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INCOME MEASURES IN EMPIRICAL WORK: RESULTS WITH FAMILY SIZE AND VALUE OF HOME

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ABSTRACT

The NBER-TH and NLS data sets are used to explore permanent and relative income consumption theories, as applied to two consumer durables, number of children and value of home. Several permanent income measures, relative income, recall information, respondent and wife's income, family income, nonlinear forms and interactions with religion are discussed. The findings of a nonlinear relationship between income and fertility suggests implications for fertility from income redistribution policies. Findings of elasticity less than unity for housing using individual data confirm others' findings and shed some light on the discrepancy between using grouped and individual data. Recall information is found to have advantages over group averages as measures of permanent income, and the advantages of using individual family member's income is found to depend on the nature of the good under study.

Income Measures in Empirical Work: Results With Family Size and Value of Home

Income is central to many economic theories, yet its measurement is often difficult. The lack of an appropriate income measure frequently prevents adequate testing of theories and distinguishing among competing hypotheses.

On a macro level the problem may be one of finding an income number for the appropriate group, where the group's characteristics are not variables of interest in themselves. On a micro level there are generally problems of distinguishing between permanent and transitory income, finding the appropriate group to define permanent and relative income, and deciding whether to use head of household or total family income. There are also problems in measuring or predicting lifetime income over extended periods, i.e., income profiles and the adequacy of discounted cross-sectional information over different age groups as an appropriate long run income measure. Overall there are problems of accuracy of information and the high cost of obtaining information, particularly from resurveys.

The National Bureau of Economic Research-Thorndike-Hagen (NBER-TH) data provide a unique opportunity to explore alternative income measures and provide some insight into both measures and consumption theories applied to two durables, number of children and value of home. Several estimates of permanent income, one based on the income history, other on grouping, relative income, head of household and family earnings, or on linear relationships and income interactions with religion are explored with the NBER-TH data. However, the NBER-TH data are limited to the upper half of the education

distribution, so the National Longitudinal Survey for older men (NLS) is used to explore robustness, possible nonlinear relationships, and implications for redistribution policies of the analyses of number of children.

Regressions are run assuming a household utility maximization framework. Separate regressions are estimated for each of two commodities providing satisfaction over long periods: number of children and value of home using the NBER-TH data. The sample used in the value of home equations is, of course, smaller since nonhomeowners are excluded.[1] The means and standard deviations of the incomes of this subgroup are almost identical to those of the entire group included in the number of children equations (see Appendix, Table A.1). Number of children is included as an independent variable in the value of home equation. The timing of these decisions--children earlier than 1969 and value of home as of 1969--indicates there should be little problem of simultaneity. Only number of children equations are run with the NLS data.

Section 1 briefly reviews relevant theories. The data are described in Section 2. Then results using the NBER-TH data for several permanent income measures, use of family or individual incomes, relative income, nonlinearities, use of recall information, and interaction of religion and income are discussed in Section 3; the results using NLS are discussed in Section 4. Conclusions are presented in Section 5. The Appendix contains tables on details of income measures and several representative full equations.

1. THEORETICAL REVIEW

Both of these durable goods--number of children and value of home--represent expenditures over a long period of time, so families are expected

to make decisions on them in terms of permanent or expected income over a long period of time. These "purchases" compete with the purchase of other goods and services because of resource limitations. Preferences (tastes) for consumption of alternative goods and services are influenced by consumption patterns of groups with which one associates. Easterlin (1969) has theorized that relative preferences for children depend upon the standard of living experienced during the adolescent years; that is, income must be considered relative to parents' income. High income relative to patents' income will be associated with more children rather than high actual income. Alternatively, Deborah Freedman (1963) suggests that husband's income should be considered relative to that expected for his education, occupation, and age group--and higher relative income again is expected to be associated with higher fertility rather than high actual income. The discussion here will focus on Freedman's relative income hypothesis since adequate income numbers for parents are not available for the NBER-TH sample.

There is far greater acceptance of a positive association between housing expenditures and income than between number of children and income. There is debate (see Carliner 1973; deLeeuw 1971; deLeeuw and Struyk 1975), however, on whether housing expenditures are a higher or lower proportion of permanent income as income increases; in other words, is the elasticity unity higher or lower? Carliner found an elasticity of less than unity, whereas deLeeuw found an elasticity close to unity using grouped households. Perhaps a relative income model underlies the discrepancy: Housing expenditures are necessary to keep up with one's group, but the more successful (those with higher relative income) spend less of their additional income on housing and more on other goods and services, including children.

