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CHANGING WAGE STRUCTURE AND BLACK-WHITE WAGE DIFFERENTIALS AMONG MEN AND WOMEN: A LONGITUDINAL ANALYSIS

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ABSTRACT

Despite several decades of research there is still widespread disagreement over the interpretation of the wage differences between black and white workers. Do the differences reflect productivity differences, discrimination, or both? If lower black earnings reflect a productivity difference, then an economy-wide increase in the relative wages of more highly-skilled workers should lead to a parallel increase in the black-white earnings gap. We evaluate this hypothesis using longitudinal data for men and women from the Panel Study of Income Dynamics.

Our findings suggest that returns to observed and unobserved skills of male workers rose by 5-10 percent between 1979 and 1985. For female workers, the return to observed skills was relatively constant while the return to unobserved skills increased by 15 percent. The evidence that black-white wage differentials rise with the return to skill is mixed. Among female workers the black-white wage gap widened in the early 1980s -- consistent with the premise that racial wage differences reflect a productivity difference. For men in our sample the black-white wage gap declined between 1979 and 1985 -- a change that is inconsistent with the rise in the return for skills.

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How do black-white wage differentials respond to a change in the relative earnings of skilled workers? The answer depends on the underlying sources of the observed racial wage gap. If lower earnings of black workers reflect a difference in productivity, then an economy-wide increase in the wage premium for skilled workers should lead to a proportional expansion in measured black-white wage differences (Chinhui Juhn, Kevin M. Murphy, and Brooks Pierce (1991), James P. Smith (1993)). If lower black wages reflect discrimination, however, then there is no obvious reason why a change in the structure of wages should affect the black-white wage differential.

The answer also depends on the nature of the changes in the overall wage structure. Labor market earnings vary across individuals with different levels of age and education, and among workers with the same observed characteristics. Unless wage differentials expand or contract proportionally, it is unclear how a given shift in the wage structure should affect black workers relative to whites. Are the assumed productivity differences between black and white workers valued in the labor market at the same rate as productivity differences by age and education, or are they evaluated like productivity differences among workers with the same observed characteristics?

In this paper we use longitudinal data from the Panel Study of Income Dynamics to measure relative changes in the earnings differentials associated with various dimensions of skill, and compare these changes to the changes in the measured black-white wage gaps for men and women. Longitudinal data enable us to identify changes in the returns to both observed and <u>unobserved</u> person-specific wage determinants. Longitudinal data also allow us to measure changes in the black-white wage differential for a fixed cohort of workers -- thereby abstracting from relative changes in background characteristics that could bias an inter-cohort comparison. We contrast the observed changes in the black-white wage gap for men and women against the predictions generated by assuming that racial wage gaps vary proportionally with the returns to observed and/or unobserved skill.

For men, our results suggest that the labor market returns to observed and unobserved skill rose roughly proportionally between 1979 and 1985. Over this period, however, the black-white wage differential for male household heads in the PSID sample was relatively constant, casting some doubt on the hypothesis that the size of the racial wage gap is linked to the return to skill. For women, on the other hand, the returns to observed wage determinants were relatively constant while the returns to person-specific unobserved wage determinants rose significantly. The black-white wage differential for female household heads/wives in the PSID sample also increased in the early 1980s. Our findings for women are therefore consistent with a link between the black-white wage gap and the return to person-specific unobserved skill.

I. Changes in the Wage Structure in the Early 1980s

Figure 1 graphs two indexes of overall wage inequality for men and women derived from Current Population Survey (CPS) data from 1973 to 1992.[1] The inequality measures are the standard deviation of log hourly wages and the differential between the 90th and 10th percentiles of log wages (the "90-10 gap"). As has been noted in several recent papers (see Frank Levy and Richard

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[1]The data are drawn from the May CPS files for 1973-78, and merged files combining one-quarter of all individuals in every monthly CPS from 1979 to 1992. The wage data are constructed from reported hourly or weekly earnings for each respondent's main job. See John DiNardo, Nicole Fortin, and Thomas Lemieux (1993) for more details. Note that these data show somewhat different trends than wage inequality measures derived from annual earnings for full-time full-year workers in the March CPS, as reported in Murphy and Welch (1993). The latter show fairly steady increases in inequality throughout the 1970s and 1980s.

