Male-Female Wages Differentials In Guatemala: 1989-1998

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I. Introduction

Guatemala, with a population of more than 11 million and a per capita income of around $1,700, is one of the poorest and most unequal countries in Latin America. The 1990s were a volatile decade in Guatemala. The 1996 peace accords ended 36 years of civil war, after that, economic reforms, including trade liberalization, downsizing of public sector, and general economic deregulation, took place all around the nation. In the 1990s, the male-female wage gap in Guatemala quadrupled (Table1). However, to the best of my knowledge, no studies have focused on the changes that occurred in male-female earnings and wage differentials in Guatemala. In this study, I try to examine the possible reasons behind the dramatic increase in the gender wage gap in Guatemala during the period from the end 1980s to the end of 1990s.

Table1. Male-female Hourly Wage Gaps ($lnwage^m - lnwage^f$)

	The early-1990s[1]	The mid-1990s	The end-1990s
Costa Rica	0.28	0.29	0.35
Guatemala	0.17	N/A	0.68
Honduras	0.38	0.35	0.34
Nicaragua	-0.06	N/A	0.17
Panama	0.20	0.24	0.23
El Salvador	N/A	N/A	0.29

II. Two Testable Research Hypothesis

Empirical research on gender pay gaps has traditionally focused on the role of gender differences in qualifications and on differences in the treatment of otherwise equally qualified male and female workers (i.e. labor market discrimination). As for the former factor, increase in women's labor force participation were often associated with a declining skill level or education level of employed women, which primarily contributed

[1] Or the end of 1980s.

to the increase in the gender wage differential (O'Neill 1985, Gindling 1993). O'Neill (1995) finds that the hourly wage gap between male and female widened from 31% in 1995 to about 36% in 1960s, and two factors account for the trend. One is that the level of schooling of men in the population as a whole advanced more rapidly than the education of women in the 1950s, as men who were aided by GI bill educational benefits increased their race of college attendance. The other is that the labor force became less selective of educated women as older married women increased more rapidly than other groups in the labor market. Dr. Gindling's paper (1993) shows that during the economic crisis of the early 1980s, since men's income decreased dramatically, many married women with low level of education or skills were forced to enter into the labor force. As a consequence, the widened personal characteristics between male and female contributed to the widened gender wage gap.

Guatemala is also the case, but not typical. Even though the education level of female workers in Guatemala is higher than male workers both in 1989 and in 1998, the advantage on education for women reduced during the 1990s. On the other side, the experience gap between male and female reduced from 1989's 3.7 years to 1998's 0.9 year. These fixed results show that productivity related characteristics (such as education, experience, etc.) are not comprehensive enough to explain the great increase in gender wage gap in Guatemala, so we have to look for other explainable variables. It is very interesting that the mean of work hour for female declined noticeably from 1989 to 1998 in Guatemala, so the first hypothesis to be tested in this paper is that the influx of women who work less hours into the labor force caused the increase in male-female wage gap.

Focusing on the role of work time as an additional factor influencing the gender gap is an innovative feature of my study.

Table2. The Mean Values for the Main Variables.

	1989			1998		
	Male	Female	M/F Ratios	Male	Female	M/F Ratios
log-wage	4.98 (1.00)	4.81 (1.05)	1.04	6.75 (1.05)	6.07(1.27)	1.11
education	3.58 (4.12)	4.55 (4.82)	0.79	4.42 (4.47)	4.58 (4.80)	0.97
experience	27.52 (16.29)	23.82 (15.82)	1.16	27.32(17.52)	26.39 (16.63)	1.04
work hours	48.65 (11.26)	42.49 (17.96)	1.14	48.27(15.62)	35.64(19.97)	1.35
race	0.65 (0.48)	0.76 (0.43)	0.86	0.55 (0.50)	0.57 (0.49)	0.96
urban	0.37 (0.48)	0.63 (0.48)	0.59	0.42 (0.49)	0.56 (0.50)	0.75

