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OCCUPATIONAL ATTAINMENT AND GENDER EARNINGS DIFFERENTIALS IN MEXICO

CYNTHIA J. BROWN, JOSÉ A. PAGÁN,
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Women earned about 20.8% less than men in Mexico in 1987, a difference that increased to 22.0% by 1993. Using 1987–93 data from Mexico's National Urban Employment Survey, the authors study the role of occupational attainment in this wage differential. Most of the 1987-93 increase in the gender log monthly earnings gap, they find, can be explained by relative changes in human capital endowments; wage coefficient changes would have slightly reduced the gap, all else equal. The increasing male-female earnings differential was tempered by a substantial decline in gender differences in occupational attainment from 1987 to 1993. Most of the male-female differences in earnings in both 1987 and 1993 can be explained by differences in rewards to individual endowments rather than gender differences in endowments.

During the years 1987–93, Mexico's economy opened up considerably and, spurred by increasing trade with the industrialized world, underwent substantial structural reforms. This experience has most likely reshaped the industrial structure of the country and its labor markets (see, for example, Cardoso and Helwege 1992; Edwards 1995; Fleck and Sorrentino 1994). In particular, from 1987 to 1993 the female labor force participation rate increased from 33.1% to almost 38% (Garro Bordonaro and Rodríguez Oreggia y Román 1996a). Women in Mexico, particularly single women, also experienced appreciable increases in real earnings and a decrease in occupational segregation. From 1988 to 1993, female real earnings grew at an annual average rate of 4.0%, and women's share of total employment increased from 33.7% in 1987 to 36.4% in 1993.

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In 1987 the gender earnings ratio was .792 (that is, women earned 20.8% less than men), but this differential fell to .78 by 1993 (women earned 22.0% less than men). Among developed countries, the gender earnings ratio has recently ranged from .614 in the United Kingdom to .67 in Canada and .773 in Sweden (Blau and Kahn 1992 1996; Kidd and Shannon 1996); in Latin American countries, the ratio ranges from 0.60–0.62 in Bolivia and Brazil to 0.85 in Colombia and 0.97 in Paraguay (Hotchkiss and Moore 1996; Psacharopoulos and Tzannatos 1992). However, unlike in Mexico, in both developed and developing economies the gender earnings gap has significantly decreased over the past few years (Blau and Kahn 1994; Kidd and Meng 1997; Psacharopoulos and Tzannatos 1992).

Kidd and Meng (1997) and Wellington (1993), among others, have analyzed changes in the gender wage differential over time. This paper examines the connection between inter-period changes in gender differences in occupational attainment and the male-female earnings gap. To properly analyze this issue (and inter-period changes in the earnings gap), we need to evaluate the relative importance of individual human capital endowments, the labor market rewards to these endowments, and occupation-related earnings effects. Doing so could shed light on whether public policy measures should concentrate on enforcing equal pay within occupations or simply on redistributing labor (or redirecting potential labor market entrants) across occupations. In particular, Mexico's National Development Plan 1995–2000 (Poder Ejecutivo Federal 1995:102) calls for "the promotion of a set of programs and actions that guarantee women equal opportunity in education, training, and employment." The Plan also calls for government programs that seek to correct male-female inequality in education and employment to reduce poverty, and it allows the use of gender as a legitimate criterion in the development and implementation of these programs (Poder Ejecutivo Federal 1995:102).

To study the 1987–93 changes in the male-female earnings gap, we use the Wellington (1993) wage decomposition technique, since it allows us to disaggregate wage gap changes into two components: relative changes in personal characteristics (which includes human capital endowments), and changes in the returns to those characteristics. We expand this analysis by decomposing gender differences in earnings across occupations, and then we analyze the role of occupational attainment in the overall earnings gap. This is particularly important since, for example, barriers to entry into certain occupations may be more prevalent in developing countries such as Mexico than in developed countries (for example, Kidd 1993).[1]

To conduct our empirical analysis, we use data from the *Encuesta Nacional de Empleo Urbano* (ENEU, National Urban Employment Survey) for the third quarters of 1987 and 1993 for employed workers aged 16–65. The ENEU provides basic socio-economic information on the Mexican urban population, and the data set is ideally suited for studying changes in employment, earnings, and the occupational structure (INEGI 1996:3). The ENEU samples about 60% of Mexico's urban population and about 90% of the population in areas with 100,000 or more inhabitants, and the results are thus relevant for most of the country's urban population (INEGI 1996).

