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Changes in Human Capital and Wage Inequality in Mexico

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Abstract

Over the last two decades Mexico has witnessed a significant increase in wage inequality, typically attributed to the increase in relative demand for skilled labor. Over this period the educational achievements and their distribution across the labor force have also changed substantially. In this paper we analyze the impact of changes in human capital on wage inequality in Mexico. We focus our analysis on decomposing (1) the level of inequality in any given year and (2) change in inequality over time, into observable (e.g. age, education, occupation, etc.) and unobservable differences across workers. The main findings of this paper are: unobservable factors (within group inequality) account for most of the inequality in any given year. Among the observable factors human capital emerges as the most important variables in explaining the level of, and changes in, inequality.

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1. Introduction

Distribution of human capital is one of the most important determinants of the wage distribution (Card, 1999 and 2001). The impact of human capital can be measured in three dimensions: changes in average levels, changes in the distribution, and changes in returns. In Mexico over the last two decades change has been observed in all three dimensions. Average levels of education have increased, distribution of human capital has become more equal, and the returns to education have become more unequal. Over this same period Mexico also witnessed a significant increase in wage inequality.

The literature on rising wage inequality in Mexico has typically attributed it to increased relative demand for skilled labor leading to increased returns to education (Cragg and Epelbaum, 1996; Feenstra and Hanson, 1997; Hanson and Harrison, 1999); declining power of unions (Fairris, 2002); and falling real value of the minimum wage (Cortez, 2001; Fairris *et al*, 2006).

An increase in relative demand for skilled labor, leading to increased earnings inequality is a finding not unique to Mexico.[1] What is distinctive about Mexico, however, is that over this period the educational achievements and their distribution across the labor force have also changed substantially. That is, the supply of human capital increased as well. As the supply of skilled labor catches up with the demand, expectation is that inequality would decrease. In this paper we analyze the impact of changes in human capital on wage inequality in Mexico, in particular we comment on the impact of the increased supply of skilled labor on wage inequality – hitherto unexplored for Mexico. Human capital is acquired in schools and in formal and informal on-the-job training programs, with in-school acquisition making up an increasingly important component. Here we will focus on in-school acquisition of skills.

The period covered by this study is 1984 to 2000. We break the two decades into two distinct periods. The first period, 1984-1994, was marked by structural reforms and trade and financial liberalization in the economy, rising relative demand for the skilled labor and rising inequality. The second period, 1994-2000, was one of growth and relative stability, increasing supply of skilled workers and some evidence of decrease in inequality. Attempt in this paper is to establish the importance of changing educational endowments and their distribution in explaining observed changes in wage inequality in Mexico. The analysis will focus on decomposing (1) the level of inequality in any given year and (2) change in

inequality over time, into observable (e.g. age, education, occupation, etc.) and unobservable differences across workers; the observables are further decomposed into their price (coefficient) and quantity (endowment) effects.

One other paper which directly looks at the impact of educational endowments on inequality in Mexico is Legovini *et al* (2005). This paper is distinct from the Legovini *et al* paper in two aspects: (1) our paper looks at a longer horizon. Legovini *et al* look only at the first period 1984-1994. The supply of skilled labor takes time to catch up to the increased demand, by extending the analysis to 2000, unlike Legovini *et al*, we are able to capture the impact of increased supply of skilled labor on inequality. (2) The methodology used in this paper is different than that used by Legovini *et al*. To answer the levels question we use the methodology proposed by Fields (2003). The benefit of this approach is, the share attributable to each explanatory factor, in explaining the level of inequality within a year, is independent of the measure of inequality used.

The main findings of this paper are as follows. First, the unobservable factors account for most of the inequality in any given year, giving an indication of a rise in within group inequality. Second, among the observable factors education and occupation emerge as important factors in explaining the level of inequality. Third, for changes in inequality over time, the single most important factor is education. In accordance with the literature we find that changing returns to skill are important in explaining the rise in inequality. Findings in this paper suggest that once the supply of skilled labor has had a chance to catch up with the demand, the quantity effect contributes to the decline in wage inequality.

We begin our analysis by describing the data used in this study and outlining the changes in average educational endowments of the workforce, their distribution, and returns to these endowments. The subsequent sections will link the changes in education to wage inequality.