Should the permanent income measure be of the family or head of household? In the case of children, wife's earnings reflect an opportunity cost of having children but also add to potential income. Since the opportunity cost effect will work toward reducing the number of children, separate income variables seem necessary both for insight and to avoid bias of the results. In the case of housing expenditures there may not be separate effects--more income may be associated with more expenditures so there are few problems of bias. In this case, total family income may be more appropriate, although separate inclusion of both incomes permits some sorting to take place.

2. BRIEF DESCRIPTION OF DATA

The NBER-TH data are from a sample of approximately 5000 white men and their immediate families, and covers 25 years. These men were among those who volunteered for pilot, navigator, and bombadeer tests during World War II. Thorndike and Hagen (1959) resampled 9700 in 1955 and the National Bureau of Economic Research (NBER) recontacted this sample in 1969, receiving replies from over 5000. They are a relatively homogeneous group in terms of age and education--they all have a minimum education equivalent to high school completion.[2]

Respondent's income is available for 1955 and 1969 based on mailed questionnaires in those years. Recall income information is available for many more years, including 1958, 1962, 1964, 1967, and 1968. These measures include earnings of head of household, total family income in 1958, earnings of other family members, and other earnings in these years. In addition, Taubman and Wales' averages (1974, p. 139), based on education

and occupation for 1955 and 1969 are used, differences between actual and their computed average incomes (for relative income measures) are derived, and a permanent income number is compiled using real 1958 prices 1955, 1967 actual income numbers and all recalled income for respondent and a 4% discount rate. (These measures are described in Appendix Table A.1.)

The similarity and differences of these income measures for the NBER-TH sample can be seen by looking at a correlation matrix, (see Appendix Table A.2). The table suggests that group averages are not highly correlated with other measures of income including, in particular, an expost present discounted value of income. This measure, (MPRY458), computed from all the income numbers respondents provided, represents, though in an expost sense, permanent income. (This assumes transitory components have cancelled out over the 15-year period included.) In a sense then, averages are only weak measures of permanent income. The average measures (MAVY558 and MAVY698) are, however, highly correlated. This may possibly indicate that an average at one point during the working lifetime may be a reasonably good proxy for a later or earlier average within an age group.

The table also indicates relative income is highly correlated with actual income, and the permanent income measure is more highly correlated with the recall income information than actual or current income reported for the year the individuals were surveyed, (MY58 and MTY58). There is a .5 correlation between actual income reported at the two survey dates--15 years apart. Not surprisingly, wife's income is more highly correlated with total family income (though this is comparing total reported family income with a constructed estimate of wife's potential earnings) than with husband's earnings. Finally, the correlations suggest that these are

different measures of income and that using different estimates will likely lead to different results.

The National Longitudinal Survey of older men, 1967, contains respondent's income, wife's income, education and occupation groups, Duncan ratings of occupations, plus family income classes. These income numbers are converted into monthly figures in 1958 prices for comparability to the NBER-TH data.

3. RESULTS

Permanent Income Measures

We have already noted the weakness of group average income as a proxy for actual permanent income in the correlation matrix (Table A.2). Not surprisingly, measured permanent income is a more significant explanatory variable than "permanent" as measured by grouped average income, both in terms of t-statistics and adjusted R^2 as reported in Table 1 below. (A representative full equation is included in the Appendix Table A.3.)

Table 1

Dependent Variable

	CHILD				HOME			
	Coefficient	Elasticity	t-statistic	$\bar{R}$	Coefficient	Elasticity	t-statistic	$\bar{R}$
MAVY558	.0009	.20	(2.74)	(.106)	38.76	.91	9.61	.123
MAVY698	.0003	.13	(2.86)	(.106)	12.85	.57	10.83	.129
MPRY458	.0003	.07	(5.31)	(.110)	19.92)	.50	31.98	.309

Note: All other variables in the equation are the same for the CHILD equation and HOME equations except that all HOME equations have CHILD as an independent variable.

More insight, however, can be gained in this comparison--particularly in terms of the discrepancy in results on housing between Carliner (1973) and deLeeuw (1971). DeLeeuw's grouped results show a higher elasticity than Carliner's household results. Results here are consistent. The elasticity of the actual permanent income measure at its mean is below the elasticity of the average measures at their means, and this is particularly so for the average at an early point in time. The timing results seem consistent with lifetime profiles on the purchase of housing services--that individuals forming their families early in married life purchase relatively more housing--but the results also suggest an elasticity of less than unity for higher incomes--those coming later in life.

The results on permanent income suggest a lower elasticity than unity and argue that using grouped income measures overstates the actual elasticity.