Women and the Mexican Labor Market

Recent research on occupational attainment and earnings has concentrated on analyzing the labor market outcomes of

[1]Gender-biased recruitment and promotion policies, self-selection of women out of high-paying occupations, and an intermittent female employment path (due to, for example, childbearing) reduce high-pay employment opportunities for women in Mexico (IDB 1995). A typical example of officially sanctioned employer bias is the custom of advertising job openings in newspapers with gender, marital status, and age requirements specified as part of the job requirements.

Table 1. Selected Labor Market Indicators: Mexico, 1987–1993.

Year	*Employment Rates*		*Real Earnings Growth Rates*		*Occupational Segregation Index*	*Female-Male Earnings Ratio*
	Men	*Women*	*Men*	*Women*		
1987	68.9	31.4			26.6	.7921
1988	70.3	31.8	7.05	-2.73	27.3	.7650
1989	69.7	32.4	4.20	5.35	28.2	.7651
1990	70.8	32.9	-2.59	-2.80	27.6	.7544
1991	72.3	34.1	2.98	7.91	27.2	.7501
1992	72.6	34.9	4.12	5.09	21.9	.7729
1993	73.3	36.1	8.90	11.40	23.5	.7803

Source: 1987–93 ENEU and authors' estimates.

women in developed economies. (See, for example, Kidd 1993; Kidd and Shannon 1996. A notable exception is Meng and Miller 1995, which focuses on occupational segregation in China.) Given the easy availability of plentiful data in developed countries, this focus is not surprising. Also worthy of attention, however, are the occupational attainment and earnings of women in developing countries. Mexico is of particular interest because of the major structural changes that have occurred in its labor market over the past few years (Fleck and Sorrentino 1994).

During the 1980s and into the 1990s, Mexico experienced high population and labor force growth. Real earnings of both men and women fell over the 1983–87 period, making it difficult for families to maintain an adequate standard of living and, as a result, increasing the number of individuals joining the work force. This trend, coupled with a large proportion of the population maturing to working age, caused the labor force in Mexico to increase at a rate of 3.2% per year by 1993 (Fleck and Sorrentino 1994). Concurrently, the 1980s saw a population shift to urban areas. With this migration came access to the educational system, which was not available in many rural communities. The result was increased educational and employment opportunities for both men and women.

The growing importance of women in the Mexican labor market over the past few years is evident in the substantial increases in female employment that occurred between 1987 and 1993 (see, for example, Fleck and Sorrentino 1994; Valdez Moreno 1997). Mexican women experienced a 4.7 percentage point increase in their employment rate during this period (see Table 1). Also, by 1993 the services industry in Mexico—the traditionally "female" occupational segment—had grown to comprise 50.6% of total employment (Fleck and Sorrentino 1994; Blau and Ferber 1992:120).

To gain a better understanding of the extent of gender occupational segregation in the Mexican labor market, we estimated the Duncan index of occupational segregation for 1987–93 using aggregate data from Mexico's National Urban Employment Survey (see Table 1). This index measures the percentage of workers (either male or female) who would have to change occupations in order for gender equality to be attained in the occupational distribution.[2] Note that the index drops from 26.6 in 1987 to 23.5 in 1993, although the drop in this index does not occur until 1992. The Duncan index hovered around 27–28 points during the 1988–91 period.

Using the International Labour Organization's *Yearbook of Labour Statistics,*

[2]The Duncan index is calculated as

$$0.5\sum_{j=1}^{J}\left|P_j^m - P_j^f\right|,$$

where P_j^m and P_j^f represent the proportion of men and women employed in occupation j.

Blau and Ferber (1992:309) reported a higher Duncan index for Mexico for the 1980s—39.0, which is very close to the index they found for advanced industrialized countries (39.5) but lower than that for other Latin American countries such as, for example, Chile (49.4) and Venezuela (48.6). We should note that the occupational indexes are based on single-digit classifications and are not strictly comparable across studies if these classifications are defined differently. With that caveat, Blau and Ferber's estimates suggest that Mexico, in its gender occupational structure, more closely resembles developed economies than developing countries.

