00	57.04	92.00	44.96	91.81	72.49
30 to 39	97.80	61.18	97.95	54.35	97.48	74.90
40 to 49	96.08	52.92	97.71	54.96	96.26	72.36
50 and over	61.52	22.89	81.13	30.91	51.65	25.47
Total	72.31	40.57	71.94	35.30	73.39	49.18

TABLE 5.4

Average Years of Education

		Employed		Unemployed		Non-participants	
Country	**Year**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**
Argentina	1980	6.0	6.5	5.4	5.5	4.7	5.1
	1989	7.1	8.1	6.5	7.3	6.2	6.4
	1998	9.7	10.9	8.6	9.8	7.5	8.0
Brazil	1981	4.6	5.5	5.0	6.5	3.6	3.6
	1989	5.2	6.3	5.5	7.1	3.7	4.1
	1998	5.9	6.9	6.3	7.2	4.5	4.8
Colombia	1981	7.5	7.1	7.4	7.7	6.9	6.2
	1989	7.9	8.3	7.5	8.2	6.9	6.5
	1998	8.5	9.0	8.2	8.9	6.9	6.8
Costa Rica	1981	7.8	8.7	6.9	8.0	7.5	6.8
	1989	8.3	9.2	7.3	7.6	6.9	6.8
	1998	9.1	10.0	8.0	8.8	7.3	7.3
Honduras	1989	4.6	6.1	6.4	8.4	4.5	4.1
	1998	5.4	6.7	6.7	9.0	5.0	4.7
Uruguay	1981	7.4	7.6	7.2	8.2	5.8	6.1
	1989	8.0	8.2	8.0	9.0	6.3	6.3
	1998	8.8	9.8	8.2	9.1	6.9	7.1

One of the more interesting aspects of the Latin American labor force is that education levels have increased significantly, especially for women (Table 5.4). In Argentina, Costa Rica, and Uruguay, women's average education levels at the end of the twentieth century were almost a year higher than those of men. In Colombia and Honduras, women not participating in the labor force had less education than men, while those in the labor force had 0.5–1 year more education than men.[10]

Unemployment levels (Table 5.2) are higher for women in all countries except Honduras—the country with the lowest female participation. In Argentina—the country with the second-lowest female participation—levels are higher for women, but the difference is very

which this occurs, followed by subsequent increases. One does not observe this in the available data, which leads one to think that maternity leave is short-term and that women have child care alternatives (extended family, domestic help, etc.).

[10] In general, those not participating in the labor force had lower education levels than those who participated. This suggests the presence of self-selection among both men and women, but especially women.

small. Conversely, in Brazil, Colombia, and Uruguay in 1998,[11] female unemployment levels were substantially higher than male levels. This seems to indicate a behavioral pattern worth analyzing in more depth: as female participation increases, difficulties in securing employment also increase, relative to men. The case of Brazil is important because it displays one of the greatest increases in level of participation between 1989 and 1998 (10 percentage points) and, at the same time, it presents increases in female unemployment (from 3 percent in 1989 to 12 in 1998). These two factors seem to indicate that the Brazilian economy had serious difficulties in absorbing the growing female labor supply over the last decade.

Gross income differences by gender: initial look

Before looking at the results of the income comparisons, it is important to clarify certain concepts. First, one must distinguish between the incomes of wage earners (employees and workers) and those of non-wage earners (independent workers and employers). Second, some comparisons are based on hourly income, while others are based on weekly or monthly income, by country. The estimates of income differentials are always expressed in terms of percentages to avoid the problem of measurement units. In all estimates, but less so in the regression analysis, these percentages are arithmetical and are defined as follows:

$$D = \frac{\textit{Male income}}{\textit{Female income}} - 1 * 100 \tag{3}$$

In the regression analysis, the differentials are measured geometrically, as the difference in the natural logarithm between two incomes. It is important to keep these different methods in mind because they introduce comparison problems between the results of the analysis presented below and the regression analysis presented subsequently.[12]

[11] The case of Brazil is surprising and requires more analysis. Levels of male and female unemployment were low and very similar (less than 5 percent). However, in 1998, the female level climbed to levels above 12 percent, while the male level grew to 8%. According to these figures, it would seem that Brazil's unemployment problem at the end of the century was almost exclusively a women's issue.

[12] For example, the arithmetic differential of 100 equals a geometric differential of 69.31.

TABLE 5.5

Monthly Income Differential* Between Men and Women (%)

	Wage-Earning			Non-Wage Earning		
	1981	1989	1998	1981	1989	1998
Argentina	43.50**	36.48	34.74	86.99**	136.01	49.55
Brazil	62.89	55.86	40.33	171.78	124.22	103.76
Colombia	38.72	28.73	14.70	67.71	81.08	58.61
Costa Rica	16.65	32.18	21.04	81.62	83.48	124.89
Honduras		9.39	7.08		55.91	44.88
Uruguay	62.71	59.78	52.18	62.71	139.91	62.88

* Arithmetic percentage: Average male income minus average female income
** Values for Argentina are actually for 1980.

Table 5.5 summarizes the differences in monthly income. From this table, various important conclusions can be drawn. First, with the exception of Costa Rica, wage gaps in Latin America reveal a clear tendency to narrow. In the case of Costa Rica, the differential climbed between 1981 and 1989, but since then, it seems to have been slowly falling (in 1998, it still had not recovered to the 1981 level). Second, this tendency is not observed in non-wage differentials (independent workers and employers), except in the case of Brazil. Third, non-wage income differentials appear higher and more volatile than wage differentials. This is not surprising given that non-wage incomes are measured using a greater margin of error than wages and because determining such incomes involves factors not only of the labor market, but also those of the capital market, such as access to credit, inputs, physical capital, etc.

Initial decompositions: expected income differences

In this section we expand the analysis of monthly income differentials to consider other aspects, such as hourly-income differences and differences in access to employment. In principle, one can define expected income as the product of three factors: employment opportunities, hours worked, and hourly income. If we refer to specific age and education groups, one could express the expected income of an individual of age *i* and education *j* as follows:

$$Y_{i,j}^{k} = E_{i,j}^{k} \cdot W_{i,j}^{k} \cdot H_{i,j}^{k} \qquad (4)$$

k = m, f (m = male, f = female)

where Y represents expected salary; E equals the employment level (one minus level of unemployment) that can be expected as the average probability of securing employment, W is the hourly wage of the group, and H represents the group's average hours worked. The wage differential for the group i, j, in terms of percentages, can be obtained from the logarithmic difference as follows:

$$D_{i,j} = \ln\left(Y_{i,j}^{m}\right) - \ln\left(Y_{i,j}^{f}\right) = \left\{\ln\left(E_{i,j}^{m}\right) - \ln\left(E_{i,j}^{f}\right)\right\} + \left\{\ln\left(W_{i,j}^{m}\right) - \ln\left(W_{i,j}^{f}\right)\right\} + \left\{\ln\left(H_{i,j}^{m}\right) - \ln\left(H_{i,j}^{f}\right)\right\} \quad (5)$$

Starting from this definition, one can obtain average accumulated differentials for different age levels (accumulating the differentials of each group j, fixed i), or for different education levels (accumulating the differentials of each group i, fixed j). For example, the differential for each education level j would be expressed as follows:

$$D_j = D_{ij}\frac{n_{ij}}{n_{ij}} = \frac{n_{ij}}{n_{ij}}\left[\ln\left(E_{i,j}^{m}\right) - \ln\left(E_{i,j}^{f}\right)\right] + \frac{n_{ij}}{n_{ij}}\left[\ln\left(W_{i,j}^{m}\right) - \ln\left(W_{i,j}^{f}\right)\right] + \frac{n_{ij}}{n_{ij}}\left[\ln\left(H_{i,j}^{m}\right) - \ln\left(H_{i,j}^{f}\right)\right] \quad (6)$$