Murnane (1992) for a survey) earnings inequality expanded in the early 1980s after a period of stability in the 1970s. Relative to 1973, the standard deviation of men's wages grew by 10 percent over the 1980s, with most of the growth concentrated between 1980 and 1985. The proportional increase in the 90-10 gap was larger but shows a similar concentration in the 1980-85 period. The trend in wage inequality for women is roughly parallel to the trend for men between 1973 and 1985, but shows a continuing increase through the later half of the 1980s.

The data in Figure 1 suggest that the structure of wages changed dramatically in the early 1980s. In order to analyze the nature of these changes and explore their implications for black-white wage differences, we created longitudinal samples of wage information using 1979-85 data from the Panel Study of Income Dynamics (PSID).[2] We used the 1985 merged family-individual file of the PSID to construct a sample of men who were household heads in every year from 1979 to 1985, and a parallel sample of women who were either household heads or wives of household heads in every year from 1979 to 1985. We excluded from our samples individuals who were over 64 in 1985, as well as individuals whose "potential experience" (age-education-6) was less than 0 in 1979.[3]

Characteristics of our PSID samples, together with comparative information for individuals in the 1979 and 1985 CPS merged monthly earnings files, are presented in Table 1. The column labelled "PSID - All" contains

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[2]Although it would be interesting to construct a longer panel (spanning the 1979-89 period, for example), the requirement of each additional year of data leads to reduction in the available sample size.

[3]We also excluded a small number of individuals with missing age, race or education data.

information on the entire sample of men or women that satisfy our age and household-head requirements. The column labelled "PSID - Continuous Wages" contains information on the subset of individuals (803 women, 1122 men) who report a valid hourly wage for their main job in each year from 1979 to 1985.[4] The "CPS" columns present information for men or women age 16-64 (with positive potential experience) who report a valid hourly or weekly wage on their main job in the 1979 and 1985 CPS surveys.[5]

The (weighted) average characteristics of our PSID samples are fairly similar to the average characteristics of workers in the CPS, although the PSID samples are slightly older and better-educated.[6] Hourly wages in 1979 are also slightly higher in the PSID samples. Between 1979 and 1985 the CPS samples show a small real wage gain for women and a real wage decline for men. The PSID samples, on the other hand, show significant real wage growth for both groups. This difference reflects the fact that the CPS samples have an (approximately) constant age structure, whereas the PSID samples age by 6 years over our sample period. In light of recent studies of the changing male-female wage gap (e.g. Francine Blau and Andrea Beller (1992)), it is interesting to compare the relative changes in male and female wages in the CPS and PSID

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[4]The PSID questionnaire asks about earnings over the relevant pay period (depending on how the respondent is paid) for the main job held at the time of the survey. The answer is then converted to an hourly rate by the PSID survey administrators assuming a fixed schedule of hours per week.

[5]Neither the PSID nor the CPS collect wage information from the self-employed. Self-employed workers are therefore excluded from the CPS samples underlying Table 1, and from the PSID sample with continuous wages.

[6]The age measures for the PSID sample are for 1979. The education measures are taken from the 1985 PSID questionnaire. We use the 1985 family weights as weights in all our statistical procedures.

samples. Between 1979 and 1985 the PSID samples actually show faster convergence in female relative wages than the CPS sample. This comparison suggests that the narrowing of the male-female wage gap over the 1980s was driven by relative female wage growth within cohorts, rather than by changing cohort composition.

Table 1 also reports the dispersion in wages and the average black-white wage gap in 1979 and 1985. In the CPS, the standard deviation of log wages for women rose by 0.074 (18 percent) from 1979 to 1985. Using the PSID sample as a cross-section (e.g., using all available wage observations in a given year to compute the standard deviation of wages in that year) the rise in female wage inequality is comparable. Among the subsample of women with continuous wage data, however, the rise in wage inequality is smaller. A similar pattern emerges for men. The rise in wage inequality for men in the PSID sample with continuous wage data is particularly small, although this is partly a reflection of the relatively high dispersion in wages for this sample in 1979 relative to 1980 or 1981. Measured from 1981 to 1985, the growth in wage dispersion for men with continuous wage data was 0.027 (7 percent).

Just as the trends in wage dispersion are somewhat different in the CPS and PSID samples, the trends in the black-white wage gap also vary between the samples. CPS data indicate a slight widening of the black-white wage gap for women between 1979 and 1985, and a more significant (4 percentage point) widening of the gap for men.[7] The PSID data show a similar trend in the black-white wage gap for women, but a slight narrowing of the wage gap for men.

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[7]See John Bound and Richard Freeman (1992) and Smith (1993) for analyses of recent changes in the black-white wage gap for men, and Blau and Beller (1992) and David Card and Lemieux (1993) for an analysis of black-white wage differentials for men and women during the 1970s and the 1980s.