Our estimates reported in Table 1 suggest that real earnings grew at an average annual rate of about 4% for both men and women during the 1987–93 period. However, male earnings were less volatile than female earnings; female earnings were fairly stagnant from 1987 to 1990 but grew at an average annual rate of 8.1% from 1991 to 1993. This explains why the gender earnings ratio (reported in column 7 of Table 1) fell from 0.79 in 1987 to 0.75 in 1990–91 and then increased to 0.78 by 1993. Linking the growth of female employment rates over the 1987–93 period with the changes in the gender earnings ratio suggests that these changes are a result of firms substituting between men and women in order to reduce labor costs and take advantage of the lower relative female wages (Valdez Moreno 1997).

Descriptive Statistics of the ENEU Data

To analyze the gender earnings gap and occupational attainment in Mexico, we use 1987 and 1993 data from the third quarter of Mexico's National Urban Employment Survey (ENEU). The 1987 ENEU encompasses 16 major metropolitan areas and provides basic socio-economic information on the Mexican urban population. Over the 1987–93 period, 23 more metropolitan areas were added to the survey, but we look only at the cities that were represented from 1987 forward in the interest of consistency across the seven years. Among the survey's main objectives is to obtain data on employment, unemployment, and underemployment, as well as basic information on the country's occupational structure (INEGI 1996:3).

Our sample consists of individuals between the ages of 16 and 65 who reported positive monthly earnings and hours of work during the months of July–September in 1987 and 1993. To control for biases arising from extreme values in the log of monthly earnings, we excluded observations that were more than three standard deviations below or above the mean (see Dávila and Bohara 1994).[3]

Table 2 reports descriptive statistics for the sample by year and gender. Note that in 1987 women earned about 20.8% (0.233 log-points) less than men in our sample, but by 1993 the gender earnings differential had widened to 22.0% (0.2481 log-points). A more detailed analysis of the data by gender and occupation also reveals that in both 1987 and 1993 the largest gender earnings differentials were in the laborers and sales occupational categories (see Table 5). However, by 1993 the gender monthly earnings differential had substantially increased in professional and managerial occupations as well as in precision production/craft/repair.

Although women represented only 32.98% of total employment in 1987, their levels of education were slightly higher than men's in all years. Potential experience (defined as years of age minus years of education minus six) was higher for men than for women, but the absolute work experience gap decreased from 4.0 years in 1987 to roughly 3.0 years in 1993. As we would expect, part-time employment rates were higher for women than for men, and they slightly increased from 1987 to 1993. Higher female part-time employment rates are usually attributed to the fact that women, more than men, tend to allocate their time between the labor market and household work. This is certainly more evident in

[3]However, the results are not sensitive to this exclusion criterion.

Table 2. Descriptive Statistics.
(Means and Standard Deviations)

	1987		*1993*	
Variable	*Men*	*Women*	*Men*	*Women*
Log Monthly Earnings	6.440	6.207	6.785	6.537
	(0.51)	(0.59)	(0.66)	(0.66)
Log Weekly Hours	3.766	3.631	3.797	3.614
	(0.29)	(0.37)	(0.33)	(0.43)
Education	8.237	9.021	9.159	9.715
	(4.33)	(4.15)	(4.27)	(4.15)
Experience	19.167	15.151	18.541	15.580
	(13.37)	(11.78)	(12.79)	(11.82)
Exp.^{2}/10	54.327	36.676	50.514	38.114
	(68.08)	(54.10)	(63.62)	(53.99)
Married	0.591	0.290	0.599	0.326
	(0.49)	(0.45)	(0.49)	(0.47)
Part Time	0.078	0.201	0.084	0.226
	(0.27)	(0.40)	(0.28)	(0.42)
Public Sector	0.220	0.289	0.162	0.249
	(0.41)	(0.45)	(0.37)	(0.43)
Non-Registered	0.147	0.158	0.084	0.145
	(0.35)	(0.36)	(0.28)	(0.35)
Border	0.405	0.422	0.416	0.423
	(0.49)	(0.49)	(0.49)	(0.49)
North	0.078	0.071	0.101	0.104
	(0.27)	(0.26)	(0.30)	(0.30)
Center	0.335	0.309	0.304	0.287
	(0.47)	(0.46)	(0.460)	(0.45)
South	0.051	0.054	0.379	0.046
	(0.22)	(0.23)	(0.19)	(0.21)
N	22,617	10,954	31,527	17,004

developing countries such as Mexico than in developed countries (Blau and Ferber 1992).

