GENERAL AND SPECIFIC COMPONENTS IN THE GENDER WAGE GAP IN CHILE.

Abstract: *In this paper a version of the Juhn-Murphy-Pierce methodology to decompose wage residuals is applied to Chile during the nineties. This version allows to identify a nepotistic and discriminatory component from the regression residuals. Moreover, a direct estimation of this decomposition is performed and the importance of general vs specific effects are evaluated for the chilean economy. The results indicate that the most important forces behind the gender wage gap reduction in the nineties are to be found in specific factors, namely reduced discrimination and nepotism.*

Keywords: gender wage gap, discrimination, nepotism

JEL Classification: J16, J31,J71

Introduction

In Chile, the nineties was a period were the economy grew rapidly, with falling inflation and low unemployment rate. Great changes ocurred in the labor market, where perhaps the most notable is the steady increase in the female participation rate. However, in spite of this shift in female labour supply, the average gender wage differential decreased in Chile during the nineties. At the same time labor demand grew rapidly, as a consequence of the high growth rate in economic activity. Moreover, the authorities launched an anti-discriminatory and female supporting policy. All these changes make it worth to analyse more closely what factors can explain the observed decrease in the gender wage differential. Have the general changes in the economy affected the price structure in a way that has favoured women? Or, should one look at

the more specific factors at play in the labor market, such as a changing behavior towards women participation, to explain the development in the differential? This question is addressed in the paper.

Two competing wage determination theories have been used to explain the gender wage gap: the human capital theory, that adscribes the gap to different human capital endowments between gender, and the wage discrimination theory, that mantains that the presence of non-productivity factors in wage determination are important to explain this differential. In the Chilean case, available cross sectional studies tend to give credit to the discrimination theory (see Gill, 1990; Paredes, 1982; Paredes & Riveros, 1994, Dresdner & Arteaga, 1997; and Aguilar & Dresdner, 2000). A general pattern that emerges from these studies is that the human capital gap is too small to explain the wage differential. Thus, when it comes to changes in the wage differential, one could be tempted to interpret this as a reduction in wage discrimination

However, in two following papers (1991 & 1993) Juhn, Murphy and Pierce (hereafter JMP), proposed a new methodology to look at this question. This methodology makes possible to distinguish betwen general price effects, such as overall changes in the wage structure and its dispersion over time, from specific changes, where discrimination could be an explanatory factor. The novelty in this methodology is that it permits the decomposition of the regression residuals in unobserved skill and skill price components. This methodology has been used to explain changes in wage differentials over time or between countries (see Dolton et. al, 1996; Blau & Kahn, 1992, 1996 & 1997). However, this methodology has received criticism on several levels (see Kunze, 2000 for a summary). First, that the methodology does not allow to separate unobservable price and skill effects from discrimination effects (Blau and Kahn, 1997). Second, the use of the male price structure as reference assumes that these prices are a correct standard

for both males and females, which is a largely debated issue in the discrimination literature (see e.g. Oaxaca & Ransom, 1994). Moreover, the estimated results are sensitive to the chosen reference distribution (Fortin and Lemieux, 1998). Third, that the methodology might bias the decomposition of unmeasured skills and prices if percentile ranks are not independent of the standard deviation (Suen, 1997). In this paper I attempt to address the criticisms to this methodology. I discuss the most proper interpretation of the residual decomposition results in the light of the chilean experience; I present a version of the JMP analytical model that has a strong anchorage in discrimination theory, and that therefore allows to identify the proper reference price structure; and I propose a different way of measuring the decomposition that does not use percentile ranks and finally I use a synthetic cohort data base that reduces the risk of bias in the estimated components.

In the following, first I present the analytical model. Then, I review the basic facts, as given by the available data base. Thereafter, I discuss the econometric model and the results. Finally, the conclusions follow.

The Analytical Model.

