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FOREGONE FUTURE EARNINGS AND THE PRESENT
LABOR SUPPLY OF WHITE, BLACK, INDIAN,
LATIN, AND ASIAN WOMEN

by

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FOREGONE FUTURE EARNINGS AND THE PRESENT LABOR SUPPLY
OF WHITE, BLACK, INDIAN, LATIN, AND ASIAN WOMEN

The large difference in labor force participation rates between black and white women has been analyzed extensively by Cain (1966), Bowen and Finegan (1969), Sweet (1973), and Bell (1974). However, much disagreement still remains. Although some of the labor supply differences can be explained by differences in other family income, marital status, and education, the effects that these variables and others have on labor supply seem to be quite different for blacks and for whites. Matriarchal family structures, differences in child rearing practices, and differences in expectations concerning marital and income stability have all be suggested as the causes of labor supply differences.

This paper presents findings on differences in female labor supply among whites, blacks, and seven other minority groups: American Indians, Puerto Ricans, Chicanos, Cubans, Japanese, Chinese, and Filipinos. Examining groups with a wide range of family structures and expectations may shed light on whether these factors are important for blacks and whites. In fact, the range of labor force participation rates is much wider than between whites and blacks. Only 33 percent of Puerto Rican women between 18 and 65 were in the labor force during Census Survey Week, 1970, compared with 58 percent of Filipino women. The rates for whites and blacks were 48 percent and 56 percent respectively. If the attitudes and expectations formed by communities rather than by individuals acting alone are important, then the behavior and experiences of communities other than blacks' and whites' may help to understand labor supply among our two largest races.

Furthermore, studying these groups is interesting for its own sake. They constitute well-defined and in some areas large minority groups who

have increasing political power and social awareness but who have received little attention in the economics literature. Fogel (1966), Lyle (1973), and Carliner (1976a) studied earnings and employment among Latin men, and Wong (1974) ran earnings regressions for Asian men in California. But no analysis at all has been done on non-black minority women.

The first section of this paper develops a multi-period model of labor supply similar to work by Ghez and Becker (1974). Certain estimation procedures are discussed in Section II, and the data and some characteristics of the groups are described in Section III. Sections IV and V present the results, and a brief summary concludes the paper.

I. THE MODEL

In the standard model of family labor supply functions, the household maximizes a utility function with market goods or money income and the leisure time of the household members as arguments, subject to a budget constraint, all in one period. The present model is identical, except that the future as well as the present affects the household's decisions. The utility function is

$$(1) \quad U = \sum_{t=1}^T \frac{U(M_t, X_{1t}, X_{2t}, K_t)}{(1+r)^{t-1}}$$

subject to the budget constraint

$$(2) \quad M_t - Z_t - w_{1t}(1-X_{1t}) - w_{2t}(1-X_{2t}) = 0 \quad \text{for } t = 1, \dots, T.$$

M_t is money income, equal to exogenously determined prices and the bundle of market goods which the household decides to purchase. X_{1t} and X_{2t} are the amounts of time spent by the woman and by all other adults in the household respectively, K_t is a measure of the number and ages of any children, and r

is the rate at which the household discounts the future. In equation (2) Z_t is other family income, and w_{1t} and w_{2t} are wage rates. If we define $L_{it} \equiv 1 - X_{it}$, where L_{it} is the amount of time the i^{th} individual spends doing market work in period t , the budget constraint can be rewritten as

$$(3) \quad M_t - Z_t - w_{1t}L_{1t} - w_{2t}L_{2t} = 0 \quad \text{for } t = 1, \dots, T.$$

Differentiating equation (1) subject to equation (3) yields the first-order conditions for utility maximization.

$$(4) \quad \frac{\partial U}{\partial L_{i1}} = \frac{\partial U_1}{\partial L_{i1}} - \lambda w_{i1} - \lambda \sum_{t=2}^T \frac{L_{it}}{(1+r)^{t-1}} \frac{\partial w_{it}}{\partial L_{i1}} = 0$$

where λ is the Lagrangean multiplier and U_1 is utility in the first period.

Since

$$(5) \quad \frac{\partial U}{\partial M_1} = \lambda,$$

λ can be interpreted as the marginal utility of money. Similarly, the derivative of the constrained utility function with respect to K_1 is

$$(6) \quad \frac{\partial U}{\partial K_1} = \frac{\partial U_1}{\partial K_1} - \lambda w_{11} \frac{\partial L_{11}}{\partial K_1} - \lambda \sum_{t=2}^T \frac{L_{1t}}{(1+r)^{t-1}} \frac{\partial w_{1t}}{\partial L_{11}} \cdot \frac{\partial L_{11}}{\partial K_1} = 0.$$

Several of the assumptions implicit in this model deserve brief mention. First, current labor supply, and thus current leisure, do not affect future utility directly. To the extent that current leisure is used for investments, either in children or in physical or human capital, this assumption will understate the total value of $\partial U / \partial L_{i1}$. Second, saving and borrowing are also not possible with this model, and assets are only important implicitly for the unearned income Z which they generate. Third, children only affect the labor supply of their mothers, since $\partial L_{21} / \partial K_1 = 0$. And finally, although

current labor supply affects future wage rates, it has no effect on present wages, since $w_{i1}/L_{i1} = 0$. Thus part-time workers are assumed to receive the same wage rate as full-time workers with similar skills, while experience explicitly affects future wage rates.