Women were also over-represented in both the public sector and non-registered firms (which proxies for informal sector employment; see Roubaud 1995) in both years.[4] Female participation in the public sector fell from 28.9% in 1987 to 24.9% by 1993, whereas male public sector participation fell from 22.0% in 1987 to 16.2% in 1993. Informal sector participation rates were higher for women than for men, and they stayed at about the same levels for women across the 1987–93 period.[5]

Roughly two-fifths of respondents resided in border states (which include the cities of Tijuana, Ciudad Juárez, Chihuahua, Monterrey, Nuevo Laredo, Matamoros, and Tampico), and about 30% were from the

[4]The ENEU asks respondents to identify by name the place of employment during the week prior to the survey. Individuals are asked whether they work in the private sector (a large firm or any other registered business) or in the public sector, as well as whether they work in a firm that has "no name" or is unregistered with the state. In a comprehensive study of Mexico's informal sector, Roubaud (1995) defined it using the latter, which is consistent with a "legal" definition of the informal sector.

[5]The overall decrease in informal sector employment and its role in retarding the observed increases in the variance of earnings during the 1987–93 period have been documented by Pagán and Tijerina (1997).

central part of the country, which includes Mexico City, the State of Mexico, and surrounding states. The rest of the respondents (12–15%) resided in either the north or the south of the country.[6]

Explaining the 1987–93 Changes in the Gender Wage Differential

As remarked, from 1987 to 1993 the male-female monthly earnings differential slightly increased from 20.8% to 22.0%. To analyze the possible causes of this increase, we use the Wellington (1993) earnings decomposition. For years t and $t-1$, we first estimate separate male and female human capital log earnings equations of the form

$$(1) \qquad W_{it}^{g} = X_{it}^{g\prime}\beta_{t}^{g} + \varepsilon_{it}^{g},$$

where W_{it}^{g} is the log wage for individual i of gender g in year t, X_{it}^{g} is a vector of individual and human capital variables, β_{t}^{g} is a vector of parameters to be estimated, and ε_{it}^{g} is a random error term. The Wellington (1993) method decomposes the changes in the gender earnings differential into inter-period changes in explained and unexplained components; namely,

$$(2) \qquad (\bar{W}_{t}^{m} - \bar{W}_{t}^{f}) - (\bar{W}_{t-1}^{m} - \bar{W}_{t-1}^{f}) = [\hat{\beta}_{t}^{m\prime}(\bar{X}_{t}^{m} - \bar{X}_{t-1}^{m}) - \hat{\beta}_{t}^{f\prime}(\bar{X}_{t}^{f} - \bar{X}_{t-1}^{f})] + [\bar{X}_{t-1}^{m\prime}(\hat{\beta}_{t}^{m} - \hat{\beta}_{t-1}^{m}) - \bar{X}_{t-1}^{f\prime}(\hat{\beta}_{t}^{f} - \hat{\beta}_{t-1}^{f})],$$

where the $\hat{\beta}$'s represent the estimated coefficients from the male and female equations for years t and $t-1$, and the $\bar{X}$'s are vectors of the mean characteristics of each group. In other words, the change in the gender wage gap from $t-1$ to t can be decomposed into (i) relative changes in the male-female human capital endowments and (ii) relative changes in the estimated coefficients over the time period.

Table 3 reports the Wellington earnings decomposition results for the 1987–93 period. The associated log earnings regressions include controls for years of education, potential experience and its square, marital status, the log of weekly hours worked, and region and occupation dummies (the results from these regressions are available upon request). When heteroskedasticity was detected (using the Breusch and Pagan [1979] test), we calculated the standard errors using White's (1980) consistent estimator of the variance-covariance matrix.

Since we are interested in analyzing the role of changes in the occupational structure in explaining the gender wage gap—and the changes in this gap—we estimated two separate models with and without occupational controls. For clarity of exposition, the region and occupation dummy variable changes in the coefficients and mean values of the $\bar{X}$'s were aggregated into single (and separate) components.