The human capital approach, synthesized in wage determination equations of the following type, is usually used to study gender wage discrimination:

(1) $$w^j_{it} = X^j_{it}\prime\beta^j_t + \epsilon^j_{it}$$

where w =is the log. of the hourly wage rate, X =is a vector of human capital (observable) characteristics,β =is a vector of human capital rewards (a price vector), ϵ_{it} =is $\sim N(0,\sigma^2_t)$. Subscripts i and t represent individual and time respectively and j =M,F, where M stand for male and F for female.

The Gender Wage Gap can be written

(2) $$\Delta\bar{w}_t \equiv \bar{w}_t^M - \bar{w}_t^F = \Delta\ \bar{X}_t\prime\ \beta_t + [\bar{X}_t^M\prime(\beta_t^M - \beta_t) + \bar{X}_t^F\prime(\beta_t - \beta_t^F)]$$

where Δ is the male - female difference operator, a bar over a variable denotes its average value, and β is the non-discriminating price vector. This equation tell us that the average gender wage differential (the wage gap) can be decomposed in a human capital gap ($\Delta\ \bar{X}$) evaluated at nondiscriminatory prices and a price differential in payments to human capital for males and females relative to nondiscriminatory prices ($\beta_t^M - \beta_t$ and $\beta_t - \beta_t^F$ respectively), evaluated at their average characteristics. A common interpretation is that these price differentials are positive as a consequence of nepotistic, respectively discriminatory behaviour from the employer's side towards men and women[1]. That is, men should receive a wage higher than the one they should obtain in a non discriminatory labor market, while the inverse should happen to women.

A general approach to the determination of the non discriminatory price structure, β, developed in Newmark(1988) and Oaxaca & Ransom (1994), and that I adopt here, is.

(3) $$\beta_t = \Omega\beta_t^M + (I - \Omega)\beta_t^F$$

where Ω is an appropiated weight matrix and I is an identity matrix[2].

>From eq.(3) we obtain

(4) $$\beta_t^M = \Omega^{-1}(\beta_t - \beta_t^F) + \beta_t^F$$

and

(5) $$\beta_t^F = (I - \Omega)^{-1}(\beta_t - \beta_t^M) + \beta_t^M$$

We can define the following residuals, employing the non discriminatory prices.

(6) $$\upsilon_{it}^j \equiv w_{it}^j - X_{it}^j\prime\beta_t$$

These residuals reflect the unexplained part of the wage after controlling for human capital

characteristics evaluated at the non discriminatory price vector.

Substituting eqs.(3) and (5) respective (3) and (4) in (6), and taking the expected value of v_{ti}^{j} , we obtain

(7) $$\bar{v}_t^M = \bar{X}_t^{M\prime}(\beta_t^M - \beta_t)$$

(8) $$\bar{v}_t^F = -\bar{X}_t^{F\prime}(\beta_t - \beta_t^F)$$

where eqs (7) and (8) reflect the nepotistic respective discriminatory (with negative sign) effects on the wage gap. Substituting these expressions in the wage gap (eq.2) we obtain

(9) $$\Delta\bar{w}_t = \Delta\bar{X}_t'\beta_t + \bar{v}_t^M - \bar{v}_t^F$$

Thus, the wage gap is composed of the human capital gap evaluated at the nondiscriminatory price vector and the difference between the average residuals for the male and female equations. Recall that the two residual terms can also be interpreted as the sum of the nepotistic and discriminatory effects. In one sense, these two terms together can be understood as a measure of the disalignment of male and female prices to the non discriminatory price structure.

The change over time in the wage gap can then be expressed as

(10) $$\Delta\bar{w}_t - \Delta\bar{w}_s = (\Delta\bar{X}_t - \Delta\bar{X}_s)'\beta_t + \Delta\bar{X}_s'(\beta_t - \beta_s) + (\bar{v}_t^M - \bar{v}_s^M) - (\bar{v}_t^F - \bar{v}_s^F)$$

where s is another time subscript and t >s.

