The Distribution of Family Earnings

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This paper investigates the influence of wives' earnings on the distribution of family earnings. In the process, some differences in the manner in which family earnings are distributed within racial groups are highlighted. Earnings of wives equalize income distributions in white families but increase dispersion among blacks. Because they have conflicting effects, covariances between spouses in their wage rates and labor supply are isolated. Male and female wage functions are adjusted for sample censoring to fill out the true population variances and covariances in wages across all families. Due to the larger positive correlation in wages of black spouses, black family earnings would be distributed more unequally even if all individuals worked the same amount. Our labor supply analysis indicates that white families attempt to stabilize family earnings with some family members increasing their labor supply in response to a decline in participation of other family members. This compensatory function of wives' earnings is much less prevalent in black families.

Two important themes in modern labor economics are the economic functions of the family and the determinants of income distributions. While research on each subject has been fruitful, developments have proceeded at best in a parallel fashion with little attempt at integrating those aspects that touch on common issues. In particular, most recent work on income distribution has focused exclusively on male earnings. However, a direct consequence of the formation of families is the pooling of individual members' incomes. Since people spend most of their adult lives in multiperson families, family earnings may be a

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more appropriate index of well-being among economic agents. Moreover, the growth in the two-earner family emphasizes the importance of supplementing studies of individual earnings with those dealing with the income distributional implications of the matching of individuals through social units such as the family. In this paper I combine some elements of the dual themes of the family and income distribution by examining the impact of wives' earnings on the distribution of family earnings.

Since individual attributes cannot be viewed as the sole underlying determinant of earnings, covariances across family members in their earnings capacities and labor supply must be elevated to a central role in the analysis. Because they have conflicting effects, the covariances between spouses in their wage rates and labor supply should be separated. Wages of husbands and wives are typically positively correlated, but labor supply is often negatively related across family members.

Throughout this paper, I will highlight some fundamental differences that emerge in the manner in which family earnings are distributed within racial groups. Earnings of wives equalize income distribution in white families but tend to increase dispersion among blacks. One goal of this research is to identify the principal behavioral responses that explain this difference between black and white families.

This paper is divided into four sections. The first describes the salient properties of male and family earnings distributions by race as they are revealed in the U.S. Census. The second examines correlations in wages of husbands and wives. Since wage rates are only observed for working women, variances and covariances in spouses' wages among working female families are corrected for sample censoring so that the variances and covariances across all families can be estimated. The third section deals with the other component of earnings–labor supply. The differential nature of the labor supply responses in black and white families is investigated. In the final section, a components-of-variance model is estimated using the Nine Year Michigan Income Dynamics Survey. By providing information on the impact of wives' earnings in dampening or expanding permanent and transitory variation in husbands' earnings, panel data are a useful supplement to the cross-sectional evidence.

I. The Distribution of Earnings

The purpose of this section is to broadly describe the impact of female earnings on family earnings distributions and to identify racial differences in the family earnings structure. Contrasting the distribution

of male and family earnings for married-spouse-present families provides a simple assessment of the contribution of female earnings across families. The distributions described here are based on the 1/100 Samples of the U.S. Census for 1960 and 1970. Families are restricted to husband-wife families, and family earnings includes only the earnings of husbands and wives.[1] Variances of log male earnings and log family earnings, a commonly used summary measure of dispersion, are listed in table 1 separately by year (1960 and 1970) and race (blacks and whites). Families are further stratified by age of the husband and the work force status of the wife. Using log variance as the criterion, earnings of black males are less evenly distributed than those of whites.[2] Black family earnings also exhibit more relative dispersion than white family earnings. By including the earnings of wives, white family earnings are considerably more equally distributed than white male earnings. This tendency for female earnings to decrease relative dispersion is more prevalent among young white families where the difference in relative dispersion between male and family earnings is quite large. In contrast, the variances of log family and male earnings are more similar in black families. The reasons for this stabilizing contribution of white wives' earnings compared with the effect of wives in black families will become a major focus of this paper.

Although summary measures of dispersion are useful, simply summary statistics that unambiguously rank distributions in terms of "inequality" exist only in special circumstances. A convenient method of comparing complete distributions is illustrated in figure 1. There, earnings of blacks at selected percentiles of the black earnings distribution are presented relative to white earnings at the same percen-

[1] The sample is further restricted to non-self-employed men and women. Because standardization for the number of potential earners is complex, the earnings of other family members were ignored. Fortunately, in the United States much of family earnings consists of earnings of spouses. Ignoring nonearnings income probably leads to an underestimation of total income at both the lower and upper tails of the income distribution; the lower tail because of government transfers, the upper section because of nonhuman wealth.

[2] In an earlier paper (Smith and Welch 1979), I examined earnings distributions of black and white males in the 1/100 Public Use Samples of the 1960 and 1970 Censuses. Using a regression accounting framework, the larger relative dispersion among black males could be attributed to larger black employment instability, a more unequally distributed black schooling distribution, a larger positive interaction of labor supply and wage rates for blacks, and substantial between-region wage differentials among blacks. After adjusting for personal attributes, residual variances obtained from the regressions were also larger among blacks. A random coefficients framework was employed to determine whether the residual variation about the earnings equation was systematically related to individual differences in the returns to certain characteristics. Variations in rates of return to schooling were large and an important source of residual variance. However, variations across individuals in schooling returns were as large for whites as blacks so that they explained little of the black-white difference.

TABLE 1

INEQUALITY IN EARNINGS VARIANCES IN LOG EARNINGS

	Family Earnings			Male Earnings	
Ages (Years)	All	Wife Working	Wife Not Working	All	Wife Working
			1970 Whites		
21–25	.3300	.2621	.4232	.5007	.5234
26–30	.2459	.1906	.2798	.3099	.3258
31–35	.2840	.2156	.3263	.334	.3307
36–40	.2930	.1800	.3787	.3411	.2866
41–50	.3475	.2205	.4570	.4158	.3689
51–60	.3767	.2129	.4952	.4401	.3758
21–60	.3356	.2351	.4231	.4224	.4059
			1960 Whites		
21–25	.3190	.2516	.3603	.4311	.4742
26–30	.2739	.2182	.2899	.3228	.3583
31–35	.2649	.2069	.2846	.3081	.3310
36–40	.3477	.2343	.4056	.3809	.3196
41–50	.3711	.2379	.4503	.4214	.3741
51–60	.4448	.2600	.5316	.5077	.4639
21–60	.3573	.2492	.4139	.4182	.4067
			1970 Blacks		
21–25	.5258	.3597	.6923	.6242	.5919
26–30	.4062	.3037	.4518	.4218	.4073
31–35	.4324	.2832	.5406	.4279	.3683
36–40	.4492	.3289	.5138	.4806	.4617
41–50	.5094	.4198	.5308	.5738	.5983
51–60	.6237	.4754	.6921	.6792	.6695
21–60	.5103	.3812	.5833	.5543	.5378
			1960 Blacks		
21–25	.5371	.4953	.5361	.5749	.6086
26–30	.4694	.4495	.4629	.5059	.5379
31–35	.4882	.4503	.4914	.5044	.5114
36–40	.5088	.4796	.5070	.5515	.5792
41–50	.5724	.5458	.5707	.6411	.6855
51–60	.6904	.6439	.7215	.8370	.9107
21–60	.5647	.5319	.5685	.6286	.6704

NOTE.—The sample is restricted to married-spouse-present families.

tile of the white earnings distribution. Since the curve is positively sloped, there exists more relative dispersion in male earnings among blacks up to the seventieth or eightieth decile. For men whose earnings rank them in the upper one-third, inequality in white male earnings is larger,[3] indicating greater positive skewness in the white

[3] This reversal in relative dispersion implies that unique rankings of inequality between the black and white distributions is not possible.