II. Estimates of the Changing Wage Structure

In this section we describe the econometric models we use to measure the changes in the structure of wages observed in our PSID samples between 1979 and 1985. We begin with an equation that describes the logarithm of the hourly wage for individual i in period t (w_{it}) as a function of observed characteristics (x_{it}), a race indicator (D_i), a set of time-varying coefficients, and a person- and time-specific residual (ε_{it}):

(1) $$w_{it} = b_t + D_i\alpha_t + x_{it}'\beta_t + \varepsilon_{it}.$$

In this equation α_t represents the black-white wage differential in period t and β_t represents a vector of returns to the characteristics included in x_{it}. Suppose that the rates of return to the various dimensions of observed skill vary proportionally over time. Then $\beta_t=\delta_t\bullet\beta$, where β is a time-invariant vector that transforms observed characteristics into a single index of skill, and δ_t represents a relative "price" of observed skill in period t (with $\delta_t=1$ in 1979). The assumption that returns to education, experience, and other observed characteristics vary proportionally over time is highly restrictive, but provides a useful benchmark for summarizing changes in the return to observed skills.[8]

For comparison with the relative price of observed skill we can express the black-white wage differential in period t as a proportion of its value in 1979: $\alpha_t=\phi_t\alpha$, with $\phi_{79}=1$. Adopting this normalization and imposing the single index assumption for observed skills, equation (1) can be rewritten as:

(2) $$w_{it} = b_t + \phi_t(D_i\alpha) + \delta_t(x_{it}'\beta) + \varepsilon_{it}.$$

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[8]The assumption that x_{it} can be aggregated to a single index of skill is necessary to define a unique "price" for observed skill in any period. We include in x_{it} a linear education term, a quartic function of potential experience, and an interaction of experience and education.

If the wage differential between black and white workers is due to productivity differences valued at the same rate as observed skills, then $\phi_t = \delta_t$ for all t. This is a readily-tested nonlinear restriction on the set of equations represented by (2).

Not all the systematic productivity differences across individuals are readily captured by the observed characteristics in x_{it}. Presumably, some portion of the residual ε_{it} represents a return to person-specific unobserved skills. Unless the rate of return to unobserved skills varies directly with the rate of return to observed skills, however, it is unclear which rate of return should be compared to the wage differential between blacks and whites. Our approach is to estimate the rates of return to observed and unobserved skills separately, and then compare changes in these rates of return to each other and to the changes in the observed black-white wage differential.

Estimation of the rate of return to unobserved person-specific skills is complicated by the fact that the error term ε_{it} is likely to contain both productivity components and reporting errors and/or random discrepancies between wages and productivity. In general it is impossible to separately identify the true productivity components of residual wage variation from random measurement errors. We make the identifying assumption that the non-productivity components of ε_{it} are independently and identically distributed over time. We further assume that the productivity component of ε_{it} can be decomposed as $\psi_t p_{it}$, where p_{it} is a stationary AR(1) process centered around a person specific mean a_i:

$$p_{it} = a_i + u_{it},$$

where $$u_{it} = \rho u_{it-1} + e_{it}.$$

In direct analogy with our treatment of the return to observed skills, ψ_t has the interpretation of the relative return to unobserved skill in period t. (We normalize $\psi_{79}=1$).

Letting v_{it} denote the measurement error in wages, ε_{it} can be written as:

(3) $$\varepsilon_{it} = \psi_t(a_i + u_{it}) + v_{it}.$$

If the rate of return to unobserved skill is constant, equation (3) implies that the person-specific wage residual is covariance-stationary with a declining autocorrelation function.[9] More generally, if the rate of return to unobserved skill varies over time, our assumptions imply a restrictive pattern in the covariance structure of the individual wage residuals.