The second point of my study is to test whether the dramatic increase in gender wage gaps in Guatemala results from women's lack of access to high-paid sector employment. Panizza's study (2000) exploits a rich collection of household surveys to investigate the gender wage differential between the public and private sectors in 17 Latin American countries during the 1980s and 1990s. His paper finds that, on average, Latin American women earn 30 percent less than men with similar skills and that approximately one third of this gender gap results from lack of access to formal sector employment. Panizza also finds that the public sector pays a significant premium to female workers in the Latin American countries. As a consequence, gender gap drops dramatically when only formal sector workers are considered. It is the case in Guatemala. In Guatemala, the gender wage gap in the public sector is very small even negative (Table3). However, we did observe a dramatic reduction of the share of workers employed in the public sector because of economic reform, but this reduction was almost all suffered by men (Table 4). It seems that women were not affected much by the downsizing of the public sector. From this point, Guatemala is different from many other Latin American countries: its great increased male-female wage differential is unlikely

caused by the more severe sector segregation for women. I will explore this view later in detail.

Table3. Log-wages of Male and Female in Different Sectors.

Sector	1989		1998	
	Male	Female	Male	Female
Informal	4.68	4.49	6.59	5.81
Private formal	5.3	5.15	6.94	6.59
Public	5.92	6.09	7.35	7.29

Table4. Labor Force Participation Rates (%)

Sector	1989			1998		
	Total	Male	Female	Total	Male	Female
Informal	60.52	43.66	16.86	64.72	39.06	25.66
Private formal	30.68	24.53	6.15	29.70	21.90	7.80
Public	8.81	6.36	2.45	5.58	3.22	2.36
TOTAL	100.00	74.55	25.46	100.00	64.18	35.82

III. Data

The data of this paper are large-scale household survey data, and they include two years: 1989 and 1998. Approximately 0.1% of the population of Guatemala was surveyed. The data provide information on earnings, hours worked, workplace characteristics, and personal characteristics of individuals in Guatemala. It is worthy to point out that this dataset just includes the information of 10 years and older employed workers who report non-zero (and non-missing) earnings and hours worked.

IV. Methodology

The econometric literature tends to group the determinations of the wage gap between males and females into two broad categories. One is labor market

discrimination, which is usually defined as "different payment rules for men and women with the same productivity" (Ehrenberg and Smith, 1991). The second determinate is differences in the "endowment" of men and women, which usually includes education, training, and experience, sometimes the job characteristics, such as size or location of firm, are also included.

The common method of measuring these two sources of gender wage gap is to estimate separate semi-log wages function for male and female and to decompose the difference of mean of log-wages using Oaxaca (1973) or Blinder (1973)'s method.

$$\ln \overline{W}^m = \alpha^m + \beta^m \overline{X}^m \quad (1)$$
$$\ln \overline{W}^f = \alpha^f + \beta^f \overline{X}^f \quad (2)$$

$\ln \overline{W}$ is the mean log-wage of men and women; β is a vector of estimated parameters; and $\overline{X}$ is a vector of the mean personal productivity-related characteristics for men or women. Subtracting equation (2) from equation (1), then adding and subtracting $\beta^m \overline{X}^f$[2], we can get

$$\ln \overline{W}^m - \ln \overline{W}^f = \overline{X}^f (\beta^m - \beta^f) + \beta^m (\overline{X}^m - \overline{X}^f)$$
$$= \quad \text{U} \quad + \quad \text{E}$$

The variable **E** is the part of log-wage differential between men and women that can be explained by different personal characteristics; **U** is the difference not explained by differences in wage-determining personal characteristics, and thus could be considered the rough measure of wage discrimination for female workers. Actually, to interpret **U** correctly and thoroughly is very difficult.

[2] There is another way to the decomposition: adding and subtracting $\beta^f \overline{X}^m$, then we can get $\ln \overline{W}^m - \ln \overline{W}^f = \overline{X}^m (\beta^m - \beta^f) + \beta^f (\overline{X}^m - \overline{X}^f)$.