In one-period labor supply models wage rates are exogenous. In this multi-period model, future wages depend on current labor supply. However, the return to experience is still exogenous. Therefore we define E the effect of the experience on wage rates

$$(7) \quad E_i \equiv \frac{\partial w_{it}}{\partial L_{i1}} = f(\text{Education, Race, Age, Sex}) > 0 \quad \text{for } t > 1.$$

The current wage rates w_{i1} is exogenous, and future wages depend only on present wage rates, the amount of current experience L_{i1} , and the effect of this experience on future wages E_i .

$$(8) \quad w_{it} = f(w_{i1}, L_{i1}, E_i) \quad \text{for } t > 1.$$

The system of equations outlined above can be used to derive a set of demand equations for money income and the leisure of the two individuals for all T periods. For the current period, labor supply of the woman is a function of her own current wage, the effect of experience on her future wage, the wage rates of other family members, other family income now and in the future, children now and in the future, and the household's discount rate.

$$(9) \quad L_{i1} = f(w_{i1}, E_i, w_{21}, Z_1, Z_t, K_1, K_t, r).$$

The advantage of this model is that it allows us to see explicitly that the cost of present leisure includes not only present foregone money income but also income foregone in the future as the result of decreased wage rates.

The value of leisure at the margin, as shown in equation (4), must equal the current wage times the marginal utility of money plus the discounted marginal utility of the effect of experience on future wage rates times future labor supply. In one-period models, the cost of a unit of leisure rises as the wage rate rises. Here, it also goes up if E , the effect of experience, is large, if L_t the expected future labor supply is large, or if r , the discount rate, is low. Similarly, the effect of children on household utility, and therefore on the labor supply function of the woman, also depends on current wages and future decreased wage rates, as seen in equation (6).

Because households maximize utility over their lifetimes rather than only in the present, women who expect to work a great deal in the future, will find decreasing their labor supply in the present more expensive than otherwise similar women who do not expect to work much in the future. Comparable differences will also exist between women whose wage rates are or are not sensitive to the amount of labor market experience they have. These differences can be expected to increase labor supply among women for whom the total cost of not working is large.

Although equation (9) and the partial derivatives of L_{11} with respect to the independent variables cannot be written explicitly unless equation (1) is fully specified, information about the signs of the partials can be inferred from equations (4) through (7). If, as is usually assumed, leisure is a normal good with a positive income elasticity, then $\partial L_{11} / \partial Z_1 < 0$. From this assumption it also follows that the effect of future income on current labor supply is negative as well. Equation (4) indicates that the higher the level of future labor supply, the greater will be the price of present leisure. A lower future wage rate will increase the price of present leisure by more

for a woman who expects to work a lot in the future than for a woman who expects not to work. Since Z_t will decrease L_{1t} and since the substitution effect is always negative, we can conclude that $\partial L_{11} / \partial Z_t$ is also negative. In general, any factor which will tend to decrease future labor supply will also decrease the price of current leisure, and therefore decrease current labor supply.

Although it is not implicit in consumer demand theory, it is also well documented that the effect of children on current labor supply is negative. Children increase the marginal utility of nonmarket time by more than they increase the marginal utility of income. There, even in one period models, they decrease the amount of labor supplied by their mothers. In our multi-period model, future children will depress future labor supply, which decreases the price of current leisure. Therefore, present labor supply is decreased because of the negative substitution effect.

Because experience increases the price of current leisure, its affect on current labor supply is just the opposite. $\partial L_{11} / \partial E_1$ will be positive. The greater the effect of experience on future wage rates, the more a woman sacrifices by staying home. Women who receive no on-the-job training ($E_1 = 0$) lose only their current wage rate for each hour of leisure, and according to this model do not need to consider the future in deciding on their current mix of leisure and market goods. But women whose wages do increase with experience will sacrifice both potential current earnings and this future increase by staying out of the labor force.

The effect of other family members' wage rates on the woman's labor supply, $\partial L_{11} / \partial w_{21}$, will also be negative. In some cases the leisure of different family members may be complementary goods (for instance, if husband and

wife must both retire to move to Florida). However, for prime age women, whose non-market time includes more work than real consumption, it seems plausible to assume that they are substitutes. Therefore an increase in the price of the husband's leisure will induce the household to substitute the wife's leisure for the husband's leisure, and the cross substitution effect will be positive (negative on labor supply). By assumption, the income effect of an increase in w_{21} on labor supply is also negative, so $\partial L_{11} / \partial w_{21}$ is negative. The sign of the own wage effect $\partial L_{11} / \partial w_{11}$, is indeterminate. The income effect will tend to increase the demand for leisure and decrease labor supply. But the substitution effect will work in the opposite direction. It is unclear a priori which effect will be larger, but previous evidence indicates that, especially for women, the substitution effect is larger and $\partial L_{11} / \partial w_{11}$ is positive.

The importance of considering the effect of expectations about future labor supply on current labor supply depends on the size of the effect of experience on future earnings. If this effect is small, then the future does not matter. However, if there is a large penalty attached to dropping out of the labor force temporarily, future expectations are likely to be important in determining women's current labor supply decisions.

Mincer and Polacheck (1974) estimated returns to experience for women with and without children by educational category. They found that wage rates depreciate by 1.1 percent for each year spent out of the labor force for mothers with 8 years of school or less, by 1.4 percent for mothers with 9 to 12 years of school, and by 4.3 percent for mothers with more than high school. Thus the cost of temporarily dropping out of the labor force to raise children is very high for college educated women, but even for women who

never attended high school the loss is considerable. One percent of thirty years' discounted earnings (age 35 to age 65) can easily exceed a quarter of one year's full-time earnings. For college educated women the cost of dropping out of the labor force in terms of foregone future earnings could easily exceed the cost in terms of present earnings.