Equations (2) and (3) yield an non-linear error-components model for log wages that is readily estimable by minimum distance methods. Specifically, these equations imply the following expressions for the first and second moments of wages, conditional on the vector of observed characteristics D_i,x_i (where $x_i=(x_{i1},...x_{it})$):

(4a) $E(w_{it}|D_i,x_i) = b_t + \phi_t(D_i\alpha) + \delta_t(x_{it}'\beta),$

(4b) $E(w_{it}^2|D_i,x_i) = [b_t + \phi_t(D_i\alpha) + \delta_t(x_{it}'\beta)]^2 + \psi_t^2(\sigma_a^2 + \sigma_u^2) + \sigma_v^2,$

(4c) $E(w_{it}w_{is}|D_i,x_i) = [b_t + \phi_t(D_i\alpha) + \delta_t(x_{it}'\beta)]\times[b_s + \phi_s(D_i\alpha) + \delta_s(x_{is}'\beta)] + \psi_t\psi_s(\sigma_a^2 + \rho^{|t-s|}\sigma_u^2).$

Here σ_a^2 is the variance of a_i across individuals in the sample, σ_u^2 is the variance of u_{it}, and σ_v^2 is the variance of v_{it}. With seven years of data (from 1979 to 1985), equations (4a-4c) specify 35 equations (7 first moments, 7 second moments, and 21 cross-products) in terms of a small set of underlying parameters, including the relative returns to observed skills (δ_t), the relative

[9]Similar models have been used in several previous studies of longitudinal wage data. See for example Douglas Holtz-Eakin, Whitney Newey, and Harvey Rosen (1988).

returns to unobserved skills (ψ_t), and the relative black-white wage differentials (ϕ_t).

To estimate these parameters we stack the equations defined by (4a)-(4c) into a system of equations of the form:

$$E(y_i|x_i,D_i) = f(x_i,D_i,\theta)$$

where:

$$y_i = [w_{i1},...,w_{i7}, w_{i1}w_{i1},...,w_{i7}w_{i7}, w_{i1}w_{i2},...,w_{i6}w_{i7}]',$$

and θ is a vector containing all the parameters of the model. We then minimize the quadratic form

$$S(\theta) = (1/N) \ \Sigma_i \ [y_i - f(x_i,D_i,\theta)]' \ W \ [y_i - f(x_i,D_i,\theta)],$$

where N represents the sample size and W is a weighting matrix formed from the cross-products of the residuals from a set of unrestricted regressions of the first and second moments of wages on (D_i,x_i) and $(D_i, x_i, x_i^2$, and $D_ix_i)$, respectively. Restrictions on the vector of parameters θ can be tested using the procedure developed by Ronald Gallant and Dale Jorgenson (1979).

One shortcoming of our econometric model is that it requires continuous wage data from 1979 to 1985. This is a serious limitation: only 63 percent of men and 21 percent of women in our PSID sample report wages every year (see Table 1). By requiring continuous wage data we are likely to exclude individuals who were subject to a substantial labor market shock at some time in the early 1980s and were unemployed at one of the interview dates. Our sample restrictions presumably lead us to understate the effect of structural shocks on the structure of wages. In principle we could either use a two-step selection correction to adjust the first and second moment equations for the sample selection requirement, or generalize our econometric procedure to incorporate unbalanced data in the estimation. We leave these extensions for future research.

III. Estimation Results

Tables 2a and 2b report the estimation results for our models of the wage structure applied to women and men in the PSID. Two specifications are presented in each table: an unconstrained model in which the vectors of returns to observed and unobserved skills, and the relative black-white wage differential are estimated freely; and a highly restrictive "one-factor" model in which the returns to observable and unobservable skill and the relative black-white wage differential are all constrained to be proportional (i.e., $\delta_t=\psi_t=\phi_t$ for all t). Although not reported in the tables, we have also estimated a variety of other models, including a stationary model with $\delta_t=\psi_t=\phi_t=1$, and a model with a constant black-white relative wage gap ($\phi_t=1$). Goodness-of-fit tests for these alternative specifications are reported in Table 3.

Looking first at the results for women, the estimated rates of return to observed and unobserved skills show a very different pattern over the 1980s. Whereas the estimated returns to observed skill (column 1 of Table 2a) follow a 'u-shaped' trajectory, the estimated returns to unobserved skills (column 2 of Table 2a) increase steadily. A test that the returns to observed and unobserved skill are equal (row 6 of Table 3) is soundly rejected. The relative black-white wage differentials (column 3 of Table 2a) are rather imprecisely estimated but show a sizeable increase from 1979 to 1985. Consequently, a test that the black-white wage differences for women are proportional to the relative return to unobserved skill is well below its critical value (row 4 of Table 3) whereas a test that the black-white differences are proportional to the return to observed skill is significant at the 10 percent level (row 3 of Table 3). It should be noted, however, that a test for <u>constancy</u> of the black-white relative wage gap over the 1979-85 period is not rejected at conventional significance levels (p-value of 0.18 -- see row 2 of Table 3).