2. Data

The data used for the analysis is from *Encuesta National de Ingresos y Gastos de los Hogares* (ENIGH). These are the national household surveys that began in 1984 and continued in 1989, 1992, and every two years thereafter. This data is nationally representative, covers a larger share of population, and has detailed information on the skill

[1] Same reasons have been explored for rising inequality in US and other OECD countries. Refer to Katz and Autor (1999) and the references therein, for a survey of these findings.

levels of the workers.[2] The survey employs a 'stratified sampling' technique, so we use sample weights made available by ENIGH in the analysis below.

The sample utilized in this analysis is only of working individuals from the surveyed households. The earnings variable is real hourly wage (in 1994 pesos), and is computed from the reported earnings during the month before the survey and reported hours of work last week. Real wages are obtained by deflating the nominal wages with the consumer price index, made available by *Banco de Mexico*. Use of wages is more appropriate in this analysis since they are more closely related to the market prices for human capital components. In the estimate of the wage, no fringe benefits, tips, bonuses or commissions are included. To ensure an accurate measure of the wage, all those who are self-employed[3] or working without pay are deleted from the sample. We also exclude from the analysis all those who hold more than one job.

3. Changes in Human Capital

In this section we describe the changing trends that have been observed in educational achievements in Mexico over time. Ten education categories are considered: (i) some primary education; (ii) primary education complete; (iii) junior high incomplete; (iv) junior high complete; (v) high school incomplete; (vi) high school complete; (vii) some college; (viii) college complete; and (ix) more than college. The default tenth category is no education. Both complete and incomplete levels are included as separate categories, as there is evidence to suggest that there are premiums to completed degree levels.[4]

Before proceeding a brief comment on the educational structure in Mexico. The Mexican education system consists of six years of primary education and six years of secondary education. The secondary education can be broken down into three years of junior high and three years of high school. Primary education is free and mandatory. In 1992 three years of junior high were also made compulsory. After primary education students have an option to choose between an academic curriculum (oriented towards preparation for higher education) and a vocational option (which prepares them for technical school). For the analysis in this paper we do not distinguish between those who choose a

[2] Feenstra and Hanson (1997) and Hanson and Harrison (1999) in their study used macro-survey data of manufacturing plants; Cragg and Epelbaum (1996) in their analysis used micro level data for only 16 urban areas in Mexico.

[3] Main reason for excluding the self-employed is the difficulty in distinguishing between the returns to skills and returns to capital for them.

[4] This is also called the 'sheepskin effect' - the existence of wage premiums for fulfilling the final years of elementary school, high school or college. For details refer to Card (1999).

technical or an academic option. There might be concerns about not distinguishing between the two, however the studies conducted on returns to education from different types of schooling do not find much difference between the two in Mexico (Parker and Pederzin, 2001).

A. Change in average levels and the distribution of education

Table 1 gives the proportion of the sample at different education levels in different years. There has been an overall increase in all education levels above the junior high level from 1984 to 2000. The share of workers with high school or higher education increased by 10 percentage points – from 16% in 1984 to almost 27% in 2000. The increase in education levels has been greater for completed degrees. For example, while the proportion of people with some college education increased by 38% over the period, the proportion of people completing college and going further increased by almost 79%.

To capture changes in the level and distribution of educational achievements, we calculate the average years of schooling, variance in years of schooling and the Gini coefficient for schooling. Data for exact years of schooling are not available from ENIGH. Until 1994 ENIGH only reported whether or not an individual completed a certain level of schooling, not the actual years spent in any particular level of schooling. For the completed levels of schooling we take the years that it would take to complete the level without repetition. For the incomplete levels of schooling it is assumed that the individual attended half of the school cycle. These are the standard assumptions made in the literature, in the absence of data on actual years of schooling (Binder and Woodruff, 2002).[5] From 1996 onwards ENIGH started reporting the actual years in school for those with less than 12 years of schooling. We compare our approximation for 2000 with the actual years; results are similar. To keep consistency with earlier years we use the approximation for 2000 as well.

Now that we have an approximation to the years of schooling for different educational levels, we use it to quantify the change in educational achievements over time. To do so, we calculate three statistics, reported in Table 1:

(1) Average years of Schooling (AYS)

$$\text{AYS} = \mu_s = \sum_{k=1}^{n} p_k y_k \ ,$$

[5] There are however limitations to this approximation, it can bias the estimates for returns to schooling if used in wage regressions (Behram and Deolalikar, 1991).

where, n is the number of educational groups (for this study n = 10), y_k be the years of schooling at different education levels, p_k is the proportion of people in the k^{th} educational category (for this study proportions for the different years are given in Table 1).