From 1987 to 1993, the gender earnings gap increased by 0.015 log-points (again, from 20.8% to 22.0%). In fact, under the assumption of no changes in the wage structure across time, the increase in the earnings gap would have been about 0.037 log-points given the changes in the relative individual characteristics—which include human capital endowments—across time. On the other hand, the effect of changes in the relative coefficients (or labor market structure), again under the assumption of no changes in the wage structure across time, would have been to reduce the gender earnings gap by 0.022 log points. The increase in the gender earnings gap is mostly explained by changes in gender differences in education (0.019 log-points in Model 1), by a reduction in male-female differences in weekly hours worked (0.019 log-points), and by changes in the gender-specific differences in the earnings structure across regions (0.021 log-points). Nonetheless, changes in the male-female differences in the coefficients of weekly hours worked and in the rate of return to education would have had the effect of closing the gap by 0.258 and 0.036 log-points, respectively, absent any changes in the wage structure. Also, gender-specific changes in the relative propensity of being employed in non-registered firms (a proxy for the informal

[6]The regional dummies were defined using the classification suggested by Hanson (1997:121).

sector) would have reduced the male-female wage gap.

Table 3 also reports the decomposition results in a model without occupational controls. The results change little except for occupation-related changes in labor market structure (that is, the coefficients). Thus, it appears that the reduction in gender differences in occupational distribution observed during the 1987–93 period did not contribute substantially toward a reduction in the gender earnings gap; changes in the occupational premiums/penalties paid to each worker constrained the gap's growth only modestly. Note that even though the occupational segregation index fell between 1987 and 1993, changes in this index do not always cause a reduction in the gender pay gap. The result depends on which occupations are changing and on the wage levels in those occupations. To gain a better understanding of gender differences in occupational structure and their role in explaining changes in the male-female wage gap during the 1987–93 period, we employ the Brown, Moon, and Zoloth (1980a; 1980b) methodology to analyze occupational attainment.

Table 3. Wellington Gender Earnings Differential Decomposition Results.

	1987–1993	
Indep. Var.	*Model 1*	*Model 2*
Due to Coefficients		
Constant	0.310	0.363
Education	–0.036	–0.088
Experience	0.000	0.036
Exp.^{2}/10	–0.005	–0.016
Married	0.014	0.016
Log Weekly Hours	–0.258	–0.279
Public Sector	–0.002	0.021
Non-Registered Firm	–0.051	–0.062
Region Dummies	0.021	0.030
Occupation Dummies	–0.025	—
Subtotal	–0.022	–0.021
Due to Mean Values		
Education	0.019	0.019
Experience	–0.032	–0.035
Exp.^{2}/10	0.022	0.023
Married	–0.002	–0.002
Log Weekly Hours	0.019	0.017
Public Sector	0.007	0.008
Non-Registered Firm	0.003	0.006
Region Dummies	0.000	0.000
Occupation Dummies	0.002	—
Subtotal	0.037	0.036
Total Differential	0.015	0.015

Occupational Attainment and the Gender Wage Gap

Assume that individuals select occupations according to their socio-economic status, personal characteristics, employment opportunities in the region of residence, and individual tastes and preferences. In particular, the probability that an individual i is employed in the j^{th} occupation depends on a vector of i's exogenous variables (Z_i), namely,

$$(3)\ P(Occupation = j) = \exp(Z_i'\beta_j)/\sum_{j=1}^{J}\exp(Z_i'\beta_j).$$

P follows a logistic conditional probability function and β_j represents a $K\times 1$ vector of coefficients for occupation j (Schmidt and Strauss 1975). These parameters are easily estimated using maximum likelihood estimation (Maddala 1983; Greene 1997).

Our first step is to estimate (3) for separate 1987 and 1993 ENEU samples of employed Mexican men. We then employ the estimated coefficients of (1) ($\hat{\beta}_j$) to generate the occupational distribution women would have if they faced the same labor market structure as men. Thus, the predicted probability that the i^{th} female is employed in occupation j ($\hat{P}_{ij}$), given her individual characteristics (Z_i^f), will be given by

$$(4)\qquad \hat{P}_{ij} = \exp(Z_i^{f\prime}\hat{\beta}_j)/\sum_{j=1}^{J}\exp(Z_i^{f\prime}\hat{\beta}_j).$$

Adding the j^{th} occupation predicted probabilities for each individual *across* the female sample allows us to get a predicted occupational distribution for women.