Eq.(10) decomposes the change in the wage gap over time in four components. The first component is the change in the endowment differential evaluated at the non discriminatory price vector. This effect can be adscribed to human capital changes that affect the wage gap. For instance, if over time women on average are increasing their skills relative to men, then this component and the effect on the wage gap should be negative. The second term reflects the change in non discriminatory human capital rewards over time, evaluated at the base endowment

gap. This is primarily a wage-structure effect. As the wage structure changes over time it will affect the wage gap through the prevailing endowment differential. Clearly, if there where no human capital differences on average between gender, this effect would be null. However, if there is an endownment differential and the price structure is changing over time, then this will have an impact on the gender wage differential. To fix ideas, if there is a positive endowment gap and the non discriminatory rewards are increasing over time, this will increase the wage gap and affect negatively the relative position of women. The third and fourth terms reflect the effects of changes in nepotism respective discrimination over time on changes in the wage gap. Or more precisely, they reflect those changes in the wage gap that cannot be adscribed to changes in observable human capital characteristics or prices. This I will call the change in the ”disalignment gap”, to indicate that this effect arises as a consequence of differences in the male and female prices from the non discriminatory ones.

The interpretation given above to eq.(10) is, however, controversial. The basic assumption is that in a well functioning labor market, wage differences between individuals should reflect productivity (valued human capital) differences, and that any discrepancy in the gender average wages not accounted by the difference in human capital endowments, should correspond to the effect of labor market wage discrimination or nepotism. That is, the ”disalignment gap” is determined residually. However, there are other possible explanations to this residual, that have been treated in the literature. Juhn et al (1991) interpret the residual as chiefly due to unobservable skills and prices, and that therefore changes in the wage gap over time can be explained by changes in the quantities and prices of unobservable skills. However, as Blau & Kahn (1992) emphasize it is not possible to analytically unravel the effects of discrimination and unobservables. Moreover, Suen (1997) hypothesizes that changes in the wage gap can be a

consequence of a change over time in the number of (unobservable) human capital characteristics that the market values Finally, Kunze (2000) points out the possibility of changes in measurement and pricing errors on changes in the residual. However, the decomposition still has some appeal, in the sense that it differentiates the observable human capital effects from other effects. For brevity, I shall continue to name the residual as the ”disaligment residual”, with the limitations this nomenclature may have and in the empirical part I shall discuss different possible interpretations of the results in the light of the chilean experience.

Let us now define wage equations with standarized residuals[3]

(11) $$w_{it}^{j} = X_{it}^{j\prime}\beta_t + \sigma_t \phi_{it}^{j}$$

where $\phi_{it}^{j} = \frac{v_{ti}^{j}}{\sigma_t}$ and σ_t is the standard deviation of the regression with the total sample (male and female).

Then

(12) $$\Delta \bar{w}_t \equiv \bar{w}_t^M - \bar{w}_t^F = \Delta \bar{X}_t' \beta_t + \sigma_t(\bar{\phi}_t^M - \bar{\phi}_t^F) = \Delta \bar{X}_t' \beta_t + \sigma_t \Delta \bar{\phi}_t$$

where $\bar{\phi}_t^j$ is the average (standarized) residual in period t for gender j.

Thus, the change in the wage differential between period t and s can be written

(13) $$\Delta \bar{w}_t - \Delta \bar{w}_s = (\Delta \bar{X}_t - \Delta \bar{X}_s)' \beta_t + \Delta \bar{X}_s'(\beta_t - \beta_s)$$
$$+ (\sigma_t - \sigma_s)\Delta \bar{\phi}_t + \sigma_s(\bar{\phi}_t^M - \bar{\phi}_s^M) - \sigma_s(\bar{\phi}_t^F - \bar{\phi}_s^F)$$

Here the two first components of the left hand side of the equation have the same interpretation as in eq.(10). The three last components show the decomposition of the standarized residual.The third component reflects the change in the wage standard deviation over time, evaluated at the existing difference in the average gender wage residual at time t. This term basically reflects the temporal changes in wage dispersion. If overall wage dispersion increases over time and women are on average at the low part of the distribution, then they will deteriorate

their position, and the wage gap will widen. However, this is not due to an increase in discrimination or nepotism per se, but to the increase in overall wage dispersion. This effect will be understand as a general wage dispersion effect. The fourth term shows the effect of the change in nepotism on the wage gap between time t and s, weighted by the variance in the base period. The fifth term shows the corresponding discriminatory effect. The two terms together reflect the effect of changes in the price disalignment (with respect to non discriminatory prices) on wage gap changes. That is, the effects of changes in both the nepotistic and discriminatory wage differentials. In our interpretation, this is a gender specific effect.