Table 5.6 summarizes the above decomposition. The advantage of this decomposition is that it allows one to observe the weight of each of the three components of expected income: employment opportunities, hourly wage differences, and hours worked. As one can see, there are important differences between the decreasing tendencies that we found earlier in the monthly wage differential and expected income behavior. What we now find is more erratic behavior of highs and lows in the expected-income differential. In the cases of Colombia, Costa Rica, Honduras, and Uruguay, we find that the component that corresponds to hourly wages tends to decrease, but this tendency is counteracted by increases in the differential of employment opportunities or hours worked. In all of the countries, one observes an increase in the difference between the weekly hours worked by men and women.[13] In such cases as

[13] Given that women usually have primary responsibility for child care and household duties, one could expect they would work fewer weekly hours than men. Never-

TABLE 5.6

Decomposition of Expected Weekly Income Differences Between Men and Women (%)

	Wage -Earning			Non Wage-Earning		
Argentina	**1980**	**1989**	**1998**	**1980**	**1989**	**1998**
Employment Opportunities	1.56	0.19	3.31	1.56	0.19	3.31
Hourly Wage	15.13	25.61	11.34	22.75	26.61	11.34
Hours Worked	17.97	17.68	30.18	35.13	40.68	30.18
Total	34.66	43.49	44.82	59.44	67.49	44.82
Brazil	**1981**	**1989**	**1998**	**1981**	**1989**	**1998**
Employment Opportunities	–0.87	–0.69	5.84	–0.87	–0.69	5.84
Hourly Wage	47.68	49.58	33.74	52.39	50.88	36.90
Hours Worked	8.22	8.97	11.60	38.03	35.27	35.58
Total	55.03	57.86	51.17	89.55	85.45	78.31
Colombia	**1981**	**1989**	**1998**	**1981**	**1989**	**1998**
Employment Opportunities	2.09	6.07	8.02	2.09	6.07	8.02
Hourly Wage	19.21	15.89	5.80	–0.14	26.35	15.98
Hours Worked	1.96	6.12	8.09	16.79	19.09	25.55
Total	23.25	28.08	21.91	18.75	51.51	49.55

(continued on next page)

TABLE 5.6

Decomposition of Expected Weekly Income Differences Between Men and Women (%) *(continued)*

	Wage -Earning			Non Wage-Earning		
Costa Rica	**1981**	**1989**	**1998**	**1981**	**1989**	**1998**
Employment Opportunities	0.92	0.94	2.65	0.92	0.94	2.65
Hourly Wage	23.25	22.71	16.58	−14.29	21.57	5.65
Hours Worked	7.40	11.29	16.16	37.02	44.11	49.94
Total	31.57	37.10	33.48	23.65	66.62	58.24
Honduras		**1989**	**1998**		**1989**	**1998**
Employment Opportunities		−3.16	−1.69		−3.16	−1.69
Hourly Wage		34.34	4.85		36.87	18.74
Hours Worked		−0.24	6.48		13.90	25.85
Total		30.94	9.64		47.60	42.91
Uruguay	**1981**	**1989**	**1998**	**1981**	**1989**	**1998**
Employment Opportunities	3.31	5.17	7.44	3.31	5.17	7.44
Hourly Wage	29.88	12.65	11.53	45.02	69.24	22.45
Hours Worked	19.53	20.10	23.75	34.13	28.71	22.05
Total	52.72	37.92	42.72	82.46	103.11	51.94

Brazil and Uruguay, this is the main component of the differential in expected weekly income; in other cases, it figures less prominently, as in the case of Honduras and of Colombia in 1981 and 1989. Differences in employment opportunities, generally, play a relatively small part in explaining income differential; in some cases, they favor women, as in the cases of Honduras and Brazil in the 1980s and early 1990s. Only in the case of Brazil in 1998 and, to a lesser extent, Colombia in 1989 and 1998, does this factor figure importantly. In the case of Brazil, we recall that it may be related to the market's difficulty in absorbing the growing female labor supply, as can be observed in its increasing unemployment rate.

Generalizing from the data presented in Table 5.6, one would have to say that there are two fundamental reasons why women receive lower monthly incomes than do men: the fact that they have a lower hourly wage and that they work fewer hours per week. Differences in employment opportunities appear to be important in Colombia and Uruguay, as well as in Brazil in 1998.

In summary, the principal findings of the above analysis are: first, there is clearly a tendency to equalize monthly wages, but not non-wage income, between men and women. Second, with the exception of Argentina, one also observes a tendency to equalize hourly wages. Third, the differential between men and women of hours worked per week has been growing, counteracting, in part, the tendency toward equalization of hourly wages. Fourth, important differences are apparent in employment opportunities between men and women in Colombia, Brazil (1998 only), and Uruguay.

Determinants of hourly income: regression analysis

Because the simple comparison of charts and tables makes it too difficult to control for all factors that intervene in determining incomes of men and women, the regression-analysis technique is commonly used. As mentioned, one of the most common models for this purpose is the

theless, the fact that the difference in hours worked between men and women increases at the same time that the level of female participation increases raises important questions. There are at least two hypotheses to analyze: one, that women entering the labor force for the first time work fewer hours (supply-side explanation); and two, that the new female labor supply has difficulties in the market, which are manifested in fewer hours worked.

human capital model—Mincer's income model—the simplest form of which is as follows:

$$\ln(W) = \beta_0 + \beta_1 Yedu + \beta_2 Exp + \beta_3 Exp^2 + \eta \tag{7}$$

where *W* equals hourly wage, *Yedu* represents years of education, *Exp* equals years of experience, and η represents the random error, with the usual characteristics (normal distribution, expected value of zero, constant variance, independence between observations and orthogonality with the regressions).

With some frequency, these models make estimates using the monthly or weekly wage as a dependent variable. We prefer not to use this because the correlation between wage and hours worked definitions implies incorporating this last variable into the regression, thereby introducing the problem of simultaneity, which can bias the estimates.[14] The experience variable (*Exp*) appears in the squared form in order to capture the decreasing marginal output of that variable. This implies that $\beta_2 > 0$ and $\beta_3 < 0$. In principle, the experience variable should measure the time that an individual has worked, but generally such information does not exist. Lacking an effective measurement of experience, one can use a measure of potential experience, defined as years of age minus years of education minus 5 (assuming that the person enters the education system at five years of age). As previously discussed, it is common for the above model to use the Heckman techniques to correct the problem of selectivity.

The Mincerian equations were estimated for men and women, with and without selectivity correction, for wage earners and non-wage earners, for each of the six countries studied. The dependent variable, as mentioned previously, is hourly income. In the cases of Brazil and Costa Rica, where surveys included information on the various jobs that a person could hold, income and hours dedicated to the main occupation were used. In cases where such a distinction was not made, total labor income and total labor hours were used.

[14] The problem of simultaneity arises because weekly income depend on hours worked, which are an endogenous variable in the system. Under these conditions, the use of least squares generates biased estimates (bias of simultaneity). The solution to this problem requires special estimation techniques (estimation of simultaneous equations, use of instrumental variables, etc.).

To correct for the selectivity bias, a version of the Heckman methodology was used in which the selectivity and income equations were estimated simultaneously, using a method of maximum likelihood,[15] which increases robustness. The selectivity equation was modeled as a labor participation equation, whereby measures of a person's reservation wage and the opportunity cost of not working were included as explanatory variables. Indicators of reservation wage included the following: remaining household income (family income minus labor income of the observed individual), a qualitative variable that indicates whether the individual is participating in the education system, a variable that indicates whether the individual is married, and a variable that indicates whether the individual is a household head. As indicators of the opportunity cost of not working, the education level and age were included in the squared form to capture the effect of the life cycle. In addition, a variable was included to measure level of household unemployment, defined as the number of unemployed family members divided by the number of participants.