In order to study the effects of work hours on the increased gender wage gap, I change a little on Oaxaca's decomposition. I decompose the log-wage gap into five parts instead of two parts.

$$\ln \overline{W}^m - \ln \overline{W}^f = \overline{X}^f(\beta_1^m - \beta_1^f) + \beta_1^m(\overline{X}^m - \overline{X}^f) + \overline{H}^f(\beta_2^m - \beta_2^f) + \beta_2^m(\overline{H}^m - \overline{H}^f) + (\alpha^m - \alpha^f)$$
$$= \quad U \quad + \quad E \quad + \quad U_h \quad + \quad H \quad + \quad I$$

$\overline{X}$ is a vector of the mean wage-determining personal characteristics of men or women; here the explainable variables include the means of education, experience, experience square, dummy variable urban and dummy variable race. Education and experience are undoubtedly the productivity-related characteristics. And by human capital theory, the earnings function is concave in experience, then the coefficient of experience square should be negative, while that of experience should be positive. Race is a dummy variable we cannot ignore (Race=0 if the worker is indigenous; Race=1 if the worker is non-indigenous). Because the bulk if the population- around 50 per cent, which is one of the highest rates in Latin America- are indigenous Mayan people, who are among the poorest in the society. Another important dummy variable I used in my paper is Urban. The Guatemala civil war mainly took place in the rural area, so the distribution of work force between the rural and urban area changed a lot during the 1990s. $\overline{H}^m$ is the mean log-work-hour for male, and $\overline{H}^f$ is the mean log-work-hour for female. **E** is the part of log-wage differential between men and women that can be explained by different personal characteristics except work time; **H** is the part of the differential that can be explained by the difference on work hours between male and female; the sum of the three parts **U**, $\mathbf{U_h}$ and **I** ($\mathbf{U}+\mathbf{U_h}+\mathbf{I}$), is the part measuring the discrimination in the labor market. This part of gender wage gap would still exist even if women workers had the same endowment and worked the same time as men.

When I study the effects of sector segregation on the greatly increased gender wage differential, I decompose the difference between mean wages of men and women into[3]

$$\ln \overline{W}^{m} - \ln \overline{W}^{f} = \sum_{j} \Pr_{j}^{f} (\ln \overline{W}_{j}^{m} - \ln \overline{W}_{j}^{f}) + \sum_{j} \ln \overline{W}_{j}^{m} (\Pr_{j}^{m} - \Pr_{j}^{f})$$

$$= \quad \mathrm{W} \quad + \quad \mathrm{J}$$

where j is the informal, private-formal, and public sector; Pr_j is the probability that man or woman is found working in a given sector. **J** is the mean log-wage differential that is due to differences between the access that men and women have to the sector where one gets higher payment, and this could roughly measure the degree of sector segregation by sex; **W** is the differential explained by the different log-wages that men and women earned within the same sector.

In addition, I use the Duncan index to measure the degree of sector segregation. The Duncan index (D) is calculated as:

$$D = 0.5 \sum_{i=1}^{N} | f_i - m_i |$$

Where N is the total number of sectors (here N=3), and f_i and m_i are the employment ratios of women and men respectively in each sector. The index is equal to one-half of the sum of the absolute differences between the women's and men's ratios in each sector. The Duncan index varies between 0 and 1. D=0, means that women and men have identical employment distributions across sectors; in other words, there is no sector segregation for female. If D=0, then there is complete segregation. In this paper, I will

[3] We can also decompose the wage gap into

$$\ln \overline{W}^{m} - \ln \overline{W}^{f} = \sum_{j} \Pr_{j}^{m} (\ln \overline{W}_{j}^{m} - \ln \overline{W}_{j}^{f}) + \sum_{j} \ln \overline{W}_{j}^{f} (\Pr_{j}^{m} - \Pr_{j}^{f})$$

test whether the increased gender wage differential in Guatemala is associated with the increased value of the Duncan index.

V. The Results

1. The Duncan index

Year 1989, D=0.718. Year 1998, D=0.434.

2. For the second decomposition,

Year	log-wage gap	W	J
1989	0.17	82.60%	17.40%
1998	0.68	95.10%	4.90%

These two results are consistent with the data in table4. It means that from 1989 to 1998, the female worker did not experience increased job discrimination. Sector segregation for female cannot explain the great increase in gender wage differentials. The gender wage gaps are mainly caused by the male-female wage differentials within the same sector.

VI. The Work to be completed

Finish the calculation of Oaxaca-Decomposition and interpret all the results, which could correlates with some technology problems, such as ‘sample selection bias’ and ‘variable mismeasurement’, etc.

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