This does not mean that all groups of women with high values of E will have high current labor supply and low values for $\partial L/\partial K$ or $\partial L/\partial Z$, since such groups may also have high values for $\partial U/\partial K$ and $\partial U/\partial Z$. For instance, Leibowitz (1975) found that $\partial L/\partial K$ was larger for educated women than for poorly educated ones. The former certainly have higher values for E than the latter. Just because the price of leisure is higher for well-educated women does not mean that they will not find it optimal to consume larger amounts of it than women who pay a lower price.

Bowen and Finegan (1969), Cain (1966), Sweet (1973), and Bell (1974) all found a smaller effect of children on the labor supply of black wives than of white wives. Sweet and Bell also found a smaller effect for having been married previously, and Bowen and Finegan found smaller effects for being married currently. All these authors cited greater marital instability among blacks as a possible reason for the lower effects of these variables. In terms of our model, a divorce would mean that future w_2 or Z may be very low compared to current values of w_2 and Z .

Implicit in this explanation is the idea that married black women anticipate in some way that their marriages may not last. Even if an individual married black woman is just as confident of her own marriage lasting as an individual white woman, her expectation of her future labor supply may be formed by her community's expectation and experience. The community's expectations will be formed by the average likelihood of a successful marriage.

Because marriage is a less certain guarantee of future income for a black woman than a white woman, expected future labor supply will be higher, and therefore for presently married black women present labor supply will be higher. Because marriage has less effect on future income for blacks, it may have less effect on their current labor supply.

Similarly, if black mothers anticipate having to work more in the future than white mothers, it will be more expensive for them to stay home to care for their young children. Of course this is also true between well-educated and poorly-educated women, whose human capital depreciates at different rates when they do not work. However, home productivity may also vary with education. There is no reason to assume that it varies by race, other things equal. For black and white mothers whose present characteristics are similar but whose expected future labor supply is different, home productivity will be the same but the price of leisure will be greater for the blacks. Thus it will be rational for the black mother to work more in the present, and for the existence of children to have less effect on her current labor supply.

One way to test this hypothesis is to compare the effect of marital status and the existence of children on the labor supply functions of women from different communities. Expectations about the future are probably formed within racial and ethnic groups, especially for relatively recent immigrants from Latin America and Asia. If groups with high rates of divorce, like blacks, also show small effects for marital status on their labor supply, but groups with stable marriages show a large marital effect, the hypothesis will tend to be confirmed. If there is no relation between marital stability and marital effects on labor supply, the hypothesis can be rejected.

It has also been argued that income instability for black men has increased the labor supply of black women, and reduced the effect of husband's earnings and other family income on the woman's labor supply. Because black women expect that they will have to work to support the family in the future, they are more likely to work in the present, and less likely to be affected by temporary changes in employment or income of their husbands. Of course the fluctuations in the household's income will be greater if the husband leaves altogether than if he is simply unemployed for a short period. But the nature of the effects on black-white differences in labor supply functions is similar.

This hypothesis can also be tested by comparing labor supply functions among different racial and ethnic groups. Groups with very high income instability should have low effects of other family income and husband's wage rate of wife's labor supply, and conversely for groups with stable income. Once again, it is not only the current experience of the individual household which determines its behavior, but also the expectations formed by the average experience of community members. Even longitudinal data on individual households would not provide information of these expectations. For these types of relationships and variables, data on different communities, such as racial and ethnic communities, are especially useful. Therefore we will use the individual's race as a proxy for her expectations about the future. Instead of estimating a function of the form of equation (9), we will estimate

$$(10) \quad L_{11} = f(w_{11}, w_{21}, Z_1, K_1, \text{Race}).$$

II. ESTIMATION PROCEDURE

Several alternative approaches to the estimation of labor supply

functions have been used, and much disagreement remains over the correct choice. First, it is not clear which measure of an individual's labor supply is best, participation in the labor force during the year prior to the survey, weeks worked during that year, hours worked during the week prior to the survey, some function of these measures, or other measures which distinguish between time spent working and time spent unemployed. Garfinkel and Masters (1974) discuss at length the advantages of each measure. The results presented below will be for regressions with hours worked during the week prior to the survey as the dependent variable, but similar results were obtained from regressions with weeks worked and labor force participation as dependent variables. For the present purposes, at any rate, choice of the dependent variable does not seem to affect the results.

The second point of disagreement is whether or not to include nonworkers in regressions of hours or weeks worked. Boskin (1973) claims, without elaboration, that including them "records inappropriately high estimates (of coefficients) at the lower bound and inappropriately low estimates at the upper end of the relation." However, Ben-Porath (1971) argues more convincingly that they should be included. An increase in wage rates may result in lower hours or weeks worked by current workers, since the income effect for them may outweigh the substitution effect. For nonworkers, however, the wage increase may be just sufficient to bring them into the labor force. If only the first effect is measured, estimated labor supply functions will bend back sooner than they do in reality. Therefore both workers and nonworkers are included in our regressions.

Another issue is whether to estimate income and substitution parameters directly, or whether to estimate a reduced form with variables that affect both labor supply and wage rates. Hall (1973) and Leibowitz (1975) used a two-

stage procedure for estimating equation (10) in order to obtain estimates of income and substitution parameters. Since wage rates cannot be observed for nonworkers, and since the wage rates and labor supply variables are often measured with errors, they first estimated a wage equation for workers. Then wage rates were imputed to the entire sample, for workers as well as nonworkers. The labor supply function was then estimated. This procedure assumes that the market wage available to nonworkers is the same as the market wage available to workers with similar measured characteristics. In other words, the only difference between workers and nonworkers is the reservation price of their time, and not in the wage rate they could get in the market.