Results of estimates

As indicated previously, equations for male and female wage-earners and non-wage earners were estimated with and without selectivity correction. A summary of these results is presented in Tables 5.7A and B.

In general, the quality of the results is good. In the estimates corrected for selectivity bias, the selectivity equations, for the most part, have a sizeable number of significant variables, and the signs are those expected. The income equations present the correct signs and high levels of significance, and the results are generally consistent. Because the Heckman estimate is made using the method of maximum likelihood and includes the estimation of a nonlinear equation, there is no coefficient that indicates the degree of goodness of fit (such as the R-square of linear equations). However, the hypothesis of which the coefficients of the system of equations equal zero are clearly reflected in all cases where the Chi-square test is based on the likelihood coefficient.

The equations without the selectivity correction are also of sound quality. The R-square coefficients vary between 0.15 and 0.5, which is

[15] In the original version of Heckman, the estimate is made in two steps: first, a probit model is estimated and second, the regression equation is estimated.

TABLE 5.7A

Summary of Results of Income Equation Estimates for Wage Earners

		Men			Women		
Argentina		**1980**	**1989**	**1998**	**1980**	**1989**	**1998**
Corrected for Selectivity	Yedu	0.07652 **	0.12796 **	0.10339 **	0.08525 **	0.11681 **	0.11224 **
	Exp	0.04371 **	0.04591 **	0.04742 **	0.03975 **	0.03716 **	0.04150 **
	Exp2	–0.00061 **	–0.00063 **	–0.00056 **	–0.00062 **	–0.00053 **	–0.00050 **
	lambda	0.19323 **	0.07960	0.01030	0.08832 *	0.10047 *	0.18156 **
	Constant	0.54492 **	1.87924 **	–0.73343 **	0.49782 **	1.82780 **	–0.99813 **
Uncorrected for Selectivity	Yedu	0.07669 **	0.12537 **	0.10332 **	0.08251 **	0.11014 **	0.10369 **
	Exp	0.03619 **	0.04269 **	0.04694 **	0.03783 **	0.03427 **	0.03475 **
	Exp2	–0.00046 **	–0.00057 **	–0.00055 **	–0.00057 **	–0.00047 **	–0.00037 **
	lambda						
	Constant	0.73350 **	1.99305 **	–0.72132 **	0.61093 **	2.01786 **	–0.67010 **
Brazil		**1981**	**1989**	**1998**	**1981**	**1989**	**1998**
Corrected for Selectivity	Yedu	0.17618 **	0.18177 **	0.15840 **	0.19151 **	0.19274 **	0.18325 **
	Exp	0.01723 **	0.01568 **	0.02945 **	0.02509 **	0.02351 **	0.02795 **
	Exp2	–0.00002 **	–0.00002 **	–0.00003 **	–0.00003 **	–0.00002 **	–0.00003 **
	lambda	0.46033 **	0.57043 **	–0.45798 **	0.18260 **	0.28002 **	0.41764 **
	Constant	2.92189 **	–0.59313 **	–0.85150 **	2.31457 **	–1.17167 **	–1.88314 **
Uncorrected for Selectivity	Yedu	0.17537 **	0.18395 **	0.164.84 **	0.18877 **	0.19117 **	0.17128 **
	Exp	0.02472 **	0.02552 **	0.02552 **	0.02811 **	0.02811 **	0.03308 **
	Exp2	–0.00003 **	–0.00003 **	–0.00003 **	–0.00003 **	–0.00003 **	–0.00003 **
	lambda						
	Constant	2.97509 **	–0.54711 **	–1.44804 **	2.34132 **	–1.14068 **	–1.64555 **

** Significant at 5%. * Significant at 10%

(*continued on next page*)

TABLE 5.7A

Summary of Results of Income Equation Estimates for Wage Earners (*continued*)

		Men			Women		
Colombia		**1981**	**1989**	**1998**	**1981**	**1989**	**1998**
Corrected for Selectivity	Yedu	0.12509 **	0.10781 **	0.11777 **	0.12709 **	0.12284 **	0.13660 **
	Exp	0.04702 **	0.03956 **	0.03888 **	0.04650 **	0.04115 **	0.02886 **
	Exp2	–0.00054 **	–0.00046 **	–0.00042 **	–0.00064 **	–0.00053 **	–0.00027 **
	lambda	–0.03258 **	0.07931 **	0.04073 **	0.11131 **	0.15470 **	0.24886 **
	Constant	2.30996 **	4.21093 **	5.76764 **	2.06430 **	3.83076 **	5.38868 **
Uncorrected for Selectivity	Yedu	0.12426 **	0.10664 **	0.11668 **	0.11365 **	0.11403 **	0.11303 **
	Exp	0.04917 **	0.03617 **	0.03683 **	0.03680 **	0.03655 **	0.01832 **
	Exp2	–0.00060 **	–0.00039 **	–0.00038 **	–0.00048 **	–0.00043 **	–0.00009 **
	lambda						
	Constant	2.27363 **	4.30743 **	5.83654 **	2.37200 **	4.09161 **	6.01312 **
Costa Rica		**1981**	**1989**	**1998**	**1981**	**1989**	**1998**
Corrected for Selectivity	Yedu	0.13527 **	0.10760 **	0.11363 **	0.19471 **	0.13714 **	0.13257 **
	Exp	0.04050 **	0.03983 **	0.01710 **	0.06284 **	0.03684 **	0.02817 **
	Exp2	–0.00017 **	–0.00043 **	–0.00003	–0.00063 **	–0.00039 **	–0.00032 **
	lambda	–0.73602 **	–0.18052 **	–0.09165 *	–0.08889	0.10549 **	0.12805
	Constant	2.39196 **	4.65446 **	6.46396 **	1.11454 **	3.93333 **	5.94833 **
Uncorrected for Selectivity	Yedu	0.14617 **	0.10921 **	0.11529 **	0.19964 **	0.13243 **	0.12575 **
	Exp	0.08334 **	0.04690 **	0.02251 **	0.06613 **	0.03386 **	0.02254 **
	Exp2	–0.00093 **	–0.00057 **	–0.00011 *	–0.00070 **	–0.00032 **	–0.00022 **
	lambda						
	Constant	1.39405 **	4.43806 **	6.35966 **	0.94363 **	4.11187 **	6.17245 **

** Significant at 5%. * Significant at 10%

(*continued on next page*)