The extent of differences in occupational attainment can then be determined by

(5) Occupational Distribution

$$\text{Dissimilarity Index} = 0.5\sum_{j=1}^{J}\left|P_j^f - \hat{P}_j^f\right|,$$

(see, for example, Pagán and Dávila 1997), where P_j^f represents the proportion of women employed in occupation j and $\hat{P}_j^f$ represents the (multinomial logit) predicted proportion of women employed in occupation j if men and women were treated equally and had the same preferences given their endowments. That is, the index tells us the proportion of women who would have to switch occupations in order for the model-predicted occupational distribution to be realized.

To analyze gender differences in earnings across occupations for the 1987 and 1993 ENEU samples, let the monthly earnings of individual i in occupation j of gender $g(W_{ij}^g)$ be determined by the human capital earnings function

$$(6) \qquad W_{ij}^g = X_{ij}^{g'}\beta_j^g + \varepsilon_{ij}^g,$$

where X_{ij}^g is a vector of individual and human capital variables, β_j^g is a vector of the parameters, and ε_{ij}^g is a random error term. A simple Oaxaca (1973) decomposition can then be calculated for each occupation and year to decompose the earnings gap into two components: differences in earnings explained by the rewards to occupation-specific individual endowments, and earnings differences explained by male-female differences in occupation-specific endowments. Namely,

$$(7) \quad \bar{W}_j^m - \bar{W}_j^f = \bar{X}_j^{f'}(\hat{\beta}_j^m - \hat{\beta}_j^f) + \hat{\beta}_j^{m'}(\bar{X}_j^m - \bar{X}_j^f),$$

where m refers to men and f refers to women. Equation (7) can also be estimated for the full sample, with and without occupation dummies, to analyze the effects of occupational attainment and occupational premiums on the gender earnings gap.

Occupational Attainment: Results

We estimated multinomial logit models for both men and women for the 1987 and 1993 ENEU samples.[7] The models included controls for years of education and years of potential experience (and its square), as well as dummies for married, part-time employment (working less than 35 hours a week), public sector employment, and informal sector employment, and four dummies for region of residence. The χ^2 statistic, which tests the null hypothesis that all the coefficients of the model are zero, was statistically significant at the 1% level for all the models. As suggested by Veall and Zimmermann (1996), we also estimated McFadden's Pseudo-R^2s for the multinomial logit models. The Pseudo-R^2 measures ranged from 0.16 to 0.39 in the four estimated models. In general terms, our results show that years of formal education and potential labor market experience, part-time/full-time and formal/informal sector employment, and region of residence are good predictors of occupational attainment.

For the two sampled years, the coefficient estimates from the male multinomial logits were combined with the Z_i^f of the female samples to obtain the predicted female probabilities of being employed in each occupation. These predicted probabilities were then added across each separate female sample to calculate the predicted 1987 and 1993 female occupational distributions.

Table 4 reports the actual and predicted occupational distributions by gender and year. A χ^2 goodness of fit test on the actual and predicted female occupational distributions shows that there are statistically significant differences in these distributions in both years. In the two sample periods, the results from the table clearly demonstrate that Mexican women were underrepresented in the professional, precision/production/craft/repair, and operators occupational categories, and over-represented in the technical, education/teacher, manager, sales, and laborer classifications.[8]

[7] These results are available upon request.

[8] A particularly surprising finding is that the model under-predicts the share of women employed in the managerial occupational category. The same or simi-

Table 4. Actual and (Multinomial Logit) Predicted Occupational Distributions of Mexican Men and Women (%).

	Men	*Women*	
Occupation	*Actual*	*Actual*	*Predicted*
	1987		
Professional	4.71	2.99	4.88
Technical	2.85	6.63	3.28
Education/Teacher	3.21	11.22	8.16
Manager	11.63	26.29	12.70
Sales	9.69	11.56	9.03
Laborer	19.60	21.42	17.31
Precision Production/Craft/Repair	38.98	19.54	33.97
Operators	9.33	0.36	10.66
N	22,617	10,954	
	1993		
Professional	5.38	4.90	5.78
Technical	3.94	6.87	4.56
Education/Teacher	2.62	10.04	6.81
Manager	15.19	26.69	15.11
Sales	10.99	12.74	9.82
Laborer	20.07	21.76	18.33
Precision Production/Craft/Repair	32.10	13.95	27.40
Operators	9.72	3.05	12.18
N	31,527	17,204	

Occupational Distribution Differences Index = $0.5\sum_{j=1}^{J}\left|P_j^f - \hat{P}_j^f\right| = 26.63(1987); 23.47(1993)$.