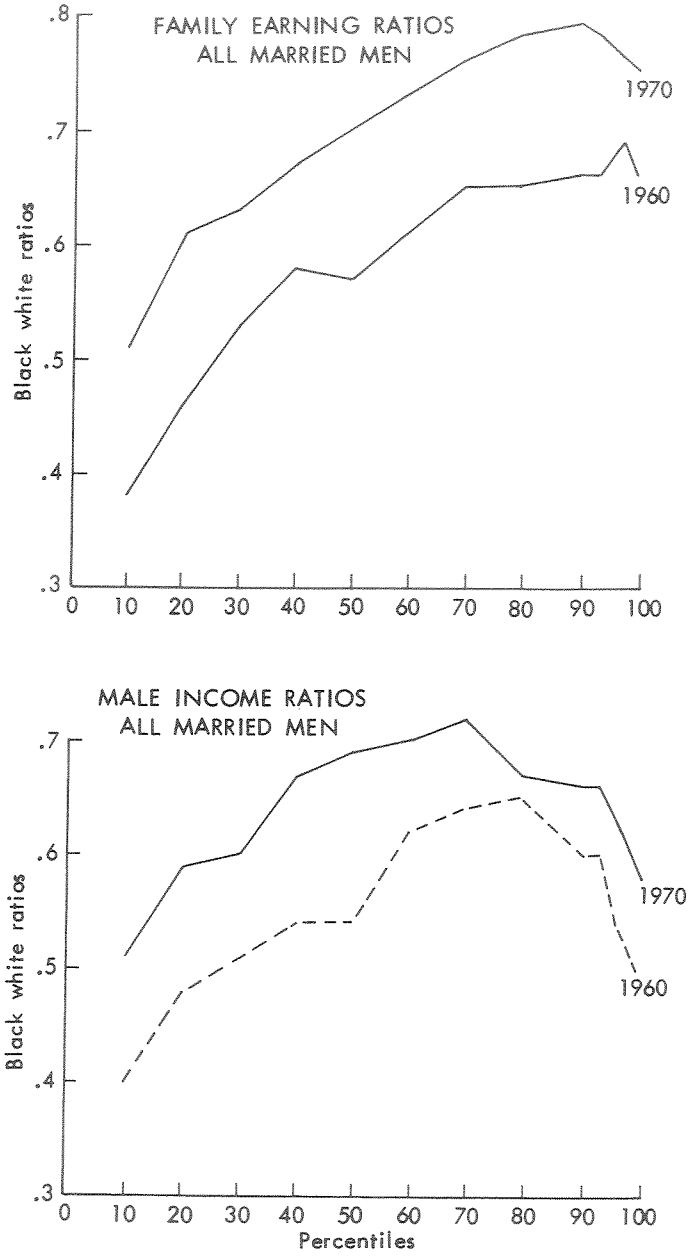

FIG. 1

distribution.[4] Black family earnings are more unevenly distributed than those of whites over a wider range, with the peak in relative black family earnings occurring after the ninetieth percentile. Comparison of the slopes of these curves is a simple index of relative dispersion in

[4] This reversal in the ranking by race in relative dispersion of male earnings in the upper third of the distribution was examined in Smith and Welch (1979). We found that although there was more variance in schooling among blacks this was not true in the upper section of the distribution. After the seventieth percentile average black schooling increased by 1.8 years while white education levels increased by 3.4 years. Combined with rising schooling coefficients by schooling level, this implies more relative earnings dispersion among whites in the top three deciles. A second reason is that the vast majority of blacks below the seventieth percentile live in the South where within-region dispersion is high relative to other regions.

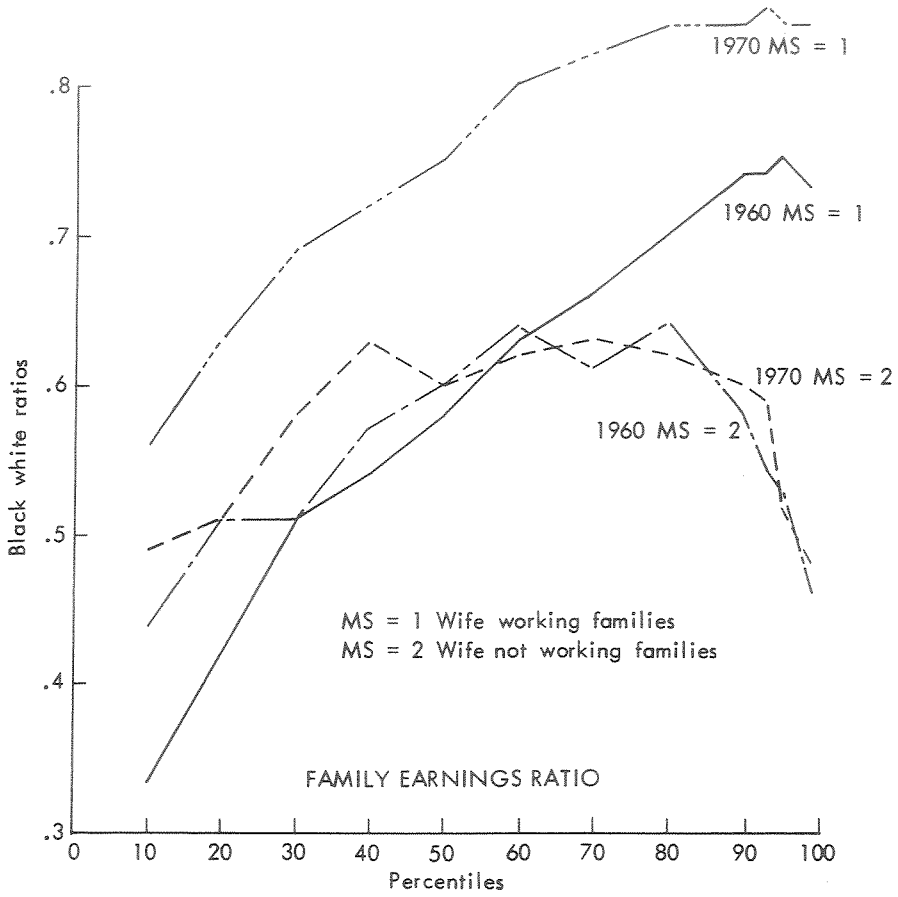

FIG. 2

individual sections of the distributions. Because the family earnings curve becomes steeper relative to male earnings only above the medians, much of the larger inequality in black family earnings (relative to whites) is concentrated in the upper half of the distribution. The smaller (negative) slope of the family earnings curve in the top decile indicates that the extent of positive skewness in white family earnings is not as pronounced as it is for white male earnings.

Table 1 and figure 2 stratify families by the current work force status of the wife. With the exception of 1960 blacks, relative dispersion in family earnings is much smaller (compared with male earnings) in working wife families.[5] The general shapes of the family

[5] The distribution of male earnings will in general differ between working wife and nonworking wife families. With the exception of the 1960 blacks, log variance of male earnings is about the same in both types of families. However, the age stratification shows that this conceals substantial differences within age categories. Log variances of male earnings are larger in working white families for those less than 30 years old but smaller for those older than 30. This reflects the life-cycle participation pattern of white women. In white families, labor force participation is strongly positively related to female education early in the life cycle. Thus, we are differentially selecting out high-wage husbands into the working sample for families under 30. For older families, the association of female education with market work is muted. The negative husband's income effect becomes dominant, and high-income husbands are more heavily represented in the nonworking wife families. For an analysis of life-cycle female participation, see Smith (1977).

curves in figure 2 resemble quite closely those for all families in figure 1.[6] The stabilizing effect of female earnings and the larger relative dispersion among blacks is therefore not simply a consequence of nonmarket participation by the wife. Over the decade there was a substantial decline in variance in both male and family earnings in black families with both spouses working. The reduced black dispersion in 1970 is concentrated below the thirtieth decile and to a lesser extent above the seventieth. Since variances in logs are particularly sensitive to dispersion in the lower tail of the distribution, the sharp decline in variances recorded in table 1 is not surprising.

The coefficient of variation in family earnings ($C.V._f$) may be expressed as $C.V._f = (\alpha_m^2 C.V._m^2 + \alpha_w^2 C.V._w^2 + 2\,\alpha_m \alpha_w \rho C.V._m C.V._w)^{1/2}$. The relative dispersion in family earnings depends upon the relative dispersion in male ($C.V._m$) and female ($C.V._w$) earnings, the shares of male (α_m) and female (α_w) earnings in total family earnings, and the correlation between husband's and wife's earnings (ρ). Unless this correlation was perfect, the coefficient of variation in family earnings must be less than a weighted average of the coefficients of variations of male and female earnings.[7] Covariances in earnings depend on the correlation in labor supply and wage rates of husbands and wives. By separating the variance in family earnings into its components, some causes for the racial differences that have emerged can be isolated.

Variances in family earnings are separated into its components in table 2. Dispersion in male earnings accounts for 55 percent of the variance in black family earnings but over 90 percent in white families. While this partly reflects larger dispersion in black female earnings, positive earnings covariances in black families are more important. In fact, negative covariances in spouses' earnings within white college families are sufficiently large that the variance in male earnings actually exceeds those in family earnings.