TABLE 5.7A

Summary of Results of Income Equation Estimates for Wage Earners *(continued)*

		Men			Women		
Honduras			**1989**	**1998**		**1989**	**1998**
Corrected for Selectivity	Yedu		0.15613 **	0.12440 **		0.21074 **	0.15233 **
	Exp		0.05778 **	0.04725 **		0.06372 **	0.03713 **
	Exp2		−0.00066 **	−0.00062 **		−0.00071 **	−0.00048 **
	lambda		0.08813	0.16242 **		0.24307 **	0.17342 **
	Constant		−1.38760 **	0.46818 **		−2.40382 **	0.13963
Uncorrected for Selectivity	Yedu		0.15232 **	0.11990 **		0.20166 **	0.15294 **
	Exp		0.05415 **	0.04222 **		0.05894 **	0.03567 **
	Exp2		−0.00060 **	−0.00052 **		−0.00057 **	−0.00038 **
	lambda						
	Constant		−1.24962 **	0.68121 **		−2.09707 **	0.24445 **
Uruguay		**1981**	**1989**	**1998**	**1981**	**1989**	**1998**
Corrected for Selectivity	Yedu	0.09760 **	0.09998 **	0.11724 **	0.12905 **	0.08497 **	0.12759 **
	Exp	0.05200 **	0.03913 **	0.05117 **	0.03664 **	0.05207 **	0.04554 **
	Exp2	−0.00067 **	−0.00035 **	−0.00056 **	−0.00045 **	−0.00076 **	−0.00054 **
	lambda	0.22428 **	−0.25093 **	−0.01243 **	0.32521 **	0.14446 **	0.12821 **
	Constant	1.32469 **	−1.59761 **	1.49019 **	0.82807 **	−2.04475 **	1.14627 **
Uncorrected for Selectivity	Yedu	0.10252 **	0.09986 **	0.11737 **	0.12477 **	0.08064 **	0.12104 **
	Exp	0.05458 **	0.04792 **	0.05108 **	0.03822 **	0.04571 **	0.04004 **
	Exp2	−0.00067 **	−0.00053 **	−0.00056 **	−0.00043 **	−0.00062 **	−0.00044 **
	lambda						
	Constant	1.32292 **	−1.83136 **	1.48070 **	0.99819 **	−1.81623 **	1.37703 **

** Significant at 5%. * Significant at 10%

TABLE 5.7B

Summary of Results of Income Equation Estimates for Non–wage Earners

		Men			Women		
Argentina		**1980**	**1989**	**1998**	**1980**	**1989**	**1998**
Corrected for Selectivity	Yedu	0.039291 **	0.1283808 **	0.1086325 **	0.0462823 **	0.1386122 **	0.1096334 **
	Exp	–0.0275819 **	0.0387601 **	0.0301622 **	–0.0098483	0.0672587 **	0.0259406 **
	Exp2	0.0004945 **	–0.0005408 **	–0.0003002 **	0.0000245	–0.0010636 **	–0.0002995 **
	lambda	–0.7744415 **	0.039976	0.0484997	–0.5112149 **	0.5545133 **	0.0938446
	Constant	2.972931 **	2.058709 **	–0.7298257 **	2.515988 **	0.4114257	–0.9587615 **
Uncorrected for Selectivity	Yedu	0.0631563 **	0.1263807 **	0.1082908 **	0.067428 **	0.1214479 **	0.1077369 **
	Exp	0.0149769	0.0366564 **	0.0277139 **	0.0160574	0.0442932 **	0.0217188 **
	Exp2	–0.0001349	–0.0005121 **	–0.000268 **	–0.0003335	–0.0007318 **	–0.0002409 **
	lambda						
	Constant	1.249295 **	2.161734 **	–0.6259089 **	1.079303 **	1.830839 **	–0.7100193 **
Brazil		**1981**	**1989**	**1998**	**1981**	**1989**	**1998**
Corrected for Selectivity	Yedu	0.1792534 **	0.1841779 **	0.15504 **	0.2213884 **	0.2026238 **	0.1831489 **
	Exp	–0.0101199 **	0.0401812 **	–0.0031 **	0.0065561 *	0.0376701 **	0.0001135
	Exp2	9.10E–06 **	–0.0005286 **	2.40E–06 **	–0.0002414 **	–0.0004347 **	8.52E–07
	lambda	–1.28832 **	–0.5681694 **	–0.88273 **	–1.004952 **	–0.2200181 **	–1.088393 **
	Constant	5.397036 **	0.4048457 **	0.721443 **	4.152429 **	–0.6708235 **	0.7410546 **
Uncorrected for Selectivity	Yedu	0.1695694 **	0.1850761 **	0.167668 **	0.1852633 **	0.1999879 **	0.1684651 **
	Exp	0.0125923 **	0.0595422 **	0.0134469 **	0.0538177	0.0468688 **	0.0297355 **
	Exp2	–0.000013 **	–0.0006691 **	–1.40E–05 **	–0.0006565	–0.0005094 **	–0.000254 **
	lambda						
	Constant	3.391081 **	–0.6287987 **	–0.74199 **	2.201022 **	–1.100511 **	–1.319663 **

** Significant at 5%. * Significant at 10%

(continued on next page)

TABLE 5.7B

Summary of Results of Income Equation Estimates for Non-Wage Earners (*continued*)

		Men			Women		
Colombia		**1981**	**1989**	**1998**	**1981**	**1989**	**1998**
Corrected for Selectivity	Yedu	0.1367996 **	0.1255607 **	0.1284907 **	0.1659487 **	0.1212788 **	0.1304239 **
	Exp	0.0093865	0.011605 **	0.0180533 *	−0.0016803	0.0123122 **	0.0209247 **
	Exp2	−0.000121 *	−0.0000937 *	−0.000143	0.0001679	−0.000142 **	−0.0002036 **
	lambda	−0.8165889 **	−0.4932008 **	−0.2967167 **	−0.4784636 **	−0.2633302 **	−0.1379788 **
	Constant	3.934251 **	5.137207 **	6.145314 *	3.172399 **	4.692069 **	5.74146 **
Uncorrected for Selectivity	Yedu	0.1386044 **	0.1256345 **	0.1243154 **	0.1593829 **	0.1233239 **	0.1295974 **
	Exp	0.0528875 **	0.0382042 **	0.0324453 **	0.0258559 **	0.025824 **	0.027405 **
	Exp2	−0.000646 **	−0.000416 **	−0.0003342 **	−0.0002398 **	−0.0003187 **	−0.0003008 **
	lambda						
	Constant	2.172361 **	4.140707 **	5.64373 **	2.021012 **	4.049416 **	5.466831 **
Costa Rica		**1981**	**1989**	**1998**	**1981**	**1989**	**1998**
Corrected for Selectivity	Yedu	0.0875613 **	0.0602775 **	0.0778668 **	0.0994913 **	0.102866 **	0.0709257 **
	Exp	0.0120436	0.0097146	0.0049996	−0.0109177	−0.0044099	0.0037741
	Exp2	−0.000102	−0.0001561	−0.000053	0.0001308	0.0001443	−0.0001015
	lambda	−0.8692793 **	−0.2159001	−0.2408958	−0.6555195 *	−0.0072639	0.1094884
	Constant	4.10892 **	5.755845 **	7.137339 **	4.318337 **	4.965446 **	6.515705 **
Uncorrected for Selectivity	Yedu	0.0884311 **	0.0592401 **	0.077198 **	0.0888966 **	0.1028188 **	0.0718142 **
	Exp	0.0520457 **	0.0195834 **	0.0191756 **	0.0103129	−0.0040613	−0.0007354
	Exp2	−0.0005403 **	−0.0002649 **	−0.0002164 **	−0.0001237	0.0001397	−0.0000412
	lambda						
	Constant	2.172106 **	5.280545 **	6.589785 **	2.65441 **	4.947112 **	6.766678 **

** Significant at 5%. * Significant at 10%

(*continued on next page*)

TABLE 5.7B

Summary of Results of Income Equation Estimates for Non-Wage Earners *(continued)*

