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THE EFFECT OF INCOME AND WAGE RATES ON THE LABOR SUPPLY OF PRIME AGE WOMEN

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Abstract

In this paper we estimate the effect of income and wage rates on the labor supply of prime age married women, single women, and female family heads. Economic theory predicts a positive substitution effect and, providing leisure is a normal good, a negative income effect. With a few exceptions we find positive substitution effects and negative income effects in all of our regressions for all of our female groups. Economic and sociological considerations also suggest that the magnitude of the income and substitution effects should vary with demographic groups. In general, the greater the social pressure to work the more narrow is the role for choice on economic grounds, and the smaller will be the income and substitution effects. As expected we find that the female groups have much more elastic labor supply than prime age married males.

INTRODUCTION

While static economic theory predicts that most income transfer programs will lead to reductions in the labor supply of program beneficiaries, the theory has nothing to say about the magnitude of such reductions.[1] In order to predict the magnitude of such reductions, the labor supply schedule of potential beneficiaries must be known.

In a previous paper we presented estimates of the effects of income and wage rates on the labor supply of prime age and older men. In this paper we present and discuss similar estimates for three groups of prime age women: married women, never married women with no children, and female heads of households with children. In subsequent papers we will present estimates for younger and older people.

A major theme of the papers is that problems that inhere in the available data prevent us--and other researchers--from making very precise estimates of the labor supply functions of any demographic group. As a result, while empirical studies of labor supply can reduce some of the uncertainty about the magnitude of the labor supply reductions that would be induced by transfer programs, much uncertainty remains.[2]

In the first section of this paper we describe the data upon which our analysis is based. This section is virtually identical to the first section in the previous paper. The next sections present and discuss our results for the 3 demographic groups. The final section contains a brief summary and conclusion.

I. DATA BASE AND VARIABLE DEFINITIONS

Our analysis is based on two data sources: the Survey of Economic Opportunity (SEO) and the Michigan Institute for Social Research - OEO Income Dynamics Panel Study (ISR-OEO). The SEO, conducted only for the years 1966 and 1967, was designed to supplement the Current Population Survey. Data were collected from 30,000 households, consisting of (1) a national self-weighting sample of 18,000 households and (2) a supplementary sample of 12,000 households from areas with a large percentage of nonwhite poor. We use only the 1967 self-weighting portion of the sample in our analysis.[3] The ISR-OEO study was a five-year longitudinal study conducted during the years 1968 through 1972. Of the 4,802 families interviewed in 1968, 1,872 were from the SEO low-income supplementary sample. The rest consisted of a national cross section of the U.S. population. Sample size decreased because of nonresponse and increased because of new family formation. By 1972, therefore, the sample consisted of 5,060 families, 1,108 of which were newly formed since the 1968 interview. Because of the smaller sample size we use the total sample ISR-OEO and run weighted regressions to take account of the nonrandom character of the sample.

For three reasons, we begin our analyses with the SEO material, and devote more attention to our results from it than from the ISR-OEO data. First, many other studies have been based on SEO data. Second, the ISR-OEO data have only recently become available so that we are less familiar with the strengths and weaknesses of the data. And finally, while the ISR-OEO study has several data advantages over the SEO for household heads, there are much less data on wives and practically no data on other family members.

A. Labor Supply Measures

Numerous measures of labor supply can be constructed from the SEO data. Adult household members were asked how many hours they worked last week, how many weeks they were employed last year, and whether they normally worked full or part time last year. Paid vacation and paid sick leave are included in the SEO definition of weeks employed but not in the definition of hours worked in the survey week. In addition, adults who worked less than 50-52 weeks or less than full time during most weeks were asked to give the major reason why they were less than full-time workers. (Unfortunately, adults who worked less than full time in the week prior to the survey were not asked why.) From the answers to these questions we have constructed the following measures of labor supply:

1. HLF_A = the product of weeks in the labor force (weeks employed plus weeks unemployed) and 40 if the individual either normally worked full time or wanted to work full time or 20 if the individual voluntarily worked part time.

2. $HEMP_A$ = the product of weeks employed and 40 if the individual normally worked full time during the year or weeks employed and 20 if the individual worked part time.

3. $EMPDUM_A$ = a dummy variable which assumes the value of 1 if $HEMP_A > 0$ and zero if $HEMP_A = 0$.

4. HWK_{SW} = hours actually worked during the survey week.

5. $HWK_{SW} \leq 40$ = HWK_{SW} or 40, whichever is smaller.

6. $WKDUM_{SW}$ = a dummy variable equal to 1 if $HWK_{SW} > 0$ and zero if $HWK_{SW} = 0$.

There are several important differences among these variables. The last five are measures of either time employed or time actually working, while the first is a measure of time spent looking for work as well as time spent employed. Measures 2, 3, 4, 5, and 6, therefore, are more likely

to reflect cross-sectional differences in the demand for as well as the supply of labor. (Since inability to find a job leads to labor force withdrawal in some cases, cross-sectional differences in the demand for labor are also likely to be reflected in the time-in-labor force measures!) In particular, if as is undoubtedly the case, the tightness of the market varies directly with skill level, low wage workers will be laid off more often and rehired less rapidly than high wage workers. Thus, the wage rate coefficients in these five measures will be positively biased.

On the other hand, the allocation of time between search for employment and actual employment is at least in part subject to the individual worker's control. Moreover, we expect the individual's decision to be influenced by economic considerations. The larger the individual's nonemployment income, the better able is he to afford to spend time looking for a satisfactory job. Similarly, the higher his potential wage rate, the better able is he to afford to spend time looking for a satisfactory job. But the higher his wage rate, the more costly is the time he spends not working. If the substitution effect dominates, the wage rate coefficient will be more positive in the time-employed than in the time-in-the-labor-force measures of labor supply. Thus, wage coefficients may be more positive in the time-employed labor supply measures either because the wage rate coefficients are more likely to inappropriately reflect cross-sectional differences in the demand for as well as the supply of labor or because these coefficients appropriately reflect the wage rate elasticity of job-search time. Because it is not possible to determine whether the differences between the time-employed and the time-in-the-labor-force measures are due to the first or second of these factors, we will present results for both of these measures.

The variables also differ in the degree to which they are comprehensive measures of labor supply. Our major focus in the discussion of the results will be on the most comprehensive measures of $HEMP_A$, HLF_A, HWK_{SW}, $HWK_{SW} \leq 40$. Only the HWK_{SW} variable measures overtime hours worked during the week. The $HW_{SW} \leq 40$ variable is constructed in order to facilitate the isolation of the overtime labor supply schedule. Since $HWK_{SW} \leq 40$ treats overtime labor supply as equivalent to full-time labor supply, it is comparable to $HEMP_A$, the major differences being that (1) it contains a more continuous measure of hours worked during the week than $HEMP_A$ and, more important, (2) unlike $HEMP_A$, it may be sensitive to seasonality problems.[4] The difference between the HWK_{SW} and $HWK_{SW} \leq 40$ coefficients can be attributed to the effects of overtime. The major reason for separating out the effects of overtime for prime age women is that doing so facilitates comparison with our annual-hours-employed measure.

In the ISR-OEO study, household heads and their spouses were asked how many weeks they worked last year and how many hours they normally worked during the weeks that they worked. In addition, household heads who worked less than 52 weeks were asked how many weeks of work they missed because of unemployment or a strike, because of illness, or finally because of vacation. Thus, in the ISR-OEO study, a measure of annual hours actually worked, in contrast to annual hours employed, is available and for heads it is also possible to construct a measure of annual hours in the labor force. Moreover, it is possible to replicate our principal SEO measures of labor supply HLF_A and $HEMP_A$. For household heads then we could use any of the following measures of labor supply:

1. HWK_A = the product of weeks worked and normal hours worked per week.

2. $HWK_A \leq 2000$ = HWK_A or 2,000, whichever is smaller.

3. $HEMP_A$-SEO = HWK_A plus the product of weeks of sick leave and weeks of paid vacation with normal hours worked per week.

4. HLF_A-SEO = $HEMP_A$-SEO plus the product of weeks unemployed or on strike with normal hours worked per week.

5. $HEMP_A$-SEO_R = a recoded measure of $HEMP_A$-SEO in which the weeks employed measure is recoded into the same categories as in SEO and the normal hours worked variable is set equal to 40 if it is equal to 35 or more, and 20 otherwise.

6. HLF_A-SEO_R = a recoded measure of HLF_ASEO in which the weeks in the labor force measure is recoded into the same categories in SEO and the normal hours worked variable is set equal to 40 if it is equal to 35 or more, and 20 otherwise.

7. EMP_A = 1 if $HWK \geq 1$

For wives, only the first, second, and seventh measures of labor supply are available. We shall focus our attention on measures 1, 6, and 7.

The ISR-OEO annual-hours-worked (HWK_A) measure is superior in several ways to the SEO measure of annual hours employed ($HEMP_A$). First, it is a comprehensive annual measure of labor supply that includes overtime work. Second, the measure of annual hours worked is conceptually preferable to a measure of annual hours employed (equals hours worked plus paid vacation and sick leave) because whether it is paid for or not, time spent vacationing constitutes leisure. Moreover, measures of labor supply which include paid vacation and sick leave are likely to result in positively biased wage rate coefficients. This will be so because the lower wage rate, the less probable it is that the worker will have a job with paid vacation or paid sick leave. Consequently, the vacations and illnesses of those with lower wage rates are likely to be counted as leisure rather than as hours employed, while the vacations and illnesses of those with higher wage rates are more likely to be counted as hours employed. Another way of putting

this is that the SEO measure of time employed does measure time employed for those with paid vacation and sick leave but measures time employed less time spent on vacation and illnesses for those who are not fortunate enough to have jobs with paid vacation and sick leave.

B. Unearned Income Measures

In order to derive an estimate of the effect of income on the labor supply of an individual, it is necessary to have a measure of the income that she has which does not depend on how much she works. Earnings of other family members and family nonemployment income (NEY) are two sources of income that do not depend directly on how much the individual works. Unfortunately, in many instances they depend indirectly on how much she works. We consider NEY first.