Thus in summary, we can identify general price effects (components 2 and 3 in eq.13) and gender specific effects (components 1, 4 and 5). Of these, the last two components can be associated with nepotism and discrimination. One point worth noting is that the last three terms of eq.(13) can be empirically evaluated directly with the help of eqs. (7) and (8).

Eq. (13) is based on the so called JMP decomposition (see footnote 3). This decomposition has been critized for several reasons (for a summary see Kunze, 2000). Following Kunze , the criticisms are on the strong interpretation of residual changes as changes in unobservable prices and quantities and the difficulty of distinguishing between discriminatory effects and these unobservable effects; on the use of the male price structure and the male distribution as reference for evaluating changes; and on the fact that the decomposition of residuals in prices and quantities of unmeasured ability is subject to bias if percentile ranks are not independent of the standard deviation. I have already commented on the first criticism. It is not possible to disentangle the unmeasured price and quantity effects from the discriminatory effects, and I do not attempt to make a clearcut theoretical distinction, but I will discuss the empirical plausibility of different interpretations. With respect to the second criticism, I do not use the male price

vector or residual distribution as reference frame. Moreover, the theoretical frame of discrimination theory gives a standard, the non discriminatory price vector and its distribution, which I use as reference frame for evaluating changes. The third criticism, based on Suen (op.cit), discusses the possibility that the measurement of the residual decomposition by percentile ranks may give biased results, when these ranks are not independent of the standard deviation. However, one should remark that this result only appears when one introduces a non standarized component in the standarized residual. In the Suen model, this non standarized component is the discriminatory shift parameter.If this parameter is introduced in a standarized manner, then the discussed bias effect does not appear. In any case, I do not use percentile ranks to measure the residual decomposition, but evaluate it with analytical formulas (eqs. 7 & 8) that do not include percentile ranks. Moreover, in the empirical part I use synthetic cohort data that, in accordance with Suen's (op.cit) owns suggestions, lessens the possibility of this bias.

The Data.

The data was obtained from the CASEN surveys for the years 1990, and 1998[4]. To build the labor force database we excluded all persons under 15 and over 65 years. Moreover, rural inhabitants were also left out, to obtain a more homogenous sample[5]. Finally, to obtain a more stable sample we selected the labor force cohorts that were active in both years. That is people between 15 and 57 years in 1990, and between 23 and 65 years in 1998. Thus, on the whole our sample should be representative of the urban labor force in Chile of ages 15-57 years in 1990. Some basic information about the sample, organized by year and some central variables, is presented in table 1.

TABLE 1.

Basic Information of the Sample

Variable	1990	1998	Change
Working Age Population	N°	N°	%
total	32555	38390	17.9%
male	15505	18243	17.7%
female	17050	20147	18.2%
Employed			
total	18475	23910	29.4%
male	12316	15308	24.3%
female	6159	8602	39.7%
Part. rate			
total	56.8%	62.3%	5.5
male	79.4%	83.9%	4.5
female	36.1%	42.7%	6.6
Diferentials			
W_m/W_f	1.25	1.19	-0.06
SC_m/SC_f	0.93	0.95	+0.02
EXP_m/EXP_f	1.09	1.06	-0.03

Source: CASEN surveys 1990 and 1998, MIDEPLAN. Own calculations.

Notes: W_m/W_f is the male female average hourly wage differential, SC_m/SC_f is the male-female average completed years of schooling differential of the employed,and EXP_m/EXP_f is the male-female average years of potential experience differential of the employed.