It hardly seems reasonable that supply factors should account for the entire difference between workers and nonworkers, and that demand factors should be entirely unimportant. Since wage rates of nonworkers will probably be lower, this method will tend to produce estimates of substitution effects that are too low.¹ For this reason, and because we are interested in the actual effects of different demographic variables on labor supply, rather than simply in income and substitution elasticities, we will estimate a one-stage regression. The arguments from the wage regression will be included directly in the labor supply regression, and no separate wage coefficient will be estimated.

The wage function implicit in the regressions to be estimated will have the form:

$$(11) \quad w_{11} = f(\text{Educ, Race, Age, South, SMSA, Engl, PNB, NB, Abr}).$$

Educ, Race, and Age are years of school completed, a race or ethnic group variable to be described below, and age, to be included both in years and the square of years. Dummy variables for residents in the South and in metropolitan areas will be included to reflect regional and city size differences in the demand for labor.

The last four variables are designed to reflect differences in labor market productivity, but they may also reflect differences in the degree of discrimination against racial minorities. Engl is a dummy variable which is one for women whose mother tongue is English, zero for women in whose childhood homes other languages were spoken. PNB and NB are dummy variables for having both parents native born and for being native born oneself. Abr is a dummy variable for women who immigrated to the U.S. during the five years preceding the survey. The reference group will be foreign-born women who immigrated prior to 1965.

Finally, I will assume that the labor supply of other family members does not depend on the labor supply of the woman. Numerous studies of married prime age men have shown very low income and substitution effects, and thus very little dependence on their wives' working. If L_2 is independent of L_1 , then w_2L_2 is exogenous, and can simply be included in Z. This is the definition of Z used in the regressions analyzed below.

Husbands do have an effect on wives' labor supply beyond their contribution to other family income, however, since most husbands are probably net consumers of household production. Though they produce more than children do, they are not likely to produce as much as they consume. Thus a married will have more demands on her leisure time and higher marginal productivity of leisure than a similar single woman. A measure of marital status (MS)

therefore belongs in a labor supply function.

One additional modification is the inclusion of a variable to identify students. Since the nonmarket activities of students increase their future wage rates and perhaps the marginal utility of their leisure as well, their present leisure is less expensive in terms of our model, and we will expect that $\partial L/\partial \text{student} < 0$. The final form to be estimated, therefore, will be

$$(12) \quad L_i = f(Z, K, MS, \text{Educ}, \text{Race}, \text{Age}, \text{South}, \text{SMSA}, \text{Engl}, \text{PNB}, \text{NB}, \text{Abr}, \text{Student}).$$

Note that Z now includes all family income other than the woman's earnings, and that the labor supply and wage rates of other family members do not appear.

III. THE DATA AND GROUP CHARACTERISTICS

The data used to estimate this model come from the 15 percent sample of the one in a hundred Public Use Sample of the 1970 Census. In addition to the standard data on age, education, sex, marital status, and number of children, this sample provides detailed information on mother tongue, place of birth of the respondents and their parents, and on what the Census Bureau calls race. Individuals were asked to identify themselves as whites, blacks, American Indians, Japanese, Chinese, Filipinos, Hawaiians, Koreans, Aleuts, Eskimos, or others. People who said they were of mixed parentage were assigned to their father's race. Three ethnic groups not defined as races by the Census Bureau, Puerto Ricans, Chicanos, and Cubans, were identified separately on the basis of the birthplace of the individual or her parents.²

Table 1 presents measures of labor supply by race or ethnic group for women between 18 and 65 in 1970. To obtain the total number of such women in the U.S., the number of women in the sample should be multiplied by 10,000 for whites, 400 for blacks, and 100 for the other groups. (Whites

TABLE 1
 Labor Supply Measures by Race for Women 18-65

	White	Black	Indian	PR	Chicano	Cuban	Japanese	Chinese	Filipino
Labor Force Participation Rate	48%	56%	42%	33%	41%	57%	56%	56%	58%
Hours Worked	15.7	17.5	13.6	10.3	12.9	19.1	18.5	19.1	20.2
Weeks Worked	21.8	24.8	17.9	15.4	17.6	24.5	26.0	25.0	25.4
Number in Sample	4629	13,761	1856	3309	7009	1808	1973	1263	925

Source: Calculated from 1/100 PUS of the 1970 U.S. Census of Population

and blacks were subsampled to reduce computing costs.) As with differences in labor force participation rates mentioned above, differences among Asian and Latin groups in hours worked during the week preceding the Census survey and in weeks worked during 1969 are far larger than the much discussed differences between whites and blacks. The average number of hours worked by the most active group, Filipinos, is almost twice as large as the average of the lowest group, Puerto Ricans. Differences in weeks worked are somewhat smaller, but still far larger than the black-white difference.

Our model suggests that differences among women in education, other family income, number of children, and age will all affect labor supply. Table 2 indicates that there are surprisingly large differences among our racial and ethnic groups in these variables. Two groups, Filipinos and Japanese, have more education on average than whites, and three groups, Chicanos, Puerto Ricans, and Indians, have less education than blacks. Blacks have the lowest other family income, and Chinese and Japanese are better off in this respect than whites.

Blacks also have the lowest percentage married spouse present, but that is partly because so many blacks are never married. Puerto Ricans are more likely to be divorced or separated. And all three Asian groups have lower percentages of women divorced or separated than whites. Similar patterns exist for the number of children. Asian women have slightly fewer than white women, who have considerably fewer than blacks, who have considerably fewer than Indian and Chicano women.