Table 3 lists simple correlation coefficients across spouses in earnings and weeks worked. Weeks worked of white spouses are nega-

[6] Most of the average rise in black-white family earnings took place in the working female sample. The reasons are (1) the much larger improvement in earnings of black women relative to all other groups; (2) compared with white women, the increase in black labor force participation rates were more heavily weighted toward more educated black women. Given the positive correlation in schooling between spouses, the working female sample had a larger proportion of highly educated black men by 1970.

[7] If the correlation coefficient between male (m) and female (w) earnings were unity, the standard deviation of family earnings (σ_f) would equal the sum of the standard deviations of male (σ_m) and female (σ_w) earnings. In all other cases it is less than the sum of the individual components:

$$\sigma_f = (\sigma_m + \sigma_w + 2\rho\sigma_m\sigma_w)^{1/2}$$

$$\sigma_f \leq \sigma_m + \sigma_w$$

$$\therefore \sigma_f/f \leq (m/f)(\sigma_m/m) + (w/f)(\sigma_w/w).$$

TABLE 2

ARITHMETIC DECOMPOSITION IN TOTAL VARIANCE IN FAMILY EARNINGS

	Variance Family Earnings	Variance Male Earnings	Variance Female Earnings	Twice Covariance
	1970 Whites			
Age group (years):				
21–25	1,347	943	567	−163
26–30	2,282	1,619	702	−38
31–40	3,617	3,339	562	−284
41–50	5,319	4,914	722	−317
51–60	4,988	4,443	867	−219
21–60	4,128	3,711	691	−274
Schooling:				
Elementary	1,739	1,241	580	−82
High school	2,684	1,262	633	−211
College	7,220	7,403	748	−932
	1970 Blacks			
Age group (years):				
21–25	1,938	1,272	488	188
26–30	2,087	1,131	675	281
31–40	2,352	1,277	758	317
41–50	2,699	1,277	953	469
51–60	2,113	1,046	652	416
21–60	2,365	1,229	760	377
Schooling of husband:				
Elementary	1,493	757	574	163
High school	1,987	969	835	183
College	3,423	1,881	1,456	86

NOTE.—Incomes are shown in hundreds of dollars.

tively related, suggesting that male and female times are substitutes for each other in maintaining a level of family earnings. Since this correlation declines with age, the substitution is strongest early in the life cycle.[8] However, weeks worked in black families are positively correlated, indicating gross complementarity. When the samples are stratified by husband's education, the largest negative correlation in both weeks and earnings occurs in the white college group. One hypothesis is that the role of female labor supply varies with the permanent income of the family. At high levels of family income (education), female labor supply may be governed more by temporary fluctuations in husband's earnings. When male earnings are tem-

[8] In table 1 the largest difference between dispersion in male and family earnings occurred among the youngest white family. Apparently, this reflects the strong negative correlation in labor supply early in the work career.

TABLE 3

CORRELATION COEFFICENTS IN SPOUSES' EARNINGS AND WEEKS WORKED

A. AGE (Years)

	21–25	26–30	31–40	41–50	51–60	21–60
	1970 Whites					
All families:						
Earnings	−.111	−.018	−.104	−.084	−.074	−.086
Weeks worked	−.059	−.040	−.036	.004	.003	−.029
Working-wife families:						
Earnings	−.018	.159	−.002	.054	.076	.062
Weeks worked	.019	.019	.030	.035	.040	.035
	1970 Blacks					
All families:						
Earnings	.120	.161	.161	.212	.252	.195
Weeks worked	−.012	.030	.047	.026	.023	.029
Working-wife families:						
Earnings	.145	.184	.263	.318	.428	.291
Weeks worked	.001	.066	.088	.090	.088	.076

B. EDUCATION OF HUSBAND

	1970 WHITES				1970 BLACKS			
	All		Working Wife		All		Working Wife	
YEARS OF SCHOOLING	Earnings	Weeks	Earnings	Weeks	Earnings	Weeks	Earnings	Weeks
8	−.048	.007	.004	.042	.123	.055	.055	.094
12	−.088	−.009	.025	.034	.101	.055	.005	.060
16	−.198	−.1088	.004	.014	.026	.008	.008	.148

porarily low because of his life-cycle stage or other transitory factors, his wife may enter the market to stabilize family income. At lower levels of permanent income, the wife's labor supply decisions may be more constrained by longer-term considerations.[9] The large negative correlation in earnings among college whites may also explain the differences above the medians in the family and male earnings curves in figure 1. Because earnings of white wives stabilize family earnings in these high husbands' income families, black family earnings will contain more relative dispersion over a wider range of the distribution.[10]

In this section, we have found that wives' earnings have a quite

[9] Some evidence relating to this differential labor supply response is provided in Sec. III.

[10] The smaller proportion of white wives to family earnings also contributes to this.

distinct impact between black and white families, reducing measured inequality far more in white families. This racial difference partly reflects the following factors: (1) black wives account for a larger proportion of family earnings, (2) the coefficient of variation of black female earnings exceeds those of white females, and (3) covariances in earnings of spouses are positive for blacks and negative for whites, reflecting in part similar correlations in weeks worked of spouses. This negative correlation in earnings is particularly strong among the more highly educated white families. Apparently, white families attempt to maintain a level of family income, with some family members increasing their labor supply in response to a decline in participation of other family members. This compensatory function of wives' earnings is much less prevalent in black families.

II. The Distribution of Full Earnings

In this section, the dispersion in family earnings that results from the correlation in potential earnings of husbands and wives is isolated.[11] The level and distribution of family earnings is directly affected by how individuals group themselves into family units. The higher the correlation in spouses' wages, the greater the degree of potential family earnings inequality relative to dispersion in individual earnings. The correlation in wages of spouses depends on the pattern of assortative mating and the joint human capital investment strategy of husbands and wives. For most traits, including education, positive assortative mating seems dominant, and we anticipate a positive correlation in wage rates. However, Gary Becker has argued that optimal sorting of mates in the marriage market predicts a negative correlation in wage rates. To put his argument simply, the economic gains from a union of a man and woman both with high wages are smaller. Essentially, by reducing the labor supply of his wife there is less benefit to a high-wage man from his wife's high wage.[12] The investment argument rests on the empirical specialization of men in market work and women in nonmarket activities. The more specialized the division of labor within the family, the larger the incentives for men to accumulate market skills and for women to

[11] For some purposes, the distribution of potential family earnings is more relevant than the distribution of observed family earnings. If leisure time has value roughly approximate to the market wage and if the hours decision is voluntary, earnings dispersion resulting from fluctuations in time worked should not be viewed as equivalent to variance associated with wage differentials.

[12] Becker's argument holds nonmarket productivity constant. Since female education probably increases the market and nonmarket productivity of women, the positive correlation through correlation in education levels does not necessarily contradict his theory.

acquire nonmarket skills (and perhaps depreciation in her market-oriented human capital). This implies a negative correlation in wages, especially as the duration of marriage increases.

If wage rates were directly observable for all individuals, constructing a distribution of potential family earnings would be straightforward. The wage rates of spouses could be added and the distribution of the sum (or ln of the sum) of wages would measure the dispersion in potential family earnings across families. However, wages are not observed for nonworking women, and the selection rule that determines whether a woman is working will generally imply that restrictions to working-wife families yield biased estimates of the variance in female wages and the correlation in wages of spouses. Since a high husband's wage reduces the probability of a woman working, a woman included in the sample of workers is more likely to have a high wage herself.[13] The correlation in wages among workers will normally be larger than the correlation across all families, and the variance in female wages across all women will be understated in a sample of workers. Before the distribution of potential family earnings can be constructed, the difficulties caused by sample censoring must be confronted.

As a point of reference the variance of the ln of male hourly wages and the ln of sum of male and female wages are presented in table A1 for families with working wives using census data. In contrast to earnings, the relative dispersion in family wage rates is larger than male wage rates for both races. Much of the stabilizing effect of female earnings apparently reflects labor supply–related behavior. Family hourly wages are also distributed more unequally in black families than white families, and the increase in dispersion between male and family hourly wages appears larger for blacks.