(2) Variance in Schooling (VS)

$$\text{VS} = \sigma_s^2 = \sum_{k=1}^{n} p_k (y_k - \mu_s)^2 ,$$

(3) Gini Coefficient for Schooling (GINI_S)

$$GINI_s = \left(\frac{1}{\mu_s} \right) \sum_{k=2}^{n} \sum_{l=1}^{k-1} p_k |y_k - y_l| p_l .$$

The average years of schooling have increased in Mexico over the period 1984 to 2000.[6] The variance in years of schooling has increased slightly, but that is not surprising as variance captures absolute dispersion and increases with increasing mean. To look at relative dispersion we look at the Gini coefficient, according to which the inequality in the distribution of education has decreased over time.

B. Change in the returns to education

To capture changes in the returns to education we run a weighted least square log-wage regression, where the dependent variable is the log of real hourly wages and the explanatory variables are: age, age-squared, nine education dummies ('no formal education' is the base), gender, union status, three regional dummies and fifteen occupation dummies. Regression results are reported in Table 2.

Looking at the coefficients of the education dummies, the gap between the returns to lower and higher education has increased over time, with most of the increased gap coming from a decline in the returns to lower skill groups. Rising relative rates of return to educational attainments may reflect the importance of demand-side factors related to liberalization and foreign investment or they may reflect changing institutional factors such as the declining real value of the minimum wage, which other results (Cortez, 2001; Fairris, 2002; Fairris *et al*, 2006) suggest have had a significantly greater impact on low-skill workers relative to high-skill workers.

To summarize the information on the education dummies, in Figure 1 we plot the 'college premium' and the 'relative supply of college graduates'. The 'college premium' is defined as the ratio of the coefficient on 'college degree' relative to the coefficient on 'high

school degree' in the wage regression; and the 'relative supply of college graduates' is defined as the ratio of college equivalents (those with at least college + 0.5 × those with some college) to non-college equivalents (those with high school or less + 0.5 × those with some college).[7] Even though the relative supply of college graduates has been increasing over the period under study, the college premiums have also been increasing. This indicates that the demand for skilled workers (as captured by college or more education) has been increasing faster than the supply of skilled workers.

Labor in Mexico is less skilled than in developed countries like the U.S., so perhaps a college degree is too high a threshold in designating the 'highly skilled'. In Figure 1 we also show the 'high school premium' and 'relative supply of high school graduates'. The premium to high school education is the ratio of the coefficient on 'high school degree' to the coefficient on 'junior high degree' in the wage regression. As before, the relative supply of high school graduates is the ratio of high school equivalents (those with at least high school degree + 0.5 × those with high school incomplete) to non-high school equivalents (those with junior high or less + 0.5 × those with some high school). The story here is slightly different. Both supply of and premium to high school graduates increased till 1994, indicating greater increase in demand than supply, however after that while the supply has continued to increase, the premium has declined. This could indicate supply catching up with demand.

4. Wage Inequality

How are the above changes in the levels, distribution and returns to skill related to wage inequality? We begin this analysis by briefly outlining recent changes in the distribution of wages.

A. Changes in the wage distribution

In Table 1 we report the mean log wage, variance of log wages and the GINI coefficient for the log wage. The mean log wage increased until 1994 and decreased thereafter, such that any gains made in real wages up to 1994 were completed eroded by 2000. This decline in real wages is by and large a result of the 1995 peso crisis, after which though the real wages recovered a little they never reached the highs of pre-crisis period.

[6] This is consistent with the findings of Duryea and Szekely (1998) and Legovini *et al* (2005).
[7] College premium and relative supply of college graduates are constructed along the lines of Autor, Katz and Krueger (1998).

Period of structural reforms and trade and financial liberalization (1984-1994) in Mexico is associated with the increase in inequality, after which the inequality started to decline or at least stabilized (depending on the measure of inequality used).