Reported NEY in the SEO includes family income from (1) Social Security (old age, survivor's, and disability insurance [OASDI]) or railroad retirement, (2) pensions from retirement programs for government employees or military personnel or private employees; (3) veteran's disability or compensation (VD); (4) public assistance, relief, or welfare from state or local governments (PA); (5) unemployment insurance; (6) workmen's compensation, illness, or accident benefits (WC); (7) other regular income such as payments from annuities, royalties, private welfare, or relief; contributions from persons not living in the household; and alimony or Armed Forces allotments; (8) interest; (9) dividends; and (10) rent. In addition, data are available to the SEO on family assets.[5] Negative correlations between components of NEY and labor supply may be observed for one of three reasons: (1) NEY leads to reduced work effort,

(2) involuntary limitations on work effort lead to NEY, or (3) some third factor simultaneously causes higher-than-average work effort. Only the first should be considered for purposes of estimating a labor supply schedule. Correlations between public assistance, unemployment compensation, veteran's pensions, workmen's compensation, and retirement pensions on the one hand, and labor supply on the other hand, are likely to be observed for either the second or third reason.

Consider public assistance. A priori, it is impossible to specify whether public assistance beneficiaries work less in order to receive aid, or receive aid because of limitations in the work they can do. In the latter case, public assistance payments should not be included in NEY since causation runs the wrong way. But consider for a moment the implications of the former hypothesis. If beneficiaries work less in order to qualify for public assistance, nonbeneficiaries could supposedly do the same thing. That is, beneficiaries and nonbeneficiaries with the same potential wage rate face identical budget constraints.[6] To attribute their differences in work effort to differences in NEY is erroneous. The differences in this case must be a result of different tastes.[7] Consequently, whether the (promised) receipt of public assistance leads to reduced work effort or vice versa, public assistance payments should not be included in NEY.[8]

The same arguments apply to unemployment compensation (UC) beneficiaries. If one assumes that the receipt of UC depends upon involuntary cessation or reduction of work, clearly UC should not be included in the measure of NEY. This appears to be a reasonable assumption for at least the initial qualification for benefits. Even if one assumes that once

unemployed, the availability of benefits induces less effort to become re-employed, the budget constraint of the short-term unemployed person is identical to that of a longer term unemployed who has an identical wage and lives in the same state. The difference in length of unemployment, therefore, must in this case be attributed to differences in tastes. Thus, UC benefits should not be included in NEY.[9]

Our treatment of workmen's compensation and veteran's disability and pensions program benefits is similar to that of public assistance and unemployment compensation benefits. We do not count WC or VD benefits as part of NEY. Most WC benefits are paid for total temporary disabilities. Because the benefits are paid for the length of the disability, the benefit amount will normally be inversely correlated with time spent working. The inclusion of WC benefits in NEY would lead to a spurious negative correlation in the NEY coefficient. Veteran's disability payments like WC payments are likely to be the best available proxy for the severity of a health limitation on work effort, while the veteran's pension program is an income-tested program, which for our purposes is similar to the public assistance program. Thus, payments from either of these programs should not be counted in NEY.

We include income from pensions in NEY.[10] Although individuals below age 62 cannot receive old age insurance payments, there may be other family members who receive either old age or survior's insurance payments. Such payments should be counted in NEY. However, if the woman whose labor supply we are examining could not work part or all of the year because of a health limitation, we presumed that any OASDI payments were disability payments. In this case, as with UC and WC benefits, we did not count OASDI payments in NEY.

To summarize, we do not include benefits from public assistance, unemployment compensation, workman's compensation or the veteran's programs

in our measure of NEY. Our NEY variable is then the sum of the remaining elements of reported NEY in the SEO, or the sum of interest, dividends, rent, pensions, and Social Security payments to those without a disability problem and a miscellaneous category called other nonemployment income. Except for the miscellaneous category that is not available, our ISR-OEO NEY measure is identical. In practice, most of the NEY for the prime age groups is attributable to interest, dividends, and rent. But even these may be indirectly related to the work effort of family members.

Holding wage rates constant, labor supply will be positively related to annual earnings. As long as the rate of savings out of extra income is positive, larger earnings will also lead to more assets and NEY. Individuals may work more than average either because they have a greater than average taste for income or a greater than average taste for work. In either case this would lead to a positive relationship between labor supply and interest, dividends, and rent. Without a variable to measure these tastes for income or work, the NEY variable will reflect this positive relationship between NEY and labor supply as well as the theoretically expected negative relationship.[11] Because of the large variation in the labor supply of wives, the problem of more work leading to more NEY is likely to be more severe for this group than for primi-age males.

In addition, to using NEY, we can also use information on earnings of other family members to generate income-effect estimates. In particular, husbands' earnings can be used to generate income estimates for wives. Unfortunately to the extent that the labor supply of husbands and wives is jointly determined, the estimated income effect generated from husbands' earnings will be negatively biased because of a cross

substitution effect. On the other hand, the earnings of one may be positively related to the other's labor supply because both may reflect the family's taste for income vis-a-vis leisure. These differences in taste may reflect either differences in tastes for lifetime income vis-a-vis lifetime leisure or differences in tastes for the timing of income and leisure. A priori, it is impossible to say which bias will dominate.

C. A Wage Rate Measure

Because many women in all three of the demographic groups that we examine do not work, it is necessary to develop a measure of their potential wage rates.[12] This was done by regressing the wage rates of women who worked on the following demographic variables: age, education, race, location, and health status. The coefficients of the independent variables were then used to impute a potential wage rate to all individuals--workers and nonworkers alike--on the basis of their demographic characteristics.

This potential wage rate measure is expected to be positively biased, however, because some of the variables that are used to predict the potential wage rate are likely to have positive direct effects on labor supply as well as positive indirect effects on labor supply through the wage rate. Education, in particular, is likely to have such effects. Ceterus paribus, women with greater tastes for market work are likely to secure more education than those with a lesser taste for market work. Moreover, schooling itself, particularly post high school education is likely to change tastes and make market work appear more acceptable and desirable. Finally, the more education a woman has, other things being equal, the more pleasant a job she is likely to be able to secure and as a consequence the higher the probability that she will work.

D. Functional Form

We present results only from regressions in which we used linear nonemployment income and other (or husband's) variables, and log linear reported wage rate and potential wage rate variables. There were two reasons for these choices. First, these functional forms generally provided the best fit. Second, the linear income and log linear wage rate coefficients are the easiest ones to convert into crude estimates of percentage reductions in labor supply that would result from NIT programs with specified guarantees and tax rates.[13]

E. Other Independent Variables

In addition to the income and wage rate variables, our SEO regressions for prime age women include the following independent variables: (a similar, though often more limited, set of variables is used for the ISR-OEO analysis)

(1) HLIMLY = a dummy variable equal to one if health prevented the individual from working part of the previous year.

(2) HLIMA = a dummy variable equal to one if the individual has a long term health disability that limits the amount of work she can do.

(3) HLIMK = a dummy variable equal to one if the individual has a long term health disability that limits the kind of work she can do.

(4) HLIMKA = a dummy variable equal to one if the individual has a long term health disability that limits the kind and amount of work she can do.

(5) BLACK = a dummy variable which is equal to one if the individual's race is Negro and zero otherwise.

(6) OTHRAC = a dummy variable which is equal to one if the individual's race is neither Caucasian nor Negro and zero otherwise.

(7) FAMSIZ = a set of dummy variables for family sizes of two, three, four, five, six, seven, or more.

(8) NTWTH = family's total assets which bear no monetary return.

The health status variables overlap to some extent. HLIMA, HLIMK, AND HLIMKA variables are designed to measure long term disabilities. The HLIMLY variable in contrast may reflect a long term disability but it is more likely to reflect the effect of an episodic illness on labor supply the previous year. Unfortunately, there is no question in the SEO which can capture the influence of such an episodic illness on labor supply during the survey week.

The larger a family, the more income the family requires to maintain a given per capita standard of living. If we assume that tastes for standards of living do not vary with family size then, ceteris paribus, the larger the family, the more the head should work. This is the rationale for the inclusion of a set of family size dummies.

Finally, while the NTWTH variable may be viewed as an alternative measure of the income effect on labor supply, for reasons discussed in footnote 4, the NTWTH coefficient is almost certain to be positively biased.

Other variables, such as presence and age of children, are used for specific groups and will be discussed in more detail later.

F. Samples

A few groups of individuals were excluded from each of the demograhic groups that we analyzed. In our SEO analysis, we excluded individuals who were enrolled in school and individuals serving in the Armed Forces either in the week previous to the SEO survey or during the previous year. Individuals older than 24 years who are enrolled in school are a very special small group. Including them in samples of prime age adults could only confound the effects of wage rates and nonemployment income on labor supply and on the propensity to attend school. Women in the Armed Forces are excluded since the SEO measure of time employed consists of time employed as a civilian. We also excluded women who reported that they could not work due to a health problem because by definition, the labor supply of individuals who cannot work will be invariant with differences in wage rates and nonemployment income. We did not do so for men because men may use health as an excuse for not working. Since not working appears socially acceptable for most women, we felt we would not bias our results by excluding those who said health prevents their working.

Finally, we excluded the self-employed from both the SEO and ISR-OEO studies because it is impossible to separate the returns to labor from the returns to captial for the self-employed. As a result, their wage rates and nonemployment income are likely to be mismeasured, and the wage rate and labor supply coefficients are likely to be biased.

From the ISR-OEO data we were unable to ascertain in individuals had been instituionalized. Even more important, while we excluded indi-

viduals who could be identified as students, we could identify only those who gave schooling as the principle reason that they did not work at all. Finally, it is not possible in the ISR-OEO study to identify members of the Armed Forces.

In addition to estimating labor supply functions for several demographic groups, we also estimate labor supply functions for low-income subsamples of these demographic groups. To avoid biasing the income and wage rate coefficients in the process of confining a sample to the low-income population, it is necessary to select individuals for inclusion in or exclusion from the sample on the basis of some measure of income or earnings capacity that is not determined by labor supply. Consequently, in constructing our low-income samples we used the head's potential wage rate as a measure of income or earnings capacity when we analyzed the head's labor supply and husband's earnings when we analyzed wives' labor supply. Heads with potential wage rates equal to more than $3.00 per hour in the SEO and $3.92 per hour in the ISR-OEO samples were excluded from the low wage samples. Wives were excluded if the husband's earnings (or family NEY) was less than $6,000 in the SEO or $7,840 in the ISR-OEO sample.

II Married Women, Age 25-54

For wives, as can be seen from the figures in Table 1 the average level of labor supply is much lower than for husbands. In part, this may reflect the result of economic forces (e.g., due to the relatively low market wage rates of wives their comparative advantage generally is in homework rather than market work). However, we suspect that the most important reason for the lower labor supply of wives is differences in social attitude about the role of husbands and wives (attitudes that also help explain why most wives face low market wage rates).

Since wives are under much less pressure to work than husbands, we expect economic incentives to play a more important role in determining the labor force participation of wives. When social pressure to work (or not work) is extreme, then variations in labor supply are likely to be small and to be dominated by individual eccentricities. When such pressures are reduced, then income and substitution effects are likely to be much more pronounced.