Although at first glance it may seem that there were no changes in the under/over-representation of women in the different occupations during the 1987–93 period (that is, in the actual and predicted occupational distributions for women), the occupational distribution differences index (reported at the bottom of Table 4) suggests that the extent of the "unexplained" observed occupational differences actually declined. The index falls from 26.63 in 1987 to 23.47 in 1993; thus, the percentage of women who would have to change occupations to equalize the actual and predicted female occupational distributions (as the index is commonly interpreted) declined (see also Table 1). This drop is particularly evident in the managerial, laborer, precision production/craft/repair, and operators occupational categories, which experienced the largest absolute percentage point declines during the 1987–93 period. For example, in 1987 21.42% of female workers were employed as laborers, but if women faced the same labor market structure as men, our model predicts that about 17.31% of women would actually be employed as laborers (a 4.11 percentage point difference). By 1993 this differential had dropped to 3.43 percentage points.

Our results from this section suggest that endowment-adjusted gender differences in occupational attainment fell during the 1987–93 period. This result is consistent with our previous finding that the simple Duncan index declined during this same period and, thus, part of this reduction may be attributed to decreases in unexplained or unjustified occupational segregation (see Table 1). This could represent employer

lar puzzling findings have been reported for Australia (Miller and Volker 1985; Kidd 1993) and Canada (Kidd and Shannon 1996). An explanation suggested by Kidd (1993) is that women's intermittent labor force participation puts them at a disadvantage in a model that treats them as though they were men.

Table 5. Earnings Decomposition by Occupation.

Statistic	*Professional*	*Technical*	*Education/ Teachers*	*Managers*	*Sales*	*Laborers*	*Prec. Prod./ Craft/ Repair*	*Operators*
			1987					
Earnings Differential	0.182	0.149	0.190	0.170	0.374	0.707	0.181	–0.059
Differences in Parameters	0.058	0.141	0.036	0.088	0.189	0.503	0.095	–0.040
Differences in Characteristics	0.124	0.008	0.154	0.082	0.185	0.204	0.086	–0.019
			1993					
Earnings Differential	0.250	0.094	0.186	0.348	0.467	0.505	0.386	0.046
Differences in Parameters	0.139	0.055	–0.028	0.104	0.256	0.192	0.233	0.019
Differences in Characteristics	0.111	0.039	0.214	0.244	0.211	0.313	0.153	0.027

exclusion, worker choice, or some combination of the two.

Earnings Decomposition: Results

Our next step is to analyze the effect of gender differences in occupational attainment on the male-female earnings differential. For brevity, our results from estimating occupation-specific earnings equations (available upon request) are not reported here. The regressions included the same controls as in (1) and are consistent with previous human capital studies, with R^2s ranging from 0.13 to 0.45. In passing, we should note that for both men and women, the rate of return to education tended to be substantially higher in managerial occupations than in all other occupations. Also, in almost all occupations, earnings increased with experience but at a decreasing rate, and married men and—to a lesser extent—women commanded a sizable wage premium across most occupations. There were also substantial differences in occupational premiums/underpayments for those employed in non-registered firms as well as public sector workers. Regional differences in earnings were also pronounced for all gender/occupation groups except female operators and men in technical and educational occupations.

Table 5 reports the monthly earnings decompositions by occupation for 1987 and 1993. The gender log earnings differential is decomposed into two components: one attributes part of the earnings gap to differences in the estimated parameters and the other to differences in individual characteristics and human capital. In 1987, the mean log monthly earnings differential varied from 0.149 log-points for technicians to 0.707 log-points for laborers. Female operators, however, earned about 5.7% more than male operators. The component of the earnings differential attributed to differences in the estimated parameters varied from a low of 32.9% in professional occupations to 94.6% in the technical classification. This unexplained portion is also relatively high for sales people (0.189 log-points) and laborers (0.503 log-points).

