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WEALTH, INCOME AND ECONOMIC WELFARE: A  
PRELIMINARY REVIEW OF MINCOME  
BASELINE DATA

**Institute for Social and Economic Research**

**Faculty of Arts  
The University of Manitoba  
Winnipeg, Manitoba R3T 2N2**

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G. Mason  
Institute for Social and Economic Research

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## 1.0 INTRODUCTION

Recently there has been an increase in research investigating the relationship between wealth and income, and how these stocks and flows may be integrated into a measure of economic well-being. There has also been increased availability of longitudinal data permitting more sophisticated testing of a number of important hypotheses about economic inequality, the measurement of poverty, the distribution of poverty throughout the population and other important policy relevant issues.

This paper briefly reviews some of the more important strands of this research, then examines the MINCOME data, especially pertaining to assets with a view to establishing the extent to which they can assist in developing policy-oriented research. The second section, then uses the Baseline data to undertake some estimates (cross-sectional) of the life cycle hypothesis of wealth holding.

## 2.0 RECENT RESEARCH IN ECONOMIC WELFARE

A number of broad trends in the literature on economic welfare are discernible. These may be roughly categorized into the following general subject areas.

### 2.1 Conceptual Issues

This aspect of the literature, one of the oldest in economics, seeks to develop unambiguous conceptual measures of economic welfare. Modern work stems from the treatment by Rawls (1971) and a good presentation of the "utilitarian" and "contractual" philosophies may be found in Cooter (1983). The basic problem is to develop procedures whereby one might, without contradiction, compare the situation of two individuals and term one better off than the other. Whether it is ever possible to make such a comparison without imposing normative rules, occupies much of the debate.

### 2.2 Operational Issues

These flow from the conceptual debate, and consist of a variety of empirical attempts to measure among other things:

1. economic inequality as captured by summary indexes such as the Gini coefficient, variance, log variance, and relative mean deviation;

2. integration of assets and income (stocks and flows) into an overall measure of economic welfare;
3. integration of various social and economic indicators into a measure of general welfare;
4. measurement (and definition) of poverty; and
5. fluctuations in economic welfare.

Each of these sub-topics has an extensive literature. A recent review of the various measures of income inequality may be found in Kondor (1975) while seminal statements may be found in Atkinson (1970) and Kakwani (1980). A recent enhancement by King (1983) is the construction of measures of vertical equity (pertaining to the distribution of welfare) and horizontal equity (relating to the ranking of individuals resulting from any redistribution) combined into one index. All measures of inequality rely upon strict assumptions, especially in the form of social welfare function in order to develop these summary indexes.

The integration of assets and income into a measure of economic welfare can be undertaken simply by annuitizing the total wealth of the household (Love and Oja, 1975) but this approach is open to objection that different assets have various explicit and implicit rates of return. Also critical is the concept of imputed income, especially relevant for housing and transportation assets. Nonetheless, the fact that many welfare jurisdictions insist that prior to social assistance, families dispose of much of their wealth reflects the common perception that economic welfare is related to stocks and not just flows such as income.

More broad is the literature from social indicators, and the widening of the basis for measuring national product. Quality of life indexes especially resulting from environmental degradation have been attempted, with a view to comparing welfare in development and developing areas.

The measurement of poverty is perhaps the most contentious operational issue. The publication in Canada of low income cutoffs for the past decade or so, is matched by other publicly presented measures of poverty all relying upon some normative judgment (National Council on Welfare, 1984, Statistics Canada, 1982). While some organizations release measures based upon a

measure of the minimum physical requirements of survival and the required cost of maintaining this level, others use a "psuedo" statistical measure based upon the percentage of the population in some lower percentile. This literature is very important for it concentrates public discussion upon the substantive notion of poverty especially within a given social context. It is sometimes helpful to consider what minimum level of income is required to survive, however there seems little prospect that the exercise can ever eliminate its strong, normative basis. It may be argued that this normative basis is not only inevitable but a desirable feature (see Sen 1983 for a review of this literature).

Finally, with the availability of longitudinal data such as the Panel Study on Income Dynamics (PSID) in the United States, more studies are examining fluctuations of income, wealth and economic welfare. Paralleling work undertaken on the duration and timing of unemployment, Bane and Ellwood (1983) have examined the PSID with a view to studying the movements into and out of poverty. Defining a period of poverty in relation to the income earned prior to any point in time, they confirm that most of those who are ever poor, will endure poverty for relatively short periods of time, that a small core of those ever in poverty will have long periods of impoverishment, and that this core accounts for the bulk of economic and social resources devoted to the alleviation of poverty. In addition, the reasons for slipping into poverty range from loss of earnings by the head, to changes in family composition (divorce and adolescents leaving home), while recovery from a state of poverty results from increased head earnings, entering the labour force (especially for female single headed households) and remarriage.

One feature of the PSID is that the period of analysis is annual and a finer temporal resolution of income fluctuations is not possible. On the other hand it now spans an 11-year period and provides a longer run view than is possible with other longitudinal data sets such as the income maintenance experiments, although these latter data sets such as MINCOME do allow much more detailed tracking of the events in a familiar life.

This is but a cursory review of the work in the theory and measurement of economic welfare. Many other sub-topics exist, such as specific policy simulations, hypotheses concerning the distribution of assets by household type and over the life cycle, and behavioural models of wealth accumulation

and disposition. Increasingly, longitudinal data sets are being used to address empirical issues underlying research in this area. MINCOME offers researchers some significant opportunities in this area.

### 3.0 WEALTH AND INCOME DATA IN THE MINCOME DATA BASE

At each survey, participants were questioned about major classes of assets, including real property, vehicles, durables (appliances, furnishings, etc.), liquid assets and the two classes of liabilities, mortgages and loans. The specificity of the data collection was significant and attempts were made to capture an accurate profile of the net worth for each household.

The basic file for longitudinal analysis of the asset and income profiles for the MINCOME participants is termed MINC5 "MINCOME Income and Net Worth File." Table 1 presents the main variables available in this longitudinal file. The documentation also contains detailed notes on the construction of these aggregates which in many cases requires the amalgamation of some 30 individual measures.

In addition to this file, other aspects of the MINCOME data may be conveniently merged. Attitudinal data, psychometric measures, and detailed job histories all can be contained with the net worth and income data to allow quite sophisticated empirical research. For example, changes in net worth and income may be collected into an overall measure of economic welfare. This can then be correlated with respondent perceptions in their status. In other words, subjective and objective measures of welfare may be compared.