		Men			Women		
Honduras			**1989**	**1998**		**1989**	**1998**
Corrected for Selectivity	Yedu		0.1549502 **	0.1351815 **		0.1151307 **	0.1176319 **
	Exp		0.0534534 **	–0.0099898		0.020293 *	–0.0090775
	Exp2		–0.0005224 **	0.000177		–0.000178	0.0001017
	lambda		0.1887022	–0.7642577 **		–0.0832396 **	–0.5259871 **
	Constant		–1.67483 **	2.264359 **		–0.8439794 **	2.008413 **
Uncorrected for Selectivity	Yedu		0.1592289 **	0.140727 **		0.1152319 **	0.1241244 **
	Exp		0.0430697 **	0.0386009 **		0.0256974 **	0.0228348 **
	Exp2		–0.0004131 **	–0.0003684 **		–0.0002392 **	–0.0002576 **
	lambda						
	Constant		–1.316651 **	0.5901857 **		–1.059607 **	0.716527 **
Uruguay		**1981**	**1989**	**1998**	**1981**	**1989**	**1998**
Corrected for Selectivity	Yedu	0.0649013 **	0.1020931 **	0.1362972 **	0.0943769 **	0.1501109 **	0.1493258 **
	Exp	0.0050703	0.019547 **	0.0325893 *	–0.0184689	0.0673458 **	0.031734 **
	Exp2	–0.0002295 *	–0.0002051 *	–0.0002793	0.0000839	–0.0008067 **	–0.0002686 **
	lambda	–0.9169072 **	–0.3976155 **	–0.071955 **	–1.027434 **	0.8566226 **	0.1603064 **
	Constant	3.901792 **	–0.8655887 **	1.563184 *	3.59998 **	–4.584184 **	0.7730191 **
Uncorrected for Selectivity	Yedu	0.1011535 **	0.1118395 **	0.1380252 **	0.1209946 **	0.1133503 **	0.139658 **
	Exp	0.0435466 **	0.036898 **	0.0359995 **	0.016576 *	0.0333972 **	0.0254466 **
	Exp2	–0.000561 **	–0.0004245 **	–0.0003248 **	–0.000207 **	–0.0004065 **	–0.0002013 **
	lambda						
	Constant	1.636437 **	–1.774065 **	1.404174 **	1.315938 **	–2.284962 **	1.246594 **

** Significant at 5%. * Significant at 10%

typical of this type of estimate.[16] In general, the estimates for wage earners (whether using the method of maximum likelihood or least squares) are of higher quality than the methods for non-wage earners because the former group's income is more accurately measured and more stable than that of the latter.

It is noteworthy that the selectivity correction seems to have only a small effect in estimating returns to education. In most cases, returns to education in the corrected equations were between only 0.5 and 1 percentage point less than in the uncorrected equations only. Returns to experience appear to be more sensitive to the selectivity correction, but the direction in which they are affected is unclear.

The selectivity correction has an added effect in this analysis. Since this equation is based, in part, on relevant household variables—such as income of the rest of the family—the Heckman procedure excludes individuals that live in the home, but that are not part of the family (for example, domestic-service employees). As we will see further on, this seems to be more important in some countries than in others.

In general, only Costa Rica and Honduras show a clear difference in returns to education for women and men (in favor of men). For the other countries, the differences are very small and change from one year to the next.

The potential-experience variable enters into the equations in squared form; therefore, its returns depend on the levels. In Table 5.8, returns are estimated at average levels of potential experience. Moreover, the squared form includes the possibility of marginal returns to experience (level of return) increasing or decreasing and existing at a level that maximizes or minimizes the variable's effect. This makes it possible to identify a critical level of experience,[17] from which the outputs change direction. By comparing this critical point with the average levels of experience, one can determine whether the yields from experience are increasing or decreasing. Results indicate that, in the majority of cases, levels of return increase with experience.

An apparent trend among wage earners is that the average rate of return to experience is higher for men than for women in Argentina and

[16] Cross-sectional estimates such as these always include a significant magnitude of statistical "noise" that makes the R-square coefficients of 0.5 considered high.

[17] The critical level of experience is expressed by $-\beta_2/(2*\beta_3)$. The conditions for a maximum and minimum are: maximum: $\beta_2 > 0$ and $\beta_3 < 0$; minimum: $\beta_2 < 0$ and $\beta_3 > 0$.

TABLE 5.8

Average Returns to Experience (%)

	With Selectivity Correction						Without Selectivity Correction					
	Men			Women			Men			Women		
	1981	1989	1998	1981	1989	1998	1981	1989	1998	1981	1989	1998
Wage Earners												
Argentina	4.2	3.0	4.6	2.6	2.6	4.0	2.5	2.9	3.5	2.5	2.4	2.7
Brazil	1.6	1.5	2.8	2.4	2.3	1.9	2.4	2.4	2.4	2.7	1.8	2.5
Colombia	4.6	3.0	3.1	3.6	3.2	2.4	3.8	2.9	2.9	2.9	2.9	1.7
Costa Rica	3.7	3.1	1.6	5.2	3.0	2.2	6.5	3.6	2.0	5.4	2.8	1.8
Honduras		4.3	3.5		5.1	2.9		4.1	3.2		4.9	2.9
Uruguay	3.6	3.0	3.8	2.7	3.5	3.4	3.2	3.1	3.4	2.5	2.6	2.7
Non–wage Earners												
Argentina	–1.3	2.3	2.2	–0.9	3.7	1.8	1.1	2.2	2.0	0.6	2.4	1.5
Brazil	–1.0	0.7	–0.3	–0.8	1.2	–0.4	1.2	2.7	1.3	1.4	0.4	1.4
Colombia	0.6	0.9	1.4	0.3	0.8	1.6	3.4	2.6	2.3	1.9	1.7	1.9
Costa Rica	0.9	0.5	0.3	–0.7	0.0	0.1	3.6	1.2	1.3	0.6	0.0	–0.2
Honduras		3.6	–0.4		1.5	–0.6		2.9	2.7		1.8	1.5
Uruguay	–0.2	1.3	2.4	–1.6	4.3	2.4	2.5	2.3	2.6	1.0	2.1	2.0

Uruguay. In Brazil and Costa Rica, women had excellent returns in 1981 and 1989, but much lower ones in 1998. In Colombia, the return to experience for men has remained relatively stable, while the return for women tended to decrease over the study period. Returns to experience for non-wage earners are more volatile and do not reveal any clear pattern. In general, the average levels of potential experience are much higher for non-wage earners (independent workers and employers). This can be an indicator of a behavioral pattern in which people start their work life as wage earners and, after a period of time, become independent and start their own businesses. The time spent as wage earners helps them gain sufficient knowledge of the nature of the business and accumulate the basic capital needed to establish independence.

Are there differences between men and women in income equations?

The basic reason to use the income equations is for the Oaxaca decomposition of difference in labor income. An important part of this decomposition is based on the difference between the equations' coefficients. An aspect worth studying is whether there is statistical evidence that the coefficients of the equations for men and women differ.

To determine this, one can use the Chow test,[18] in which the null hypothesis states that the parameters of the income equation for men are equivalent to those for women. Given that this test uses the F distribution, is it necessary to use income equations without the selectivity correction.[19]

The results of the Chow test show that, without exception, the hypothesis of equality of the equations is rejected. This leads one to con-

[18] The Chow test compares the difference in the sum of errors squared between an equation estimated under the assumption that the coefficients are equal (restricted estimate) and another in which the coefficients differ (non-restricted estimate). If the null hypothesis is correct, the difference should be small and vice versa. An F distribution is used for the test with a number of degrees of freedom in the numerator equal to the number of restrictions (parameters in the restricted equation), and in the denominator equal to the number of men, plus the number of women, minus twice the number of estimated coefficients in the equation.

[19] It is possible to design a similar test for equations corrected for selectivity bias; however, given that the estimation method is that of maximum nonlinear likelihood, it is necessary to use the reason of likelihood. Unfortunately, the program does not report the appropriate coefficient; thus, we omitted it.

clude that, in effect, there is strong statistical evidence that the coefficients of the equations for men and women differ.