Following suggestions by Gronau (1974) and Heckman (1979) on censoring bias, consider the following system:

$$W_M^H = \alpha X + u_1$$

$$W_M^W = BY + u_2$$

$$W_R^W = CZ + u_3$$

where W_M^H, W_M^W, W_R^W are the husband's market wage, the wife's market wage, and the wife's reservation wage, respectively. A woman participates in the market if $I = (BY - CZ)/\sigma_p > (u_3 - u_2)/\sigma_p = u_p/\sigma_p$ where I (the participation index) is a standardized normal variable measuring

[13] This point was made by Gary Becker (1973) in "The Theory of Marriage: Part I." Becker uses it to argue that the positive correlation in wages of husbands and wives in the working female sample is consistent with a negative correlation when nonworking wives are included.

the probability of participating. Heckman has demonstrated that the censoring problem can be viewed as one of specification bias since

$$E(W_M^W \mid I \cdot \sigma_p > u_p) = BY + \frac{\sigma_{22} - \sigma_{23}}{\sigma_p}\lambda = BY + \frac{\sigma_{2p}}{\sigma_p}\lambda = BY + \gamma_2\lambda. \quad (1)$$

A similar equation for husbands[14] in working-wife families exists where

$$E(W_M^H \mid I \cdot \sigma_p > u_p) = \alpha X + \frac{\sigma_{12} - \sigma_{13}}{\sigma_p}\lambda = \alpha X + \gamma_1\lambda. \quad (2)$$

Including an instrument for λ (inverse of Mill's ratio) among the regressors provides a simple correlation for bias. Using the same properties of truncated normal distributions, the residual covariances are

$$\text{cov}\ (u_i u_j \mid I \cdot \sigma_p > u_p) = \sigma_{ij} - \gamma_i\gamma_j\,(\lambda^2 + I\lambda) \quad (3)$$

where σ_{ij} is the true covariance over the complete sample.[15] A simple method of retrieving the error structure involves estimating wage equations for both husbands and wives over the sample of female workers, correcting both equations for sample censoring. Using equation (2), the computed residual variance and covariance in husbands' and wives' wages are used to estimate σ_{12} and σ_{22}.

Separate (ln) hourly wage equations were estimated by race for men and women in married-spouse-present families[16] using the 1967 Parnes data for mature women. The regressors in the husband's wage equation included years of schooling, residence in the South, and a quadratic in experience.[17] The explanatory variables for female wages were her education, southern residence, and the number of years worked 6 months or more prior to the current year as a proxy for market experience. In the censored samples, an instrument for λ was

[14] Since his wages are observed regardless of his wife's working status, one would not normally worry about censoring in the husband's wage equation. However, this equation will be useful for another purpose.

[15] See Hanoch (1979) for a proof. The residuals in the censored sample are $u_{11}^* = u_{11} - \gamma_1\lambda$ and $u_{22}^* = u_{22} - \gamma_2\lambda$.

[16] The families were restricted to husbands who had positive earnings. All families in which weeks worked, hours per week, earnings, education, or female experience were not reported were eliminated. There were 1,711 white families and 428 black families in the full sample, including nonworking wives. In the sample of working wives, there were 580 white and 223 black families.

[17] Husbands' experience was defined as current age − education completed − 6. Since the ultimate aim of these regressions is to fill out the unobserved variances and covariances for families without working wives, a reasonable argument could be made to expand the set of regressors to maximize R^2. This would clearly eliminate placing any behavioral interpretation on these wage regressions.

TABLE 4

PARNES WAGE EQUATIONS FOR HUSBANDS AND WIVES

A. HUSBANDS

	WHITES		BLACKS	
	Full Sample	Censored Sample	Full Sample	Censored Sample
Education	.0616	.0578	.0513	.0423
	(14.54)	(7.26)	(6.29)	(4.10)
Southern residence	−.1382	−.2283	−.5301	−.5019
	(5.74)	(5.60)	(10.79)	(7.93)
Experience	.0231	.0252	−.0006	−.0220
	(2.89)	(1.87)	(.03)	(.98)
Experience^2	−.0004	−.0004	.0002	.0005
	(2.50)	(1.32)	(.57)	(1.16)
γ	...	−.0744	...	−.1191
		(1.32)		(1.02)
Constant	.2268	.1846	.4818	.9811
	(1.98)	(.81)	(2.04)	(2.62)
R^2	.167	.153	.351	.346

B. WIVES

	Whites	Blacks
Education	.0689	.1051
	(6.94)	(6.68)
Southern residence	−.0388	−.4151
	(.81)	(5.42)
Experience	.0360	.0142
	(4.89)	(1.49)
γ	.2998	−.1084
	(2.22)	(.40)
Constant	−.8710	−.7001
	(3.63)	(1.61)
R^2	.131	.410

NOTE.—t-statistics in parentheses.

computed from a probit equation of the participation probability for women.[18] The wage equations are reported in table 4.

The coefficients for the standard explanatory variables are consistent with those available in the literature. For all groups, schooling significantly increases hourly wages with average returns for white males exceeding black males and black females exceeding white fe-

[18] The variables in the probit equation were male and female education, southern residence, wife's experience, presence of children at home less than 6 years old, and number of children in the family.

males.[19] Experience coefficients are larger among whites, possibly reflecting the strong cohort effects in raising relative black wages among younger workers. Wages for all groups are lower in the South, but the wage differential between regions is much larger for blacks. For our purposes, interest centers on the censoring correction (λ). Point estimates indicate that, controlling for observable characteristics, the average white working woman earns a 35 percent higher hourly wage than the average white woman. In contrast, black working women receive 10.3 percent lower wages than the average black woman. Husbands in families with working wives have lower wages than the average for all husbands, with a differential of 7.2 percent for white men and 11.3 percent for black men. Using equation (2), the negative coefficients of λ in the husband's wage equations indicate that husbands' wage residuals are more highly correlated with wives' reservation wage residuals than wives' market wage residuals—a result that seems reasonable on a priori grounds.[20] The positive coefficient on λ in the white female sample implies that in a regression of the residuals of the reservation wage equation on the residuals in the female market wage equation, a 1 percent increase in female wages produces less than a 1 percent increase in reservation wages.[21] Controlling for the deterministic vector, white women with the highest market wage opportunities will be in the market sector. The opposite is true for black women, so that black women with the highest market wage residuals are in the nonmarket sector.[22]

The censored wage regressions in table 4 were used to compute the residual variance in female wages and the residual covariance in male and female wages over all families. Censoring bias is more important in white families. As expected, residual variance in female wages is larger and covariance in wage residuals between spouses is lower in the complete sample (see table 5A). The correlation coefficient between wage residuals is reduced from .098 to .035 by the censoring corrections. The adjustments are smaller in black families with a slightly larger variance in female wage residuals, covariance in

[19] For male comparison by race, see Smith and Welch (1977). A racial comparison for females is available in Smith (1979).

[20] One test of the appropriateness of the censoring model involves coefficient equality between the male wage regressions in the censored and full sample. As one can readily see from table 4, the only variable that differs significantly is southern residence in the white sample.

[21] The numerator in the coefficient on λ in eq. (1) may be written as $\sigma_{22}(1 - \sigma_{23}/\sigma_{22}) = \sigma_{22}(1 - b_{Wr \cdot Wm})$ where $b_{Wr \cdot Wm}$ is the regression coefficient from a regression of reservation wages holding Z constant on market wages controlling for X. The coefficient will be negative only if a dollar increase in market wages produces more than a dollar increase in reservation wages.

[22] Although the t-statistics for three of the four groups are not large the point estimates are not trivial, and they are consistent with average wage differences for males stratified by their wives' labor force status in data sets such as the census which contain many more observations.

TABLE 5

ESTIMATED CORRELATIONS AND VARIANCES IN HOURLY WAGES

A. ESTIMATED RESIDUAL VARIANCES IN WAGE EQUATION

	Censored Sample	Full Sample
Whites:		
$\hat{\sigma}_{11}$	.1923	.1999
$\hat{\sigma}_{22}$	.2656	.3190
$\hat{\sigma}_{12}$	.0221	.0089
$\hat{\rho}_{12}$	.0980	.0350
Blacks:		
$\hat{\sigma}_{11}$	.1843	.2164
$\hat{\sigma}_{22}$	.2589	.2653
$\hat{\sigma}_{12}$	.0448	.0518
$\hat{\rho}_{12}$	.2050	.2160

B. CORRELATION AND VARIANCES IN ln HOURLY WAGES OF SPOUSES

	Whites	Blacks
Correlation:		
Residual wages	.035	.216
Predicted wages	.360	.735
Total correlation	.100	.412
Variances:		
Male	.2393	.3295
Female	.3994	.4518
Censored female	.3028	.4291

NOTE.—The full sample refers to families with and without a working wife.

spouses' wages, and correlation coefficient in wage residuals. The increase in covariance reflects the fact that high-wage black men and women are systematically excluded in the sample of working women.

Using the censored wage equations for women, ln hourly wages were predicted for all women. Table 5B reports correlation coefficients for the residual, predicted, and predicted plus residual wages of husbands and wives. The correlation in wages in black families is much larger than that in white families. This results not only from the larger residual correlation among blacks but also from the quite high correlation in predicted wages.