Much of the analysis in MINCOME is usefully executed by distinguishing between the three household types -- double headed, single headed (most often female) and single individuals. Table 2 presents the distribution of assets among these three household types at the Baseline (Survey 1).

The distribution of net worth is shown in Table 3 for the three household types. Notice that a number of respondents record significant negative Net Worth.

Finally, the relationship between income and net worth is depicted in Figures 1-3. Apparently, there is considerable variation in the distribution of income and wealth and significantly there are a large number of households with low incomes but comparatively high levels of wealth.

Table 1

2.1 VARIABLES IN THE INCOME AND NET WORTH FILE

2.1.1 Header (Household) Information

Field	Name	Description
----	----	-----
1.	FAMNUM	Family Number
2.	PLAN	Treatment Plan
3.	ATTRIT	Attrition Code
4.	FTYPE	Family Type Code
5.	FSI	Family Size Index (X100)

2.1.2 Survey Information

Field	Name	Description
----	----	-----
6.- 16.	MEARN1-MEARN11	male head job earnings (Surveys 1-11)
17.- 27.	MDI1-MDI11	male head - date of interview
28.- 38.	MINT1-MINT11	male head - # of days since last interview
39.- 49.	FEARN1-FEARN11	female head job earnings
50.- 60.	FDI1-FDI11	female head date of interview
61.- 71.	FINT1-FINT11	female head - # days since last interview
72.- 82.	OEARN11-OEARN111	other adult 1 - job earnings
83.- 93.	OINT11-OINT111	- # days since last interview
94.-104.	OEARN12-OEARN112	other adult 2 - job earnings
105.-115.	OINT12-OINT112	- # days since last interview
116.-126.	OEARN13-OEARN113	other adult 3 - job earnings
127.-137.	OINT13-OINT113	- # days since last interview
138.-148.	OEARN14-OEARN114	other adult 4 - job earnings
149.-159.	OINT14-OINT114	- # days since last interview
160.-170.	OEARN15-OEARN115	other adult 5 - job earnings
171.-181.	OINT15-OINT115	- # days since last interview
182.-192.	JTRAN1-JTRAN11	family job transfers
193.-203.	HSELL1-HSELL11	estimated resale value of owned dwelling
204.-214.	INCOW1-INCOW11	income received from property
215.-225.	BRDW1-BRDW11	board and room income
226.-236.	RODW1-RODW11	room only income
237.-247.	HPRIN1-HPRIN11	principal outstanding on owned dwelling
248.-258.	BRPD1-BRPD11	room and/or board paid monthly
259.-269.	RENTPD1-RENTPD11	monthly rent paid after subsidy
270.-280.	OPSELL1-OPSELL11	estimated selling price of other property
281.-291.	OPPRIN1-OPPRIN11	principal outstanding on other property
292.-302.	OPSELL1-OPSELL11	selling price of disposed property
303.-313.	CASH1-CASH11	money in banks, trusts, on hand
314.-324.	INSUR1-INSUR11	money in insurance policies
325.-335.	BOLOAN1-BOLOAN11	money in bonds, securities and money owned
336.-346.	RRSP1-RRSP11	money in pension funds and RRSP
347.-357.	VEHIC1-VEHIC11	value of all vehicles
358.-368.	DURAI-DURAI1	value of all durables
369.-379.	LENGT1-LENGT11	no. of days since last interview
380.-390.	GOVT1-GOVT11	income from government sources
391.-401.	PRIV1-PRIV11	income from private sources
402.-412.	INVEST1-INVEST11	income from interest and dividends
413.-423.	WELFA1-WELFA11	amount of welfare received
424.-434.	WELFT1-WELFT11	type of welfare received
435.-445.	DEBT1-DEBT11	amount owed, except mortgages

Table 2  
Percent Reporting Asset Ownership

	House	Other Real Property	Vehicles	Savings	Durables
Double Headed n=1238	51.4	5.1	78.2	59.6	89.9
Single Headed n=396	30.8	2.8	32.8	50.5	79.0
Single Individual n=539	8.5	1.1	25.2	66.2	61.6

Source: MINC1 - Baseline Summary File.

Table 3  
Net Worth By Household Type  
(Baseline)

Net Worth (Dollars)	Double Headed	Single Headed	Single Individual
Less than 0	268	56	119
0- 500	106	121	171
501- 1,000	96	39	73
1,001- 1,500	83	33	41
1,501- 2,000	82	23	32
2,001- 2,500	59	14	21
2,501- 3,000	62	15	11
3,001- 3,500	47	6	10
3,501- 4,000	55	16	12
4,001- 5,000	68	10	15
5,001- 7,500	108	20	10
7,501-10,000	81	12	8
10,000+	123	31	16

Source: MINC1 - Baseline Summary File.



Figure 1

INCOME VERSUS NETWORTH  
DOUBLE HEADED  
(INCLUDES HOUSE EQUITY)