The implication that the coefficients of the equations differ is the subject of controversy. Some people interpret this difference as evidence of discrimination in the labor force. Others have alternate interpretations. Those who argue that the difference in coefficients reflects different (and possibly discriminatory) treatment between men and women claim that the coefficients reflect the market's rules of the game.

From this empirical point of view, however, one discovers that the coefficients of the equations differ but are not always greater for men. The only coefficient of the income equation that is systematically greater for men is the interceptor of the equations corrected for selectivity (and with a few exceptions, that of the uncorrected equations). The interceptor is the basic wage (income that a person would receive without any education or experience). The wage that a person receives can be interpreted as that basic wage plus the corresponding outputs from different forms of human capital. According to this interpretation, women enter the market with the disadvantage of lower wages because the basic wage is lower and, even though their returns to education are higher, they do not compensate for the initial disadvantage.

In the case of gender wage differences, quality of education differences are especially relevant. Whatever differences in educational quality exist between men and women, they can be reflected in different returns to education, and, in this sense, one can speak of "discrimination." However, it would be a type of discrimination prior to entering the labor market, which would only be reflected in different wages for men and women. This is a point on which much analysis, both theoretical and empirical (especially the latter), is still lacking. However, the available evidence seems to indicate that differences in educational quality are not as relevant as some have argued. In effect, if such a hypothesis were true, the returns to education for women would be lower than those for men; however, what one finds is that at times they are, while, at other times, they are not. In such countries as Colombia, Costa Rica, and Honduras, the returns to education are always greater for women than for men, at least in the equations corrected for selectivity. In the other countries, sometimes the returns for women are greater than those for men; at other times, they are not. In none of the six countries studied are the returns always greater for men than for women.

Something similar occurs with returns to experience. There is no clear pattern that indicates that some returns are greater than others or vice versa. It is important to highlight that, lacking a better measure of experience, the estimates were made with what is called potential experience. This can have implications for the estimates of returns to experience. In the case of men, potential, and possibly actual experience levels are similar, and the differences that exist between the two could be due to periods of unemployment, illness, etc. In the case of women, there exists the possibility of a much larger discrepancy between the two types of experiences because women can be out of the market for long periods of time in order to raise a family. If this were true, the estimated returns to experience would capture this measurement error, which would be manifested in a subestimate of the true returns. However, the statistical data presented previously does not seem to indicate that this temporary retirement is as characteristic of female behavior in Latin America as it can be in other regions,[20] possibly because the family structure (extended family) and the existence of domestic help serve as a support mechanism for the working woman during such time.

In general, what the results discussed thus far indicate is that the structures of the income equations for men and women are statistically different; however, we still do not clearly understand why or what this difference signifies. The Oaxaca decomposition that we present below allows us to revisit these questions.

Decomposition of wage differences

One of the most common methodologies for analyzing wage differences between groups is the Oaxaca decomposition, which divides the average salary differences in two: one component owing to differences in the average productive characteristics of the two groups and the other (residual), which reflects the differences in the coefficients in the income equations. More specifically, the differential can be expressed as follows:

$$\ln(W_m) - \ln(W_w) = (x_m - x_w)\beta_m + X_w(\beta_m - \beta_w)$$

[20] In the statistics, one does not see a decline in the level of female participation during child-raising years, followed by increased levels during older years. Similarly, in the studies on labor participation—and in the equations of selectivity correction presented in this chapter—having children does not seem to have as clear an effect as one might expect (even though it does have some effect). This is not necessarily to say that family obligations do not affect women's labor situation, but that their effect is not manifested so directly in the level of participation or that it is influenced by other factors.

where the subscripts m and w represent men and women, respectively, W reflects the average hourly wage, X_i is the vector of the averages of productive characteristics (education, experience, and experience squared in our case) of group i, and β_i represents the vector of the parameters of the income equation estimated for group i. The fact that the wage differences are in logarithmic terms allows one to interpret them as percentage differences,[21] and, for this reason, the composition does not depend on measurement units of income or wages. The first term to the right of the equals sign reflects the contribution of the differences in human capital (characteristics) between men and women, evaluated in accordance with the returns corresponding to men. The second term represents the contribution of the differences in returns. As we have already stated, this second component is often taken as a measurement of discrimination.[22] The test of coefficient differences previously discussed basically indicates that this last component is statistically significant, except in the case where the difference in coefficients and the measurements of human capital (in the case of men) are orthogonal.

A summary of the results of the Oaxaca decomposition appear in Table 5.9. The conclusions that can be drawn from this summary are as follows:

1. During the period analyzed, one observes a very strong tendency toward a decreased difference in hourly earnings in all countries except Costa Rica. In Argentina, Colombia, and Honduras, the estimated difference through equations corrected for selectivity indicates that, at the end of the study period, women were earning higher wages than men.
2. The same tendency is observed regarding non-wage hourly income (independent workers and employers), although, in this case, the differences are still large (over 15 percent).
3. The main reason for these wage and non-wage gaps decreasing during the study period is the decrease in differences in productive characteristics. For 1998, in all of the countries studied, wage-earning women had higher rates of human capital than did men,

[21] However, by being geometric percentage differences, these differences are not strictly comparable to those presented in the earlier tables, which are arithmetic differentials. In general, geometric differences tend to be smaller than arithmetic ones because they are based on continuous changes, while arithmetic ones assume discrete variations.

[22] There are other forms of wage-differential decomposition, a good number of which are based on changing the weightings of the terms.

TABLE 5.9

Summary of the Oaxaca Decomposition (%)

Wage Earners

		With Selectivity Correction			Without Selectivity Correction		
		1981*	**1989**	**1998**	**1981**	**1989**	**1998**
Argentina	Characteristics	–8.75	–15.48	–12.00	–1.13	–12.70	–11.57
	Remainder	19.61	24.86	8.53	12.17	22.41	8.61
	Total	10.86	9.38	–3.47	11.04	9.71	–2.96
Brazil	Characteristics	–12.26	–16.46	–22.36	–15.07	–19.86	–18.77
	Remainder	46.55	46.79	31.73	48.81	49.62	30.57
	Total	34.29	30.34	9.37	33.74	29.76	11.79
Colombia	Characteristics	–0.71	–9.20	–9.41	11.54	0.00	–3.36
	Remainder	11.67	16.27	8.29	13.27	16.09	5.91
	Total	10.97	7.07	–1.12	24.81	16.09	2.55
Costa Rica	Characteristics	22.59	–3.17	–2.98	–6.62	–8.33	–7.41
	Remainder	–15.17	16.70	10.08	15.46	22.06	14.81
	Total	7.41	13.53	7.10	8.84	13.73	7.40
Honduras	Characteristics		–37.43	–29.20		–20.07	–19.02
	Remainder		28.42	19.33		37.07	21.88
	Total		–9.00	–9.87		17.00	2.86
Uruguay	Characteristics	–3.01	9.36	–9.73	–0.27	0.67	–9.63
	Remainder	38.47	18.03	22.37	34.68	26.34	23.07
	Total	35.45	27.40	12.64	34.41	27.01	13.44

* Values for Argentina are actually for 1980.