The family size results suggest that actual permanent income is a better explanatory variable than "permanent" as measured by averages, and that there is a very small positive relation between permanent income and family size. The timing results again seem consistent with expectations, either in terms of decisions on number of children being made primarily during younger adult years or with diminishing marginal utility, so that higher incomes are associated with more children but at a diminishing rate.

Family or Individual Incomes

When looking at income distribution or returns to investment in human capital, the desirable income figure--family income or individual earnings--is clear. For demand analysis however, the income figure may not be as clear. This may be significant since it is expected that spouses' incomes

are positively correlated and if the relationship is not symmetric for both individuals' income, estimates will be biased.

In cases where the commodity under consideration is likely to be quite time-intensive, particularly of one family member's time, separate earnings figures are desirable. The high opportunity cost for one family member is likely to be associated with a negative substitution effect; higher income for the other without the increase in opportunity cost is likely to have a positive association with the commodity. Combining the two will therefore bias the results, presumably more using combined income than just respondent's income.

Children are considered to be quite time-intensive, and in the generation considered here, particularly so for the mother. Increases in her income may, therefore, be dominated by a negative effect--related to a negative substitution effect. Since, however, higher income translates into higher potential income, the findings may combine negative short run effects with more positive long run effects.

As reported in Table 2, the strong negative findings of wife's potential earnings and children are robust and indicate a negative elasticity of approximately 1.7, regardless if other income measures are included in the equation.[3] Husband's earnings show a quite small positive association with family size. The positive association increases in terms of coefficients and level of significance when wife's earnings are included in the equation. Husband's earnings are more significant than total family income. This is as expected since family income includes two variables working in opposite ways.

In the case of durable goods that are less affected by opportunity costs, income of both family members may work in the same direction so there is less

Table 2

Dependent Variable

	CHILD					HOME				
	Coefficient on Named Income Variable	t	Coefficient on Wife's Potential Earnings	t	$\bar{R}$	Coefficient on Named Income Variable	t	Coefficient on Wife's Potential Earnings	t	$\bar{R}$
MY58	.0002	(4.78)			.106	13.40	(26.31)			.240
	.0003	(5.99)	-1.54	(6.75)	.112	13.06	(25.35)	10,108.36	(4.09)	.244
MTY58	.0001	(1.94)			.098	11.91	(26.77)			.245
	.0002	(3.92)	-1.57	(6.64)	.108	11.79	(25.46)	2,293.08	(.90)	.245
MPRY458	.0002	(3.88)			.100	20.26	(32.95)			.301
	.0003	(5.31)	-1.56	(6.76)	.111	19.92	(31.98)	7,481.32	(3.16)	.309

to be gained from separate inclusion. In the home equations, wife and husband's earnings both have positive associations with value of the home. In this case, the coefficient on total family earnings does not change by the inclusion of wife's earnings, whereas the coefficient on husband's earnings is very slightly reduced. The findings indicate a surprising generally higher elasticity between wife's potential earnings and value of home. Perhaps this reflects the nonlinear relationship of higher elasticities for lower incomes, or a translation of potential productivity in the market place to higher productivity in the home, which affects the capital value of the home.

Relative Income

Evidence on relative income are similar for both dependent variables as can be seen in Table 3: The marginal propensity to consume is less but more statistically significant than average income for the education-occupation group.

Table 3

Dependent Variable

	CHILD			HOME		
	Coefficient	t	R^2	Coefficient	t	R^2
MAVY558	.0010	2.99	.110	42.52	11.05	.201
MDFY558	.0003	4.63		14.52	18.43	
MAVY698	.0003	3.06	.111	14.04	13.21	.302
MDFY698	.0001	4.76		8.80	28.90	

This appears consistent with declining marginal utility and also with a positive relative income effect. The results do not, however, support Deborah Freedman's findings (1963) of no positive income effect for average income, and only a positive income effect for those with income above that expected. She states "An income which is above the average for one's status is associated with more children, but being in a higher absolute income class means fewer children if the higher income is only what is usual for the husband's age and occupational status (p. 422)."

In a sense these veterans may be a better test of this hypothesis than alternative groups. They have some shared experience and opportunities in terms of education, are of similar age, and have a minimum education of high school. Thus they may be more aware of themselves as a group and so serve more accurately as appropriate groups of comparison.

Nonlinear or Linear Association

Most measures of income used in both sets of equations reported in Table 4 show a nonlinear association between income and family size: The intercept term is positive, whereas the square term is negative. This seems consistent with notions of diminishing marginal utility and again, indicates a declining elasticity toward housing expenditures as income increases. This might be more pronounced or indicate other nonlinearities if the entire income distribution were included.