The distribution of potential family earnings for black and white families can now be constructed. Since the wage equations were run in logs, the moments for ln wages were transformed into the corresponding moments for arithmetic wages.[23] These variances and co-

[23] X and Y have a bivariate normal distribution $E(X) = u_1$, $E(Y) = u_2$, var $(X) = \sigma_X^2$, var $(Y) = \sigma_Y^2$, and $\rho = \text{cor}\ (X, Y)$. Then $X^* = e^X$ and $Y^* = e^Y$ have the following moments: $E(X^*) = e^{u_1 + 1/2\ \sigma_X^2}$, $E(Y^*) = e^{u_2 + 1/2\ \sigma_Y^2}$, var $(X^*) = E(X^*)^2\ (e^{\sigma_X^2} - 1)$, var $(Y^*) = E(Y^*)^2\ (e^{\sigma_Y^2} - 1)$, and cov $(X^*, Y^*) = E(X^*)^2\ E(Y^*)^2\ (e^{\rho\sigma_x\sigma_y} - 1)$ (see Aitchison and Brown 1957).

TABLE 6

VARIANCES IN WAGES AND POTENTIAL FAMILY EARNINGS

	WHITES		BLACKS	
	Total	Residuals	Total	Residuals
Husband's wage	3.675	.2703	2.256	.3000
Wife's wage	1.083	.5169	1.467	.3961
Correlation in wages	.071	.0310	.362	.1960
Var family earnings	5.041	...	5.041	...
ln var family earnings	.2013	...	.3101	...

variances of male and female hourly wages are presented in table 6 along with the variance in potential family earnings and the variance in the ln of potential family earnings. The estimated variance in ln family earnings for whites is 0.2013 and for blacks, 0.3103. This compares with a variance in the censored sample of 0.1487 for whites and 0.3050 for blacks. Therefore, the principal effect of the censoring corrections is to increase relative dispersion in white potential family earnings.[24] However, even after adjusting for censoring, there exists more relative dispersion in black family earnings. Due to the much larger correlation in wages of spouses in black families, black family earnings would be distributed more unequally even if all individuals worked the same amount. The larger relative dispersion in black family earnings is not simply a consequence of differential labor supply behavior.

A full investigation of the causes for this larger correlation in black wages is outside the scope of this paper. But the discussion at the beginning of this section may suggest some possibilities. There, it was argued that correlations in wages should decline with the duration of marriage because of specialized market investment by husbands and the depreciation of market-oriented human capital of women. Black marriages are less stable than whites (i.e., a higher probability of divorce), lowering the average duration of black marriages, and for any given duration blacks still face a higher prospect for future dissolution. Marriage partners may insure against this risk by reducing their specialization in the market or nonmarket sectors. More generally, since the division of labor within the household is less sex oriented in black families, when choosing a mate, blacks may be less concerned with the sort of considerations producing negative correlations emphasized in Becker's theory of marriage. The roles performed in black families are more similar for men and women, and

[24] The underestimate of the variance in white female wages dominates the overestimate in the correlation in spouses' wages.

both the optimal sorting and investment arguments predict higher correlations in black wage rates.

A simpler but potentially more powerful explanation may flow from the fact that as individuals group into families they typically reside in the same location and are subjected to similar local labor market conditions. Given the substantial between-region wage differentials for black men and women, the geographical diversity of the population will produce larger positive correlations in spouses' wages among blacks.[25] Another possible reason is that my analysis only considers married-spouse-present families. Indeed, this may well be a more serious selectivity problem than the market participation restriction examined in this paper. Given that a larger proportion of blacks are eliminated by examining intact marriages, the bias depends upon the unobserved correlation in spouses' wages in those marriages that terminated.

III. Labor Supply

As the simple correlations in Section I indicated, part of the racial difference in family earnings distributions may also be due to associations between spouses in hours worked. If these simple correlations are preserved in behavioral labor supply functions, a deeper understanding of the resulting distribution of family earnings is possible. The central issue is the extent to which husbands and wives compensate for events affecting each other's work effort. For example, a wife may compensate for her husband's unemployment experience by entering the market in order to maintain family income. Similarly, the presence of children, by reducing the wife's labor supply, may encourage additional market work by the husband.

The intrafamily allocation of time is certainly more complex than the simple labor-leisure model permits. Since the reference period represents a full life span, it is best suited to predicting average lifetime participation rates. But many of the decisions faced by families are outside the scope of this simple framework. For example, in a life-cycle context, families are confronted with temporal variation in wage rates and other variables that could elicit timing responses about long-run levels of desired participation. In addition, these are transitory variations common to most individuals (business cycles) or specific to individual families (health). Rather than incorporating all aspects directly in one integrated empirical approach, I will present a partial analysis of some of these dimensions. These include life-cycle

[25] This suggests that the appropriate test for Becker's theory of marriage involves netting out of the observed wage correlation that component caused by regional and other similarities in the environments faced by families.

issues, short-run decisions pertaining to yearly participation and annual hours, and longer-run measures of lifetime labor supply. The consistent empirical finding that emerges is that labor supply of husbands and wives in white families is compensatory—an increase in market participation by one member is offset by reduced participation of the other. This intrafamily substitution contributes to the stabilizing impact of female earnings on white family earnings. In contrast, while there is certainly an element of the division of labor within black families that is sex specific, the extent to which levels of labor supply of one member are related to characteristics of the spouse is considerably smaller.

This is illustrated first in figure 3, where life-cycle profiles of male home time relative to female home time are presented.[26] For white families the profile is U-shaped, reflecting clear substitution over the life cycle in the extent of market work between white husbands and wives. Relative to his wife, both the husband's market time and his hourly wage are lowest at the youngest ages. When male earnings and labor supply are relatively low at the beginning of his work career, his wife compensates by entering the market sector. The most rapid increase in husband's relative market time (before the mid-30s) occurs simultaneously with the sharpest rise in male relative wages. The expanding white female market participation after age 35 corresponds to the period of the life cycle in which fertility is declining and children are aging, reducing the value of female home time. In contrast, the relative hours of black spouses are age invariant. Black female life-cycle patterns of hours resemble more closely those of males than they do white females.

Stratifying these life-cycle profiles by education levels of the husband provides additional evidence on this substitution. Before age 30, white wives' market hours are positively related to their husbands' educational attainment, but this relation reverses over the remainder of the life cycle. The education-specific profiles also tend to flatten out and lower the education level of the husband. The positive correlation at younger ages between women's market participation and husbands' education results from the higher expected levels of future relative male wages. Wives of more educated men concentrate their market activity during years when the husbands' comparative advantage in market activities is low. The more rapid withdrawal of these women from the market sector coincides with a steeply rising relative male wage. The smaller curvature in the relative-hours profiles for the less educated mirrors the absence of curvature in relative wages of

[26] These profiles are derived using synthetic cohorts. Mean values of time spent at home are calculated at each age. For details of the derivation, see Smith (1977). U.S. Census data for 1970 were used to construct these profiles.