The argument for a strong income effect is simply a special case of the more general argument already presented. While the psychic cost of reducing employment below 40 hours per week may be very high for most prime age males, wives are not subject to the same pressure to work and thus can shift some of their time from market work to leisure and to homework without paying such psychic costs. Since leisure and the output of homework are both assumed to be normal goods, we expect an increase in family income to lead to a relatively large reduction in the market work of wives, (since substitutes for the wife's homework can generally be hired, we are assuming that the wife's time spent on homework doesn't decrease faster

Table 1: Mean Values of Labor Supply and Income Variables for 1967 SEO and 1972 ISR-OEO Samples of Prime Age Married Women and Men

Labor Supply and Income Measures	Married Women (N=6662)	Married Men (N=6263)	Married Women			
			With No Children (N=1597)	With Child Less Than Age 6 (N=2384)	With Child Age 6-13 (N=1998)	With Child Age 14-17 (N=683)
	1967 SEO					
HLF_A	694	1965	1089	380	670	930
$HEMP_A$	671	1918	1053	367	645	911
$EMPDUM_A$	.51	.98	.68	.35	.53	.63
$HWK_{SW} \leq 40$	12	35	19	7	13	17
HWK_{SW}	13	41	20	7	13	17
$WKDUM_{SW}$	.37	.91	.54	.20	.39	.49
NEY	443	300	574	251	505	621
WAGE RATE	2.19	3.53	2.24	2.17	2.20	2.14
HUSBAND'S EARNINGS	7807	1666*	7284	7458	8836	9216
OWN EARNINGS	1476	7565	2135	655	1169	1626
TOTAL INCOME	10201	9531	10458	8839	10543	11267
	1972 ISR-OEO					
	(N=1875)	(N-1284)	(N-436)	(N=607)	(N=637)	(N=195)
HWK_A	709	2190	1018	445	709	844
$EMPDUM_A$	.56	.99	.68	.44	.59	.59
NEY	677	431	1000	372	648	998
WAGE RATE	2.90	5.20	3.21	2.75	2.65	3.00
HUSBAND'S EARNINGS	11220	2947*	10249	10730	12034	12320
OWN EARNINGS	2126	11430	3291	1284	1976	2580
TOTAL INCOME	14023	15328	14540	12386	14658	15898

Note: Annual measures refer to previous year.

N = Sample size

*For married men the figure given in the husband's earnings row is equal to earnings of other family members.

than time spent on leisure). The substitution effect should also be relatively large for wives to the extent that they can shift their time between market work and either leisure or homework with less psychic cost than for prime age men (with the possible exception of the male decision involving overtime).

Up to this point, we have discussed arguments that should apply to all wives. The main differences in elasticities among married women are likely to occur for those with children of different ages. At least, the presence of young children appears to be the single most important determinant of a wife's labor supply. Presumably because they place a high value on spending their time at home caring for their children, wives with young children are much less likely to be in the labor force.

For some families with young children, the wife will be unwilling to work under almost any circumstances and both the income and substitution effects will be near zero. For others, however, maintaining an "adequate" standard of living will come first and, once this standard is achieved, extra income may be allocated largely to the wife's staying home with the children. In this case, the income effect could be very high.

A smaller substitution effect for women with young childern might be expected if most families including those with highly educated wives regard day care and other such arrangements as a poor substitute for the mother caring for her young childern. For example, differences in education may lead to much greater differences in perceived home productivity for wives with young childern than for other wives. On the other hand, many families may regard it as desirable for the wife to work if and only if she earns enough to pay for good day care arrangement, in which case the substitution effect might be quite large for mothers of young childern.[14]

So far we have argued that the income and substitution effects could be either quite low or quite high for wives with young children. These arguments have been based largely on our views of individual's tastes. Let us shift now to a slightly different view of the issue, where we concentrate on social pressures that affect individual tastes rather than simply on individual tastes per se. We expect wives with young children to be under fairly strong social pressure not to work. In other cases, where social pressure is important (e.g., married males), we have argued that such pressure should reduce the importance of the income and substitution effects. In the case of mothers with young children, however, the social pressures may be more complex. For example, there may be relatively little social pressure against a wife working if the family is known to be suffering financial difficulties or (perhaps) if the family can arrange for good day care. Consequently the income and substitution elasticities could be relatively high for mothers of young children.

A. Biases

To generate estimates for the income effect, we can use coefficients for either nonemployment income (NEY), other earnings (OTHERN) or husband's earnings (HE). Since OTHERN and HE are very highly correlated, it does not make sense to present results for both variables and we concentrate on HE, which appears to be a slightly more appropriate measure.[15] The choice between HE and NEY is more significant since the HE coefficient may overestimate the income effect in that it includes a cross-substitution effect (wives doing relatively more market work and less

homework when their wage is high relative to the husband's, holding total income constant). On the other hand, the NEY coefficient may underestimate the income effect since, ceteris paribus, extra earnings by the wife should lead to more saving and such saving is likely to lead to higher NEY. While a similar problem exists for married men, we expect differences in income for such men to come mainly from differences in their wage rates. For married women, however, the variation in income comes at least as much from differences in hours worked as from wage rate differences. Thus, this bias should be more serious for the NEY coefficient for married women than for married men.

Because these biases work in opposite directions, the true estimate should lie someplace in between. Given that the labor supply of married males has been shown to be rather insensitive to economic factors, however, we expect the cross-substitution effect to be small. Thus we are inclined to place somewhat greater confidence in the results for HE than for NEY.[16]

Because about one-half of married women do not work, there is little choice but to rely on the potential wage rate. But the potential wage rate coefficient is likely to be positively biased because it is likely to reflect the direct effects of schooling on labor supply as well as the indirect effect through wage rates. Holding wage rates constant, those with more schooling are likely to be more work oriented (as cause or effect of more schooling) and are likely to have more pleasant working conditions. Moreover, these effects seem likely to outweigh the effect of greater perceived productivity in the home for such women, at least for those without young children. While various other approaches

will be considered in an effort to investigate the magnitude of this bias, all available approaches for estimating wage elasticities may have some upward bias.

In summary, we hope to obtain upper and lower bounds for the income effect for married women. For the substitution effect, however, we can only expect an upper bound.

B. Basic Results

Regression coefficients for both the SEO and IRS-OEO samples are presented in Table 2. In addition to the control variables enumerated in Section I, all regressions include variables for the age of youngest child (<3, 3-5, 6-13, 14-17), amount of husband's employment and, for the SEO, whether someone else is available to help with the housework. (Health variables are not available for wives in the ISR-OEO sample).

All the coefficients have the correct sign and those for HE and PW are almost always highly statistically significant. The HE coefficients are always much larger in absolute value than the NEY coefficients.

In order to analyse these results farther and compare them with our a priori predictions, we need to convert these coefficients to elasticity estimates. The elasticity estimates derived from the regression coefficients in Table 2 are presented in Table 3 along with comparable elasticities for prime age married men.[17] The married women elasticities are significantly higher than for married men, but are all still well below unity. The income elasticity estimates, based on HE, are amazingly consistent. Except for the dummy dependent variables, they are all about -.4. We expect lower values for the dummy dependent variables since these elasticities represent only one component of labor supply.[18]

Table 2: Income and Wage Rate Coefficients for Prime Aged Married Women

	SEO (1967)						ISR-OEO (1972)					
Labor Supply Measures	HE		NEY		LNPW		Labor Supply Measures	HE		NEY		LNPW
HLF_A	-.0298	(15.0)	-.0152	(2.1)	298	(7.3)						
$HEMP_A$	-.0292	(15.0)	-.0133	(1.9)	318	(8.0)	HWK_A	-.0258	(8.57)	-.0379	(3.32)	320 (4.38)
$EMPDUM_A$	$-1.63 \cdot 10^{-5}$	(13.6)	$-.90 \cdot 10^{-5}$	(2.1)	.152	(6.2)	$EMPDUM_A$	-.00001	(6.92)	-.00002	(2.87)	.2149 (4.87)
$HWK_{SW} \leq 40$	-.000547	(13.4)	-.000281	(1.9)	8.24	(9.9)						
HWK_{SW}	-.000571	(12.8)	-.000316	(2.0)	8.70	(9.5)						
DUM_{SW}	$-1.48 \cdot 10^{-5}$	(12.8)	$-.79 \cdot 10^{-5}$	(1.9)	.239	(10.1)						

Note: Numbers in parentheses are t-statistics.

Table 3: Income, Wage Rate and Substitution Elasticities for Prime Age Married Women and Married Men

Labor Supply Measures	Married Women				Married Men		
	Income				Income		
	NEY	HE	Wage Rate	Substitution[a]	NEY	Wage Rate	Substitution
	SEO						
HLF_A	-.22	-.44	.43	.49	-.06	.02	.07
$HEMP_A$	-.20	-.44	.47	.52	-.05	.05	.09
$EMPDUM_A$	-.18	-.33	.30	.35	-.04	.01	.04
$HWK_{SW} \leq 40$	-.23	-.45	.66	.72	.00	.09	.09
HWK_{SW}	-.25	-.45	.67	.73	.05	.05	.01
$WKDUM_{SW}$	-.22	-.41	.64	.70	.01	.07	.08
	ISR-OEO						
HWK_A	-.75	-.51	.45	.53	.00	.01	.18
$EMPDUM_A$	-.50	-.25	.38	.42	-.13	.01	.27

[a]The substitution elasticities reported in the text are based on the income effect derived from the HE coefficient.

These results are quite consistent with those of Cain and of Bowen and Finegan.[19] On the other hand, the income elasticity estimates based on NEY are much lower.

For the substitution elasticity, we obtain a wide range of estimates. Demand factors, which apparently had little effect on our income elasticity estimate, appear to play a more important role in our substitution estimates. First, the estimate for $HEMP_A$ is about 10 percent larger than for HLF_A--a result that seems quite reasonable since both demand and wage rates are likely to be positively related to schooling. Our relatively large results for the survey week dependent variables may also be the result of demand factors--assuming that differences in demand by education are particularly important during the time of the survey week (February and March), an assumption that is not unreasonable because total demand is low in these months, especially in agricultural areas. Because we would like to abstract from demand factors, we place our greatest confidence in the HLF_A estimate.[20] Therefore our best guess as to the substitution elasticity is about 0.4 to 0.6 (about 0.4 to 0.5 for the wage elasticity). These results are consistent with Cain's estimates from the 1/1,000 sample of the 1960 Census but a little lower than his estimates from the Growth in American Families data.[21]

As we indicated earlier, however, our estimates for the wage and substitution elasticities are likely to have a strong positive bias. These estimates (and Cain's) are based on a potential wage variable which, in turn, is based mainly on differences in education. However, differences in schooling are likely to have a direct influence on labor supply quite apart from the indirect effect through higher wage rates.