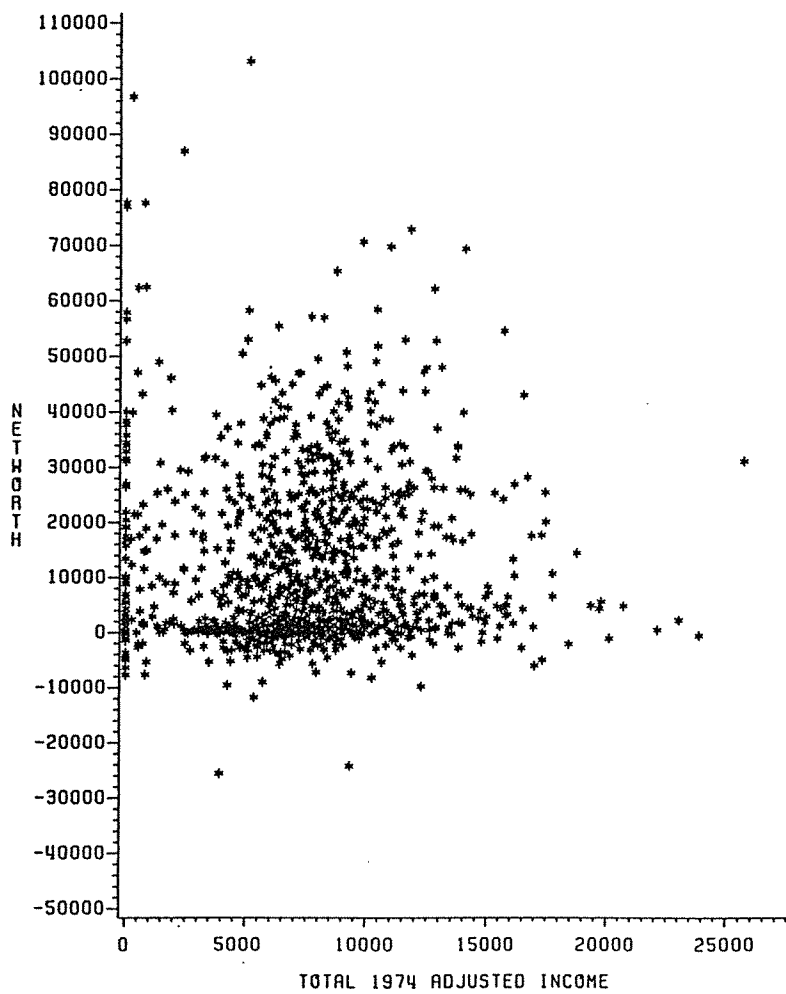


Figure 2

INCOME VERSUS NETWORTH  
SINGLE HEADED  
(INCLUDES HOUSE EQUITY)

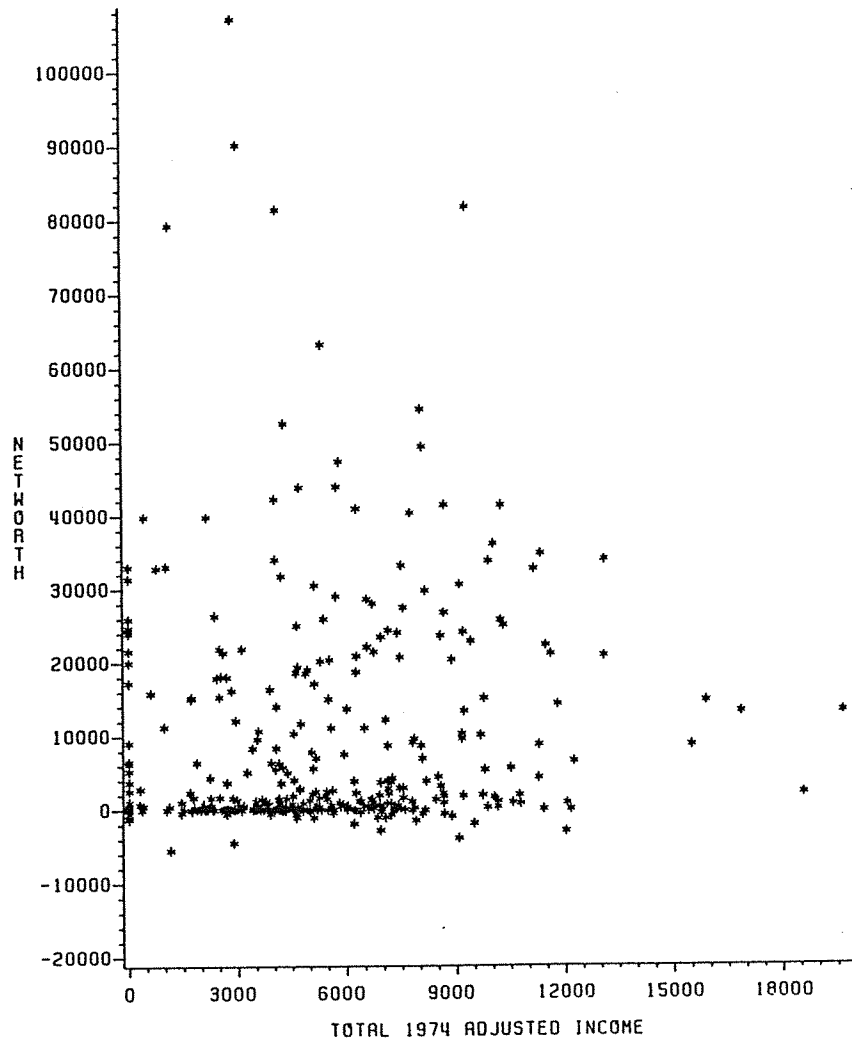
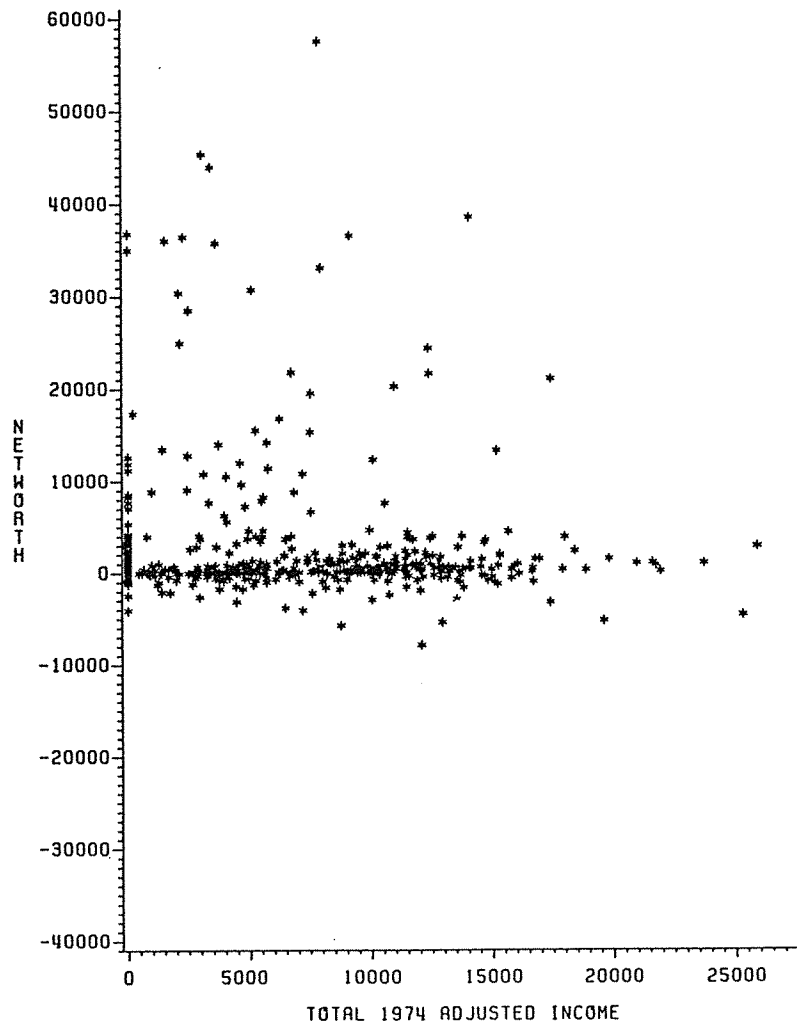


Figure 3

INCOME VERSUS NETWORTH  
SINGLE INDIVIDUAL  
(INCLUDES HOUSE EQUITY)



This section has served to present a descriptive overview of the wealth data in MINCOME especially the Baseline. The data set is sufficiently large to permit a wide range of hypotheses to be tested relating to wealth holding such as the life cycle savings hypothesis.