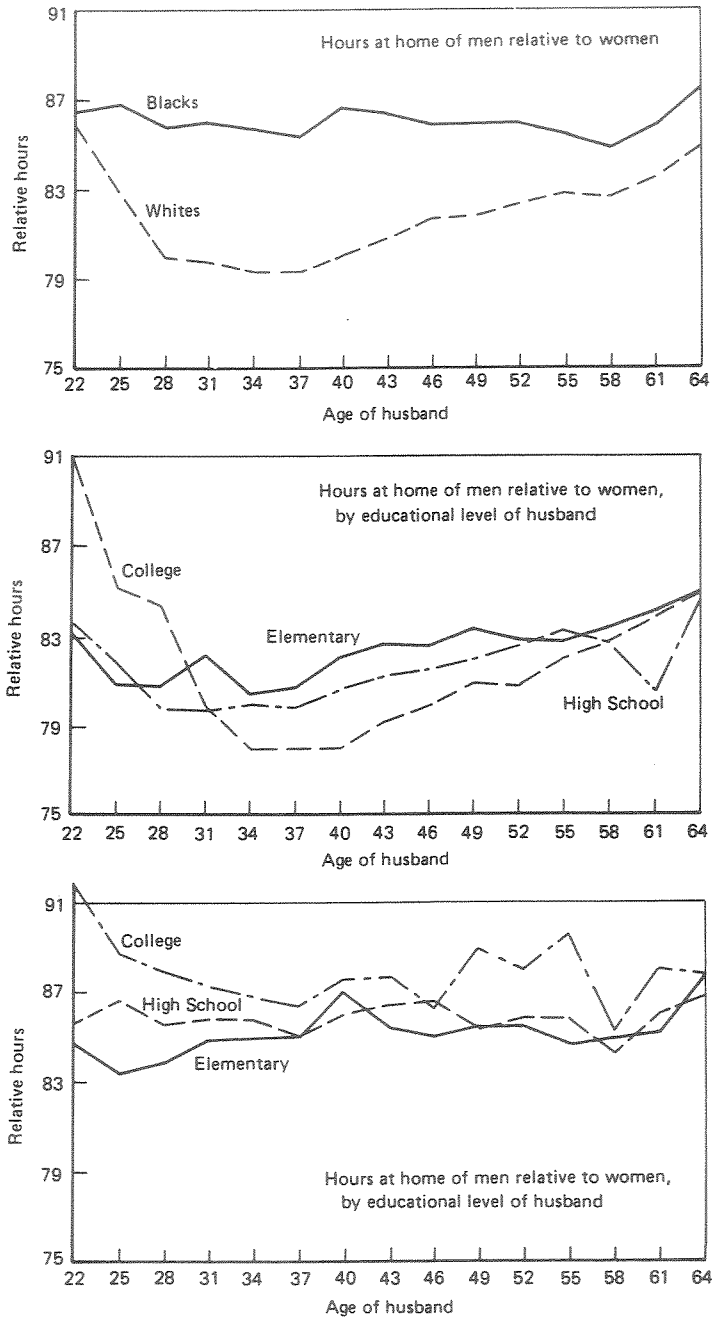

FIG. 3.—Top, blacks and whites. Middle, whites. Bottom, blacks.

spouses. The black profiles by husband's education indicate that the extent of labor supply substitution between spouses over the life cycle is substantially less than that in white families.[27] Note as well that throughout the entire life cycle black female market specialization is largest in the college class.

In table 7, the demand equations for male and female home time

[27] There is of course less incentive to time market activity in black families. Black male/female wage ratios do not rise much with age (compared with whites), and black mothers do not concentrate the childbearing to the degree that white mothers do.

TABLE 7

LIFE-CYCLE (Synthetic Cohort) REGRESSIONS FOR MALE AND FEMALE TIME AT HOME

DEPENDENT VARIABLE LOG OF TIME AT HOME FOR	INDEPENDENT VARIABLE				
	Log Husbands' Hourly Wage	Log Wives' Hourly Wage	Age	Children Less than 7 Yrs Old	Constant
White males	−.0851	.0087	.0004	−.0049	8.94
	(20.9)	(.65)	(4.72)	(2.21)	(193.8)
White females	.0444	−.0841	.0014	.0478	8.95
	(5.49)	(3.11)	(7.36)	(10.89)	(358.9)
Black males	−.0748	.0270	.0053	−.009	8.81
	(3.10)	(.62)	(2.67)	(1.65)	(191.5)
Black females	−.0401	−.0605	.0006	.0184	9.02
	(1.72)	(2.56)	(3.36)	(3.53)	(509.0)

SOURCE.—Data were derived from the 1970 Census. See Smith (1977) for details; t-statistics in parentheses.

over the life cycle are estimated.[28] These regressions allow us to separate out the confounding influences of life-cycle variation in market and nonmarket productivity. The own wage effect should be negative, since increasing the price of a factor induces two substitution effects—between time and goods in any period and between consumption across time periods—each lowering the demand for time at home. The sign of the spouse's wage is theoretically ambiguous, depending upon whether substitution between time of family members is stronger than substitution between time periods. The age coefficients capture the interplay of time preference and interest rates. If families have neutral time preferences and face positive interest rates, the age coefficients should be positive.[29]

The estimated coefficients by and large support the life-cycle model. The age term is positive for all groups. Among white families, the evidence of substitution between spouses is relatively strong. Own wage coefficients are negative and spouse wage effects are positive. In particular, rising husband's wages significantly increase the amount of white female time at home. The proxy for nonmarket productivity—the number of children younger than 7—also supports the notion that family members' times are substitutes in white families. An increase in the number of young children at home re-

[28] These regressions are reported in Smith (1977).

[29] The life-cycle demand equation is $dF_t/F_t = -(S_F\sigma_C + S_M\sigma_{MF} + S_F\sigma_{FX})\,(dW_{ft}/W_{ft}) + S_M(\sigma_{MF} - \sigma_C)\,(dW_{Mt}/W_{Mt}) + \sigma_C(r - \alpha)$ where F is female time at home, S_F the share of female time in home production, r and σ are the interest rate and time-preference index, W_f and W_M are female and male wage rates, and σ_{MF} and σ_C the elasticity of substitution between male time and female time in home production and the elasticity of substitution between the periods, respectively (see Smith 1977 for a proof).

TABLE 8

PROBIT ESTIMATES FOR PARTICIPATION PROBABILITIES

	Whites	Blacks
Residence South	.0171	.1112
	(.29)	(.95)
Education-wife	.0584	.0415
	(4.39)	(2.00)
Predicted experience	.0119	.0302
	(.77)	(1.43)
Education-husband	−.0373	.0080
	(3.61)	(.50)
Children 0–5 yrs old	−.5941	−.3310
	(9.15)	(2.42)
Children born	−.0454	.0001
	(2.01)	(.01)
Constant	−.2603	−.5927
	(1.04)	(1.43)
−2 (log-likelihood ratio)	192.5	32.9

NOTE.—Asymptotic t-values in parentheses.

duces female market work and increases male market work. The results for black families are quite different, with the family variables indicating less association between spouses. The magnitude of the children variable is smaller than that for whites, and an increase in black male wage rates actually increases market participation of black women (although the coefficient is only marginally significant).

Tables 8, 9, and 10 present estimates of female labor supply functions separately for black and white females based on the 1967 Parnes data for mature women. These tables attempt to capture different aspects of labor supply decisions within the family. The dependent variable for the probit participation regressions in table 8 is the probability of market participation within a given year. The time frame is short term (yearly) and indexes simply whether a woman worked in a particular year, ignoring information on the extent of work. The tobit experience equations (table 9) hopefully capture a longer-term measure of lifetime labor supply.[30] Finally, the annual hours equation in table 10 relates to the extent of work during one calendar year.

The principal variable of interest in the probit equation is husband's education. An increase in husband's years of schooling significantly reduces the probability of white female participation but has a positive (but statistically insignificant) effect in black families. At

[30] Experience is defined in the Parnes data as the number of years worked 6 months or more.

TABLE 9

TOBIT FOR PREDICTING EXPERIENCE

Variables	Whites	Blacks
North Central	−.008	−1.960
	(.02)	(1.75)
South	−.4346	.5622
	(1.19)	(.58)
West	−.2698	−2.318
	(.67)	(1.50)
Age of husband	−.0782	−.0057
	(2.55)	(.09)
Years in current residence	.0506	−.0985
	(2.87)	(1.76)
Children born	−1.118	−.3407
	(12.10)	(2.34)
Years children present 0–6 yrs old	−.0396	−.3910
	(.84)	(3.56)
Labor market exposure*	.3155	.4156
	(7.60)	(4.92)
Labor market exposure × ed 9–12 yrs	.0914	.0206
	(4.85)	(.58)
Labor market exposure × ed 13+ yrs	.1298	.1991
	(4.34)	(2.67)
Labor market exposure × hus ed	.0021	−.0032
	(.88)	(.72)
Constant	5.580	6.968
	(5.12)	(2.71)
Average experience (yrs)	8.05	10.74

NOTE.—*t*-statistics in parentheses.
*Labor market exposure is defined as age − education − 6.

TABLE 10

ANNUAL HOURS REGRESSION FOR MARRIED WOMEN

	Whites	Blacks
Children born	−84.69	−25.97
	(2.94)	(1.49)
Children younger than 5	−1,420.23	−38.93
	(2.81)	(.22)
Predicted (log) husband's wage	−1,758.81	120.52
	(4.07)	(.56)
Predicted (log) wife's wage	1,739.91	163.60
	(3.26)	(.79)
λ	2,543.3	96.00
	(2.49)	(.14)
Constant	887.0	1,456.80
	(1.51)	(3.99)

NOTE.—*t*-statistics in parentheses.

least for the short-term question of market entry, husband's and wife's time are substitutes in white families, with little association evident in black families.[31]

The purpose of the tobit estimates for experience is to obtain a less transitory measure of labor supply. The labor market exposure variable measures the potential years available for market activity since schooling.[32] The greater degree of continuous labor force involvement for black women is reflected in their average experience levels, which exceed those of white women by more than 2½ years. Since a larger fraction of black married women never work, the more permanent commitment of black women to the labor market is even larger among workers. For each year of labor market availability black women worked 6 months or more 40 percent of those years, while white women worked approximately 30 percent of those years. This racial difference is particularly impressive for women with more than a high school education, where the differential by race is large. In fact, our life-cycle evidence suggests that this is an understatement of the true racial difference. The Parnes data are for women aged 30–44, and this is the period of more intense labor market activity among college-educated white women. Highly educated black women appear to have a labor force history of relatively continuous work experience, resembling those of males, without the interruptions that typify the patterns for white women.