Specifically, we expect that, holding wage rates constant, those with more schooling are likely to have both greater tastes for work and more pleasant working conditions.

In an attempt to avoid this difficulty, Cain as well as Bowen and Finegan have both calculated wage effects using aggregate data, such as for $SMSA_s$. In this case the wage rate is measured by the average earnings of women who work full time. Except for Cain's estimates for 1950 $SMSA_s$, all their wage elasticities are about .4 - .5.[22] Thus, this approach gives results that, in general, are very close to our results based on the potential wage.[23] While this correspondence in the two sets of results is somewhat encouraging, there may also be a positive bias in the aggregate estimates. For example, if wage rates are determined in labor markets that are sufficiently competitive so that there is no significant excess supply of labor, then employers are likely to compete for labor not only in terms of wage rates, but also in terms of other factors, such as cleanliness of plant and courtesy of supervisors. (On the other hand, these wage rate coefficients could be negatively biased due to measurement error difficulties since inter SMSA differences in the average earnings of full-time workers may be a poor proxy for differences in the potential earnings of nonworkers). Thus, again the wage rate coefficients and the corresponding elasticities may overestimate the effects of a change in wage rates holding all other factors constant.

Another approach to estimating the bias in our wage estimates is to compare results for the potential wage with results for actual wage rates. Such comparisons can be made best using the ISR-OEO data because for this sample we have actual wage data for all those who worked any time in the last five years rather than just for those who worked in

the past year as in the SEO. In Table 4, below, we present regression coefficients for the log of the actual average wage (LnAw) and the log of the potential wage (LnPw). Each coefficient is taken from a different regression, but in both cases the sample is limited to those having an actual wage sometime during the past five years. While the potential wage coefficients are expected to have an upward bias because of the correlation between education and tastes for work, the actual wage coefficients will have an upward bias if those who are willing to work steadily and full-time can command higher wage rates. The coefficients and t-values are higher for the actual than the potential wage coefficients, thus suggesting that the former bias is less severe than the latter one. Although the potential wage coefficients probably do have an upward bias, these results, taken together with the interurban results, suggest that elasticity estimates based on the potential wage rate coefficients are as good estimates as we can currently obtain from national data.

C. Further Results By Age of Youngest Child

In Table 5 we present income elasticity estimates calculated separately for five categories of wives (those with no children, some children, children < 6, children 6-13 but not less than 6, and children 14-17 but not less than 13.)[24]

If we restrict our attention to the results based on husband's earnings, we see that the income elasticity estimates are generally higher for wives with children (especially young children), which suggests that social pressures to stay home with the children are related to family income (e.g., there is pressure to stay home with the children

Table 4: Reported and Potential Wage Coefficients for IRS-SEO Sample of Wives with Reported Wage for Five Years

Labor Supply Measures	LNAW	LNPW
HWK_A	235 (6.3)	200 (2.4)
$EMPDUM_A$	.153 (7.9)	.108 (2.5)

Note: Numbers in parentheses are t-statistics.

Table 5: Income Wage Rate and Substitution Elasticities of Married Women by Age of Youngest Child

Labor Supply Measures	Income Elasticities: Based on Heads Earnings Coefficient						Income Elasticities: Based on Non-Employment Income Coefficient					
	All Married Women	No Kid	Kid	Kid < 6	Kid 6-13	Kid 14-17	All Married Women	No Kid	Kid	Kid < 6	Kid 6-13	Kid 14-17
	SEO											
HLF_A	-.44	-.31	-.48	-.58	-.46	-.38	-.22	-.47	-.09	.00	-.02	-.24
$HEMP_A$	-.44	-.32	-.49	-.59	-.47	-.38	-.20	-.44	-.07	+	-.01	-.25
$EMPDUM_A$	-.33	-.24	-.36	-.40	-.37	-.26	-.18	-.38	-.08	-.19	.00	-.47
$HWK_{SW} \leq 40$	-.45	-.32	-.50	-.70	-.47	-.33	-.23	-.46	-.11	-.17	+	-.45
HWK_{SW}	-.45	-.33	-.45	-.66	-.45	-.35	-.25	-.49	-.14	-.26	+	-.46
DUM_{SW}	-.41	-.30	-.44	-.68	-.41	-.26	-.22	-.47	-.09	-.11	+	-.50
	ISR-OEO											
HWK_A	-.51	-.37	-.60	-.78	-.53	-.55	-.75	-1.23	-.28	-1.11	-.41	.42
$EMPDUM_A$	-.25	-.28	-.27	-.56	-.35	-.27	-.50	-1.07	-.13	-.28	-.07	.00

Labor Supply Measures	Wage Rate Elasticities						Substitution Elasticities					
	All Married Women	No Kid	Kid	Kid < 6	Kid 6-13	Kid 14-17	All Married Women	No Kid	Kid	Kid < 6	Kid 6-13	Kid 14-17
	SEO											
HLF_A	.43	.54	.34	.20	.37	.42	.49	.60	.39	.24	.42	.47
$HEMP_A$	.47	.59	.39	.25	.38	.49	.52	.65	.44	.29	.43	.54
$EMPDUM_A$	.30	.32	.28	.13	.37	.37	.35	.37	.32	.16	.41	.40
$HWK_{SW} \leq 40$	.66	.66	.67	.64	.63	.74	.72	.72	.72	.69	.68	.78
HWK_{SW}	.67	.68	.62	.57	.64	.76	.73	.75	.67	.62	.69	.81
DUM_{SW}	.64	.56	.67	.74	.65	.70	.70	.62	.71	.79	.70	.73
	ISR-OEO											
HWK_A	.45	.58	.34	.20	.22	.78	.53	.66	.42	.28	.29	.87
$EMPDUM_A$	.38	.49	.32	.29	.31	.50	.42	.55	.35	.35	.36	.54

if one can afford it). On the other hand, the results for the NEY variable are in the opposite direction. Perhaps these latter results are dominated by different wives. Because most wives with no children do work, the minority who do not work may contain a disproportionate number of wealthy families, perhaps with considerable NEY from inherited wealth. Consequently, the NEY coefficient may be biased upwards for the no children group while it is biased downwards for most others as a result of the effect of wives' income on NEY.[25]

Next let us look at the substitution elasticities. Here the annual elasticity estimates are generally smaller for those with children (especially for young children). These estimates make sense if we assume that most families regard day care and other such arrangements as a poor substitute for the mother caring for her young children. On the other hand, if a mother is only willing to work if she can afford to pay for high quality expensive day care out of her earnings, we might expect a high substitution elasticity productivity.[26] For the survey week, however, our SEO estimates are always very high and there is little difference by presence or age of youngest child. At this point we have no explanation for the difference between the SEO annual and survey week results.

D. Results by Race

Because the labor supply behavior of Black wives is quite different from that of white wives, we ran SEO regressions interacting race with each of our three key independent variables (HE, NEY, and LnPW). Although none of the interaction variables was statistically signifi-

cant, there were some interesting results. Although there is little difference in the husband's earnings results by race, for Black wives there is always a positive relation between labor supply and nonemployment income. This latter result probably occurs because the wife's earnings are more important to the average Black family and thus are a more important determinant of family savings, wealth, and NEY. Consequently, the NEY results are not useful for generating income elasticity estimates for Black wives. The wage coefficients are larger for Blacks (except for the EMPDUM regression), but so is their average labor supply. Thus, it appears most useful to concentrate on elasticity estimates, which are presented in Table 6.

The income elasticity estimates are considerably lower for Blacks than for whites. The lower income elasticity for Black women may be due to the fact that a black husband's income in any particular year is a poorer proxy for the family's permanent income than is a white husband's income--due either to greater unemployment or to greater marital instability or to both among Blacks. With regard to the substitution elasticities, there is little difference by race for the continuous measures of labor supply last year. In the EMPDUM regression, however, the estimate is much lower for Blacks thus indicating that Black wives with little education are likely to do some market work (e.g., as private household workers). The results for the survey week are also lower for Blacks, which suggests that the seasonality issue may be less important for them (again possibly because of the importance of domestic jobs for low wage Black wives).

Table 6: Income and Substitution Elasticities for White and Black Married Women

Labor Supply Measures	Black Married Women		White Married Women		All Married Women	
	Income	Substitution	Income	Substitution	Income	Substitution
HLF_A	-.19	.48	-.46	.45	-.44	.49
$HEMP_A$	-.23	.54	-.46	.49	-.44	.49
$EMPDUM_A$	-.23	.21	-.34	.39	-.33	.35
$HWK_{SW} \leq 40$	-.18	.66	-.47	.78	-.45	.72
HWK_{SW}	-.13	.53	-.47	.68	-.45	.73
DUM_{SW}	-.29	.55	-.44	.72	-.41	.70

Note: All elasticities are based on coefficients for HE rather than NEY.

E. Low-Income Samples

Because our ultimate purpose is to develop elasticity estimates that can be used to estimate the labor supply effects of income transfer programs targeted at poor families, it is important to see if results for the low income population are similar to those for the total sample. In addition, it will be interesting to compare our results for Blacks with results for the low-income sample.

We define our low income SEO sample to include all wives with husband's earnings and NEY each less than $6,000.[27] Similar cutoffs are used for the IRS-SEO sample, but with an adjustment made for increases in incomes between 1966 and 1972.[28] The estimated income, wage rate and substitution elasticities for the low-income sample, together with corresponding elasticities for the total sample, are presented in Table 7.

The income elasticity estimates are generally quite a bit smaller for the low-income samples and are actually positive for the low-income ISR-OEO sample. As in the case of Blacks, wives in the low-income samples whose husbands earn more may often have stronger tastes for income, work, and upward mobility than do those whose husbands earn little. However, there is relatively little difference in the wage and substitution elasticity estimates between the low income and total samples.

Table 7: Income, Wage Rate and Substitution Elasticities for Low Wage Married Women

Labor Supply Measures	Low Income			Total		
	Income	Wage Rate	Substitution	Income	Wage Rate	Substitution
	SEO					
HLF_A	-.28	.40	.47	-.44	.43	.49
HLF_A(NEY)	-.26	.40	.47	-.22	.43	.46
$HEMP_A$	-.31	.45	.53	-.44	.47	.49
$EMPDUM_A$	-.22	.20	.26	-.33	.30	.35
$HWK_{SW} \leq 40$	-.21	.64	.69	-.45	.66	.72
HWK_{SW}	-.23	.61	.67	-.45	.67	.73
DUM_{SW}	-.14	.51	.55	-.41	.64	.70
	ISR-OEO					
HWK_A	+	.40	.40	-.41	.39	.51
HWK_A(NEY)	+	.40	.40	-.10	.39	.45
$EMPDUM_A$	+	.07	.07	-.25	.47	.42

Note: Income and substitution elasticities are based on coefficients for HE unless otherwise stated.