The picture of economic and social success of the three Asian groups in comparison not only with other minorities but even with whites, is even more impressive in light of the recent immigration of the Chinese and Fili-

TABLE 2

Characteristics by Race

	White	Black	Indian	PR	Chicano	Cuban	Japanese	Chinese	Filipino
Education	11.5	10.0	9.6	8.1	7.6	10.0	12.0	10.9	12.3
Other Family Income	\$9067	\$5228	\$5715	\$5983	\$6994	\$8037	\$10,500	\$9361	\$8206
Number of Children	2.1	2.5	2.8	2.5	3.2	1.6	1.8	1.9	1.9
Marital Status (%)									
Married, Spouse Present	72.3%	50.8%	62.6%	62.1%	68.5%	67.6%	72.4%	67.5%	50.3%
Divorced or Separated	5.9%	16.7%	11.6%	17.8%	8.6%	8.3%	4.4%	2.5%	4.4%
Never Married	14.8%	19.9%	17.0%	13.9%	15.3%	15.6%	17.6%	23.5%	27.1%
Native Born (%)	95%	99%	97%	14%	58%	6%	68%	38%	29%
Students (%) 18-24	28%	23%	21%	14%	18%	29.0%	48%	58%	23%

Sources: Calculated from 1/100 PUS, except last line, from 1970 Census of Population PC(1), Part 1, Section 2, Tape 197, PC(2)-1B Table 3, PC(2)-1E Table 4, PC(2)-1C Table 4, PC(2)-1F Table 3, and PC(2)-1G Tables 3, 18, and 33.

pinos. Only 38 percent of the former and 29 percent of the latter are native born. Although Asian occupational achievement is slightly below that of whites, their wage rates are somewhat higher.³ Moreover, their prospects for the future seem promising indeed. While 28 percent of white women between 18 and 24 were enrolled in school in 1970, 48 percent of Japanese, 58 percent of Chinese, and 23 percent of Filipinos were.⁴

The situation of Indians, Puerto Ricans, and Chicanos, on the other hand is not very bright. They have low levels of education, low occupational achievement and wage rates, relatively high rates of marital instability, and low family income. By some measures they are worse off than blacks. For instance, the unemployment rate for black women in 1970 was 7.7 percent, but for Puerto Rican, Chicano, and Indian women it was 8.3 percent, 8.9 percent, and 10.2 percent respectively. And if education is any clue to the future, their relative position in society may not improve as fast as the position of blacks: the percentages of young women from these groups who were students were lower than the percentage of black women.

In general, the groups with high labor supply are also the groups with characteristics conducive to working, and vice versa for groups with low labor supply. To see how much of the labor supply differences can be accounted for by differences in characteristics, regressions were run for all groups, weighted to reflect the differing sampling ratios discussed above. Dummy variables were included for each ethnic group except whites, who were the reference group. This procedure constrains the effect of the independent variables to be the same for each group, but it allows us to see how much labor is supplied by women similar in every respect but race.

In regressions using all three labor supply measures as dependent

variables, all the standard independent variables had the expected signs and were highly significant. The effects of other family income, number of children, marriage, and being a student are all negative, the effect of age is quadratic, and the effect of education is positive. Also as expected, living in a metropolitan area results in significantly more hours worked. Living in the South is also associated with significantly more hours. None of the variables controlling for place of birth, or mother tongue was significant.⁵

The racial coefficients from a regression with hours worked as the dependent variable are shown in Table 3. Although these coefficients are closer than average hours worked by group, unadjusted for differences in the independent variables, most of the differences remain. The range in unadjusted hours was 9.9. The difference between the largest coefficient, for Chinese, and the smallest, for Puerto Ricans, is still 7.6 hours. Whites lie approximately in the middle of both ranges. Many of the coefficients are significantly different from each other, and an F test of the set of racial coefficients is significant at the 1 percent level. Thus differences in current characteristics among groups explain only a small part of their differences in labor supply. The remainder must stem from differences in the way these characteristics affect their labor supply.

IV. EFFECT OF MARRIAGE AND FAMILY

To test the hypotheses discussed in Section I by allowing the effects of the independent variables to differ by race, separate labor supply regressions were run for each of the nine groups. These regressions were identical to the ones for the entire sample of women, except for the omission of the race dummies. Dummy variables on place of birth and mother tongue

TABLE 3

	White	Black	Indian	PR	Chicano	Cuban	Japanese	Chinese	Filipino
Coefficient from Hours Worked Regression (standard error)	---	1.40 (.19)	-.39 (.42)	-3.10 (.32)	1.14 (.22)	2.46 (.43)	2.05 (.41)	4.48 (.51)	3.12 (.60)
Other Adults/Household	.37	.58	.57	.39	.54	.65	.70	.76	.70
Male Unemployment Rate	3.6%	6.3%	11.6%	6.2%	6.1%	4.3%	2.0%	3.0%	4.7%
Private Household Workers (%)	2.0%	18.0%	6.7%	1.0%	5.5%	1.2%	3.9%	2.0%	2.3%

Source: See Table 2.

were also omitted when too few observations were available in those categories. Table 4 presents the coefficients and standard errors from regressions with hours worked as the dependent variable.

Our model emphasizes that the cost of not working includes lower future wage rates as well as the loss of current earnings. The size of the future loss will depend on the size of expected future labor supply. Married women whose expectations are formed in communities with high divorce rates may expect to work more than similar women in communities with stable marriages. A current marriage may not be as sure a guarantee of future marriage and future other family income for the former women as for the latter. Therefore current leisure will cost them more in terms of future wage rates, and they may work more in the present as well as in the future. If this is so, the effect of marriage will be weaker for groups that have unstable marriages than groups with stable marriages.

The coefficients in Table 4 tend to confirm this hypothesis. As reported by previous studies, the effect of marriage is much smaller for black women than for whites, and the percentage of divorced or separated women among ever-married women is much larger for blacks. A married black woman is likely to work only one hour less per week than a similar never-married woman, but a married white woman is likely to work ten hours less. Differences between married and divorced women are also small for blacks but large for whites.