B. Accounting for within-year inequality

To account for the different factors contributing to inequality we use the procedure proposed by Gary Fields (2003). Consider the wage regression,

$$(4) \qquad \ln w_{it} = \sum_{j=1}^{J+2} a_{jt} Z_{jit} \ ,$$

where w_{it} is the wage of the i^{th} individual in the t^{th} time period, $a_t = [\alpha_t \quad \beta_{1t} \quad \beta_{2t} \quad ... \quad \beta_{Jt} \quad 1]$ and $Z_{it} = [1 \quad X_{1it} \quad X_{2it} \quad ... \quad X_{Jit} \quad \varepsilon_{it}]$ are vectors of coefficients and the explanatory variables (including the residual term), respectively. For the wage regression of the form given in equation (4) and using the variance of log wages as a measure of inequality, Fields shows that the share of the variance of log wages that is attributable to the j^{th} explanatory variable can be written as:

$$(5) \qquad s_j = \frac{a_j \sigma(Z_j) Cor.(Z_j, \ln w)}{\sigma(\ln w)},$$

where, $\sigma(.)$ is the standard deviation of the variable and $Cor.(Z_j, \ln w)$ is the correlation between the explanatory variable and ln*w*. s_j is also called the 'relative factor inequality weight', such that $\sum_{j=1}^{J+2} s_j = 100\%$, and $\sum_{j=1}^{J+1} s_j = R^2$ of the regression in (4). The advantage of using Field's method to estimate the relative factor inequality weights is that it is not sensitive to the measure of inequality used.

s_j can be calculated for every explanatory variable in the wage regression. We have nine dichotomous variables for education in the model, and a s_j measure is calculated for each of them. To estimate the total share of education in explaining wage inequality, the s_j's for the entire set of education dummies are summed together. Similarly, we can estimate the total relative factor inequality weight for the other categorical variables, like region and occupation, in the wage equation. For age we sum the weights for age and age squared.

The relative factor weights for the different explanatory variables for 1984, 1994 and 2000 are reported in Table 3. While all the variables are significant in explaining the level of

mean wages, not all of them have equal weight in explaining the level of inequality. For all three years the unobservable factors (residuals) are most important in explaining the level of inequality. After the residuals the most important variable explaining inequality is occupation followed by education; however, if we use age and education together as human capital variables then they together account for a bigger share of inequality. Gender is not important, the importance of union has decreased over time, while the effect of region has increased.[8]

C. Decomposing the change in across-year inequality

The Change in inequality over time can be written as:

$$(6) \qquad \sigma^2(\ln w_2) - \sigma^2(\ln w_1) = \sum_j [s_{j2}\sigma^2(\ln w_2) - s_{j1}\sigma^2(\ln w_1)],$$

where 1 and 2 represent two time periods. The contribution of the j^{th} factor to the change in inequality can in turn be written as:

$$(7) \qquad \pi_j = \frac{s_{j2}\sigma^2(\ln w_2) - s_{j1}\sigma^2(\ln w_1)}{\sigma^2(\ln w_2) - \sigma^2(\ln w_1)},$$

such that $\sum_j \pi_j = 100\%$. We calculated the contribution of the different factors to changing inequality over the 1984-1994 and 1994-2000 periods, the results are reported in Table 3. Larger π_j indicates a larger contribution of the j^{th} factor to change in inequality, which in turn could indicate the following: j^{th} factor contributes to the increase (decrease) in inequality due to (i) a larger increase (decrease) in the regression coefficient of the j^{th} factor, and/or (ii) a large increase (decrease) in the variation of the j^{th} factor.

For both the period of rising and decreasing inequality, education has the largest contribution to the change in inequality. Second most important factor after education is occupation, in fact the importance of occupation in explaining the change in inequality has increased over time. While for the period of rising inequality gender and unions had an equalizing impact, for the period of falling inequality the two factors were working in the direction of raising inequality. The importance of age and region in explaining the changes in inequality increased over the two periods. While changes in age accounted for only a small part of increasing inequality, it was a big factor in explaining the fall in inequality.

[8] There is evidence of significant regional differences in the impact of trade and financial liberalization in Mexico, which in turn have impacted inequality (Hanson, 2003).