The sample is over 32.000 observations in both years. Of these, over half of the individuals actively participate in the labor force. While the distribution in the whole sample is relatively equal between men and women, the distribution becomes highly skewed towards men when we consider only the labor force. The employed grew faster than the working age population, which is shown in the change in the participation rates over time. As it can readily be seen, the female participation in the labor market increased more rapidly over the period. Men earned one fourth more than women in 1990. This raw labor income differential decreased to 19% in 1998.

However, the average schooling levels was higher for females than males. On the other hand, the potential experience differential favoured men[6].

In terms of what is to be explained, the raw wage differential fell by six percentage points between 1990 and 1998. In this period the schooling differential rose by two percentage points, thus going in the opposite direction of one should expect according to human capital theory. On the other hand, greater relative experience of women, of three percentage points, could explain at least a part of the decrease in the wage differential. For this, experience should be highly rewarded to compensate for increasing male scholarship.

The Empirical Application

To estimate the wage equations Heckman's sample selection correction was used (Heckman, 1974 & 1979). A probit equation for the participation decision of the individual, was estimated. The results obtained from this regression were used to calculate the inverse of Mill's ratio, hereafter lambda, (see Heckman, op. cit). Plunging this variable in the wage equation, we estimated the wage equations for male, female and total for 1990 and 1998. The form of the estimated equations were

$$w_j = \beta_0 + \beta_1 SC_j + \beta_2 EXP_j + \beta_3 EXP_j + \beta_4 D8SC_j + \beta_5 D12SC_j + \beta_6 \hat{\lambda}_j \quad (14)$$

where w is the log of hourly wages, D8SC and D12SC are splines for 8 and 12 years of completed studies respectively and $\hat{\lambda}$ is Mill's inverse ratio estimated previously with the probit. The estimation was also controlled for administrative region and sector of economic activity. The results were corrected for heterocedasticity using White's procedure (White, 1980), and observations were weighted by the relevant expansion factors. The results were in general

significant, with the expected signs and in line with previous estimates for the Chilean economy (see appendix)[7]

These results were used to calculate the wage change decomposition according to eq.(13), and are presented in table 2. The second column shows the percentage of the total change in the wage gap corresponding to the different estimated components, while the third column shows the absolutes percentage points. The first row shows the human capital component. The results indicate that the change in the human capital gap, evaluated at non-discriminatory prices, tended to decrease the wage gap during the period. About 0.7 percentage points of the reduction in the wage differential can be attributed to the (average) improvement of female human capital characteristics in relation to male in the period. On the other hand, as it can be seen in row 2, the general wage effect worked against the reduction in the wage gap. In effect, during the period, the positive increase in the non discriminatory prices tended to disfavoured women relative to men. If everything else had remained constant, the wage gap would have incresed by 4.6 percentage points, as a consequence of the initial detrimental relative position of female in the wage distribution. On the other hand, relative wage volatility did not show an important effect on relative wages. As it can be seen in row 3, general wage variance actually was reduced in the period, and in that sense it contributed to the reduction in the gender wage differential, although the effect is negligible. Finally, both nepotism and discrimination (the price disalignment effect) have decreased between 1990 and 1998 and their joint effect is great enough to counteract the opposite effect of the general price increase. Actually, the two effects in combination amount nearly to a nine percentage points decrease in the wage gap during the period. Thus clearly the decrease in nepotism and discrimination, according to the present interpretation, are the components that can explain, to a great extent, the observed fall in the wage gap in Chile.

Moreover, the decomposition allows us to distinguish the relative importance of these effects, and in this case the evidence points that the more strong effect is the decrease in discrimination against female workers.