III Single Females Age 25-54

Because women are under less social pressure to work than are men, we expect the income and substitution elasticities for prime age single women to be larger than those for prime age single men. The relationship between the elasticities of single and married women is not quite as clearcut. In general single women may be subjected to somewhat more social pressure to do market work than are married women because housework is clearly a legitimate alternative for married women--including those without children--while just keeping house for oneself is probably not quite so legitimate for single women. But caring for relatives or doing volunteer work are quite acceptable alternatives.

As the figures in Table 1 indicate, single women without children work much more than married women without children and slightly less than single men. (In the ISR-OEO sample only single women who are heads of households are included because sufficient data on other single women are not available). This labor supply differential can be interpreted either as reflecting different social pressures or as being the result of economic factors (less OTHERN for single than married women--higher values of NEY and OTHERN and lower wage rates for single females than single males).

A. Biases

As with married women, both the wage rate coefficient is expected to be positively biased because it will reflect the positive effects of schooling and ambition and the nonpecuniary desirability of a job on labor supply as well as the positive substitution effect of wage rates

Table 8: Mean Values of Labor Supply and Income Variables for Prime Age Single Women and Men and Married Women Without Children

	SEO 1967			ISR-OEO 1972	
Income and Labor Supply Measures	Single Females (N=392)	Married Women Without Children (N=1597)	Single Men[a] (N=613)	Income and Labor Supply Measures	Single Female (N=65)
HLF_A	1771	1089	1893	HLF_A-SEO_R	1792
$HEMP_A$	1720	1053	1762	HWK_A	1788
$EMPDUM_A$	.92	.68	.98	$EMPDUM_A$	.97
$HWK_{SW} \leq 40$	32	19	33		
HWK_{SW}	36	20	38		
$WKDUM_{SW}$	.85	.54	.86		
NEY	744	574	313		228
WAGE RATE	2.38	2.24	2.90		4.01
OTHERN	2789	7284	1057		554
OWN EARNINGS	4075	2135	5562		7501
TOTAL INCOME	7608	10458	6932		8283

Note: Annual Measures of labor supply refer to the previous year.

N = Sample size

[a]The labor supply values are for single males who did not have a health problem that prevented them from working.

on labor supply. (Differences in demand by skill classes are also likely to lead to a positive bias, especially when our measures of labor supply do not include unemployment). The NEY coefficient is likey to be positively biased because it reflects the positive effect of economic ambition on both labor supply and NEY, and the positive savings effect of working more and earning more than average on NEY, as well as the negative effect of income on labor supply.

B. Results

The NEY and LNPW coefficients from both data sources are presented in Table 9. All of the NEY coefficients in the SEO are negative and highly significant. Similarly all of the SEO LNPW coefficients are positive and highly significant. In contrast, one of the NEY coefficients in the ISR-OEO data is slightly positive, two of the LNPW coefficients are slightly negative, and, most important, none of the coefficients are statistically significant. The more erratic ISR-OEO results are probably attributable to the fact that the ISR-OEO sample is so much smaller--65 as opposed to 392.[29]

In Table 10 we present the income wage rate and substitution elasticities derived from the SEO NEY and LNPW coefficients in Table 9. In addition we present comparable elasticities for prime age married women without children and for prime age single men. As expected the single female income, wage rate, and substitution elasticities are substantially higher than those for single men.

The income elasticities for single women are for the most part of comparable magnitude to those for married women without childern. The elasticity for the HWK_{SW} measure is larger than both the other single

Table 9: Income and Wage Rate Coefficients for Single Females Age 25-54

	SEO			ISR-OEO		
Labor Supply Measure	NEY		LNPW	Labor Supply Measure	NEY	LNPW
HLF_A	-.0871	(3.54)	513 (5.23)	HLF_A-SEO_R	-.1669 (0.94)	171 (0.50)
$HEMP_A$	-.0864	(3.32)	535 (5.15)	HWK_A	-.1974 (1.12)	-73 (0.22)
$EMPDUM_A$	-.00004	(3.38)	.1621 (3.57)	$EMPDUM_A$	.0000 (0.34)	-.0069 (0.15)
$HWK_{SW} \leq 40$	-.0021	(3.58)	14 (4.91)			
HWK_{SW}	-.0029	(2.76)	14 (3.12)			
$WKDUM_{SW}$	-.00005	(3.32)	.2807 (4.81)			

Note: Numbers in parentheses are t-statistics.

Table 10: SEO Income, Wage Rate and Substitution Elasticities for Prime Age Single Females, Married Women Without Children and Single Men

Labor Supply Variables	Income Elasticity				Wage Rate Elasticity			Substitution Elasticity		
	Single Women	Married Women		Single Men	Single Women	Married Women	Single Men	Single Women	Married Women	Single Men
	(NEY)	(NEY)	(HE)	(NEY)						
HLF_A	-.37	-.31	-.47	-.12	.29	.54	.06	.49	.60	.16
$HEMP_A$	-.38	-.32	-.44	-.07	.31	.59	.10	.51	.65	.16
$EMPDUM_A$	-.33	-.24	-.38	-.02	.18	.32	.01	.36	.37	.03
$HWK_{SW} \leq 40$	-.50	-.32	-.46	-.08	.34	.66	.02	.61	.72	.08
HWK_{SW}	-.61	-.33	-.49	.10	.38	.68	-.12	.71	.75	-.20
$WKDUM_{SW}$	-.45	-.30	-.47	-.12	.33	.56	.16	.57	.62	.13

Note: The substitution elasticities reported in the text are based on the income effect derived from the HE coefficient.

female elasticities and the married female elasticities. A larger income elasticity for a labor supply measure that includes overtime is not surprising. The absence of any significant difference between the income elasticities among married women may be due to the fact that so few married women work overtime. The wage rate elasticities for single women are considerably smaller than those for married women. Like the wage rate elasticities, the substitution elasticities of single women are generally somewhat smaller than those for married women, but the differences are not as large. Probably market productivity is higher than home productivity for most single women, while for married women without children market productivity is likely to exceed home productivity by increasing amounts as education increases.

C. Further Results

As with married women, we examined a subsample of low-income single females--those with potential wage rates less than $2.00 per hour. The income, wage rate and substitution elasticities for this low wage sample were generally about 1 1/2 to 2 times larger than those for the total sample. But probably because of small sample size--62--the coefficients from which the low wage elasticities are derived were almost uniformly significantly different from zero at the .05 level.

IV Female Heads, Age 25-54

The labor supply elasticities of female heads of families particular interest because of the controversy that surrounds the Aid to Families with Dependent Children (AFDC) Program. This program--popularly known as welfare--provides aid primarily to children from female-headed families. One important question about the effects of this program is, "To what extent does it discourage female heads of families from working?" While this question is fraught with great emotion in the political arena, there are very few studies of the actual effects of the AFDC program on the labor supply of program beneficiaries. Moreover, none of these studies, to our knowledge, has been placed in the broader perspective of the labor supply schedules of all female heads and married women with children. In this section we examine the labor supply schedules of prime age female household heads with children and compare them to those of married women with children. In addition, we examine the economic factors that lead some female heads of households to become AFDC beneficiaries while others do not.

As the figures in Table 11 indicate, female heads with children work about twice as much as married women with children. (In fact, we discovered that even the female heads who received AFDC during the past year worked more than married women with children.) Most of the difference in the labor supply of female heads and married women is very likely attributable to the fact that female heads have less other income than married women.

We expect the income and substituion effects of female heads to be about the same as married women with children since in both cases 1) social pressures to work are are minimal and 2) (perceived) home productivity is

Table 11: Mean Values of Labor Supply and Income Variables for Prime Age Female Heads of Families with Children and Married Women with Children

	SEO				ISR-OEO		
Labor Supply and Income Variables	Female Heads (N=523)	Wives with Children (N=506)	Low Wage Female Heads (N=250)	Labor Supply and Income Variables	Female Heads (N=557)	Wives with Children (N=1439)	Low Wage Female Heads (N=444)
HLF_A	1243	569	1073	HLF_A-SEO_R	111	--	1112
$HEMP_A$	1193	550	1018	HWK_A	1222	615	1187
$EMPDUM_A$	.75	.46	.70	$EMPDUM_A$	.77	.52	.75
$HWK_{SW} \leq 40$	22.6	10	19.3				
HWK_{SW}	24.3	11	21.2				
$WKDUM_{SW}$	.64	.32	.59				
NEY	1067	401	733	NEY	1091	781	808
WAGE RATE	1.99	2.18	1.56	WAGE RATE	2.60	2.74	2.14
OTHERN	1011	83.8	938	OTHERN	1656	12213	955
OWN EARNINGS	2386	1001	1365	OWN EARNINGS	2177	1773	2540
TOTAL INCOME	4464	9851	3036	TOTAL INCOME	5924	13866	4303
PERCENT RECEIVING AFDC	22.6	--	46.6	PERCENT RECEIVING AFDC	18.9	--	24.2

high. Perhaps the only difference might be a greater desire to work on the part of female heads in order to have some social life outside the home. Since this taste for work should be unrelated to income and wage rates, it should make the income and substitution effects somewhat smaller for female heads than for married women.

A. Biases

The potential wage rate coefficients are likely to be positively biased because they will reflect the effects of personal characteristics, such as ambition, on the supply of labor and the effects of differences in the demand for different skill classes of labor as well as the effect of wage rates on labor supply. On the other hand, the SEO wage rate coefficients could be biased towards zero because many state AFDC programs in 1966 had 100 percent tax rates on all income. In these states, an AFDC beneficiary's wage rate would have no effect on how much she worked. Similiarly, the amount of NEY that an AFDC beneficiary had in these states would have no effect on how much she worked. (However, both NEY and the potential wage rate would affect the probability of female head becoming an AFDC beneficiary.) Consequently, the NEY coefficient in the SEO sample may also be biased towards zero.