Moreover, a similar pattern exists for the other races. The three Asian groups, with more stable marriages than whites, show a large effect for marriage. Differences between married and never-married women are 7.5 hours, 11.9 hours, and 9.1 hours for Japanese, Chinese, and Filipinos respectively. Differences between married and divorced women are also large

TABLE 4

Hours Worked Regressions by Race

Variable	White	Black	Indian	PR	Chicano	Cuban	Jap	Chinese	Fil
Log OFY	-1.78 (.22)	-1.392 (.12)	-1.92 (.33)	-.99 (.24)	-1.54 (.19)	-1.51 (.37)	-1.31 (.35)	-.84 (.41)	-2.03 (.41)
EDUC	.82 (.10)	1.07 (.05)	1.10 (.11)	.65 (.08)	.63 (.05)	.54 (.12)	.30 (.155)	.19 (.117)	.97 (.16)
AGE	1.11 (.15)	1.41 (.09)	1.12 (.24)	1.17 (.17)	.96 (.12)	1.66 (.26)	1.16 (.29)	1.24 (.36)	1.53 (.37)
AGE ²	-.013 (.002)	-.017 (.001)	-.013 (.003)	-.0127 (.002)	-.011 (.001)	-.021 (.003)	-.011 (.004)	-.012 (.004)	-.018 (.005)
NUMKIDS	-1.45 (.17)	-1.00 (.07)	-.63 (.19)	-1.63 (.15)	-.81 (.09)	-2.20 (.34)	-1.20 (.29)	-.05 (.38)	-.80 (.36)
SOUTH	1.81 (.66)	2.46 (.34)	-.62 (1.05)	.84 (1.67)	-.62 (2.05)	.71 (.88)	.80 (2.17)	-3.87 (2.31)	-8.26 (2.38)
SMSA	.55 (.56)	.79 (.37)	1.64 (.89)	-.36 (1.33)	2.16 (.48)	4.90 (2.28)	4.33 (1.30)	2.64 (1.82)	3.83 (1.83)
ENGL	-.92 (.85)	-.43 (1.29)	.97 (.87)				-1.56 (1.30)	4.67 (2.19)	-3.01 (2.13)
PNB	.97 (.88)	2.56 (1.66)					.08 (1.31)	-.62 (1.91)	.66 (2.57)
NB	.94 (1.40)	-6.76 (2.19)		1.74 (.85)	.74 (.45)	-2.42 (1.93)	7.14 (1.12)	-2.70 (1.44)	-2.72 (1.85)
Abroad	-.42 (2.72)	3.39 (2.06)		-1.46 (.89)	-.59 (.84)	-.78 (.96)	-6.12 (1.58)	-3.70 (1.49)	-2.13 (1.48)
MSP	-10.07 (.98)	-1.09 (.50)	-1.31 (1.38)	-8.02 (.97)	-11.53 (.71)	-7.49 (1.56)	-7.50 (1.58)	-11.90 (1.97)	-9.09 (1.78)
MSA	-7.86 (2.08)	-2.00 (.95)	.26 (2.53)	-4.66 (1.99)	8.05 (1.48)	-6.41 (2.62)	.89 (3.39)	-8.54 (4.05)	-10.29 (2.95)
WIDOW	-2.45 (1.49)	-1.08 (.71)	-3.92 (2.24)	-7.33 (1.77)	-8.13 (1.14)	-5.48 (2.55)	-3.84 (2.65)	-12.61 (3.37)	-8.23 (3.85)
D/S	.52 (1.40)	.60 (.60)	.64 (1.76)	-7.65 (1.14)	-4.43 (.96)	-3.41 (2.07)	-.19 (2.48)	-7.68 (3.91)	-1.81 (3.23)
Student	-13.17 (1.21)	-8.11	-5.91 (1.83)	-9.02 (1.44)	-8.41 (1.08)	-12.38 (2.04)	-9.70 (1.82)	-12.46 (1.86)	-10.89 (2.18)
CONSTANT	2.45	-8.14	-9.20	-3.05	5.11	-4.24	-4.99	4.43	-4.26
R ²	.14	.10	.11	.13	.14	.12	.14	.10	.21
NOBS	4628	13760	1855	3308	7008	1807	1972	1262	924
\bar{HW}	15.7	17.5	13.6	10.3	12.9	19.1	18.5	19.1	20.2

for these groups, though smaller for Chinese women than for the others. All the differences mentioned so far but this last are statistically significant at the one percent level.

The marital coefficients of groups other than blacks with relatively unstable marriages also tends to support the hypothesis, though the pattern is not so strong. Puerto Ricans have the highest percentage of divorced women among ever-married women. The hypothesis predicts a weak effect of marriage, but the difference between married and never-married women is eight hours, and significant. However, the difference between married and divorced Puerto Rican women is less than half an hour, and insignificant. Among Indian women, whose percentage divorced lies about midway between whites and blacks, differences between married women on the one hand and never married or divorced women on the other are both less than two hours and not significant. Cuban and Chicano women, with percentages divorced equal to and 50 percent greater than whites respectively, both show large differences between married women and divorced and never married women.

Obviously no firm conclusions can be drawn from such diverse findings. Not all the variations among racial groups in the effect of marriage can be explained by one theory. However, the pattern of marital coefficients from the nine regressions in Table 4 does tend to support the hypothesis that the importance of marriage in reducing labor supply of women depends on racial divorce rates.