Regional variations continue to exert an upward pressure on inequality, more so in the second period.[9]

D. Price and quantity effects

If education is important in explaining the change in inequality over time, it is of interest to know – whether it is the changing returns to education (the price effect) or the changing levels of education (quantity effect) that is important. The contribution of any factor to the change in inequality can be decomposed into its price and quantity effects as argued by Yun (2002) and Juhn, Murphy and Pierce (1993). To do this we define a counterfactual regression, $\ln w_{ic} = \sum_{j=1}^{J+2} a_{j1} Z_{ji2}$ (subscript *c* denotes counterfactual), adding and subtracting this to equation (6) we get:

$$
\begin{aligned}
\sigma^2(\ln w_2) - \sigma^2(\ln w_1) &= \sigma^2(\ln w_2) - \sigma^2(\ln w_c) + \sigma^2(\ln w_c) - \sigma^2(\ln w_1) \\
&= \sum_j [a_{j2}\sigma_{j2} cor.(Z_{j2}, \ln w_2)\sigma(\ln w_2) - a_{j1}\sigma_{j2} cor.(Z_{j2}, \ln w_c)\sigma(\ln w_c)] \\
&+ \sum_j [a_{j1}\sigma_{j2} cor.(Z_{j2}, \ln w_c)\sigma(\ln w_c) - a_{j1}\sigma_{j1} cor.(Z_{j1}, \ln w_1)\sigma(\ln w_1)] \\
&= \sum_j PE_j + \sum_j QE_j ,
\end{aligned}
\tag{8}
$$

where the first summation is the price effect, with PE_j being the price effect of the j^{th} variable, and the second summation is the quantity effect, with QE_j being the quantity effect of the j^{th} variable. Using equations (6) and (7), we can decompose the contribution of the j^{th} factor to the change in inequality as $\pi_j = \dfrac{PE_j + QE_j}{\sigma^2(\ln w_2) - \sigma^2(\ln w_1)} = \rho_j + q_j$, giving us

$$
1 = \frac{\rho_j}{\pi_j} + \frac{q_j}{\pi_j}, \tag{9}
$$

where the first part of equation (9) is the fraction of the contribution of the j^{th} factor to the change in inequality due to its price effect and the second part is due to the quantity effect.

To estimate the total effect of a categorical variable on the change in inequality we propose the following: let π_c be the share of the categorical variable explaining the change in inequality. Define $\pi_c = \sum_{l=1}^{k} \pi_l$, where *k* is the total number of dummy's representing the categorical variable (in this paper for education *k* = 9, for occupation *k* = 15, and for region *k*

[9] Coefficients on the region dummies have increased in magnitude over time, indicating bigger regional effects.

= 3) and π_l is estimated using equation (7). π_c can be decomposed into price and quantity effect as $\pi_c = \sum_l \pi_l = \sum_l (\rho_l + q_l)$, from which we get:

$$(10) \qquad 1 = \frac{\sum \rho_l}{\pi_c} + \frac{\sum q_l}{\pi_c}.$$

The fraction of the change in π_c attributable to the price effect is given by the first term of equation (10) and the fraction attributable to the quantity effect is given by the second term of the equation. Using equations (8), (9) and (10) we decompose the contribution of the factor to the change in inequality into its price and quantity effect. The results are reported in Table 4.

Increasing returns to education (i.e. the price effect) contributed to the rise in inequality and increasing endowments of education (i.e. the quantity effect) as expected contributed to a decrease in inequality, over both the periods. For the period of rising inequality, the price effect dominated, indicating that demand for skilled workers increased faster than supply.[10] Subsequently as the supply of skilled labor caught up to the demand the quantity effect dominates the price effect, thus education overall contributes to a decrease in inequality in the second period.

The second most important component of rising wage inequality is occupation, which may incorporate human capital attainment on the job in the form of job training. It is the changing returns to occupation and not the changing occupational mix that appears to account for both the increase and decrease in inequality.

6. Conclusion

In this paper we focused on the impact of changing human capital skills on wage inequality in Mexico. While a number of papers have commented on the impact of changing relative demand for skilled labor on wage inequality in Mexico, not much has been said about the impact of the changing supply of skilled labor. Our findings suggest that education plays an important role in both the dispersion of wages among Mexican workers and in changes in this dispersion over time. The results not only document the degree of importance of education in wage dispersion in Mexico, they also reveal that both the changing returns to education and the changing educational attainments are important factors in the increasing, and then decreasing, wage inequality over the past two decades. Over the

[10] Impact of the price effect on the rising wage inequality, associated with rising demand for labour, has also been found for the U.S. (see Juhn *et al.* 1993).

period of trade liberalization and structural reforms in the country the demand for skilled labor increased, which lead to an increase in returns to education and increases in wage inequality. However as the supplies of skilled labor caught up to the demand, inequality started to decrease.