B. Results

The income and wage rate coefficients from several regressions on the SEO and ISR-OEO samples are presented in Table 12. The other independent variables are the same as for married women except for the addition of several variables that reflect the financial parameters of the AFDC program in the area in which the individual lives. Because these

parameters effect both the probability of a female head becoming an AFDC beneficiary and the labor supply of female heads who become AFDC beneficiaries, they must be included in the labor supply regressions. In the next part of this section we explain how these paramenters should effect AFDC beneficiary status and labor supply and present empirical estimates of their effects. In Table 13 we present the income and wage rate elasticities derived from the coeffients in Table 12. In addition, we present the comparable elasticities for married women with children.

All but one of the NEY coefficients in Table 12 are negative and highly significant.[30] The ISR-OEO income coefficients and elasticities are somewhat smaller that the comparable SEO coefficients and the coefficient in the employment regressions is 5 times smaller. (The explanation for the latter difference is not clear.) For the annual measures of labor supply, the income elasticities of female heads and married women with children are amazingly close. But the female head elasticities for the survey week are substantially smaller that those for married women.

The female head wage rate coefficients in the SEO sample are quite large. The wage rate elasticities implied by these coefficients are about twice as large as those for married women. The same is true for the substitution elasticities for the annual labor supply measures, but the large married income elasticities for survey week labor supply measures substantally reduce the difference in substitution elasticities for survey week labor supply measures. While it is possible that the wage rate and substitution elasticities of female heads are

Table 12: Income and Wage Rate Coefficients for Prime Age Female Heads of Families

	SEO					ISR-OEO			
Labor Supply Measure	NEY		LNPW		Labor Supply Measure	NEY		LNPW	
HLF_A	-.1209	(5.19)	773	(5.59)	HLF_A-SEO_R	-.09910	(4.06)	70	(0.51)
$HEMP_A$	-.1147	(4.92)	820	(5.93)	HWK_A	-.0917	(3.73)	214	(1.54)
$EMPDUM_A$	$-.35\text{-}10^{-4}$	(2.96)	.3017	(4.29)	$EMPDUM_A$	-.000007	(0.64)	.0981	(1.49)
$HWK_{SW} \leq 40$	-.00137	(2.37)	14.3	(4.16)					
HWK_{SW}	-.00139	(2.85)	13.2	(4.50)					
$WKDUM_{SW}$	$-.28\text{-}10^{-4}$	(2.11)	.2577	(3.30)					

Note: Numbers in parentheses are t-statistics.

Table 13: Comparison of Income, Wage Rate, and Substitution Elasticities for Female Heads of Families with Children and Married Women with Children

	Female Head of Families					
	SEO			ISR-OEO		
Labor Supply Measure	Income	Wage Rate	Substitution	Labor Supply Measure	Income	Wage Rate	Substitution
HLF_A	-.43	.62	.86	HLF_A-SEO_R	-.50	.06	.32
$HEMP_A$	-.43	.69	.92	HWK_A	-.43	.18	.40
$EMPDUM_A$	-.21	.40	.51	$EMPDUM_A$	-.05	.13	.16
$HWK_{SW} \leq 40$	-.27	.63	.77				
HWK_{SW}	-.25	.54	.67				
$WKDUM_{SW}$	-.20	.40	.51				

	Married Women with Children					
	SEO			ISR-OEO		
Labor Supply Measure	Income	Wage Rate	Substitution	Labor Supply Measure	Income	Wage Rate	Substitution
HLF_A	-.48	.34	.39	HWK_A	-.60	.34	.42
$HEMP_A$	-.49	.39	.44	$EMPDUM_A$	-.27	.32	.35
$EMPDUM_A$	-.36	.28	.32				
$HWK_{SW} \leq 40$	-.50	.67	.72				
HWK_{SW}	-.45	.62	.67				
$WKDUM_{SW}$	-.44	.67	.71				

larger than that of married women, we are more inclined to believe that the positive bias in the potential wage rate is more serious for female heads than for wives because of the interaction between low wage rates, the AFDC program and labor supply. About one-fifth of all female heads are AFDC beneficiaries. Female heads with low wage rates are much more likely than those with higher wage rates to view AFDC benefits as an attractive alternative to earnings. As a consequence they are more likely than those with higher wage rates to become AFDC beneficiaries and to work less. Once they become AFDC beneficiaries their net wages rates will be even lower than they were before they became beneficaries because of the implicit tax rate on earnings in the AFDC program. Thus female heads with low wage rates are likely to work less than those with higher wage rates not only because the reward for work is less but also because the AFDC program is more attractive to them than to higher wage female heads and because their net wages rates are further reduced by the implicit tax rate in the AFDC program.

For the ISR-OEO, the substitution elasticity estimates are about the same for female heads as for married women with children. While we are not sure why the estimates for female heads aren't larger (as they were for the SEO), one possibility is that the low-wage welfare-oriented portion of the sample has been placed under greater pressure to work as a result of various changes in the welfare system during the late 1960's and 1970's.

The overall results suggest that female heads of households with children behave mush the same way in response to economic incentives to work as do married women with children. For both groups, labor supply

decreases substantially as ceterus paribus the net rewards for working decreases and alternative sources of income increases.

C. Low Wage Sample

While there is a substantial degree of interest in the labor-supply elasticities of that subset of all female heads which constitute the AFDC beneficiary group, it is impossible to get unbiased estimates of the labor supply elasticities of this group. As noted in section I, the income coefficients are negatively biased if the sample is limited to those with incomes below some specfic amount. The bias arises because total income depends upon labor supply. Similarly, to confine a sample to only AFDC beneficiaries is to implicity choose the sample on the basis of a variable--AFDC status-- that depends upon labor supply. In this part of section IV therefore, we attempt to ascertain if female family heads with low wage rates--who are more likely to be AFDC beneficiaries than female heads with higher wage rates--have more elastic labor supply curves than all female heads. For the SEO we define a low-wage sample of those with potential wage rate of more than $2.00. For the ISR-OEO, we use a comparable cutoff of $2,61.[31]

In Table 14 we present the NEY and LNPW coefficients for the low wage samples from several regressions. The other independent variables are identical to those used in regressions for the total sample. In Table 15 we present income, wage rate, and substitution elasticities derived from these coefficients, and in addition, we present the comparable elasticities for the total samples.

The income elasticities from the low-wage samples are fairly similar to those for the total samples. While the substitution elasticity estimates from the SEO are considerably lower for the low-wage sample than for the

Table 14: Income and Wage Rate Coefficients for Low Age Female Heads of Families

	NEY		LNPW	
	SEO			
HLF_A	-.1226	(2.80)	342	(1.44)
$HEMP_A$	-.1080	(2.47)	419	(1.76)
$EMPDUM_A$	$-42 \cdot 10^{-4}$	(1.84)	.1778	(1.40)
$HKW_{SW} \leq 40$	-.0022	(2.43)	8	(1.64)
HW_{SW}	-.0028	(2.48)	12	(1.96)
$WKDUM_{SW}$	$-47 \cdot 10^{-4}$	(1.88)	.1582	(1.17)
	ISR-OEO			
HLF_A-SEO_R	-.1113	(3.4)	314	(1.4)
HWK_A	-.0703	(2.1)	224	(1.0)
$EMPDUM_A$	$-18 \cdot 10^{-5}$	(0.1)	.184	(1.7)

Note: Numbers in parentheses are t-statistics.

Table 15: Comparison of the Income, Wage Rate and Substitution Elasticities for Low Wage and All Female Heads of Families With Children

Labor Supply Measure	Low Wage Female Heads			All Female Heads		
	Income	Wage Rate	Substitution	Income	Wage Rate	Substitution
			SEO			
HLF_A	-.35	.32	.48	-.43	.62	.86
$HEMP_A$	-.32	.41	.55	-.43	.69	.92
$EMPDUM_A$	-.18	.25	.33	-.21	.40	.51
$HWK_{SW} \leq 40$	-.35	.42	.58	-.27	.63	.77
HWK_{SW}	-.40	.57	.75	-.25	.54	.67
$WKDUM_{SW}$	-.24	.27	.38	-.20	.40	.51
			ISR-OEO			
HLF_A-SEO_R	-.43	.28	.53	-.50	.06	.32
HWK_A	-.25	.19	.34	-.43	.18	.40
$EMPDUM_A$	+.01	.25	.25	-.05	.13	.16

total sample, we do not find the same results for the ISR-OEO sample. As a result, the substitution estimates are considerably higher for the total SEO sample than for the other three groups, all of which are relatively similar to each other and to the results for married women with children. While we did expect larger substitution elasticity estimates for female heads than for married women with children as a result of a bias introducted by AFDC, we cannot explain why the estimates are large only for the total SEO sample.

D. The Effects of AFDC Program Parameters on Caseload and Labor Supply

For female heads labor supply issues are closely interrelated with the AFDC program. Whether a female head will be an AFDC beneficiary and how much she works will depend not only on the amount of nonemployment income that she has and her wage rate, but also upon the nature of the AFDC program in the state where she lives. There are at least five parameters of the AFDC program that will effect both the probability that a female head will be an AFDC beneficiary and the amount that she works. The AFDC guarantee (GUAR) is the payment to a family with no other income. The higher the guarantee in the state in which she resides the more likely it is that a female head will be an AFDC beneficiary and, ceterus paribus, the less she will work. The tax rate (TAX) in the AFDC program is the percentage amount by which the AFDC payment is reduced as earnings increase. The set aside (SA) is the initial amount of earnings that is taxed as a zero rate. The smaller the tax rate, and the larger the set aside, the greater is the economic incentive for AFDC mothers to work. The eligibility level (E.L.) of income is the maximum income that a family of a given size can have and still qualify initially for aid

from the AFDC program. The break-even level of income (BEL) if the maximum income that an AFDC family may have and still receive AFDC benefits. Because work-related expenses and other deductions from gross income are made when calculating the break-level of income but not when calculating the eligibility level of income, the former is substantially higher in most states than the latter. The higher the break-even and eligibility levels of income, the greater is the probability that a female head will be an AFDC beneficiary.

Data were available for all of the above AFDC parameters for 1971, but not for 1967.[32] In the SEO analysis, therefore, our parameters are limited to the guarantee, eligibility level of income, and the ratio of the guarantee to the eligiblity level, which is a crude measure of the average tax rate (ATAX). Furthermore, while the ISR-OEO data identifies the state in which the individual lives, the SEO identifies only the region in which the individual lives except for individuals who live in the twelve largest Standard Metropolitan Statistical Areas (SMSAs). Consequently, SEO female heads not living in one of the 12 largest SMSAs were assigned regional averages of the AFDC parameters.