Finally, table 10 presents estimates for annual hours worked of participants. These equations are corrected for both censoring bias and the simultaneity between wages and hours. The ln hourly wages are imputed from the censored wage equations reported in Section II.[33] The estimates for blacks are clearly not terribly precise, due to multicollinearity introduced by the high correlation in imputed hourly wage rates of spouses. Subject to this qualification, these annual hours regressions are basically consistent with the other definitions of labor supply examined. Husband's wages are significantly negative in the white female supply function but are insignificantly positive for black females. The body of evidence presented in this section is therefore consistent with our hypothesis that white families attempt to maintain family income levels with one family member

[31] If husband's income is substituted for his education, it has a negative coefficient of whites and a significantly positive effect for blacks.

[32] It is in fact the standard variable used to measure actual male experience in most studies. Although tobit estimation incorporates the zero truncation of experience, one difficulty with the estimates presented is that the upper limit of maximum experience for a given age is ignored. A preferred estimation strategy would be a two-limit tobit with a variable upper truncation.

[33] For the econometric methodology used to estimate these labor supply equations, see Heckman (1979).

increasing his(her) labor supply in response to a decline in participation of other family members. This compensatory function of wives' earnings is simply not as common in black families.

IV. The Dynamics of Family Earnings

It is useful to supplement the cross-sectional evidence on earnings distribution with information obtainable only from panel data. Cross-sectional data are largely silent concerning the question of mobility over time within an income distribution. It cannot distinguish between a cross-sectional snapshot that represents a permanent stratification of the population into income deciles and one in which there is considerable reshuffling of individuals or families within the distribution over time. Using the Nine Year Michigan Income Dynamics Survey Panel, I estimated an earnings function for log male earnings, log family earnings, and log family taxable income separately for black and white married-spouse-present families. The structure of the model follows that developed recently by Lillard and Willis (1978).[34] For each definition of earnings (y_{it}), the earnings function takes the form $y_{it} = X_{it}B + u_{it}$ where $u_{it} = \delta_i + v_{it}$, and $v_{it} = \gamma v_{it-1} + \eta_{it}$ where δ_i is a permanent individual error, η_{it} is a purely random component, and γ is the serial correlation coefficient common to all individuals.[35]

The residual covariance structure is of the form[36]

$$E(u_{it}u_{\tau}) = \begin{cases} \sigma_\delta^2 + \sigma_v^2 = \sigma_\mu^2 & 1 = j,\ t = \tau \\ \sigma_\delta^2 + \gamma^s\sigma_v^2 = \sigma_\mu^2[\rho + (1-\rho)\gamma^s] & 1 = j,\ (t-\tau) = s \\ 0 & 1 \neq j \end{cases}$$

where $\sigma_v^2 = \sigma_\eta^2/(1-\gamma^2)$ and $\rho = \sigma_\delta^2/\sigma_\mu^2$; ρ measures the proportion of residual variance that represents permanent variation across individuals.

These earnings functions were estimated for 789 white and 68 black married-spouse-present families for 9 years (1967–75).[37] Parameter estimates for the residual structure are reported in table 11. The complete regressions are in tables A2 and A3.[38]

[34] I would like to thank Lee Lillard for many insightful comments and his assistance in the estimation of these equations. The LISREL program was used to estimate the model.

[35] As is conventional, δ_i, η_{it} are assumed to be distributed independently of X_{it} and joint (log) normality is assumed throughout.

[36] This assumes that at the beginning of the work history, initial earnings are shocked by an error of the form $v_{i1} = \eta_{i1}/\sqrt{1-\gamma^2}$.

[37] The sample was restricted to males between the ages of 18 and 58 in 1967 who were not disabled, retired, or full-time students during the period and who reported positive earnings in each year and were continuously married.

[38] The explanatory variation for husbands' earnings included schooling and a quadratic in experience. For family earnings, female schooling, wife's market experience, and number of children were added.

TABLE 11

COMPONENTS OF VARIANCE

	$\hat{\sigma}^2_\mu$	$\hat{\sigma}^2_\delta$	$\hat{\sigma}^2_\eta$	$\hat{\sigma}^2_v$	$\hat{\gamma}$	$\hat{\rho}$	$\hat{\sigma}^2_{yp}$	σ^2_y	$\frac{\hat{\sigma}^2_{yp}}{\sigma^2_y}$
A. Log husband's earnings:									
All whites	.214	.137	.064	.077	.411	.640	.210	.287	.731
All blacks	.194	.131	.057	.063	.299	.675	.291	.354	.822
B. Log family earnings:									
All whites	.192	.115	.058	.077	.494	.599	.192	.269	.777
All blacks	.159	.099	.055	.060	.289	.633	.301	.361	.834
C. Log family taxable income:									
All whites	.192	.116	.060	.076	.456	.604	.196	.272	.720
All blacks	.195	.086	.088	.109	.436	.441	.291	.400	.728

First consider the components of variation controlling for individual year effects. Permanent variance is larger for blacks than whites in both male and family earnings, due principally to measured variables. In addition, a larger proportion of residual variation represents permanent differences among blacks. Compared with whites, the permanent component is more dominant for blacks in family earnings than in male earnings. It is 37 percent higher for blacks in male earnings but 57 percent higher for blacks in family earnings.[39] This seems consistent with the results presented in Sections II and III. On the wage side (the source of positive covariance), permanent wages of spouses are more highly correlated in black families. Since permanent components of white spouses negatively covary and are compensatory through their long-term labor supply decisions, this stabilizes earnings distribution and reduces permanent variation in white family earnings.

Whether male or family earnings are used, cross-sectional earnings distributions constitute a more permanent ranking among black families. The correlation in white male earnings 1 year apart is .842 compared with .875 for blacks. For family earnings, the corresponding correlations are .855 and .885.[40] Blacks not only represent a larger proportion of the (earnings) poor, but they are more likely to remain in that status relative to the white poor. Moreover, this long-term poverty problem is intensified in the black population by the inequality-expanding impact of wives' earnings.

[39] This results from black female characteristics adding more explanatory power in the family earnings regression. Explained variation due to the x vector increased from 0.16 to 0.20 for blacks when moving from male to family earnings. It increased only from 0.073 to 0.077 for whites.

[40] Asystematically, these correlations approach 0.731, 0.822, 0.713, and 0.722 for white male, black male, white family, and black family earnings, respectively.

Transitory variances in earnings are larger both absolutely and as a proportion of the total for whites in both male and family earnings. Of the total transitory variation, a larger fraction constitutes purely stochastic variance for blacks. The most noticeable difference between male and family earnings is the increase in the serial correlation coefficient for white family earnings. Because serial correlation in family earnings is some combination of that in male and female earnings, this suggests a larger serially correlated female earnings.[41] While open to other interpretations, this is consistent with the differential pattern of market participation of black and white females. The intermittent market participation of white women should translate into a serially correlated pattern of female earnings. When white women enter the market, perhaps to compensate for a transitory decline in husbands' earnings, they do so not for 1 year but for a period of years.

In table 11, C, the model is estimated for log family taxable income. The parameters are essentially identical with those obtained with white family earnings, but among black families important differences emerge. There is 10 percent more dispersion in taxable family income than family earnings in black families. All of this additional dispersion is accounted for by transitory variation, with increases in both the purely stochastic and serially correlated components. Since permanent characteristics are less important in taxable income, black *income* distributions are characterized by less individual stability over time. The correlation across years for blacks asymptotically approaches .838 for family earnings and .727 for family taxable income. One must be cautious in extrapolating conclusions reached for family earnings to broader definitions of income particularly for low-income groups.