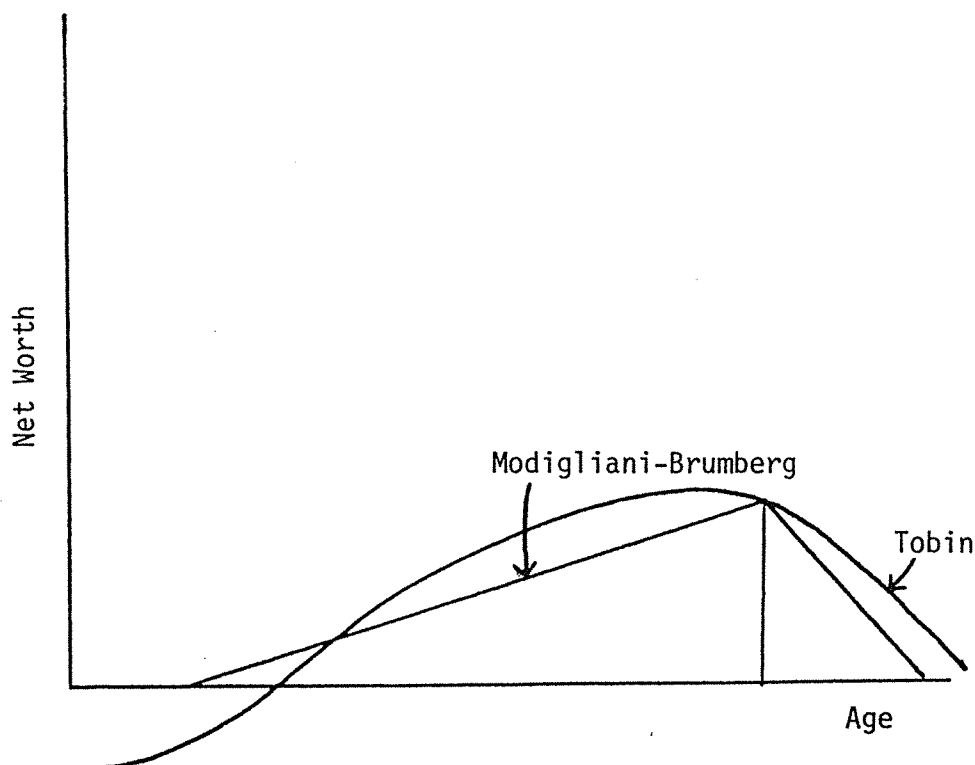
#### 4.0 SOME PRELIMINARY ESTIMATES OF LIFE CYCLE SAVINGS AMONG LOWER INCOME FAMILIES

The life cycle savings hypothesis first proposed by Modigliani and Brumberg (1954) has endured in the economic literature as the predominant explanation of household savings behaviour. Empirical estimates of this hypothesis (e.g., Mayer, 1972) have tended to disconfirm the validity of this model, however it remains as a corner stone in economic modelling and policy formation. The basic "rationality" of household's dissaving in the early part of their existence, accumulating assets for retirement after the children have left home, and the subsequent dissaving leaving the household with zero wealth at death is very appealing for economists. Recent research (e.g., Wolff, 1981) has indicated that the life cycle hypotheses cannot be sustained when micro-data are employed. In particular, it appears that savings behaviour varies by socio-economic status household structure and other "noneconomic" factors. Moss (1979) has developed a useful perspective basic upon four "classes" of wealth holders. Top wealth holders, benefiting from an initial asset base from inheritance tend to accumulate continuously throughout their lives. High income households, after an initial period of dissavings (perhaps to acquire professional status) quickly accumulate throughout their lives then dissave but rarely draw their assets to zero, passing on a significant inheritance. Middle income earners conform to the traditional life cycle model and begin wealth accumulation prior to higher income households, but since their income is less throughout their lives they tend to dissave heavily after retirement. Finally, transient workers, because of frequent income interruptions fail to acquire much in the way of wealth.

The classic life cycle hypothesis, and a variation by Tobin appears in Figure 4. The Tobin variation postulates negative net worth in the early years, perhaps even to the mid-thirties. Flowing from these two models are the following hypotheses:

1. Wealth rises with age until retirement.
2. Wealth is a non-linear function of age.
3. Wealth is zero or near zero at death.
4. Young households tend to have negative net worth, which is also a function of number of children, and occupation. Occupation plays a role in that higher occupations will tend to produce more negative net worth due to the costs of education.

Figure 4



#### 4.1 Measurement of Net Worth

Aside from the Survey of Consumer Finances, there are few data sets available in Canada which attempt to present the value of assets and other wealth stocks as well as income. MINCOME was designed to integrate stock and flow sources of economic welfare, and all participating families were surveyed for:

1. houses (including second homes such as recreational property);
2. major durables (appliances);
3. vehicles (up to five);
4. financial assets (savings, stocks, bonds, etc.); and
5. liabilities such as mortgages and consumer loans.

Within the population surveyed, these comprise a comprehensive set of assets and liabilities. Two measures of net worth were developed, one including all assets and liabilities, the other excluding housing (and mortgages).

There is some question about the quality of these survey data. In some cases, self-report data and respondent estimates were used to develop the value of assets. For example, the respondent was asked for their estimate of the value of the house. Although this may appear to be problematic, research in real estate appraisal has indicated that most homeowners are able to accurately estimate selling prices with 5 percent. On other assets, such as savings, confirmation was required in the form of bank statements, while the value of vehicles was developed from standard industry sources (e.g., the Sanford Evans Goldbook on used car prices). There is no reason to believe that for the baseline data, used in the empirical estimates below are significantly worse than other self-report data sets purporting to measure wealth. There is some reason for concern about the quality of data on subsequent surveys in the panel, since interviewers merely confirmed the existence of assets noted in previous surveys and changes were then noted. In general, one may surmise that less effort was made to validate asset data compared to information pertaining to job holding and other labour market related variables.