Table 4

Dependent Variable

	CHILD				HOME			
	Coefficient	t	Coefficient Squared Term	t	Coefficient	t	Coefficient Squared Term	t
MY5558	.0006	(4.98)	-.0000	(-2.67)	29.08	(21.31)	-.0041	(12.27)
MPRY458	.0004	(5.84)	-.0000	(-2.98)	35.99	(23.15)	-.006	(11.24)
MY6958	.0002	(2.74)	-.0000	(-.73)	17.21	(23.06)	-.002	(11.73)

Recall Versus Current Information

Current earnings information was collected in 1955 and 1969; in 1969, individuals were asked their earnings for specified intervening years--1958, the year closest to the earlier current earnings is included here.

The results are quite interesting: The recall income number (MY58) is a better fit--more significant than the earlier income number in both the Child and Home equations, and in the Child equation is also better than the later current earnings figure (see Table 5). This last result seems likely because of the timing of births, which mostly occurred during the earlier years. Value of home or home purchases generally take place later, or rather adjustments can be more easily made later and so are more influenced by later income.

The results on the recall income, however, may at first appear surprising. Recalled numbers may be more inaccurate in terms of actual income but may come close to permanent income. For evidence, the recall income figure is more highly correlated with permanent income and 1969 earnings than are

Table 5

Dependent Variable

	CHILD			HOME		
	Coefficient	t	$\bar{R}$	Coefficient	t	$\bar{R}$
MY58	.0003	(5.99)	.112	13.06	(25.35)	.243
MY5558	.0004	(4.98)	.110	15.16	(19.57)	.191
MY6958	.0002	(5.31)	.110	9.15	(30.86)	.298

1955 earnings. Thus, surveys asking for income in an expost sense may have reasonably good measures of permanent income in the recalled income figures. Individuals may estimate an approximate income figure for past earnings based on permanent income. Current earnings may be more accurate in the sense that the individual knows his or her current earnings; but current earnings are also likely to contain transitory components that weaken their usefulness.

Religious Interactions

Religion is a variable frequently unavailable in survey data but one that may be important in explaining behavior. It is available in the NBER-TH data, and has been shown to be an important explanatory variable for income differentials in the NBER-TH sample (see Taubman and Wales 1974) with a positive coefficient on being Jewish. It is hypothesized here that religion and income interact so that Catholics have a higher marginal propensity to consume toward children and Jews have a lower marginal

Table 6

Dependent Variable

	CHILD				HOME			
	Coefficient - Intercept	t Variable	Coefficient - Interaction	t Variable	Coefficient - Intercept	t Variable	Coefficient - Interaction	t Variable
MY5558	.0006	2.38			13.96	5.47		
Catholic	.62	3.07	.0002	.64	-8086.69	3.67	12.68	3.99
Jewish	.11	.45	-.0004	-1.19	5805.08	2.18	-1.98	.63
Protestant	.08	.48	-.0003	-1.22	-881.12	.45	-.66	.24
MY6958	.0001	.57			10.35	9.94		
Catholic	.46	2.74	.0002	1.80	421.52	.23	-.85	.72
Jewish	-.28	1.19	.0001	.74	7399.06	3.04	-3.32	2.51
Protestant	-.19	1.21	.0001	.61	99.01	.06	-1.04	.94

propensity to consume. This is weakly supported by the regression results shown in Table 6, which also indicate the larger family size of Catholics, on average.

For home, there again appears to be a higher marginal propensity to consume among Catholics than Jews, but the direct relationship between religion and home is opposite, with Jewish having a larger positive coefficient than Catholic.

What these results may indicate are the important "taste" effect of religion and that group averages should, if possible, use religion as a basis for grouping.

4. EVIDENCE FROM THE NATIONAL LONGITUDINAL SURVEY--OLDER MEN

The results with number of children as the dependent variable for the total group,[4] show a negative coefficient on the various measures of income and a larger negative coefficient on wife's income. (A representative full equation is reported in the Appendix Table A.4.) The squared term, however, has a positive and significant coefficient indicating a nonlinear negative and then positive effect of income on fertility. This is verified by the larger negative coefficient on income of the subgroup with less than 12 years of education and the positive coefficient on the group comparable to the NBER-TH sample--whites with 12 or more years of education. These results, which seem intuitively appealing and generally consistent with cross-sectonal information, may have important implications for the family size consequences of income redistribution.

In terms of the individual **or** family income measures as reported in Table 7, the results are basically consistent with the NBER-TH results: Wife's income has a strong and consistently negative association with family size. This presumably reflects the opportunity costs of raising children. Husband's earnings (though negative) are more significant than family earnings. The difference may be exaggerated because family income is converted into dollars, using mid points of reported income classes as opposed to reported family income in the NBER-TH data.