In Table 16 we present the NEY, OTHERN, LNPW, GUAR, BEL, and EL coefficients from regressions in which the dependent variable is a dummy variable equal to one if the individual was an AFDC beneficiary during the previous year and zero otherwise. The GUAR, BEL, and EL variables are measured in dollars per year. In addition to results for the total SEO and ISR-OEO samples, we also present results for low-wage subsamples since the low-wage populations should be much more affected by the AFDC parameters.

Table 16: Effect of Income, Wage Rates and AFDC Parameters on the Probability of Being an AFDC Beneficiary

Independent Variable	1967 SEO				1972 ISR-OEO			
	Total		Low Wage		Total		Low Wage	
NEY	$-.53 \cdot 10^{-4}$	(5.09)	$-.78 \cdot 10^{-4}$	(3.7)	$-.57 \cdot 10^{-4}$	(5.37)	$-.82 \cdot 10^{-4}$	(5.3)
OTHERN	$-.35 \cdot 10^{-4}$	(5.20)	$-.48 \cdot 10^{-4}$	(3.5)	$-.18 \cdot 10^{-4}$	(3.93)	$-.21 \cdot 10^{-4}$	(2.5)
LNPW	-.198	(3.22)	-.243	(2.1)	-.0758	(1.16)	-.0541	(0.5)
GUAR	$1.0 \cdot 10^{-4}$	(2.55)	.0044	(3.5)	$+.52 \cdot 10^{-4}$	(2.78)	$.67 \cdot 10^{-4}$	(2.7)
E.L.	$-.50 \cdot 10^{-4}$	(0.54)	-.0049	(2.2)	$+.06 \cdot 10^{-4}$	(0.21)	$-.25 \cdot 10^{-4}$	(0.6)
B.E.L.					$.03 \cdot 10^{-4}$	(2.07)	$.03 \cdot 10^{-4}$	(2.8)

Note: Numbers in parentheses are t-statistics.

Table 17: The Effect of AFDC Guarantees, Tax Rates, and Set Asides on the Labor Supply of Female Heads of Households

Labor Supply Measure	ISR-OEO GUAR		TAX		SA		Labor Supply Measure	SEO GUAR		ATAX	
							Total Sample				
HLF_A-SEO_R	-.1317	(2.7)	442	(1.4)	.0670	(0.9)	HLF_A	-.1992	(1.3)	-697	(1.2)
HWK_A	-.1670	(3.5)	924	(3.0)	.0101	(0.1)	$HEMP_A$	-.2583	(1.7)	-534	(0.9)
$EMPDUM_A$	$-.67 \cdot 10^{-4}$	(2.9)	.1799	(0.2)	$-.06 \cdot 10^{-4}$	(0.2)	$EMPDUM_A$	$-.22 \cdot 10^{-4}$	(0.3)	-.670	(2.2)
							$HWK_{SW} \leq 40$	-.0079	(2.5)	7.8	(0.6)
							HWK_{SW}	-.0092	(2.5)	9.6	(0.7)
							$WKDUM_{SW}$	-.00015	(1.7)	-.0142	(0.4)
							Low Wage Sample				
HLF_A-SEO_R	-.1080	(2.0)	282	(0.8)	.0334	(0.4)	HLF_A	1.523	(0.5)	-1948	(2.0)
HWK_A	-.1467	(2.6)	1135	(3.2)	.0432	(0.5)	$HEMP_A$	1.936	(0.6)	-2151	(2.2)
$EMPDUM_A$	$-.75 \cdot 10^{-4}$	(2.8)	.1749	(1.0)	$-.01 \cdot 10^{-5}$	(0.0)	$EMPDUM_A$	.0012	(0.7)	-1.242	(2.3)
							$HWK_{SW} \leq 40$	-.0598	(0.9)	3.3	(0.2)
							HWK_{SW}	-.0135	(1.7)	22.9	(0.9)
							$WKDUM_{SW}$	-.0006	(0.3)	-.294	(0.5)

Note: Numbers in parentheses are t-statistics.

The estimates from all four data sources are relatively consistent. As expected, the higher the amount of NEY, earnings of other family members, and the potential wage rate of the head, the lower the probability that the family will be an AFDC beneficiary. Similarly, the higher the guarantee and break-even level in the state in which the family resides the higher the probability that the family will receive AFDC benefits. Only the coefficients for the eligibility level of income have the wrong sign and these are statistically insignificant in all but one case.[33]

We turn now to the effects of the AFDC program parameters on the labor supply of female heads. The guarantee, set aside and tax rate coefficients in the total sample may be thought of as a reduced form estimate of the effects of the AFDC guarantees and tax rates on the labor supply of all--AFDC and non-AFDC--female heads. However, the guarantee (and perhaps the tax rate) coefficients may be negatively biased because the states with the lowest guarantees and tax rates--mostly Southern--by reputation also exert the most effect both to prevent potential AFDC beneficiaries to work. More generally the parameters of the AFDC program may serve as proxies for differences in unmeasured variables that vary systematically by state and affect labor supply. For this reason our results should be viewed with caution.

In Table 17 we present the GUAR, TAX, and SA coefficients from several ISR-OEO regressions and the GUAR and ATAX coefficients from several SEO regressions. (The TAX and ATAX variables range in value from 0 to 1.) The GUAR coefficients are negative and statistically significant in both the total and low wage ISR-OEO sample. But while they are negative in the total

SEO sample, in the annual labor supply regressions from the low wage SEO sample, they are positive--though not significantly different from zero. All of the SA coefficients are statistically insignificant. The most surprising result is the positive sign in the ISR-OEO results on the TAX coefficient and in the SEO on the survey week ATAX coefficients. In the HWK_A regressions the TAX coefficient is not only positive but statistically significant. The fact that the TAX coefficient is positive suggests that it must be a proxy for some factor in a state that is positively related to labor supply. In turn this suggests, as noted above, that even when the results are consistent with our a priori expectations, we should be skeptical of our estimates of the effect of the state AFDC parameters on labor supply.

V. Conclusion

In this paper we have estimated income, substitution, and wage elasticities for various groups of prime-aged women. For the most part the results conform to our a priori expectations. The income effects are generally negative and the substitution effects are positive. When exceptions do occur (as in some of the NEY results for married women) there are obvious biases that can account for the anomalous results.

In comparison to the elasticities for prime-aged males that we presented in an earlier paper, the elasticities for women are much greater. These results are not surprising since women appear to be under less pressure to work then men, thus allowing economic factors to play a larger role. In two subsequent papers we shall extend our analysis to younger and older demographic groups.

FOOTNOTES

[1]Economic theory assumes that an individual's choice between work and leisure (or other nonwork activities) depends on his net wage rate and his nonwage income. Since, other things being equal, the individual is assumed to prefer leisure to work, an increase in his nonwage income will lead him to work less and "consume" more leisure. In other words, there is a negative income effect on labor supply.

A change in the net wage will have a similar income effect on labor supply. However, there will also be a positive substitution effect in this case since an increase in the net wage means that each hour of leisure is now more expensive. Thus an increase in the wage may lead to either an increase or a decrease in the supply of labor depending on whether the substitution or income effect dominates.

Income transfer programs involve a guarantee, G, the amount of income a given individual or family will receive if they have no other income and a marginal tax rate, r, the rate at which the income support decreases as the family's earnings and other sources of income increase. Income maintenance programs not only increase the beneficiary family's nonwage income, but, if the marginal tax rate is positive, also reduce the net wage of each family member. Thus both the total income effect and the substitution effect will act to reduce the family's work effort.

Some income transfer programs have a zero guarantee and a negative marginal tax rate. These earnings or wage subsidy programs could lead to either increases or decreases in labor supply because while they increase income, they also increase the cost of leisure by increasing net wage rates.

[2]The results reported in these papers will constitute a part of our forthcoming monograph on The Labor Supply Effects of Income Maintenance Programs.

[3]We use only the 1967 SEO data because only part of the 1966 sample was re-interviewed in 1967 and the 1967 questionnaire is superior in a number of ways, the most important of which is that an hourly wage rate variable is available for 1967 but not for 1966. We use the self-weighting sample only because it is sufficiently large to make reliance on the over-sampled poor part of the sample unnecessary. Moreover, we have some qualms about using the supplementary subsample because we believe that the way the sample was chosen may introduce some biases into our results. While it is possible to weight the total sample in such a fashion that it corresponds to the self-weighting sample, there is not a one-for-one correspondence between the method of selecting the supplementary subsample and the method of assigning the weights. In the ISR-OEO data we made use of the supplementary subsample because the self-weighting sample size was so much smaller than that in the SEO. In future work, however, we will use the total SEO sample and the self-weighting ISR-OEO sample to test how sensitive our results are to this sample selection problem.

[4]The survey week took place in early spring. Unemployment is generally higher than average in this period.

[5]The following information on the family's assest position is available in the SEO: (1) market value and mortgage or other debt of farms, business or professional practices, (2) market value and debt of real estate, (3) market value and debt of own home, (4) money in checking , savings accounts, or any place else, (5) stacks, bonds, and personal loans and mortagages, (6) market value and debt of motor vehicles, (7) other assets (excluding personal belongings and furniture), and (8) consumer debt.

A conceptually appropriate measure of NEY would include imputed returns to assets as well as reported returns from assets. A house no less than a bond produces a stream of goods and services unrelated to current work effort. If assets with no reported return vary directly (inversely) with measured or reported nonemployment, failure to impute a return to assets will lead to a negative (positive) bias in the NEY coefficient. But while it is clear that some return should be imputed to assets, doing so creates several problems.

First, it is not clear what interest rate to use for imputing returns to these assets. The interest rate is important because, given observations on labor supply and net worth, the NEY coefficient will vary inversely with the interest rate.

A second much more serious problem is that certain kinds of assets are likely to be spuriously correlated with labor supply. For three reasons, this problem is likely to be especially severe for equity in one's home. First, the supply of mortgage loans will depend in part on how steady a worker the individual is. Second, home ownership normally entails a commitment to steady work to repay a large mortgage debt. Finally, both home ownership and full-time work are, in part, reflections of individual characteristics such as steadiness and ambition.

The spurious positive correlation between home ownership and labor supply may dominate the theoretical negative relationship between NEY and labor supply if an imputed return to the individual's equity in his home is added to reported NEY. Home equity accounts for about one-half of all assets for which no return is reported. And, even if only a 5 percent return is imputed to home equity, this one source of imputed NEY will be slightly larger than total reported NEY.

Finally, data on assets in the SEO are frequently missing so that an additional cost of trying to impute returns to assets is the loss of all the missing asset data observations.