#### 4.2 Cross-Sectional Estimates of Life Cycle Wealth Holding

The life cycle hypothesis is longitudinal in orientation, and attempts to test both the actual hypothesis and derivatives must be viewed with circumspection. In its most limited form, the life cycle hypothesis proposed by Modigliani and Brumberg supposes that the interest rate is zero and earnings constant through time, implying that savings behaviour will not vary among cohorts. To the extent that these assumptions hold, cross-sectional data may be used to estimate the longitudinal life cycle hypotheses. Shorrocks (1975) has shown that under relatively wide age-earnings differentials, an inverted "U" shaped cross-sectional age-wealth distribution is a necessary but not sufficient condition for an inverted "U" shaped age-wealth distribution over the life cycle. There simply are no data sets spanning a typical life cycle of 75 years which permits a straightforward test of the life cycle hypothesis. Thus, if the inverted "U" shape age-wealth distribution is rejected using cross-sectional data, it may be rejected longitudinally,

however acceptance of the basic age-wealth distribution in the cross-section, allows no imputation about the shape through time. Wolff (1979) discusses this point at greater length, but clearly, the cross-sectional tests used on life cycle data are less than perfect.

The basic functional form to be estimated is:

$$W = b_0 + b_1(\text{Age}) + b_2(\text{Age})^2 + e \quad (1)$$

where Age refers to the age of the head and  $b_1 > 0$  and  $b_2 < 0$ . In the case of double headed households, the age of the male head was chosen for convenience. Estimates using an average of the male and female head showed insignificant differences in parameter values.

An alternate functional form for the Tobin variation appears as:

$$W = b_0 + b_1(\text{Age}) + b_2(\text{Age})^2 + b_3(\text{Age})^3 + e \quad (2)$$

where  $b_1$  and  $b_3 > 0$  and  $b_2 < 0$ .

Following the work of Moss (1975), estimates on these equations were divided into different classes. It was not possible to separate the sample into the four income categories, simply because MINCOME selected participants on the basis of income (Households with a 1973 adjusted - for family size - income in excess of \$13,000 were excluded). In addition, there is a severe truncation of the sample with relatively few heads in the Baseline over 57 years. Rather the sample is divided by household type consisting of double headed, single headed (usually female) and single individual. In addition, estimates were conducted with and without house equity included in the definition of net worth. Finally, estimates were conducted in rural and urban households (see Table 4).

From these results it is clear that for the lower income sample contained in the MINCOME Baseline, the house dominates the pattern of wealth holding. Double headed household, and rural and urban subset of the sample do conform generally to a life cycle model, at least when estimated cross-sectionally. In these groups, the coefficients are in the appropriate direction (demonstrating high negative net worth for young ages, and the inverted "U" shape postulated by the theory). Table 5 presents the estimate for the Tobin variation of the model for double headed.

Table 4  
Modigliani - Brumberg Life Cycle  
Hypotheses

Net Worth	Intercept	Age	Age <sup>2</sup>	R <sup>2</sup>
<u>Double Headed</u>				
Total	-1715.5 (-4.102)	1097.85 (4.94)	-7.79 (-2.84)	.149
Less House	2329.8 (1.07)	-79.85 (-.69)	2.74 (1.91)	.054
<u>Single Headed</u>				
Total	-4640.40 (-.588)	331.45 (.74)	.36 (.06)	.080
Less House	-2503.33 (-.536)	180.55 (.68)	-.62 (-.185)	.034
<u>Single Individual</u>				
Total	-588.89 (-.22)	22.55 (.13)	1.97 (.86)	.133
Less House	1964.85 (1.43)	-104.43 (-.96)	2.19 (1.53)	.052
<u>Rural</u>				
Total	-12964.67 (-.288)	849.59 (3.60)	-6.19 (-2.18)	.113
Less House	-1918.94 (-.69)	139.10 (.96)	.06 (.04)	.057
<u>Urban</u>				
Total	-16415.61 (-4.48)	1024.49 (4.65)	-7.52 (-2.49)	.155
Less House	1960.76 (-1.12)	173.82 (1.64)	-1.09 (-.75)	



Table 5  
Tobin Variation for Double Headed

Net Worth	Intercept	Age	Age <sup>2</sup>	Age <sup>3</sup>	Age <sup>4</sup>	R <sup>2</sup>
Total	-30,224 (-1.663)	330.64 (1.739)	-121.33 (-1.712)	1.911 (1.703)	-.010 (-1.642)	.056
Less House	-13,538 (-.388)	526.89 (.144)	-21.28 (.144)	-.585 (.150)	.004 (-.2711)	.1499