In terms of permanent income, it is not possible to construct the same sort of permanent income measure as for the NBER-TH sample. Group averages were, however, constructed and an additional average measure based on a more detailed occupational breakdown (the Duncan's 2-digit index) was also constructed.

Table 7

Regression Results: NLS, Child as Dependent Variable

	Income Variable Coefficient	t	Wife's Earnings Coefficient	t	$\bar{R}$
MINCR58	-.00022	2.02			
	-.00023	2.10	-.00163	5.99	
MINCF58	-.00008	.82			
	-.00003	.32	.000161	5.92	

The results (see Tables 8 and 9) tend to show little gain from the more detailed grouped income measure and results of the same sign as actual incomes (or no effect for the sample like NBER-TH). For this more inclusive sample, there does appear to be some gain from using a permanent income measure--even based on grouping--compared to actual income, but this is less true for subgroups.

Table 8

	Coefficient	t
MAVIOC58	-.0012	3.95
MAVIDN58	-.0006	3.21

Table 9

	Whole Sample		Like NBER-TH		Educ. < 12 yrs.	
	Coefficient	t	Coefficient	t	Coefficient	t
MINCR58	-.0002	2.10	.0002	1.45	-.0008	4.25
MAVIOC58	-.0012	3.95	-.0001	.41	-.0018	4.04

This fits in with concerns over using income at different points in the life-cycle--cross-sectional information--as a measure of permanent income. When the group is restricted so that they are at similar points in the life-cycle, actual income may not be such a poor indicator of permanent income. When, however, individuals in the sample are at different points, an average number based on education-occupation differences may be a better indicator of permanent income than actual income.

The NLS results on relative income reported in Table 10 are somewhat puzzling. For the entire sample the results on relative income, as measured by the difference between average income for an individual's occupational group and education and the individual's actual income for the same year, show no association with fertility. For the sample like the NBER-TH there is a positive effect associated with relative income, and for those with less than 12 years of education, a negative association between relative income and family size. The coefficient on relative income is smaller than on average income, a finding consistent with the nonlinear association between income and family size discussed earlier.

Table 10

	Whole Sample		Like NBER-TH		Educ. < 12 yrs.	
	Coefficient	t	Coefficient	t	Coefficient	t
MAVIOC58	-.0012	3.94	-.0002	.43	-.0018	4.04
MDIFOC58	-.0001	.67	.0002	1.68	-.0006	2.75

The overall results, then, appear to show no relationship because of the small positive association for the higher education group and small negative association for the lower education group.

For the higher education group, these results are consistent with Deborah Freedman's relative income hypothesis (1963)--a positive income effect only for those with income above that expected. This may indicate either that the NBER-TH is made up of men generally more successful than expected, so that the average income measure already reflects higher relative income, or that we need more homogeneous groups in terms of experience and opportunities to define average expected income. If so, these more aggregated groups, such as in the NLS study, may mask the true relationship.

Finally, the negative relationship between relative income and family size for the lower education group may indicate a continued desire for more goods and services, and aspiring toward the standards of those who are more successful and have more education. In other words, the appropriate comparison group may change or elasticities of demand for certain commodities may be such that they are not yet on the upward segment of the nonlinear income relation to fertility.

Thus, the results for the NLS are partially consistent with the NBER-TH results. Perhaps the greatest consistency is the positive relationship between income and family size for white respondents with 12 or more years of education. The nonlinear relationship, which appears quite robust, may explain the generally nonsignificant or negative findings of others. They do indicate that children are "normal goods" beyond some income level and that greater equality in terms of income distribution may well mean smaller families.

5. CONCLUSIONS

We have gained some insights into measurement of income. Average income for education-occupation groups, which in these samples are also for age groups, are not very good estimates of permanent income. Current earnings and recall income appear to be better estimates.

Recall income represents a surprisingly good proxy for permanent income. This is likely to reflect individuals' estimating recall information on the basis of permanent income.

The importance of separately measuring respondents' and spouses' earnings depends upon the nature of the commodity. If the substitution and income effects are expected to work in the same direction for both individuals, some detail may be lost by using family income, but the general nature of the association between increased income and demand for the commodity is represented by the coefficient of family income. When this is not the case, however--for example when a negative substitution effect dominates only wife's income--the results using either husband's income alone or family income are biased. The bias is greater for family income than spouse's income.

In terms of implications for utility maximization models of fertility and housing expenditures there are several interesting results. The basic finding using all of these income measures is that a nonlinear relationship exists between income and family size. At lower levels of income, increases in income are associated with smaller families; eventually this effect weakens and the association becomes positive. Diminishing marginal utility is reflected in the eventual decline of the positive effect.