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Table 1: Average sample characteristics

	1984	1994	2000
% of sample at different education levels			
No formal education	7.26	6.47	4.21
Primary incomplete	23.89	16.22	13.20
Primary complete	24.77	20.12	18.91
Junior high incomplete	6.54	6.05	5.16
Junior high complete	18.39	24.35	27.04
High school incomplete	3.06	4.08	4.80
High school complete	5.81	8.50	9.48
Some college	3.92	5.54	5.46
College complete	6.10	8.12	10.89
More than college	0.28	0.56	0.86
Changes in educational attainments			
Average years of schooling	6.94	7.96	8.65
Variance in years of schooling	17.40	18.62	18.22
Gini coefficient for schooling	0.33	0.30	0.28
Changes in (real hourly) wage distribution			
Mean log wage	3.74	3.84	3.68
Variance of log wages	0.59	0.70	0.67
Gini coefficient of log wages	0.11	0.12	0.12
Sample size	3644	10891	8824

Sample weights are used in all calculations.
Since we are using sample weights throughout, the standard formula for calculating the Gini coefficient cannot be used. Instead we use the procedure for calculating the Gini coefficient for weighted samples as given by Lerman and Yitzhaki (1989).
Source: Author's calculations from the ENIGH data set for various years.

Table 2: Wage regression, dependent variable: log real hourly wage

Independent Variables	**1984**	**1994**	**2000**
Age	0.06	0.05	0.05
Age Square	0.00	0.00	0.00
Union (1 = union member)	0.25	0.07	0.17
Male (1= male)	0.16	0.17	0.16
Education Dummies (base: no education)			
Primary incomplete	0.27	0.14	0.10
Primary complete	0.46	0.29	0.19
Junior high incomplete	0.54	0.40	0.18
Junior high complete	0.60	0.43	0.30
High school incomplete	0.57	0.51	0.39
High school complete	0.70	0.72	0.47
Some college	0.71	0.78	0.66
College complete	0.86	1.10	0.96
More than college	1.34	1.40	1.27
Region Dummies (base: South)			
Centre	0.10	0.23	0.27
North	0.15	0.21	0.40
Federal District	0.25	0.34	0.37
Occupation Dummies (base: Agricultural workers)			
Professionals	0.84	0.97	0.77
Technicians	0.66	0.85	0.76
Educational workers	0.91	1.12	0.96
Workers in arts, entertainment and sports	0.66	0.94	0.95
Senior directors, administrators in public and private enterprises	1.07	1.32	1.44
Supervisors – industrial production	0.70	0.70	0.82
Workers, operators – industrial production	0.34	0.42	0.43
Less-skilled workers – industrial production	0.17	0.25	0.29
Administrative workers – industrial production	0.65	0.77	0.71
Salespersons	0.23	0.33	0.27
Vendors, peddlers – with no business representation	0.00^{NS}	0.45	0.27
Personal service workers – Establishments	0.30	0.31	0.30
Personal service workers – Domestic	-0.12^{*}	0.32	0.18
Transport workers	0.42	0.47	0.51
Police and armed forces	0.27	0.22	0.34
Constant	1.39	1.57	1.47
R-Square	0.539	0.578	0.563

Sample weights are used in the estimation.
All coefficients are significant at 1% level, unless stated otherwise: * significant at 5% level; NS not significant.
Region Dummies Center: Aquascalientes, Colima, Jalisco, Michoacan, Guanajuato, Queretaro, Morelos, Tlaxcala, Puebla, Hidalgo, Mexico. North: Baja California, Baja California Sur, Sinaloa, Sonora, Nayarit, Nuevo Leon, Tamaulipas, Chihuahua, Durango, Coahuila, San Luis Potosi, Zacatecas. South (base): Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Yucatan, Campeche, Quintana Roo.
Source: Author's calculations from the ENIGH dataset for various years.

Table 3: Contribution of each explanatory variable to the level of wage inequality and to the change in wage inequality

Explanatory Variable	Relative factor inequality weight s_j			Contribution of the factor to change in inequality π_j	
	1984	**1994**	**2000**	**1984-1994**	**1994-2000**
Age	0.09	0.08	0.06	0.04	0.34
Education	0.15	0.22	0.20	0.57	0.53
Region	0.02	0.03	0.04	0.04	-0.23
Gender	0.00	0.00	0.00	-0.01	-0.06
Union	0.05	0.01	0.02	-0.20	-0.26
Occupation	0.23	0.25	0.23	0.33	0.53
Residual	0.46	0.42	0.44	0.23	0.14

s_j is calculated based on equation (5) in the paper; π_j is calculated based on equation (6) in the paper.