Table 2

Decomposition of the Change in the Wage Gap. Chile: 1990-1998 (percentage)

Components	**Percentage**	**Absolute values**
$(\Delta\bar{X}_t - \Delta\bar{X}_s)'\beta_t$	14.5%	-0.0074
$\Delta\bar{X}_s'(\beta_t - \beta_s)$	-91.1%	0.0464
$(\sigma_t - \sigma_s)\Delta\ \bar{\phi}_t$	0.4%	-0.0001
$\sigma_s(\bar{\phi}_t^M - \bar{\phi}_s^M)$	66.9%	-0.0341
$\sigma_s(\bar{\phi}_t^F - \bar{\phi}_s^F)$	109.4%	-0.0558
Sum of components	100.0%	-0.0510

Source: Own Results

The methodology used does not allow to make a clear distinction between the present interpretation of the results and other interpretations. For example, in the JMP tradition, one could think that what here is called the price disalignment effect, is simply the reflection of unobservable skill convergence between males and females. That is that women have increased their non -observable but marketable skills in relation to men. Although this interpretation is, in principle, possible it is not clear what these skills could be or whether they have increased in the assumed way during the period in Chile. Moreover, it should be remembered that in the data selection we controlled for the effect of new cohorts, which usually is supposed to account for a great deal of the unmeasured skill effects. On the other hand, the proposed interpretation in this paper, seems consistent with other casual information. The rapid economic development during the nineties increased labor demand, which led many females to go out in the labor market. Female participation increased not only in traditional female sectors, but all over the economy.

Increased acquantaince might have reduced prejudgements and decreased both taste discrimination and nepotism. Moreover, the development of the labor market might have increased competition and reduced the scope for discriminatory practices. Finally, the government's antidiscriminatory policy might have also contributed to reduce discrimination.

CONCLUSIONS

In this paper I have addressed the question of the factors that can explain the reduction in the gender wage differential in Chile during the nineties. Using an extended version of the JMP methodology I have been able to decompose the wage change in general and specific factors. General price increases to skill levels and the change in wage dispersion do not appear to be important factors to explain the fall in the gender wage gap. In fact, general price changes tended to favor the male position, and in that sense counteracted the observed decrease in the gender wage gap. The factors that can explain the tendency in relative wage development in Chile during the period are of specific character. Both human capital considerations as well as less discrimination and nepotism account for the fall in the gender relative wage. On one hand, females increased their average human capital attributes vis a vis males. On the other hand, discrimination and nepotism seems to have decreased, perhaps as a consequence of a more dynamic and competitive labor market. Actually, these two last effects account for the largest measured impact on the gender wage gap.

NOTES.

1.The theory of employer discrimination is found in Becker (1957) and Arrow (1972). Goldberg (1982) expands the theory to acccount for the possibility of nepotism. Newmark (1988)

offers a theoretical anchorage to the interpretation of the Oaxaca-Blinder decomposition.

2.$\Omega = (X'X)^{-1}(X^{M\prime}X^{M})$, where X^{M} and X are the male and total (male plus female) observation matrix of independent variables respectively. Equation 3 is consistent with a model of employer discrimination with different labor qualities and an employer utility function homogenous of degree zero for each type of labor. See Newmark (op.cit)

3.This is the so called JMP decomposition, which is based on the work of Juhn et al. (1991) & (1993).

4.The Encuesta de Caracterización Socio-Económica Nacional (CASEN survey) is driven by the National Planning Ministry (MIDEPLAN) every two years, and is oriented towards the study of social conditions in Chile.

5.The inclusion of rural labor force in the estimation of human capital models in Chile affects the stability of the results, since the differences between rural and urban labor markets sweeps through almost all relations (Gill, 1991). To select the sample we chose all communes (comunas) that showed a proportion of urban population greater than 85%, according to the 1992 population census. This percentage was chosen to assure country wide representativeness in the sample.

6.The measure of potential experience is as usual Age-SC-6. Thus, since women on average show the same age as men but are more schooled, one should expect that their experience was less than men. Therefore, in some proportion the experience differential is a statistical artifact.

7.The estimation was made for other periods and subperiods, and although some of the quantitative results changed, the qualitative results, both in terms of signs and general importance of the components did not change.

REFERENCES

Aguilar, R. & J.Dresdner (2000): ”La Evolución de la Discriminación Salarial por Género en Chile: 1987-1998”, *Documentos de Trabajo* 2000.12, Departamento de Economía, Universidad de Concepción.