No such support is given to similar hypotheses on the effect of children on labor supply. All the coefficients on NK (the number of children ever born) have the expected sign, and all but one are significant. As with earlier studies, the white coefficient is significantly larger than the black coefficient,

but the range among other races is larger still. However, the regression results do not support the hypothesis that marital instability reduces the effect of having children on labor supply. The group with the lowest percent of divorced women, Chinese, has the lowest coefficient. The group with the second highest percentage of divorced women, Puerto Ricans, has the second highest coefficient. There seems to be little connection between the two terms.

Another explanation of differences in the effect of children, advanced by Cain, Bowen and Finegan, and Sweet, is that overcrowding and an extended family structure make babysitters more available for blacks than for whites. Bell rejects this suggestion because labor force participation rates have been increasing even though overcrowding has been decreasing. Moreover, he found that participation rates were higher among black women outside of poor central cities than inside, where one would expect worse housing conditions. However, overcrowding may still increase female labor supply, even if other factors also affect it over time. And while black housing outside the central city may be of better quality than black housing within, it does not automatically follow that black families are less extended outside than inside. Bell presents no evidence on this point.

To see if overcrowding or extended families might explain differences in the effect of children on labor supply among other races, the number of adults per household other than heads and their spouses are shown in Table 3. These adults include nonrelatives, siblings, parents, and children of the household head who are over 18.⁶ This statistic ranges from .37 for white households to .76 for Chinese. The correlation coefficient between the NK coefficient and the number of other adults per household is .43. This is not very strong evidence that overcrowding or extended family structure decreases

the effect of children on labor supply.

Finally, Leibowitz (1975) found that the effect of having children on labor supply increased with the education of the mother. Since the nine groups in this study have widely differing average years of school, we might expect the average effect of having children to differ widely as well. While Leibowitz's finding may be true within racial groups, it is not true between them. Puerto Ricans and Cubans, with the highest NK coefficients, have below average education. Chinese and especially Filipinos have above average education but below average NK coefficients.

Perhaps these weak results stem from the poor quality of the variable used to measure the effect of children. Young children are likely to demand far more work than older children. Older children, especially those who are grown and no longer living in the household, may have reduced their mother's labor supply in the past. Because of less experience, the woman's actual or potential wage rate will be lower, and thus her labor supply may be lower because of her children. But the effect will be far less than for actually having young children at the present.

Gramm (1975), Leibowitz (1975) and others have included dummy variables for women with children under 3 or under 6, and earlier regressions included such variables for the present sample. These regressions were run with and without the NK variable, and separately for all women, married women, and unmarried women. For all specifications, the coefficients on the dummy variable were often positive, and rarely significantly negative. In regressions that included NK as well as the dummy variable, the coefficients on the former were usually significantly negative and virtually the same as the values presented in Table 4.

While Census data specify the number of children borne to each woman, the number of young children present is only available for the household. Thus it is not possible to determine if the young children belong to the individual or to another person in the household. This ambiguity may explain why the dummy variables performed so badly. Having a young child in the same household may have little effect on a woman's labor supply if the child is a sibling or grandchild.

V. OTHER RESULTS

Earlier studies have found large and significant differences in the effect of other family income (OFY) on the labor supply of black and white women, but the nine coefficients on that variable in Table 4 show relatively little variation. The black coefficient is smaller than the white coefficient, but only 22 percent smaller, and the difference is not significant. The coefficients from all nine regressions are negative and significant at the one percent level. Only two pairs of coefficients are significantly different from another, the smallest, Chinese, from the two largest, Filipino and Indian.

Discussion above suggested that the effect of other family income might be decreased by marital instability or by fluctuating other family income. If the woman expects this variable to be low in the future, either because her marriage will end or her husband's income will fall, she may work more in the present. If these expectations are formed within racial or ethnic groups, we might expect the size of the OFY coefficients in Table 4 to be correlated with our measure of marital instability, or a measure of income instability such as the male unemployment rate, shown in Table 3. In the full employment year of 1970 this measure ranged from 2.0 percent for Japanese men to 3.6

percent for white men, to just over 6 percent for Chicano, Puerto Rican, and black men, to 11.6 percent for Indian men.

Neither the male unemployment rate nor the percentage of divorced women seem at all related to the size of the OFY coefficient. The group with the highest OFY coefficients, Filipinos, has an unemployment rate slightly below the average of the groups, but Indians have the second highest OFY coefficient and by far the highest male unemployment rate. Filipinos and Chinese both have low percentages of divorced women, while Indians and Puerto Ricans, who have the second lowest OFY coefficient, both have high percentages of divorcees. The correlation coefficient between the OFY coefficient and the male unemployment rate is only $-.38$. The correlation coefficient between the OFY coefficient and the percentage of divorced women is also low, $.14$.

It is not clear why the earlier studies should have found effects twice or three times larger for whites than for blacks, while the present study shows no significant difference. Bowen and Finegan, Cain, and Sweet all used 1960 data, but Bell used 1967 data. Three years from 1967 to 1970 are unlikely to have produced such large changes. The present similarity of coefficients may result from using the log of other family income instead of a linear form used by Bell or the dummy variable specification used by Bowen and Finegan. Earlier regressions on the present sample which used linear other family income instead of the log form produced differences which were somewhat larger than among the log coefficients but still substantially smaller than those of other studies.

Education enters the labor supply function primarily because of its effect on actual or potential wage rates. The size of its effect on labor supply therefore depends on its effect on wage rates, and on income and sub-

stitution effects. Differences among racial and ethnic groups can arise from any of these three sources, and with the limitations of the present study, it is difficult to know which is responsible for the wide range of coefficients shown in Table 4. The smallest effect, .19 hours increase for each year of education among Chinese women, barely significant at the 10 percent level, is a small fraction of the 1.1 hours increase for Indians. Many of the differences between groups are significant at the one percent level.