The estimated parameters of the residual wage process (equation (3)) are presented in the lower panels of Tables 2a and 2b, together with goodness-of-fit tests for the unrestricted and restricted models. The estimates of the productivity process are close to a random-walk model, with an estimated autoregressive parameter just below 1 and an estimate of σ_a^2 that is arbitrarily close to 0. The relative magnitudes of the estimated variance components suggest that about 10 percent of residual wage variation is attributable to random measurement error, with the remainder attributable to a slowly decaying productivity process.

The goodness-of-fit statistics in Table 2 are substantially above their critical values, suggesting that our models for the first and second moments of female wages are too restrictive. Part of the reason for this lack of fit is a failure of the single-index restriction $\beta_t = \delta_t \cdot \beta$ for the observable wage determinants.[10] Part is also attributable to the overly restrictive model of the wage residuals implied by the combination of i.i.d. measurement error and a stationary AR(1) productivity process.[11] In principle we could easily generalize our models by relaxing the single index restriction for observable skills, and by introducing a multi-dimensional vector of unobserved skills (see Murphy, Mark Plant, and Finis Welch (1988)). Given the relatively small sample sizes available from the PSID, however, we defer these extensions to future work.

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[10]This parallels the findings in our earlier work (Card and Lemieux (1993)). The difficulty for the single index restriction arises from a relative flattening of the experience profile of more-educated relative to less-educated workers over the 1980s. If we exclude the interaction of experience and education from our specification of the x_{it} vector the goodness-of-fit improves significantly.

[11]We fit a model with no restrictions on the observable determinants of wages (i.e., β_t unrestricted) and still obtained a goodness-of-fit statistic considerably in excess of its critical value.

The estimation results for males differ from the results for females in several important respects. First, contrary to the results for women, the estimated rates of return to observed and unobserved skill are relatively similar for men. A test of equality of the rates of return to observed and unobserved skills (row 6 of Table 3) is far below its critical value. Second, the estimated black-white wage differentials (column 3 of Table 2b) are extremely variable and seem to bear no strong relation to the returns to either observed or unobserved skill. Indeed, the "best fitting" model for the black-white wage gap is one that imposes a constant differential (ϕ_t=1). Despite these differences, the estimated parameters of the residual wage process are fairly similar for men and women. Again, about 10 percent of residual wage variation is attributable to random measurement error, with the remainder attributable to a very slowly decaying productivity process.

To summarize these results we present in Figure 2 the actual series of relative black-white wage gaps for men and women in our PSID samples, and the implied gaps under two alternative assumptions: that the black-white wage gap is proportional to the relative return to observed skill ($\phi_t=\delta_t$); and that the gap is proportional to the relative return to unobserved skill ($\phi_t=\psi_t$). For women, the assumption of proportionality between the return to unobserved skill and the black-white wage differential is potentially consistent with the data: both series show a rapid expansion between 1979 and 1985. For men, on the other hand, the returns to observed and unobserved skills increase proportionally over the 1980s, and neither series reproduces the pattern of the estimated black-white wage gap.

VI. Conclusions

We have proposed a relatively simple econometric methodology, based on the use of individual panel data, to estimate relative changes in the labor market returns to alternative dimensions of skill. Although the methodology is readily generalizable, we adopt a very restrictive two-dimensional model that distinguishes between a one-dimensional index of observed skill and another one-dimensional index of unobserved skill. We compare the estimated rates of return to these two components of wages over the early 1980s to the changes in the black-white wage differential over the same period. This comparison allows us to test the implicit assumption in several recent papers that the black-white wage differential is proportional to the "return to skill".

Our empirical results suggest that the returns to observed and unobserved skills for male workers increased by about 5-10 percent between 1979 and 1985. For female workers, the return to observed skills was relatively stable while the return to unobserved skill increased by 15 percent. The evidence that changes in the black-white wage differential are linked to changes in the return to skill is mixed. On the one hand, the black-white wage gap among female workers in our PSID sample widened in the early 1980s -- consistent with the hypothesis that the wage gap between black and white women reflects a productivity difference valued in the labor market at the same rate as unobserved skills. On the other hand, the black-white wage gap for male workers in our PSID sample declined between 1979 and 1985 -- a change that is inconsistent with the rise in return for skills.