Since the results of the NLS data support the NBER-TH study on the upper half, it is possible to suggest that this nonlinear relationship would hold with permanent income measures for the entire population (of this age cohort). This implies that economists' models which specify a positive relationship between family size and income need modification. The lack of positive results in other empirical work can less comfortably be explained away by lack of appropriate income numbers. Only above certain income levels or education levels does income have this positive relationship. Perhaps it is necessary to acquire a certain standard of living first. In any case, it is interesting to find this posited positive effect for the higher education subgroup; a finding that appears quite robust. It gives some support to the "normal good" theory of number of children, even if only for a subgroup of the population.

In terms of the relationship between housing value and permanent income, the results here suggest an elasticity of less than unity for the group that might be termed the top half of the population. Using grouped data increases the elasticity, suggesting that the grouping process may incorporate other factors that influence demand. These findings are consistent with both Carliner's (1973) and deLeeuw's (1971) results, and offer an explanation of their differing results.

Finally, in terms of the relative income hypotheses explored here, there appear to be some differential effects of average and relative income. The NBER-TH results suggest a differential positive effect, but disagree with Deborah Freedman's hypotheses (1963) that only high relative income will have a positive association with family size. Alternatively, the NLS results are consistent with her hypothesis for the group with 12 or more years of education, but not for the rest of the group. This again reinforces

the nonlinear negative and then positive relationship between income and fertility, and suggests Freedman's theory may apply to the better educated-higher income group. The inconsistent NBER-TH findings may reflect a success bias on their average incomes. Alternatively, the bulk of results do not support the strong form of her hypothesis that higher relative income has a positive association with fertility, but average income does not. For both housing and family size, relative income has a different effect than average income. Whether or not this reflects a different response, or simply decisions on the margin, is not clear.

Hopefully, this research has moved us closer to understanding differences between income measures, and the association between income and two consumer durables. Further explanation of the entire population, and particularly the Easterlin (1969) relative income hypotheses, await measures of potential income, permanent income for all education levels, parental standard of living, and further defining of appropriate groups for relative income definitions.

APPENDIX

Table A.1

Description of Income Measures
NBER-TH Data Set

	All		Home Respondents	
	$\bar{X}$	σ	$\bar{X}$	σ
MY5558 Monthly 1955 salary income in 1958 prices.	608.68	317.85	608.01	315.10
MAVY558 Average monthly 1955 salary income in 1958 prices for education-occupation group.	641.29	71.71	641.68	71.01
MDFY558 Difference between respondent's 1955 monthly income and average for his education-occupation group in 1958 prices.	-32.61	309.59	-33.56	307.62
MPRY458 1955 present discounted value of income through 1969 (discounted at 4%) in 1958 prices, computed as monthly income. Uses 1955, 1969 incomes and where possible 1958, 1962, 1964, 1967, 1968 income figures. Incomes are interpolated for each of the remaining intervening years before being discounted to 1955.	682.01	427.70	680.20	370.71
MY58 Monthly 1958 salary income (based on recall information).	759.97	469.21	759.53	460.21
MTY58 1958 monthly total family income (based on recall information).	836.82	549.36	834.07	523.66
MY6958 Monthly 1969 salary in 1958 dollars.	1220.70	788.49	1224.60	787.25

Table A.1--Continued.

	All		Home Respondents	
	$\bar{X}$	σ	$\bar{X}$	σ
MAVY698 Average monthly 1969 salary income in 1958 prices for education-occupation group.	1226.00	252.89	1227.00	251.90
MDFY698 Difference between respondent's 1969 monthly income and average for his education-occupation group in 1958 prices.	-5.22	737.82	-2.36	737.65
Wealth58 Sum of 1969 values of assets less debts in 1958 dollars.	-6803.60	2352.90	61121.00	529.31
PYL58 Constructed value of potential earnings of wife in 1958 (based on those with earnings in 1958).	3.27	.13	3.27	.13

NLS Sample--Older Men

	All		Like NBER-TH		Educ. < 12 yrs.	
	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ
MINCR58 Monthly 1966 salary of husband in 1958 prices.	443.62	386.77	611.40	494.77	353.69	285.59
MINCW58 Monthly 1966 earnings of wife in 1958 prices.	89.08	149.51	104.61	183.30	76.71	124.35
MAVIOC58 Average monthly 1966 salary in 1958 prices (by education and occupation code).	426.62	194.21	574.61	190.81	338.98	136.88

Table A.1--Continued.