(*continued on next page*)

TABLE 5.9

Summary of the Oaxaca Decomposition (%) (*continued*)

Non- Wage Earners

		With Selectivity Correction			Without Selectivity Correction		
		1981*	**1989**	**1998**	**1981**	**1989**	**1998**
Argentina	Characteristics	40.96	1.08	–7.84	–0.02	2.40	–5.48
	Remainder	–8.39	38.83	25.07	32.25	37.53	22.70
	Total	32.57	39.91	17.22	32.23	39.93	17.22
Brazil	Characteristics	7.46	–3.28	10.97	3.98	–6.98	–16.77
	Remainder	55.16	55.79	5.44	60.88	59.70	32.74
	Total	62.61	52.50	16.41	64.86	52.72	15.97
Colombia	Characteristics	47.65	24.80	9.88	15.59	2.60	–0.59
	Remainder	6.15	12.95	14.10	39.38	35.35	24.04
	Total	53.80	37.75	23.98	54.97	37.95	23.45
Costa Rica	Characteristics	66.47	8.01	12.89	7.25	–8.33	2.67
	Remainder	–29.78	19.37	14.09	30.36	22.06	24.31
	Total	36.69	27.38	26.98	37.61	13.73	26.99
Honduras	Characteristics		–15.17	21.82		–6.12	–0.77
	Remainder		33.79	9.50		24.73	32.06
	Total		18.62	31.32		18.61	31.29
Uruguay	Characteristics	2.45	13.37	–9.10	2.71	0.11	–11.87
	Remainder	59.18	46.19	29.05	59.05	58.56	31.86
	Total	61.62	59.56	19.95	61.76	58.66	19.99

* Values for Argentina are actually for 1980.

making the component known as characteristics negative—a difference favoring women. The reason that the total wage differential continued as positive in most countries was, in fact, because the difference in coefficients favored men.

4. Even in the case of non-wage income differentials, the changes in differences in characteristics play an important role in the decrease of the total differential, even though, in this case, exceptions occur, as in the case of Brazil.

Clearly, hourly income differences are much greater between independent workers and employers than between wage earners. This may have various causes, among which two appear important: one, the fact that non-wage incomes may have a much larger measurement margin of error than wage incomes[23] and two, that non-wage incomes depend not only on the quantity of individual human capital, but also on physical and financial capital. In so far as the financial and capital markets fail to perform adequately, their differential effect contributes to increasing the differences between genders.[24]

One can observe that the measurement of hourly wage differences differs, depending on whether it is based on equations corrected or uncorrected for selectivity. The explanation of the difference is that the selectivity correction excludes people for whom data are lacking on the variables of the selectivity equation. This is the case, for example, for people who work in domestic services and who live in the household in which they work (internal), about whose family there is practically no information. Another group that remains excluded is tenants and non-relatives who live in a household. The case of domestic service is important because, in many countries, it involves an occupation that is almost exclusively female, with very specific working conditions, poorly defined working hours (owing to the workplace and residence being the same), and pre-capitalistic work relationships.

[23] This not only involves the problem of measurement and proper reporting of income, but also the periodicity and variability of non-wage incomes. In the case of wage incomes, it is much easier to know the total by period (month, week, etc.) because the payments are fixed and regular. In the case of non-labor income, the payment periods and totals are variable, possibly affected by seasonal and cyclic factors. This makes the figures for non-wage income less reliable than those for wage income.

[24] Often one mentions income differences between men and women as a factor independent from differences in access to capital markets, the fact that the rules for allocating credit (for example) discriminate against women, and the fact that, in general, women have more difficulty in backing loans.

In the case of Colombia, the inclusion or exclusion of domestic service workers changes the previous conclusions in an important way: By including the group "internal girls," as they are called in Colombia, wage differentials favoring men increase,[25] and that portion of the differential corresponding to characteristics increases, reflecting the fact that domestic service workers may be the group with the least marketable skills and lowest wages.

Evidence of discrimination against women

The results above show some intriguing aspects, even though they leave a wide margin for interpretation. Further on, we discuss some of those interpretations seeking to suggest to what extent they are consistent with some of the main hypotheses on wage discrimination. The following points summarize the principal results obtained from the previous econometric analysis:

1. Nearly all the countries have wage differences that favor men, except for Argentina and Colombia for the year 1998 and Honduras for the whole period studied. The case of Honduras is interesting because it has the lowest level of female participation of all the countries studied and the differences favoring women are caused primarily by the characteristics component. Moreover, the sign of differences changes with the Heckman correction.
2. The gross differences have tended to decrease, except for Costa Rica between 1981 and 1989.
3. In the Oaxaca decomposition of wage differences, one finds that the characteristics component has been negative in most of the cases studied, with the following exceptions: Costa Rica in 1981, Uruguay in 1989, and Colombia in 1981 (without selectivity correction).
4. The characteristics component has tended to decrease (becoming increasingly negative), reflecting the tendency of women to accumulate human capital more rapidly than men. This is what produced the decrease in the gross or average differences.
5. The residual component (difference of coefficients) has been positive (except for Costa Rica in 1981) and has fluctuated over time without a definite trend.

[25] The negative differential (that is, that in favor of women) of 1998 is converted into a positive differential (in favor of men).

6. When one observes the residual of the decomposition or component corresponding to differences in coefficients, one finds that, in general, the interceptor of the equation is always greater for men (in the case of wage earners). Conversely, the returns to education are nearly always greater for women, with the exceptions of Argentina in 1989, Brazil in 1998, and Uruguay in 1989.

The fact that average wage differences favor men but have decreased over time (items 1 and 2 in the numbered list above) is consistent with the general predictions of the discrimination model of Becker. However, as items 3 and 4 indicate, this average decrease is caused mainly by the fact that the productive characteristics of women have increased more rapidly than those of men. The residual of the Oaxaca decomposition does not appear to have any clear trend. This is inconsistent with Becker's theory, according to which wage differences, controlled by levels of skills and productivity, should decrease over time.

On the other hand, item 6 in the above list seems to indicate a different relationship from what Becker's model would suggest. It suggests that, controlling for experience, the wage differences between men and women are high for low skill levels and decrease as individuals' education levels increase. This behavior suggests an apparent relationship described in our discussion of the theory of statistical discrimination. According to this theory, years of education are not a measurement of human capital (or they are but are subject to error) without an indicator of productivity. Gender is another indicator of productivity, which, combined with education, is used to predict workers' productivity levels. Clearly, the prediction is subject to error and assumes that the error is random in nature and is greater for men than for women.

If the statistical discrimination theory explains the econometric results encountered, then the question one must ask is which one is the rationale for this type of behavior on the part of employers. Any answer should keep two factors in mind: first, an explanation of why average levels of productivity are lower for women than for men (in terms of the model presented earlier, because the coefficient b has a negative sign); second, why the estimates for women's productivity have a greater variance than that of men.

One possible answer can be found in the traditional structure of Latin American society and the roles that men and women play within it. Although important changes may be discerned among the younger generations, one can state that currently, the primary responsibilities of women are childrearing and child care, administering and organizing household duties, handling emergencies and unexpected events (such as children's illnesses, etc.). This means that the labor force activity of married women mainly, but also single women, competes with other activities that they perform outside the market. A large quantity of anecdotal evidence indicates that women who have remunerative employment carry out a double workday, with both long working hours at home and working for pay. For women who have this dual activity, family obligations can become a key constraint to remunerative work.[26] For example, it is more difficult for them to take on extra work hours, attend training courses outside of regular working hours, take trips that involve being away from home for several days, etc. This may significantly limit these women's productivity in relation to that of the men, who have fewer activities competing with their remunerative work time; it also justifies the fact that employers consider that, *on average,* women are less productive than men.

It is true that the above-described restriction does not apply to all women. On the one hand, not all women are married, and on the other, some married women have alternative means of managing responsibilities of administering the household and caring for children, which allow them to devote more time to their paid work activities. The problem for employers is that it is very difficult to predict which women have the greatest and least constraints in terms of a double workday and, even more importantly, how such restrictions will change in the future. For this reason, predicting female productivity is subject to greater variance than predicting male productivity.

As indicated earlier, this model predicts that the relationship between years of education and productivity (from which the wage is set) differs for men and women. The wage differences are greater for lower skill levels and decrease as years of education rise. Women's rates of return to education are greater than for men, but wage levels are lower. This closely coincides with the results of the econometric analysis previously presented. Moreover, the higher returns to education for women can help explain why they have accumulated human capital more rapidly than men.