Source: Author's calculations from the ENIGH data set for various years.

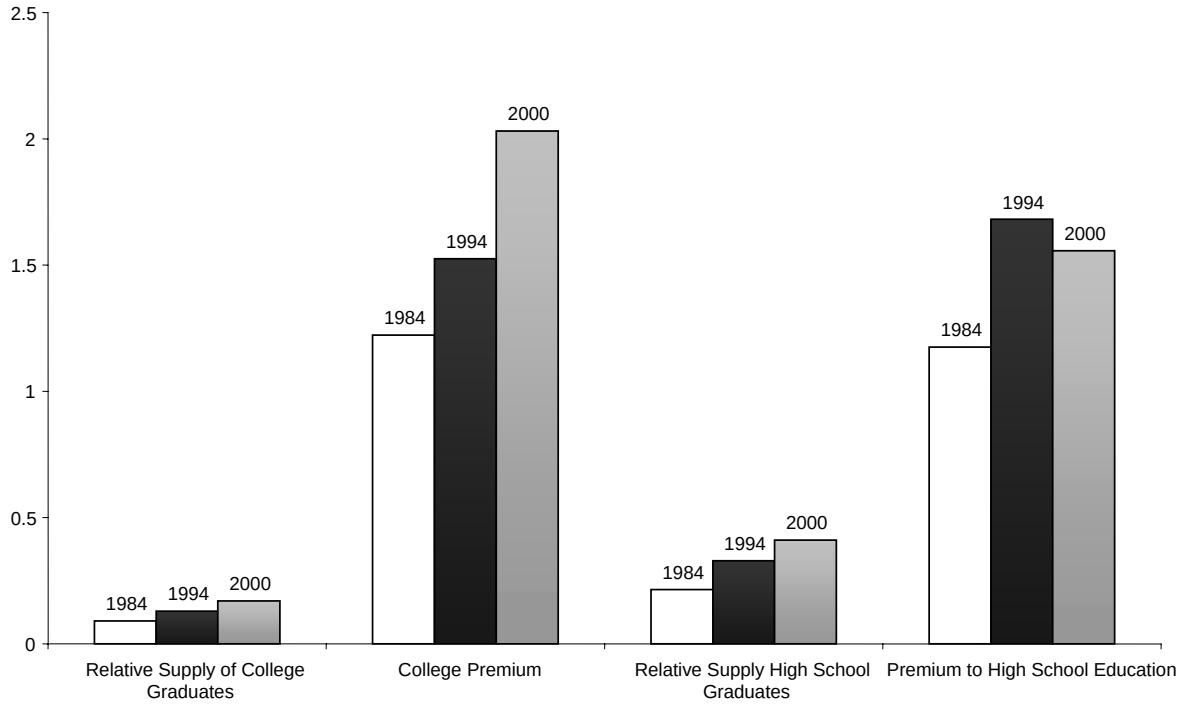
Table 4: Decomposing the contribution of each explanatory variable to the change in wage inequality

Explanatory Variable	Fraction of π_j explained by:			
	1984-1994		1994-2000	
	Price Effect	Quantity Effect	Price Effect	Quantity Effect
Age	0.21	0.79	0.80	0.19
Education	1.88	-0.88	-6.89	7.88
Region	0.21	0.79	-3.99	4.97
Gender	8.74	-7.73	-6.14	7.12
Union	-0.10	1.11	1.51	-0.52
Occupation	0.85	0.15	0.96	0.03

π_j is calculated based on equation (5) in the paper, decomposition is done using equations (8), (9) and (10).

Source: Author's calculations from the ENIGH data set for various years.

Figure (1) Relative supply and returns to skilled labor



College premium is the ratio of the coefficient on 'college degree' relative to the coefficient on 'high school degree' in the wage regression.
Relative supply of college graduates is the ratio of college equivalents (those with at least college + 0.5 × those with some college) to non-college equivalents (those with high school or less + 0.5 × those with some college).
High school premium is the ratio of the coefficient on 'high school degree' to the coefficient on 'junior high degree' in the wage regression.
Relative supply of high school graduates is the ratio of high school equivalents (those with at least high school degree + 0.5 × those with high school incomplete) to non-high school equivalents (those with junior high or less + 0.5 × those with some high school).
Source: Author's calculations from the ENIGH dataset for various years.