Bowen and Finegan and Bell both suggest that the higher effect of education on labor supply for blacks than for whites may stem from the very high percentage of poorly educated blacks who are domestic servants. Black women with little schooling, only able to work at jobs which they find demeaning and degrading, may choose not to work at all. White women with little schooling are able to find jobs which they like more, and so their participation rates and hours worked are higher. Therefore the correlation of education with labor supply, other things equal, is larger for blacks than for whites.

The percentage of servants by race is shown in Table 3. This percentage ranges for 1.0 percent for the poorly educated Puerto Ricans to 18 percent for blacks, 11 points higher than the second highest group, Indians. Blacks and Indians also have the highest education coefficients, while Chinese are the lowest in both percentage servants and education coefficient. The correlation coefficient between the two terms is .52. In spite of this definite correlation, this evidence does not really support the hypothesis. Puerto Ricans and Chicanos have considerably lower average education than blacks and Indians, and are probably restricted to similarly menial occupations. Since

they are even more adverse to working as servants than blacks, their education coefficients should be even larger. Since they are not, it seems unlikely that the servant hypotheses explains racial differences in the effect of education on labor supply.

Another possible explanation for differences in the education coefficient may be differences in nativity. Other work in progress indicates that the effect of foreign birth and language on wage rates and occupational achievement are highly significant for most of the groups in this study. If these variables do not have the same effect on home productivity that they have on labor market productivity, especially if returns to education are smaller for immigrants, then the education coefficient may be smaller for races with high percentages of immigrants.

To test this hypothesis, an additional variable equal to years of schooling for native born women and zero for other women was constructed. The coefficient on this variable is the difference between the effect of education on the labor supply of all women and native born women. A similar interaction variable was constructed for recent immigrants. None of the coefficients on either of these variables was significantly different from zero for any of the nine races. The hypotheses that the effect of education on labor supply is different for immigrants and natives, or that differences in the percentage of immigrants accounts for differences in education coefficients among racial groups, cannot be confirmed.

Furthermore, even the dummy variables for place of birth and native language were seldom significant. I expected that labor supply would be greater among native English speakers and among native born women than among

immigrants, especially recent immigrants. Language difficulties and other problems of acculturation might be expected to reduce market wages by more than they reduce the productivity of housework, or the marginal utility of leisure. However, the full set of variables was significant only among the Chinese, though significant differences between natives and immigrants also exist among Puerto Ricans, Japanese, and blacks. Perhaps language and nativity affect productivity of home and market work to the same extent. Or perhaps other differences between natives and immigrants, such as motivation, compensate for differences in labor market productivity.

VI. CONCLUSION

Although considerable difference exists between the labor supply of black and white women, it is small compared to the differences among the other groups in this study. Filipinos, Chinese, Japanese, and Cubans all work at least as much as blacks, and Indians, Chicanos, and Puerto Ricans all work less than whites. The groups also have greater variation than blacks and whites in marital status, education, number of children, and student status. However, even after controlling for these variables and other family income, nativity, mother tongue, age, and location, about half the differences in labor supply remain. In a regression with hours worked as the dependent variable, Chinese, Filipino, and Cuban women work significantly more hours than blacks. Japanese, blacks, and Chicanos work significantly more than whites, and all groups have coefficients significantly larger than Puerto Ricans.

Earlier studies have suggested that at least part of the higher labor supply of black women compared with whites can be explained by greater marital

instability. The model developed above emphasized that the cost of present leisure includes not just foregone present earnings but also the cost in future earnings of lower wage rates due to lower levels of experience. Groups with high levels of marital instability will be more likely to work in the future, and therefore must pay a higher price for leisure in the present. Thus their present as well as future labor supply may be higher than groups with more stable marriages.

This hypothesis received support from the data on other races analyzed in this paper. The three Asian groups, Japanese, Chinese, and Filipinos, all with low divorce rates, show large differences in labor supply between married and unmarried women. Puerto Ricans and American Indians, with high divorce rates, both have relatively small and insignificant coefficients on marital status variables in labor supply regressions. However, the marital coefficients for Cubans and Chicanos are large even though both groups have relatively high divorce rates.

Data from other races do not support similar hypotheses on black-white differences in the effect of having children or of other family income. There was a low correlation between the size of the coefficient on the number of children ever born and the percentage of divorced women. Black-white differences in the effect of other family income were much smaller than previous studies have shown. Although the full range of coefficients among all nine races was larger, these differences were still not significant. The differences that did exist were not correlated either with the percentage of divorcees or with a measure of income instability, the male unemployment rate.

Differences in the effect of education on labor supply were much larger than differences in income elasticities among the groups. It is not

clear if this was due to large differences in elasticities of substitution, in the effect of education of wage rates, or in some other factor. Education coefficients were correlated with the percentage of women who were servants. There were no significant differences in the effect of education between immigrants and natives. Indeed there were few differences at all between immigrants and natives.

FOOTNOTES

¹Because Hall includes potential full-time earnings in his definition of other income, his estimates of income elasticities are also too large.

²Because these three groups were not defined by descent, but only by birthplace of parents, perhaps one or two percent of third generation Puerto Ricans, Cubans, and Chicanos were included with whites. Hawaiians, Koreans, Aleuts, Eskimos, and others were not included in this study, because even in the 1/100 Census sample there were too few such women to analyze their labor supply decisions in detail.

³See Carliner (1976) for a fuller description and a discussion of measurement problems.

⁴1970 Census of Population, Vol. 1, Part 1, Section 1, Table 197 and PC(2)-1G, Tables 3, 18, and 23.

⁵These coefficients, plus race coefficients from regressions with weeks worked and participation in the labor force as dependent variables, are available from the author on request.

⁶Unfortunately available for all households only, including families with and without children. See Table 3 for sources.

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