In table 12 (log) husband's earnings and family earnings are estimated for white families stratified by the work force status of the wife.[42] Families are divided into those where the wife (1) never worked over the 9 years, (2) worked some but not all the years, and (3) worked all 9 years. Since the sample is stratified by an endogenous

[41] Consider the sum of two serially correlated errors:

$$\begin{aligned} \mu_1 &= \rho_1\mu_{1-1} + \eta_1 \\ \mu_2 &= \rho_2\mu_{2-1} + \eta_2 \\ \mu_1 + \mu_2 &= \rho_1\mu_{1-1} + \rho_2\mu_{2-1} + \eta^* \end{aligned}$$

$$\rho^F = \frac{(\mu_1 + \mu_2)(\mu_{1-1} + \mu_{2-1})}{\sigma_{11} + \sigma_{22} + 2\sigma_{12}} = \frac{\rho_1\sigma_{11} + \rho_2\sigma_{22} + (\rho_1 + \rho_2)\sigma_{12}}{\sigma_{11} + \sigma_{22} + 2\sigma_{12}}$$

where ρ^F is the serial correlation coefficient for the sum of male and family earnings. If $\rho_1 = \rho_2$, clearly $\rho^F = \rho_1 = \rho_2$. A larger ρ_2 will increase ρ^F relative to ρ_1. This must be qualified by the log transform of family earnings.

[42] The sample sizes for blacks were not large enough to perform a similar stratification for them.

TABLE 12

COMPONENTS OF VARIANCE BY WHITE WIVES' LABOR FORCE STATUS

	$\hat{\sigma}_\mu^2$	$\hat{\sigma}_\delta^2$	$\hat{\sigma}_\eta^2$	$\hat{\sigma}_v^2$	$\hat{\gamma}$	$\hat{\rho}$	$\hat{\sigma}_{yp}^2$	σ_y^2	$\frac{\hat{\sigma}_{yp}^2}{\sigma_y^2}$
A. Husband's earnings:									
Wife never worked	.235	.168	.059	.067	.346	.714	.287	.354	.811
Wife worked 1–8 yrs	.175	.102	.071	.073	.435	.583	.174	.247	.704
Wife always worked	.162	.105	.048	.057	.405	.648	.151	.208	.725
B. Family earnings:									
Wife never worked	.231	.164	.059	.067	.346	.710	.286	.353	.810
Wife worked 1–8 yrs	.173	.078	.067	.095	.540	.450	.149	.244	.611
Wife always worked	.121	.080	.030	.041	.521	.667	.120	.161	.750

variable, this classification must be treated with caution. Indeed, the coefficients reported in table A2 reflect the censored character of the division. As we would expect from censoring, male education and experience coefficients are largest for the wife-never-worked group and smallest for the wife-always-worked sample.[43] The differences in coefficients between those three classes also allow for an interpretation that has more economic content. Since husbands in the never-worked category have more incentive to accumulate human capital, their wages should grow at a more rapid rate with experience. In spite of the necessary qualifications, the estimates obtained within the three groups are suggestive about the role of female earnings on the family earnings of stability over time.

As expected, the variance components for male and family earnings are essentially identical in the wife-never-worked families. In families with working wives her earnings reduce total dispersion in family earnings, and this reduction is largest in the wife-always-worked category. This reduction in dispersion results from a decline in the permanent component attributed to both observable and nonmeasured factors. This supports our notion that the permanent components of husband's and wife's labor supply negatively covary and are compensatory in white families. Transitory year-to-year earnings variation around the permanent earnings level may be either negatively or positively related across spouses. One partner may compensate for unforeseen changes in the earnings of the other in order to maintain a stable family earnings over time. On the other hand, both partners are generally subject to similar local labor market demand conditions which may cause their transitory earnings to vary together. Purely transitory variation is lower in family earnings when the wife works,

[43] For example, the wage equation for husbands for families in which wives always work is $w_m = \alpha X + \gamma_1 \lambda$. Since λ is not included in these equations, standard specification bias implies that the estimated $\hat{\alpha}$ are biased downward. From Sec. III, $\gamma_1 < 0$ and education or experience and λ are positively correlated.

tending to support the compensation hypothesis. This reduction is larger in the always-worked category, which may indicate that it is less costly for women with continuous labor market experiences to react more quickly to transitory changes in their husbands' earnings. As anticipated from our earlier discussion, wives' earnings add to the serial correlation in family earnings since the serial correlation coefficients are higher for family earnings than male earnings. This is true even among families where the wife worked all years. This increase in serial correlations is sufficiently large that total transitory variation is greater for family earnings when wives have an intermittent work history.

V. Conclusion

In this paper I examined the influence of wives' earnings on the distribution of family earnings for black and white families. Earnings of women equalized income distributions in white families but increased dispersion among blacks. After correcting wage functions for sample censoring, we found that there was a considerably larger positive correlation in wages of black spouses. Thus, black family earnings would be distributed more unequally than those of whites even if all individuals worked the same amount. Our analysis of labor supply functions indicated that white family members compensate through their labor supply adjustments to changes in the earnings of other family members in order to maintain aggregate family income. This compensatory function of wives' earnings is much less common in black families. Finally, our cross-sectional evidence was supplemented with a components-of-variance model estimated using the Michigan Income Dynamics Survey. Compared with blacks, the effect of earnings of white wives is to stabilize family income levels over time.

Appendix

TABLE A1

VARIANCE IN LOG MALE WAGES AND LOG (Male plus Female Wages) IN MARRIED-SPOUSE-PRESENT FAMILIES WITH WORKING WIVES

	1970 WHITES		1970 BLACKS	
AGES (Years)	Family Hourly Wage	Male Hourly Wage	Family Hourly Wage	Male Hourly Wage
21–25	.3714	.3204	.4714	.4101
26–30	.3129	.2505	.3867	.3190
31–35	.2845	.2518	.3753	.3279
36–40	.2710	.2572	.3819	.3723
41–60	.2555	.2692	.4241	.4243
51–60	.2648	.2894	.4389	.4222
21–60	.3019	.2859	.4180	.3876

SOURCE.—This table is based on the 1970 U.S. Census.

TABLE A2

HUSBAND'S ln EARNINGS

	ALL BLACK	ALL WHITE	WHITE—WIFE WORKED		
			Never	1–8 yrs	Always
σ_η^2	.0569	.0636	.0587	.0708	.0478
	(.0038)	(.0013)	(.0251)	(.0019)	(.0020)
γ	.2989	.4108	.3460	.4352	.4047
	(.0465)	(.0151)	(.0314)	(.0205)	(.0308)
σ_δ^2	.1306	.1366	.1684	.1019	.1050
	(.0249)	(.0079)	(.0202)	(.0085)	(.0129)
Schooling	.1105	.0867	.1006	.0883	.0706
	(.0144)	(.0050)	(.0123)	(.0059)	(.0095)
Experience	.0311	.0345	.0426	.0365	.0278
	(.0191)	(.0053)	(.0151)	(.0064)	(.0117)
Experience^2	−.0006	−.0007	−.00008	−.0007	−.0006
	(.0004)	(.0001)	(.0003)	(.0002)	(.0003)
σ_{YP}^2	.2913	.2102	.2862	.1743	.1508
N	68	789	168	445	176
χ^2	109.2	434.2	137.5	372.6	158.6

NOTE.—Standard errors in parentheses.

TABLE A3

ln FAMILY EARNINGS

	ALL BLACK	ALL WHITE	WHITE—WIFE WORKED		
			Never	1–8 Years	Always
σ_η^2	.0548	.0577	.0587	.0672	.0296
	(.0037)	(.0012)	(.0025)	(.0018)	(.0013)
γ	.2891	.4944	.3463	.5401	.5208
	(.0487)	(.0156)	(.0314)	(.0211)	(.0335)
σ_δ^2	.0985	.1149	.1635	.0780	.0803
	(.0192)	(.0071)	(.0196)	(.0077)	(.0101)
Husband's schooling	.0709	.0603	.0854	.0595	.0432
	(.0156)	(.0058)	(.0144)	(.0071)	(.0105)
Husband's experience	.0350	.0333	.0403	.0292	.0280
	(.0172)	(.0051)	(.0150)	(.0062)	(.0107)
Husband's experience^2	−.0008	−.0007	−.0008	−.0006	−.0007
	(.00037)	(.0001)	(.00033)	(.0002)	(.0002)
Wife's schooling	.0688	.0447	.0327	.0495	.0316
	(.0159)	(.0076)	(.0190)	(.0090)	(.0141)
Children (N)	−.0426	−.0066	−.0032	.0031	−.0214
	(.0267)	(.0110)	(.0258)	(.0136)	(.0202)
Wife's schooling	.0004	.0065	.0059	.0010	.0052
	(.0056)	(.0019)	(.0044)	(.0028)	(.0031)
σ_{YP}^2	.3006	.1916	.2862	.1484	.1197
N	68	789	168	445	176
χ^2	180.4	407.4	170.0	347.8	201.0

NOTE.—Standard errors in parentheses.

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