Given the above arguments, we believe that an alternative procedure to imputing income to assets is, desirable. The simplest alternative which we have adopted, is to include in all regressions in addition to a reported NEY variable, a variable which measures the value of assets that have no reported return in the SEO. This approach not only provides a solution to the spurious correlation problem but also solves (or skirts) the problem of choosing the appropriate interest rate to impute assets. In the ISR-OEO study only data on the family's net equity in its home and the gross value of its cars were available and these were used as control variables in our regressions.

[6]The statement in the text should be qualified slightly. Guarantees and implicit marginal tax rates vary from state to state. In addition, eligibility depends upon other variables besides income. But for each P.A. beneficiary in the sample, it remains true that numerous nonbeneficiaries living in the same state, with the same family size, potential wage rate, and other characteristics, have the same budget constraint.

[7]The point in the text can be illustrated with the aid of the diagram. Hours worked is measured from left to right on the horizontal axis and total income is measured along the vertical axis. Assume both individuals have a market wage rate of OW. Further assume that if they earn less than G dollars (work less than H hours) they are eligible for a public assistance subsidy equal to $G less whatever they earn. Hence, the budget line is OGJW. (Although not all public assistance programs have implicit 100 percent tax rates as depicted in Figure 1, most did in 1967, the year when our SEO data were collected. The basic analysis is not altered by assuming a less than 100 percent tax rate.) I_1 represents an indifference curve of man I. It is tangent to the JW segment of the budget line at E_1. Man I, therefore, works F hours and receives no public assistance. I_2 represents the indifference curve of man II. Man II clearly has much stronger aversion to work (vis-a-vis income) than does man I. He achieves a corner solution at E_2, works 0 hours and receives OG dollars in public assistance. Clearly, to the extent that work reductions are a voluntary response to the availability of tranfers, the transfer is a proxy for taste differences.

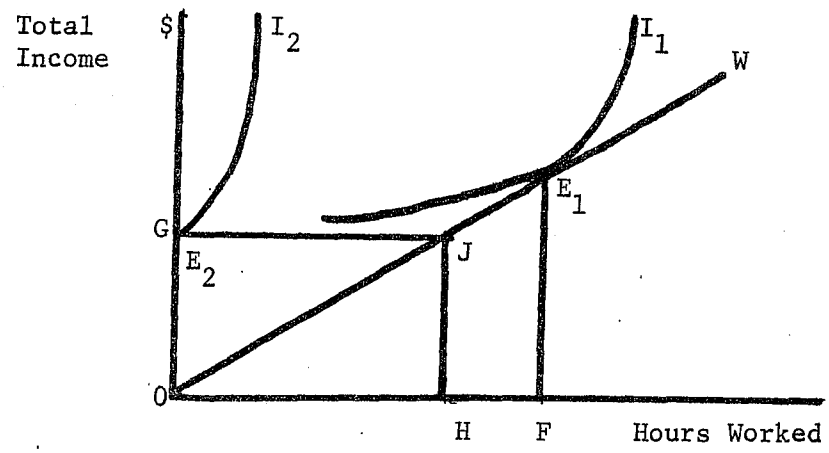

Figure 1

[8]When we estimate labor supply schedules of female heads of households, we also examine the labor supply elasticities of this group with respect to guarantees and tax rates in the Aid to Families with Dependent Children program. Because there are so few other PA beneficiaries, this procedure is not viable with other demographic groups.

8 (cont.)

There are two reasons for simply excluding PA beneficiaries in other groups from the sample. First, because of the implicit marginal tax rates in the PA programs, it is difficult, in some cases impossible, to specify the potentially effective wage rate that confronts PA beneficiaries. Consequently, including PA beneficiaries may distort wage rate coefficients. In addition, since a potential beneficiary must dispose of his assets other than his home before he can qualify for public assistance, PA beneficiaries will have no non-transfer NEY. At the same time their labor supply will be low. Thus including them in the sample and excluding PA payments from NEY may lead to a negative bias in the NEY coefficient. On the other hand, since PA beneficiaries can be expected to have lower than average wage rates and to work less than average, simply excluding them could lead to a negative bias in the WR coefficient. Since the NEY coefficients were virtually the same but the wage rate coefficients were less positive when PA beneficiaries were excluded, with the exception of female heads of households we report results only from samples which include PA beneficiaries.

9 While it would be possible in principle to estimate the response of the unemployed to the parameters of the UC program that they confront, in practice it is nearly impossible to identify these from the SEO data.

10 We tried using a pension dummy for single females and female heads of families, as we have done for males. In the male case, this dummy was interpreted as reflecting increased tastes for leisure. For females, however, a pension dummy also reflects whether (and how steadily) the women has worked in the past. Emprically this latter effect appears to dominate since we obtain positive coefficients. However, we do not include this variable in our basic set of control variables since past employment history is determined partly by the wage and income effects we are trying to estimate. Thus including the pension dummy might lead to more rather than less severe biases in our income and substitution elasticities for females.

11 An extreme case would be the individual who works more in order to satisfu a greater than average desire to accumulate assets. See David H. Greenberg and Marvin Kosters, "Income Guarantees and the Working Poor: The Effect of Income Maintenance Programs on the Hours of Work of Male Family Heads," in Income Maintenance and Labor Supply, eds. Glen Cain and Harold Watts (Chicago: Rand McNally College Publishing Co., 1973).

12 Hourly wage rates are unavailable for all individuals who did not work for wages during the survey week. This includes both the self-employed and the unemployed.

[13]Because the major rationale for estimating these labor supply functions is to use them to estimate the effects of transfer programs on labor supply, this is a definite advantage which will be important in our forthcoming monograph on the issue of the effects of transfer programs on labor supply. To calculate the reductions implied by the coefficients, one can multiply the income coefficient by the NIT guarantee, and assuming that the existing tax rate is zero, multiply the wage rate coefficient by the NIT tax rate. The percentage reduction is simply the sum of these two divided by the mean labor supply of the sample population.

[14]Much better, less expensive substitutes appear to be available for most other household tasks (e.g., eating in restaurants or buying packaged prepared food, sending clothes to the cleaners, hiring a part time cleaning lady, etc.).

[15]OTHERN depends largely on household composition (e.g., whether there is a grandparent, aunt, or teenage son present) and household composition is both partly exogenous and also indicative of expense differentials. The OTHERN and HE coefficients, however, were invariably nearly equivalent.

[16]In addition, there is much greater variation in HE than in NEY, thus leading to lower standard errors for the HE coefficients.

[17]The married male elasticities are derived from Tables 3 and 9 in Irv Garfinkel and Stanley Masters "The Effect of Non-Employment Income and Wage Rates on the Labor Supply of Prime Age and Older Males, Institute for Research on Poverty Discussion Paper No. .

[18]For the survey week, about 85 percent of the total elasticity appears to be represented by the work-not work component. For last year (where weeks worked per year can vary more or less continuously rather than just in terms of working or not working), the work-not work component represents about 70 percent of the total (though this figure may be a little high due to the poor measures of hours per week in HLFA and HEMPA).

[19]Using two samples of disaggregate data, Cain obtains income elasticities varying from -.3 to -.7. (See Glen Cain, Married Women in the Labor Force, University of Chicago Press, 1966.) Bowen and Finegan estimate a regression coefficient of -2.4×10^{-5} when the dependent variable is labor force participation and the independent variable is HE plus OTHERN. (See William G. Bowen and T. Aldrich Finegan, The Economics of Labor Force Participation, Princeton University Press, 1969.) Our most comparable coefficient is -1.4×10^{-5} when the independent variable is HE and the dependent variable is whether the wife worked in the survey week. Adjusting for differences in total income, their elasticity estimates would be about -.45 compared with our -.38.

[20]We assume that most differences in unemployment reflect differences in circumstances rather than differences in search time for those in similar circumstances.

[21]Bowen and Finegan only estimate wage effects only from aggregate data.

[22]We converted Bowen and Finegan's wage rate coefficient to an elasticity of about 0.44. Cain's 1950 estimate is about 1.0.

[23]Because the aggregate results are based almost entirely on SMSAs, we should really compare them to disaggregate results restricted to those living in SMSAs. The closest results we have obtained so far are results with interactions for rural-urban status. These results suggest that wage (and income) elasticities for urban wives are similar to our national results, though perhaps a little higher. However, wage elasticities for rural wives appear to be much higher than our national estimates; perhaps because of a lack of steady demand for poorly educated women in rural areas.

[24]Experimental data may be of some help here. However, the experimental results for the effect of the two parameters, are subject to other serious difficulties. For example, the short time period of the experiments is likely to lead to an upward bias in the substitution effect estimates from the experiment.

[25]When we disaggregate by age of youngest child, we get quite a different pattern of results from the SEO and IRS-OEO samples. We have no explanation for these differences.

[26]Because the estimates are largest for those with no small children and because this group has the largest average labor supply, a failure to disaggregate by age of child might lead to an underestimate of the effects of an NIT on the labor supply of wives.

[27]While we discovered that this procedure caused a significant bias for males, we do not expect a serious problem for wives--partly because a small absolute bias will have little effect on the relative magnitudes of these elasticities. Later we do expect to obtain results based only on a PW cutoff.

[28]The adjusted factor used is based on the increase in manufacturing wages between the two years.

[29]In addition, the lower values for the wage rate coefficients are partly the results of the ISR-OEO sample being limited to family heads. When a similar limitation is applied to the SEO analysis, the wage coefficients are considerably reduced (though not to as low values as for the ISR-OEO). Such a finding is not surprising since those with low wage who

29 (cont.) don't work much must have some means of support and living with other family members is a likely possibility.

Restricting the SEO results to family heads increases the NEY coefficients, which is consistent with the very high NEY coefficients in two of the three ISR-OEO regressions. Here the explanation may be that the family NEY is much less under the control of the single female.

30 Since alimony payments are sometimes based in part on how much the women works, we tried excluding the other income component--which includes alimony--from our NEY measure. The resulting NEY coefficients were virtually identical to those reported in the text.

31 We inflated by the change in manufacturing wages between 1966 to 1971. For both data sources our cutoffs are very close to the mean values for the potential wage. Mean values for the low income samples are presented in Table 11.

32 We are indebted to Irene Lurie for estimates of effective tax rates and set asides in 1971 AFDC programs. Her estimates are based on data from the 1971 AFDC Survey.

33 Since the eligibility level and the break-even level are highly correlated, the inclusion of the break-even level in the ISR-OEO regression may be partly responsible for the insignificance of the eligibility level in this equation. The negative E.L. coefficients for the SEO sample (especially the low wage sample) are consistent with the view that states with low tax rates presented greater administrative barriers to those scaling AFDC benefits. See the discussion of such biases in the text when we consider effects of AFDC parameters on labor supply.