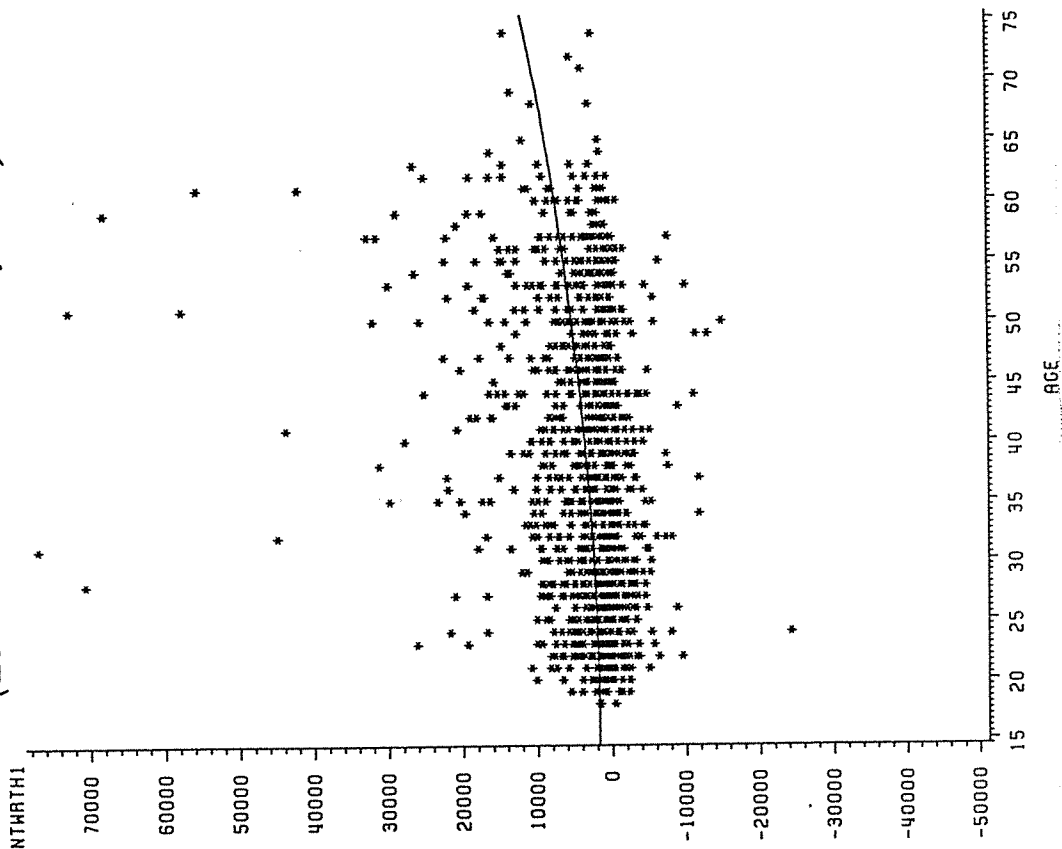
Apparent also from the plots (Figures 5-9) is that heteroscedasticity is likely to render the estimates in Tables 4 and 5 inefficient. Corrected regressions on double headed confirmed that the t values rose, but this matter is reserved for later work.

#### 5.0 SUMMARY

In summary, cross-sectional estimates on the MINCOME Baseline support the life cycle hypothesis, or at least, do not allow one to reject this hypothesis for double headed families and when the sample is subsetted for rural and urban. Most likely the large domination of traditional double headed households is the entire Baseline file accounts for the robustness of the hypothesis throughout. Not surprisingly, single headed households (resulting from divorce or widowhood) are economically more marginal as are single individuals. Note that by definition all single headed households have at least one dependent child. For these groups the life cycle hypothesis can be rejected using these data.

Figure 5

AGE VERSUS NETWORTH  
DOUBLE HEADED  
(EXCLUDES HOUSE EQUITY)



AGE VERSUS NETWORTH  
DOUBLE HEADED  
(INCLUDES HOUSE EQUITY)

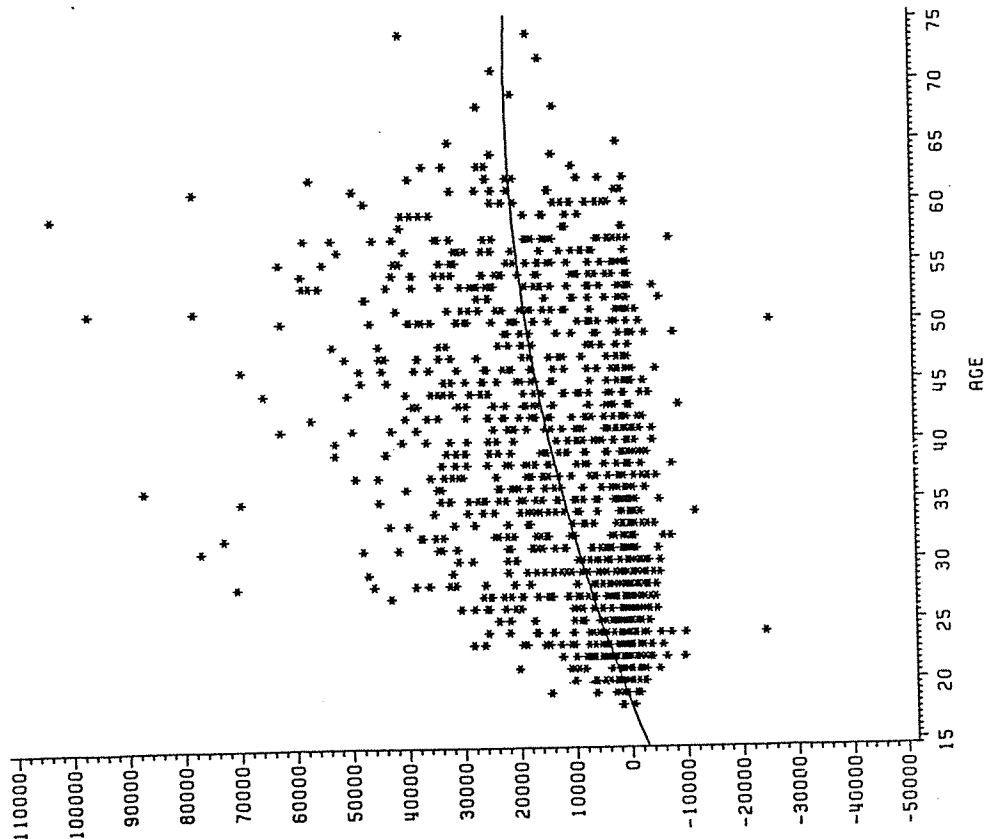
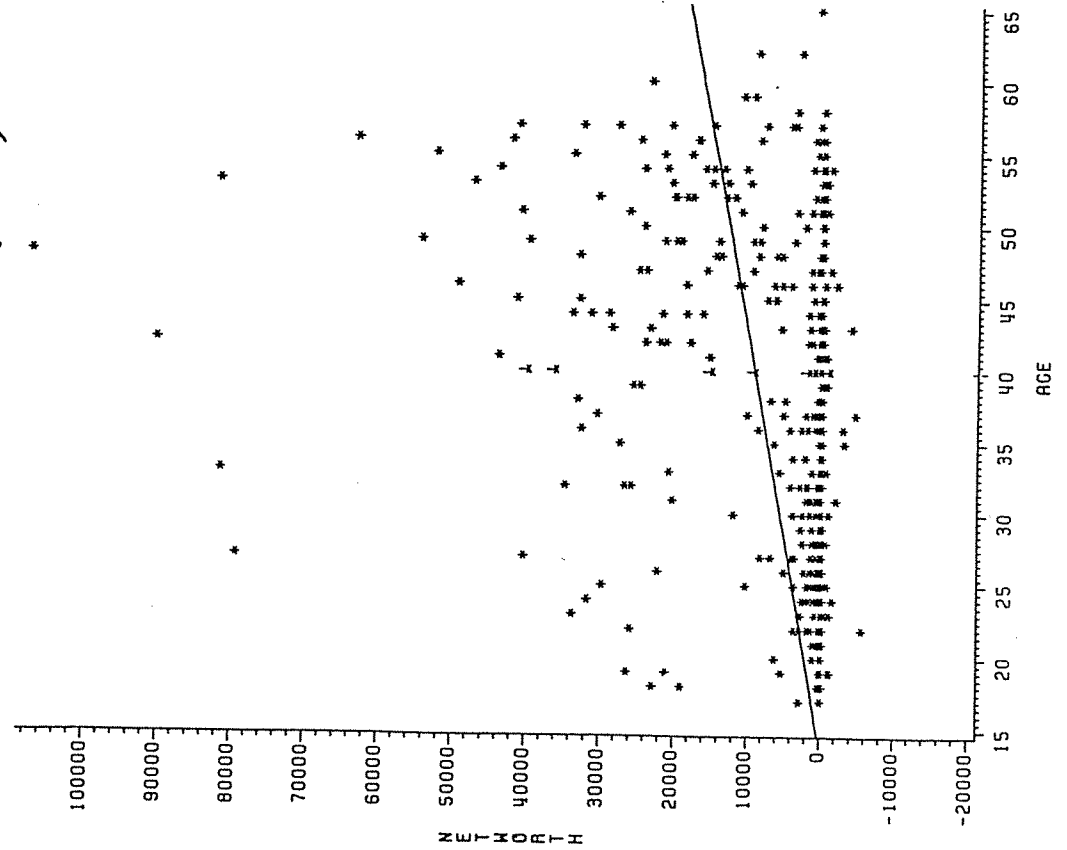