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Table 1: Comparisons of Sample Characteristics: CPS and PSID Samples
WOMEN

	Current Population Survey All Employed Workers		PSID Female Heads/Wives	
	1979	1985	All	Continuous Wages
Average Age	35.1	35.4	37.3	37.5
Average Education	12.5	12.9	12.6	13.2
Percent Black	11.2	11.3	11.9	11.6
1979 Log Wages:				
Mean (Std error)	1.462 (0.002)	--	1.524 (0.009)	1.591 (0.013)
Standard Deviation	0.413	--	0.394	0.380
Black-White Wage Gap (Std error)	-0.056 (0.005)	--	-0.156 (0.027)	-0.198 (0.041)
1985 Log Wages:				
Mean (Std error)	--	1.473 (0.002)	1.605 (0.011)	1.763 (0.015)
Standard Deviation	--	0.487	0.473	0.426
Black-White Wage Gap (Std error)	--	-0.067 (0.006)	-0.159 (0.033)	-0.243 (0.044)
Change from 1979 to 1985:				
Mean Log Wage	0.011 (0.002)		0.081 (0.010)	0.172 (0.010)
Std Dev Log Wage	0.074		0.079	0.046
Black-White Wage Gap (Std error)	-0.011 (0.008)		-0.003 (0.031)	-0.044 (0.032)

Notes: CPS samples include only paid non-self-employed workers with non-allocated hourly or weekly wages, between the ages of 16 and 64, with non-negative potential experience. Sample sizes in 1979 and 1985 are 62,168 and 71,151, respectively. PSID sample is drawn from the 1985 merged family-individual PSID file and consists of 3834 women age 16-57 in 1979 who were either heads of households or wives of the heads of households in every year from 1979 to 1985. The PSID sample with continuous wages consists of 803 women who report a valid wage for their main job in each of the 1979-85 interviews.

Both the CPS and PSID wage data exclude observations with real hourly wages less than $1.25 per hour in 1979 dollars. Wages are deflated using the personal consumption deflator to 1979$.

Table 1 (continued)

MEN

	Current Population Survey All Employed Workers		PSID Female Heads/Wives	
	1979	1985	All	Continuous Wages
Average Age	35.4	35.6	37.7	37.2
Average Education	12.4	12.8	13.0	13.4
Percent Black	9.1	9.3	7.9	8.5
1979 Log Wages:				
Mean (Std error)	1.836 (0.002)	--	2.025 (0.009)	2.089 (0.013)
Standard Deviation	0.494	--	0.439	0.421
Black-White Wage Gap (Std error)	-0.223 (0.006)	--	-0.311 (0.033)	-0.271 (0.044)
1985 Log Wages:				
Mean (Std error)	--	1.793 (0.002)	2.047 (0.011)	2.158 (0.013)
Standard Deviation	--	0.557	0.477	0.430
Black-White Wage Gap (Std error)	--	-0.263 (0.007)	-0.275 (0.039)	-0.267 (0.045)
Change from 1979 to 1985:				
Mean Log Wage	-0.043 (0.003)		0.023 (0.010)	0.069 (0.008)
Std Dev Log Wage	0.063		0.038	0.009
Black-White Wage Gap (Std error)	-0.040 (0.009)		0.036 (0.027)	0.004 (0.027)

Notes: CPS samples include only paid non-self-employed workers with non-allocated hourly or weekly wages, between the ages of 16 and 64, with non-negative potential experience. Sample sizes in 1979 and 1985 are 76,345 and 78,892, respectively. PSID sample is drawn from the 1985 merged family-individual PSID file and consists of 3067 men age 16-57 in 1979 who were heads of household from 1979 to 1985. The PSID sample with continuous wages consists of 1122 men who report a valid wage for their main job in each of the 1979-85 interviews.

Both the CPS and PSID wage data exclude observations with real hourly wages less than $1.25 per hour in 1979 dollars. Wages are deflated using the personal consumption deflator to 1979$.

Table 2a: Method of Moments Estimates of the Structure of Wages, Women.

	Estimated returns			
	Unconstrained model			Constrained Model
Year	Observed Skills	Unobs. Skills	Race	
79	1.000	1.000	1.000	1.000
80	1.001 (0.024)	1.001 (0.028)	1.008 (0.145)	0.998 (0.014)
81	0.886 (0.025)	1.050 (0.029)	1.179 (0.173)	0.976 (0.015)
82	0.910 (0.029)	1.087 (0.033)	1.279 (0.206)	1.012 (0.018)
83	0.950 (0.032)	1.129 (0.036)	1.312 (0.221)	1.050 (0.020)
84	0.941 (0.035)	1.128 (0.039)	1.445 (0.254)	1.056 (0.021)
85	0.991 (0.041)	1.145 (0.041)	1.235 (0.234)	1.081 (0.023)

Other parameters

	Unconstrained model	Constrained model
St. deviation of person specific effect	0	0
St. deviation of AR error	0.296 (0.012)	0.309 (0.011)
St. deviation of residual error	0.102 (0.004)	0.102 (0.004)
AR(1) parameter	0.974 (0.004)	0.972 (0.004)
Goodness-of-Fit (deg. of freedom)	118.36 (55)	150.56 (67)

Notes: See text for details on the estimation procedure. Samples are derived from 1985 PSID Merged Family-Individual File. The sample sizes are 803 women and 1122 men. Standard error in parentheses unless otherwise indicated.