The nature of this type of discrimination is a combination of information problems in the market and a culture that assigns specific roles to

[26] In some cases, female absenteeism from work due to "problems at home" has been documented. Some have argued that the frequency of male absenteeism does not differ much from female absenteeism, but the reasons do. However, the point we are trying to emphasize does not depend only on work absenteeism; it also depends on the amount of effort and dedication that workers can devote to labor activities.

women and men. Most women end up earning lower wages than men because they are judged on the basis of women's expected average productivity. Obviously, the policies that would emerge from this type of analysis differ from those that would result from a diagnostic in which wage differences are caused by discrimination based on Becker-type biases. In the case of statistical discrimination, one would consider two general types of measures. The first would be direct or subsidiary services to support the work of household care and childrearing, such as the creation of good quality nursery school services, with adequate hours of service and other measures directed at decreasing women's double workday. The second would comprise educational and training campaigns so that men can take charge of some of the child-raising and household duties.

Conclusions

The analysis carried out allows us to draw some interesting conclusions and consider some policy lines. The main conclusions are as follows:

1. In the countries studied, with the exception of Costa Rica, there is a clear tendency toward equalizing monthly wage incomes.
2. This tendency toward wage equalization, however, is not observed in non-wage incomes. Because non-wage incomes have to do with the functioning of other markets, as well as the labor market, a possible explanation for such a discrepancy would have to be found in the functioning of these markets. For example, in the income differences of independent workers, access to capital markets can play an important role.
3. Hourly income differences between men and women are decreasing, with certain exceptions, such as Costa Rica. In effect, in the cases of Argentina, Colombia, and Honduras, the average female hourly wage exceeds the male hourly wage, if domestic service employment is excluded.
4. The main reason for women's monthly wages being lower than those of men is that women work fewer hours than men. The difference in hours worked per week has been increasing. The reasons why women work fewer hours than men can be on the demand or supply side, but it is more likely that supply-side reasons predominate. This is consistent with the "double workdays" that women

work (at the workplace and at home), which limit their ability to take on extra work hours, etc.

5. In general, differences in employment opportunities (measured from levels of unemployment) were not found to be an important factor in determining expected incomes, except in the cases of Colombia and Brazil in 1998. In Colombia, women have had significantly higher levels of unemployment than men over the 20-year period analyzed; it was estimated that this has had a bearing on a growing component of expected wage differences of men and women. For 1998, this component represented more than one third of the differential. The problem in Brazil appears to be more current since differences in levels of unemployment only appear for 1998. Until 1989, gender differences in employment opportunities were almost nil.
6. The regression analysis and Chow tests show that, in effect, determining the incomes of men and women is done using different mechanisms. This indicates that, in the Oaxaca decomposition, the residual is statistically significant. However, its interpretation is not an easy task. In many cases, such a remainder is interpreted as evidence of discrimination against women, but according to the analysis carried out in this study, that interpretation does not appear correct. What we find is that the residual is a positive sign for the simple reason that the difference of interceptors in the male and female equations is positive (that is, men have an advantage). However, the returns to education for the same levels of education are greater for women than for men. If the discrimination hypothesis of Becker (1971) were true, one would expect that this remainder would also be positive. However, results show the opposite.
7. The study suggests a hypothesis for interpreting the results that falls within the general lines of statistical discrimination theory. According to such a hypothesis, the reason why women are treated differently than men in the labor market is based more on sociocultural factors related to women's position in society generally and the roles they are assigned. As a result, women, on average, have such activities as childrearing and household management that compete for their available time in the labor market (double workday). For employers, these activities introduce a risk factor and uncertainty about decisions related to contracting women, and end up penalizing them with lower salaries. However, the penalization is not uniform. If women or their families have incomes to shift around, these risks could be partial and the penalty decreases. This

may be correlated with the woman's education level; for this reason, the penalty may decrease as years of education increase. The resulting situation, as one observes from the estimates, is that the returns to education are higher for women than for men, but the interceptor of the equation is lower.

Some comments on policy aspects

Seldom does one find materials on antidiscriminatory policy in the economic literature, even in the more developed countries. For this reason, the comments that follow are intended only to open up discussion on the topic. In general, there are three types of antidiscriminatory policies: 1) affirmative action, 2) equal pay for equal work, and 3) direct subsidies for female work. The first and third groups of measures are those most referred to in Latin America.

Affirmative action consists of such measures as imposing job quotas for women in certain occupations, key positions, or high-salary positions.[27] Generally, it is argued that such measures have a short-term, negative effect in terms of productive and cost efficiency, but they can have long-term benefits in terms of both equity and social efficiency. Coate and Loury (1993b) analyze these aspects in a model in which discrimination is based on stereotypes that make it more difficult (not impossible) for women to have access to higher-paying positions in companies. The short-term result is that the returns to investing in human capital are lower for women than for men. In the long-term, women invest less in human capital and thus confirm the stereotype that they are less productive than men. The effects of affirmative action can improve or worsen the situation. On the one hand, improving the likelihood that women have access to better-paying positions also improves the expected returns to investing in human capital. However, these authors point out the possibility that the opposite could result, which would occur if, in order to improve women's access to such positions, it is necessary to lower standards to the point that women would not need to invest in human capital in order to obtain the positions. In this case, affirmative action ends up confirming the stereotypes that it tries to fight.

[27] An example of this type of policy is the Colombian government's law of quotas, which was approved in 2000; according to this law, 30 executive positions in the government should be held by women.

The information presented in this chapter shows that, over the past 20 years, the levels of women's accumulated human capital have exceeded those of men. In this sense, it is unclear whether affirmative action policies offer important avenues for improving women's situation in the labor market. However, this is a point that requires further research.

The second type of measure, "equal pay for equal work," has been explored even less in the economic literature. The superficial impression is that, in those countries in which this type of policy has been implemented, such as Canada, it has been very difficult to find operative criteria for defining "equal work" in a broad context. On the other hand, in some studies (see, for example, Castillo and Barrero 2000), it has been documented that at least the large companies set salary scales guided by market criteria without explicitly including gender criteria (each position in the company has predetermined salaries, whether the position holder is a man or woman). In the work of Castillo and Barrero (2000), wage differences in the financial sector of Colombia are found to be caused more by women's difficulty in getting certain jobs, problems that have to do, above all, with family situations and obligations. Women who have achieved such positions have done so at a higher personal cost than men (divorces, not having children, etc.). If, as this study suggests, such differences are caused by factors more related to female roles in the home and a double workday than to employer biases, then another type of measure could be more relevant.

The policy measures most often discussed in Latin America involve direct or indirect subsidies to female work. The creation of such subsidies recognizes that it can be more costly for employers to hire women and that it can be more costly (in terms of opportunity cost) for women to accept jobs in the market. This type of subsidy would include maternity compensation, nursery schools for infants, kindergartens for school-age children, etc. To the authors' knowledge, there has been no evaluation of this type of subsidy and its effect on female participation in the labor market or the intensity (hours worked per week) of their participation. The little evidence available from studies on the determinants of female participation indicate that, when women control their marital status, having children in the household often does not have the negative effect one would expect in labor-market participation because there are alternatives for child care, such as domestic-service workers in the home and the extended family. Even though these results can have elements of spurious correlation or reverse causality (women work because they have domestic service, or they have domestic service because they work), the result suggests that decisions of female participation are influenced by many factors related to family structure and support of the extended family.

As suggested by the results of this study, it is through this third type of policy women's equality in the labor market can be most effectively promoted.

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