	All		Like NBER-TH		Educ. < 12 yrs.	
	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ
MAVIDN58 Average monthly 1966 salary in 1958 prices (by education and Duncan code for occupations).	435.41	262.49	599.39	316.08	343.09	176.50
MAVIOC58 Difference between respondent's actual 1966 monthly income and average for his education and occupation.	17.00	330.28	36.80	449.23	14.71	248.61
MAVIDN58 Difference between respondent's actual 1966 monthly income and average for his education and Duncan code occupation.	8.21	288.62	12.02	389.63	10.60	221.46
MINCF58 Monthly 1967 total family income, converted from eleven classes using midpoints in 1958 prices.	671.68	484.76	964.65	569.95	515.25	351.60

Table A.2

Correlation Matrix--NBER-TH Sample

	MY5558	MAVY558	MDFY558	MPRY458	MY58	MTY58	MY6958	MAVY698	MDFY698
MAVY558	.23								
MDFY558	.97	.00							
MPRY458	.67	.24	.63						
MY58	.63	.21	.60	.86					
MTY58	.60	.20	.57	.83	.93				
MY6958	.52	.28	.46	.82	.65	.93			
MAVY698	.25	.87	.06	.29	.25	.23	.35		
MDFY698	.46	.01	.48	.77	.61	.56	.95	.04	
MY5558	.15	.17	.12	.20	.19	.30	.14	.14	.10

Table A.3

Full Equations: NBER-TH Sample
MPRY458 As Income

	Dep. Var: Child				Dep. Var: Home			
			adding wife's potential earnings				adding wife's potential earnings	
Constant	2.309	(1.88)	6.360	(4.66)	-6,878	(-.53)	-26,552	(-1.85)
Dummy: Respondent-Some College	-.011	(-.17)	-.069	(-1.11)	373	(.60)	653	(1.04)
Dummy: Respondent-B.A.	.080	(1.25)	-.036	(-.54)	2,018	(3.16)	2,576	(3.90)
Dummy: Respondent-M.A.	.166	(1.90)	-.013	(-.14)	1,257	(1.45)	2,125	(2.35)
Dummy: Respondent-Some Graduate School	.051	(.49)	.064	(.62)	3,800	(3.56)	3,732	(3.50)
Dummy: Respondent-Ph.D.	.154	(1.51)	.055	(.54)	493	(.48)	975	(.901)
Dummy: Wife-No high school	.212	(1.33)	.180	(1.13)	-1,207	(-.75)	-1,082	(-.67)
Dummy: Wife-Some College	-.006	(-.11)	-.009	(.17)	2,414	(4.34)	2,320	(4.17)
Dummy: Wife-B.A.	.025	(.40)	.160	(2.50)	2,938	(4.82)	2,276	(3.55)
Dummy: Wife-Some Graduate School	-.254	(-2.31)	.175	(1.38)	4,162	(3.81)	2,050	(1.61)
Wife's Age	.174	(3.78)	.178	(3.89)	812	(1.65)	766	(1.56)
Wife's Age Squared	-.002	(-4.75)	-.003	(-4.98)	-10.17	(-1.81)	-9.33	(-1.66)
Years Married	.246	(5.07)	.022	(4.47)	-24.59	(.50)	-12.00	(-.24)
Dummy-Protestant	-.012	(-.14)	-.099	(-1.21)	-1,228	(-1.51)	-781	(-.95)
Dummy-Catholic	.797	(9.04)	.719	(8.12)	-465	(-.52)	-128	(-.14)
Dummy-Jewish	-.316	(-2.56)	-.168	(-1.34)	2,270	(1.79)	1,538	(1.19)
Respondent's Age	-.045	(-4.03)	-.022	(-1.91)	-54.71	(-.49)	-169	(-1.44)
Divorced or widowed	-.729	(-4.84)	-.689	(-4.59)	-4,190	(-2.21)	-4,331	(-2.28)
MPRY458	.00039	(5.10)	.00044	(5.84)	36.32	(23.37)	35.99	(23.14)
MPRY458SQ	-.00000003	(-3.36)	-.000000028	(-2.98)	-.006	(-11.71)	-.006	(-11.24)
PYL58			-1.518	(-6.58)			7,531	(3.24)
Number of children					-206	(-1.30)	-152	(-.95)
R^2 (corrected)	.103		.112		.332		.338	
N	3,976		3,976		3,385		3,385	

Table A.4

National Longitudinal Sample Older Men, 1966
Number of Children as Dependent Variable