Arrow, K. (1972): ”Models of Jobs Discrimination” chapter 2 in *Racial Discrimination in Economic Life*, Lexington, Mass.D.C. Heath, pp. 83-102.

Becker, G. (1957): ”*The Economics of Discrimination*”, University of Chicago Press, Chicago.

Blau, F.& L. Kahn (1992): ”The Gender Earnings Gap: Learning from International Comparisons”, *American Economic Review* 82 (2), pp.533-8.

Blau, F.& L. Kahn (1996): ”Wage Structure and Gender Earnings Diferentials: An International Comparison”, *Economica*, 63 (250), pp.S29-62.

Blau, F.& L. Kahn (1997): ”Swimming Upstream: TRends in the Gender Wage Differential in the 1980s”, *Journal of Labor Economics*, 15(1), p.1-42.

Dolton, P.; D. O’Neill & O. Sweetman (1996): ”Gender Differences in The Changing Labor Market. The Role of Legislation and Inequality in Changing the Wage Gap for Qualified Workers in the United Kingdom”, *The Journal of Human Resources* 31, N° 3, pp.549-65.

Dresdner, J. & J. Arteaga (1997): ”Diferencial de Salario y Discriminación por Género: Gran Concepción 1994”, *Economía y Administración*, Vol. 34, N° 49, (December) pp. 7-26.

Fortin, N. & T. Lemieux (1998): ”Rank Regressions, Wage Distributions, and the Gender Wage Gap”, *The Journal of Human Resources,* 33, N°3, pp.610-43.

Gill, I (1991): ”Is There Sex Discrimination in Chile? Evidence from the CASEN Survey.”in *Women’s Employment and Pay in Latin America*, Psacharopoulos, G y Z.Tzannatos (eds), Report

Nº 10, Latin America and the Caribbean Technical Department, Regional Studies Program, The World Bank, Washington D.C., Chapter 10, pp. 10.1- 10.29.

Goldberg, M. (1982): ”Discrimination, Nepotism and Long Run Wage Differentials”, *The Quarterly Journal of Economics* 97(2), May, pp. 307-19.

Heckman, J. (1979): ”Sample Selection Bias as a Specification Error”, *Econometrica,* volumen Nº 47, Enero, pp. 153-161.

Heckman, J (1974): ”Shadow Prices, Market Wages, and Labour Supply”, ”*Econometrica*”, pp. 679-694

Juhn, C.; K.Murphy & B.Pierce (1991): ”Accounting for the Slowdown in Black-White Wage Convergence” in *Workers and their Wages* ed. M. Kosters, pp. 107-43, Washington D.C., AEI Press.

Juhn, C.; K.Murphy & B.Pierce (1993): ”Wage Inequality and the Rise in Returns to Skill”, *Journal of Political Economy* 101(3), pp. 410-442

Kunze, A. (200): ”The Determination of Wages and the Gender Wage Gap: A Survey”, *IZA Discussions Papers* N° 193, August, Institute for the Study of Labor, Bonn.

Neumark, D. (1988): ”Employer’s Discriminatory Behavior and the Estimation of Wage Discrimination”, *The Journal of Human Resources* 23 (3), pp.279-95.

Oaxaca, R. & M. Ransom (1994): ”On Discrimination and the Decomposition of Wage Differentials”, *Journal of Econometrics* 61 (1), pp. 5-21.

Paredes, R. (1982) : ”Diferencias de Ingreso entre Hombres y Mujeres en el Gran Santiago 1969 y 1981”, *Estudios de Economía* Nº 18, pp.pp. 99-121.

Paredes, R. y L. Riveros (1994): ”Gender Wage Gaps in Chile. A Long Term View: 1958 -1990”, *Estudios de Economía* Vol. 21, número especial, (Noviembre), pp. 211-30.

Suen, W. (1997): ”Decomposing Wage Residuals: Unmeasured Skill or Statistical Artifact?”, *Journal of Human Resources* 15 (3), pp. 555-66.

White, H (1980): ”A Heteroskedasticity Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity”, in *Econometrica*, november, pp.817-838.