Table 2b: Method of Moments Estimates of the Structure of Wages, Men.

	Estimated returns			
	Unconstrained model			Constrained Model
Year	Observed Skills	Unobs. Skills	Race	
79	1.000	1.000	1.000	1.000
80	0.967 (0.016)	1.019 (0.026)	0.949 (0.083)	0.984 (0.010)
81	0.942 (0.018)	1.019 (0.028)	1.104 (0.098)	0.974 (0.011)
82	0.993 (0.020)	1.036 (0.029)	1.100 (0.098)	1.012 (0.013)
83	1.004 (0.023)	1.055 (0.032)	1.061 (0.106)	1.022 (0.013)
84	1.051 (0.025)	1.087 (0.034)	0.898 (0.102)	1.055 (0.016)
85	1.048 (0.029)	1.106 (0.037)	0.927 (0.113)	1.061 (0.017)
	Other parameters			
St. deviation of person specific effect	0.224 (0.097)			0
St. deviation of AR error	0.212 (0.102)			0.319 (0.013)
St. deviation of residual error	0.089 (0.004)			0.090 (0.003)
AR(1) parameter	0.940 (0.066)			0.974 (0.003)
Goodness-of-Fit (deg. of freedom)	217.00 (54)			236.85 (66)

Table 3: Specification Test Results

Hypothesis being tested:	Women	Men
1. $\phi_t = \delta_t = \psi_t = 1$	72.83	75.96
(Black-white gap and returns to skill constant)	[0.000]	[0.000]
2. $\phi_t = 1$	7.47	10.32
(Black-white gap constant)	[0.180]	[0.112]
3. $\phi_t = \delta_t$	10.84	15.82
(Black-white gap proportional to return to observed skill)	[0.093]	[0.015]
4. $\phi_t = \psi_t$	4.18	13.58
(Black-white gap proportional to return to unobserved skill)	[0.652]	[0.035]
5. $\phi_t = \delta_t = \psi_t$	32.20	19.64
(Returns to observed and unobserved skill equal, and proportional to black-white gap)	[0.001]	[0.074]
6. $\delta_t = \psi_t$	26.74	4.71
(Returns to observed and unobserved skill equal)	[0.000]	[0.582]

Note: Under the null hypothesis, the test statistics are distributed as chi-squared with either 6 degrees of freedom (rows 2, 3, 4, and 6), 12 degrees of freedom (row 5), or 18 degrees of freedom (row 1). The P-value for hypothesis test in square brackets.