	Sample											
	All				Whites, Ed > 12				All, Ed < 12			
nstant	1.039	(.73)	.813	(.58)	.692	(.28)	.451	(.18)	1.911	(1.05)	1.593	(.88
mmy Wife: No H.S.	.798	(5.92)	.709	(5.25)	.747	(1.92)	.679	(1.75)	.735	(4.39)	.632	(3.76
mmy wife: Some College	.088	(.55)	.100	(.63)	.213	(1.47)	.220	(1.52)	-.083	(-.24)	-.076	(-.22
mmy wife: B.A.	-.075	(-.37)	.106	(.52)	.420	(.79)	.210	(1.08)	-.345	(-.87)	.116	(.28
mmy wife: Some H.S.	.395	(4.10)	.336	(3.48)	-.076	(3.22)	.391	(3.00)	.328	(2.42)	.259	(1.91
mmy wife: Graduate School	-.311	(-.95)	.096	(.29)	.173	(-.27)	.149	(.51)	-.013	(-1.23)	-.654	(-.64
Life's Age	.163	(3.01)	.174	(3.23)	-.002	(1.79)	.181	(1.89)	.150	(2.15)	.168	(2.41
Life's Age Squared	-.003	(-4.41)	-.003	(-4.66)	.090	(-2.40)	-.003	(-2.52)	-.002	(-3.35)	-.003	(-3.66
mmy: Divorced or Widowed	-.995	(-.89)	-.900	(-.81)	-.014	(.09)	.174	(.18)	-4.943	(-1.99)	-5.028	(-2.04
sband's Age	-.004	(-.33)	-.0005	(-.05)		(-.85)	-.010	(-.65)	-.006	(-.39)	-.003	(-.19
mmy husband: No H.S.	.542	(4.15)	.530	(4.07)					.361	(2.89)	.340	(2.74
mmy husband: Some H.S.	.081	(.76)	.089	(.84)								
mmy husband: Some College	-.113	(-.68)	-.108	(-.65)	-.149	(-1.12)	-.148	(-1.12)				
mmy husband: B.A.	-.122	(-.56)	-.196	(-.91)	-.234	(-1.32)	-.272	(-1.54)				
mmy husband: M.A.	-.279	(-.69)	-.344	(-.86)	-.533	(-1.72)	-.560	(-1.81)				
mmy husband: Graduate School	.347	(1.40)	.335	(1.36)	.365	(1.79)	.353	(1.74)				
mmy: race nonwhite	.219	(2.27)	.229	(2.38)					.389	(3.12)	.379	(3.06
INCR58	-.00097	(-5.33)	-.00090	(-4.99)	-.00035	(-1.76)	-.00032	(-1.63)	-.00148	(-5.03)	-.00136	(-4.66
INCR5859	.0000004	(5.13)	.0000004	(4.65)	.0000002	(3.04)	.0000002	(2.81)	.0000005	(2.77)	.0000004	(2.45
INCW58			-.00152	(-5.58)			-.00084	(-2.99)			-.00214	(-4.62
R^2 (corrected)	.099		.107		.069		.076		.101		.109	
	3,419		3,419		1,133		1,133		2,120		2,120	

NOTES

[1]The sample size used in the Child regressions is 3976 and in the Home regressions is 3385. Single men and nonrespondents on the child, 1955, or 1969 income questions are excluded.

[2]See Wolfe (1973) and Taubman and Wales (1974) for more information on the sample.

[3]Here are the t tests for equality of income coefficients across regressions, with and without wife's potential earnings (PYL58) included.

	Child as Dependent	Home as Dependent
MPRY458	1.51	.54
MY58	1.27	.67
MTY58	-2.07	.25

[4]The sample of 3419 excludes those with no response on respondent's 1966 income, and single men.

REFERENCES

Carliner, G. 1973. Income elasticity of housing demand. Review of Economics and Statistics 55: 528-532.

deLeeuw, Frank. 1971. The demand for housing: a review of cross sectional evidence. Review of Economics and Statistics 53: 1-10.

deLeeuw, Frank, and Struyk, R.J. 1975. The web of urban housing. Washington D.C.: Urban Institute.

Easterlin, R.A. 1969. Towards a socioeconomic theory of fertility: A survey of recent research on economic factors in American fertility. In Fertility and family planning: a world view, S.J. Behrman, Leslie Corsa, Jr., and Ronald Freedman, ed. pp. 127-156, Ann Arbor: University of Michigan Press.

Freedman, Deborah. 1963. The relation of economic status to fertility. American Economic Review 53: 414-426.

Taubman, Paul, and Wales, Terrance. 1974. Higher education and earnings: college as an investment and a screening device. New York: National Bureau of Economic Research.

Thorndike, Robert L., and Hagen, Elizabeth. 1959. Ten thousand careers. New York: Wiley.

Wolfe, Barbara. 1973. A socio-economic analysis of family building behavior. Unpublished Ph.D. dissertation, University of Pennsylvania.