Perhaps the most important finding reported in Table 5 is that the two occupations with the largest gender log wage differential—sales and laborers—are exactly the same in both 1987 and 1993 (although the magnitude of the differential changes). From 1987 to 1993 the gender wage gap widens substantially in precision production/craft repair, managerial, and professional occupations. Thus, it is possible that part of the increase in the 1987–93 gender earnings gap was due to this occupation-specific wage gap ranking shift.

Table 6 reports the decomposition of the aggregate gender earnings differential by year (see equation 7). The decompositions are reported first without and then with

Table 6. Decomposition of the Male-Female Earnings Differential.

Statistic	1987		1993	
	Value	*% of Total*	*Value*	*% of Total*
	Without Occupation			
Earnings Differential	.2330	100.0	.2481	100.0
Differences in Parameters	.1615	69.3	.1327	53.5
Differences in Characteristics	.0715	30.7	.1154	46.5
	With Occupation			
Earnings Differential	.2330	100.0	.2481	100.0
Differences in Parameters	.1771	76.0	.1689	68.1
Differences in Characteristics	.0559	24.0	.0792	31.9

occupation dummies. The gender earnings differential increases from 0.2330 log-points in 1987 to 0.2481 in 1993. In both models and years, most of the gender earnings differential is explained by differential rewards to male and female characteristics. The role of gender differences in the regression parameters declines between 1987 and 1993, suggesting that relative gender-specific changes in the Mexican labor market structure (coefficients) came to play a smaller role in explaining differences in earnings between men and women.

When we include occupation dummies in the regressions, the portion of the male-female earnings gap explained by differences in labor market rewards to individual endowments increases from 69.3% to 76.0% in 1987, and from 53.5% to 68.1% in 1993. This result suggests that gender differences in occupational premiums partly explain the gender earnings gap in Mexico, particularly in 1993. However, given the lack of detail in our occupational classifications, this result might simply be capturing heterogeneity within occupational categories.

The results presented above show that a large portion (76.0%) of the monthly gender earnings gap in Mexico might be attributed to male-female differences in rewards to individual endowments, but by 1993 the importance of this component had fallen by 7.9 percentage points to 68.1%. These findings are in line with those of Psacharopoulos and Tzannatos (1992), who found that about 72–80% of the gender earnings gap in Mexico in 1984 was explained by differences in rewards to individual characteristics. They also found similar results for most Latin American countries (that is, about 86–88% of the gender earnings gap was due to differences in rewards to individual endowments), except for Ecuador and Guatemala, where about half of the gender differences in earnings could be explained by male-female differences in individual endowments. The results for Mexico are also in line with those of Kidd (1993) for Australia (65% of the gap was unexplained), Hawke (1991) for the United States (85.7% of the gap was unexplained), and Meng and Miller (1995) for China's rural industrial sector (112.1% of the gap was unexplained).

Concluding Remarks

In 1987 Mexican women earned about 20.8% less than men, and this differential widened to 22.0% by 1993. Our analysis of 1987 and 1993 data from Mexico's National Urban Employment Survey yields several conclusions.

First, changes in human capital endowments during the 1987–93 period explain more than 100% of the increase in the gender log earnings gap. In particular, the increase in the gender earnings gap is mostly explained by increases in the relative levels of education for men, changes in gender

differences in the log of weekly hours, and changes in the regional structure of wages. Unequally aligned against those forces were at least three factors working in the opposite direction: reductions in male-female occupational distribution differences; changes in the relative occupational premiums/penalties observed during the period, which may have tempered the widening of the gender earnings differential via education/experience-related differences across occupations; and, most important, changes in Mexico's wage-determining labor market structure, which, in the absence of countervailing influences, would have reduced the monthly earnings gap by 0.022 log-points.

Second, we find that during this period Mexican women apparently were underrepresented in the professional, precision production/craft/repair, and operators occupational categories and over-represented in the technical, education/teacher, manager, sales, and laborer classifications. Although there are certainly gender-related differences in the occupational distributions, our results show that the endowment-adjusted gender differences in occupational attainment fell during the 1987–93 period.

Last, our male-female earnings decomposition shows that the gender earnings gap in Mexico increased during the 1987–93 period, but the portion of the gap attributed to male-female differences in rewards to individual endowments fell, even after one controls for occupation.

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