Figure 1a: Changes in Wage Inequality
Women, 1973 to 1992, CPS Data

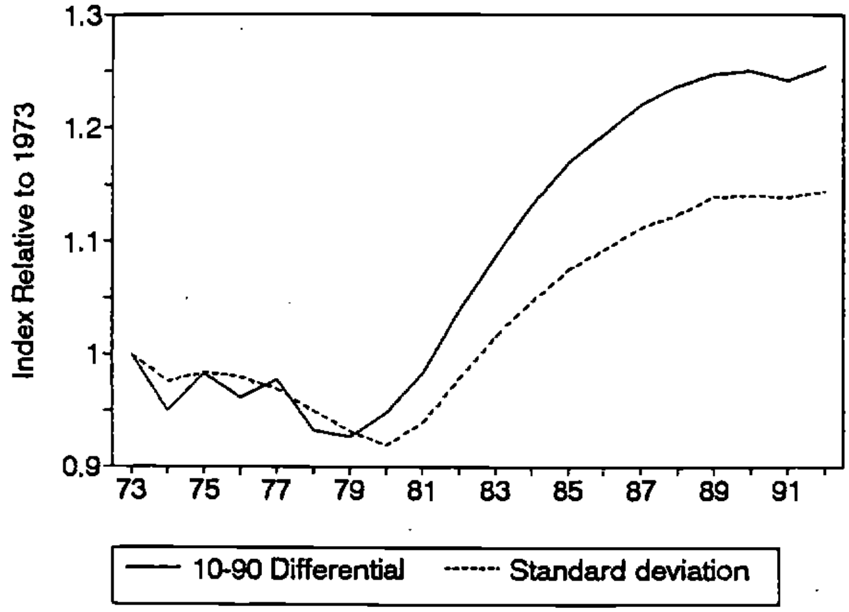

Figure 1b: Changes in Wage Inequality
Men, 1973 to 1992, CPS Data

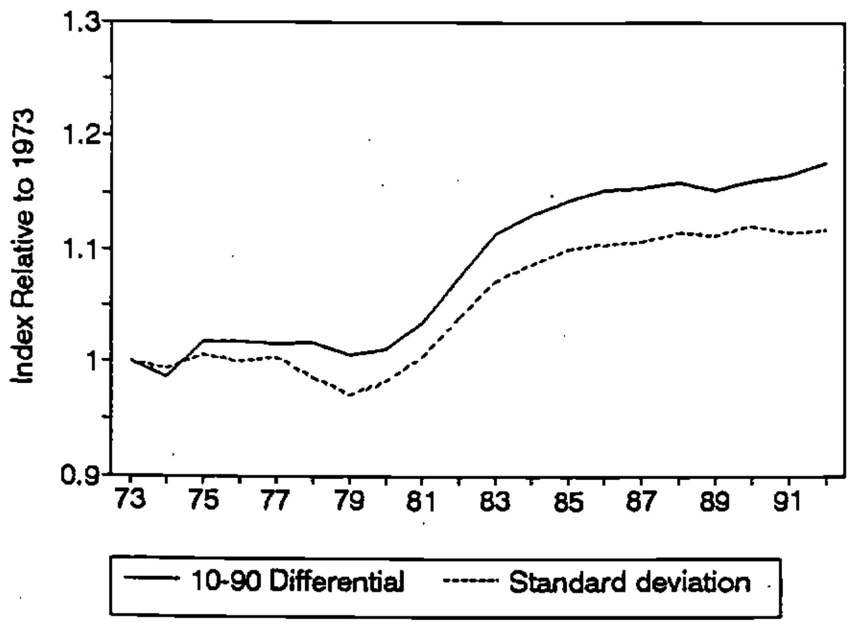

Figure 2a: Estimated Returns to Skills and Racial Wage Differentials for Women

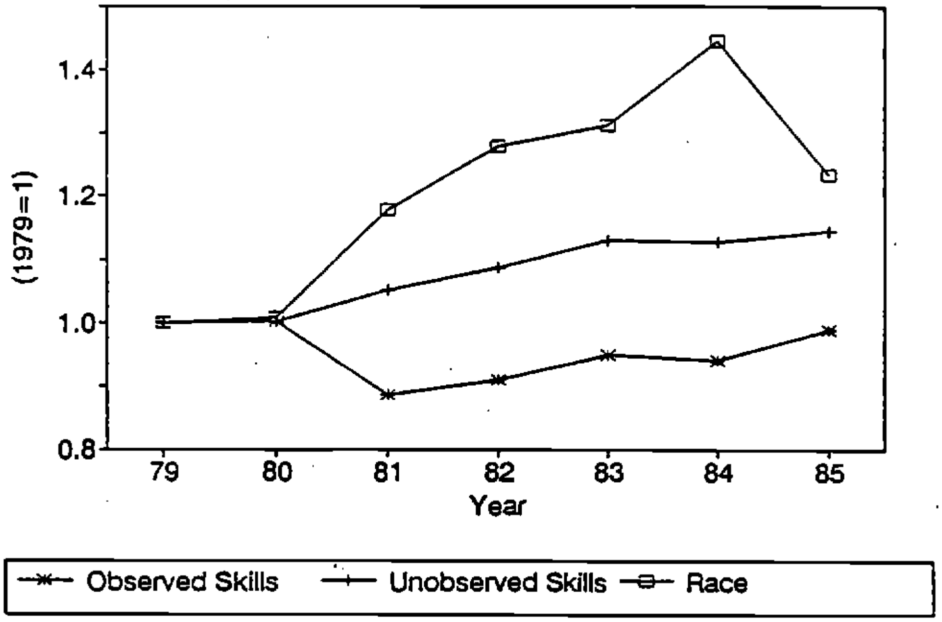

Figure 2b: Estimated Returns to Skills and Racial Wage Differentials for Men