Figure 6

AGE VERSUS NETWORTH  
SINGLE HEADED  
(INCLUDES HOUSE EQUITY)



AGE VERSUS NETWORTH  
SINGLE HEADED  
(EXCLUDES HOUSE EQUITY)

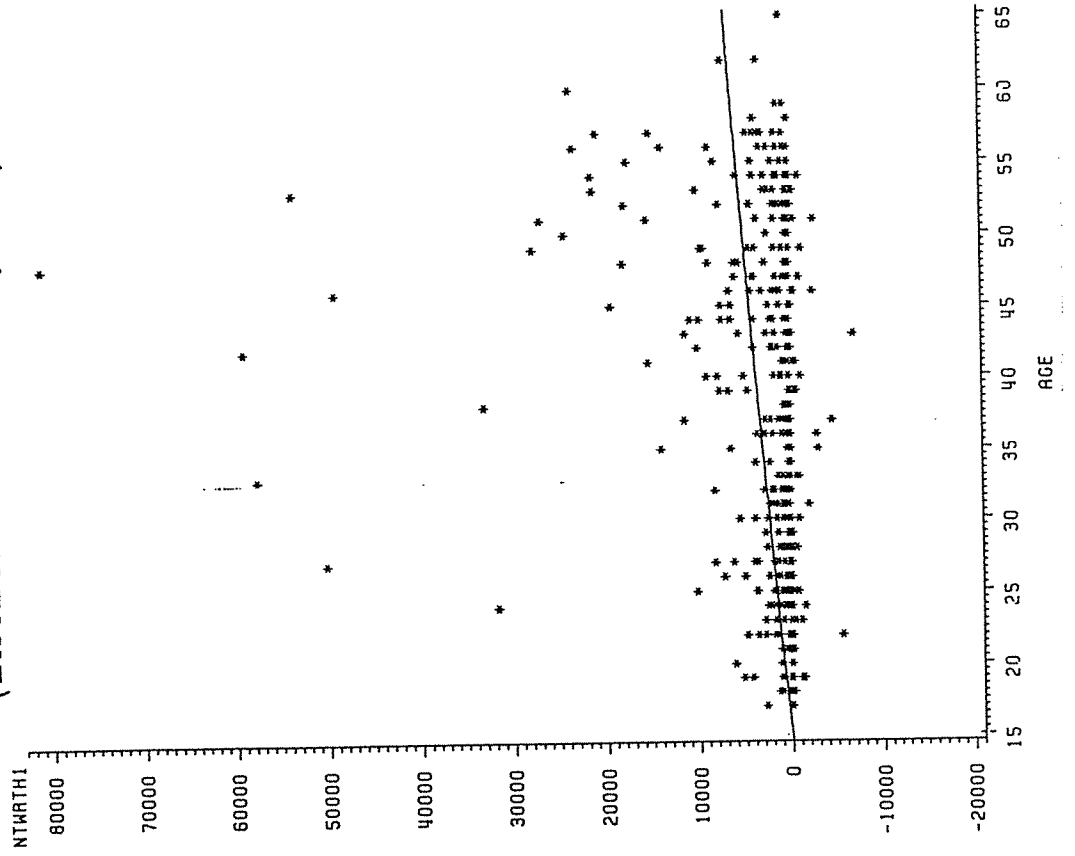


Figure 7

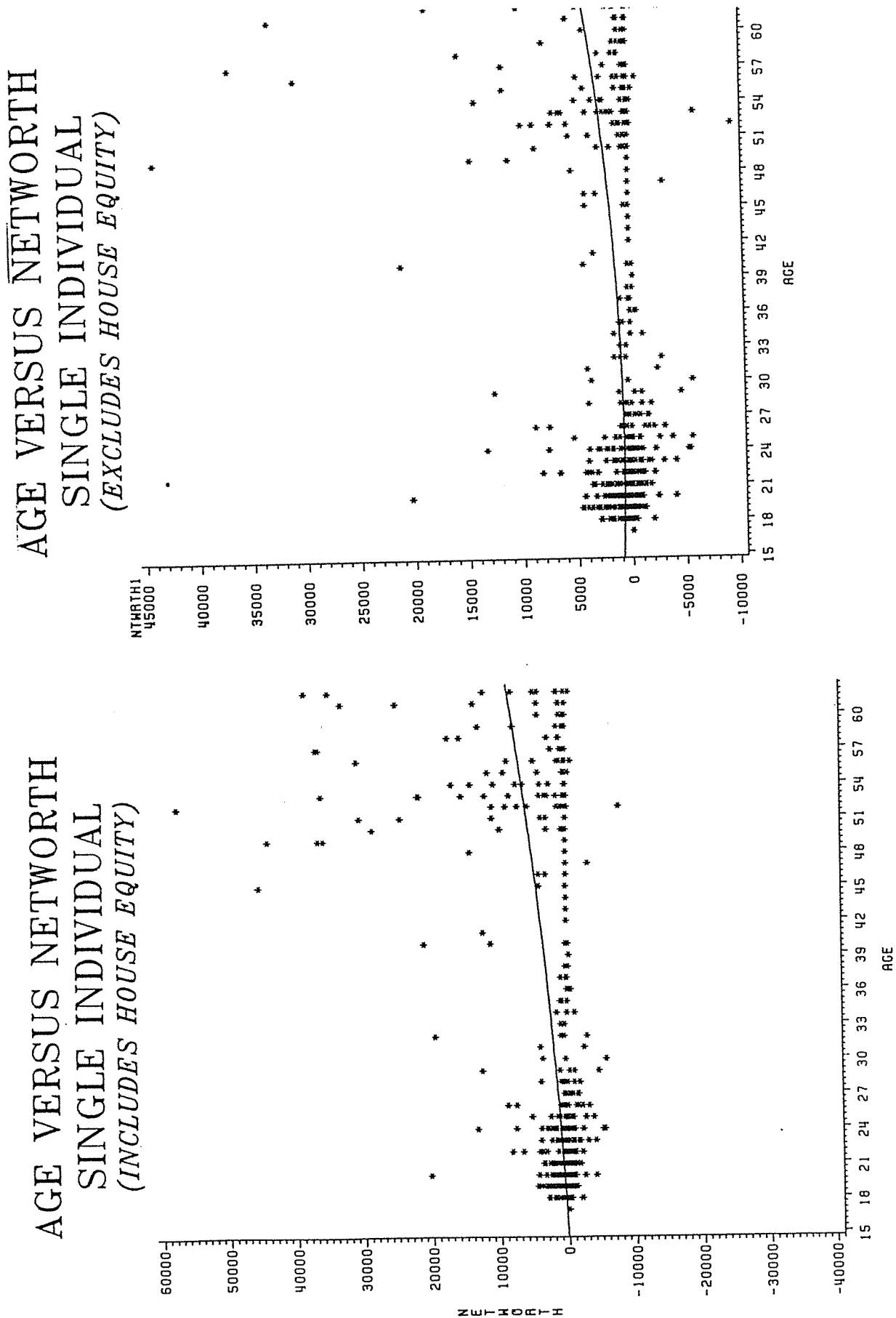


Figure 8

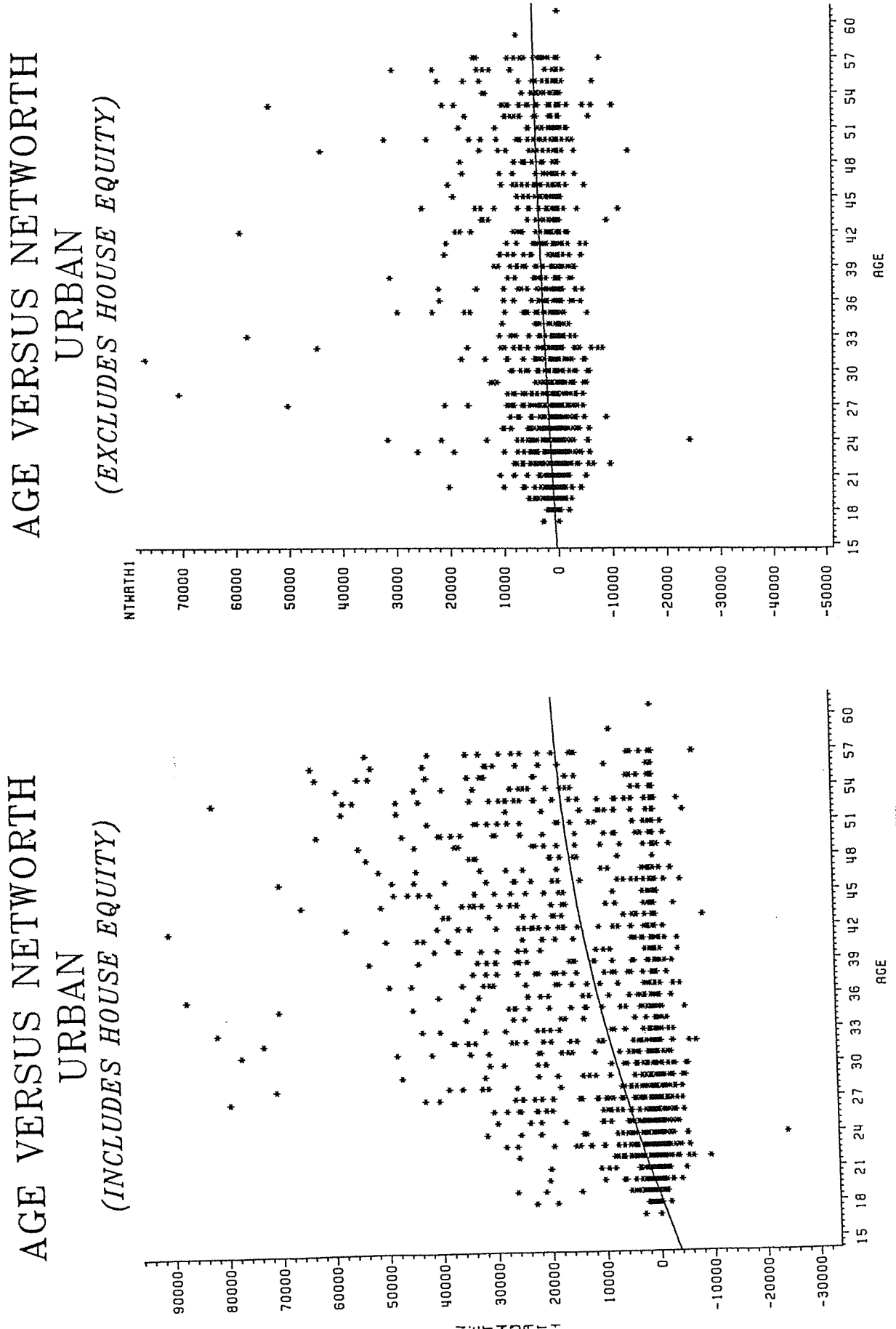
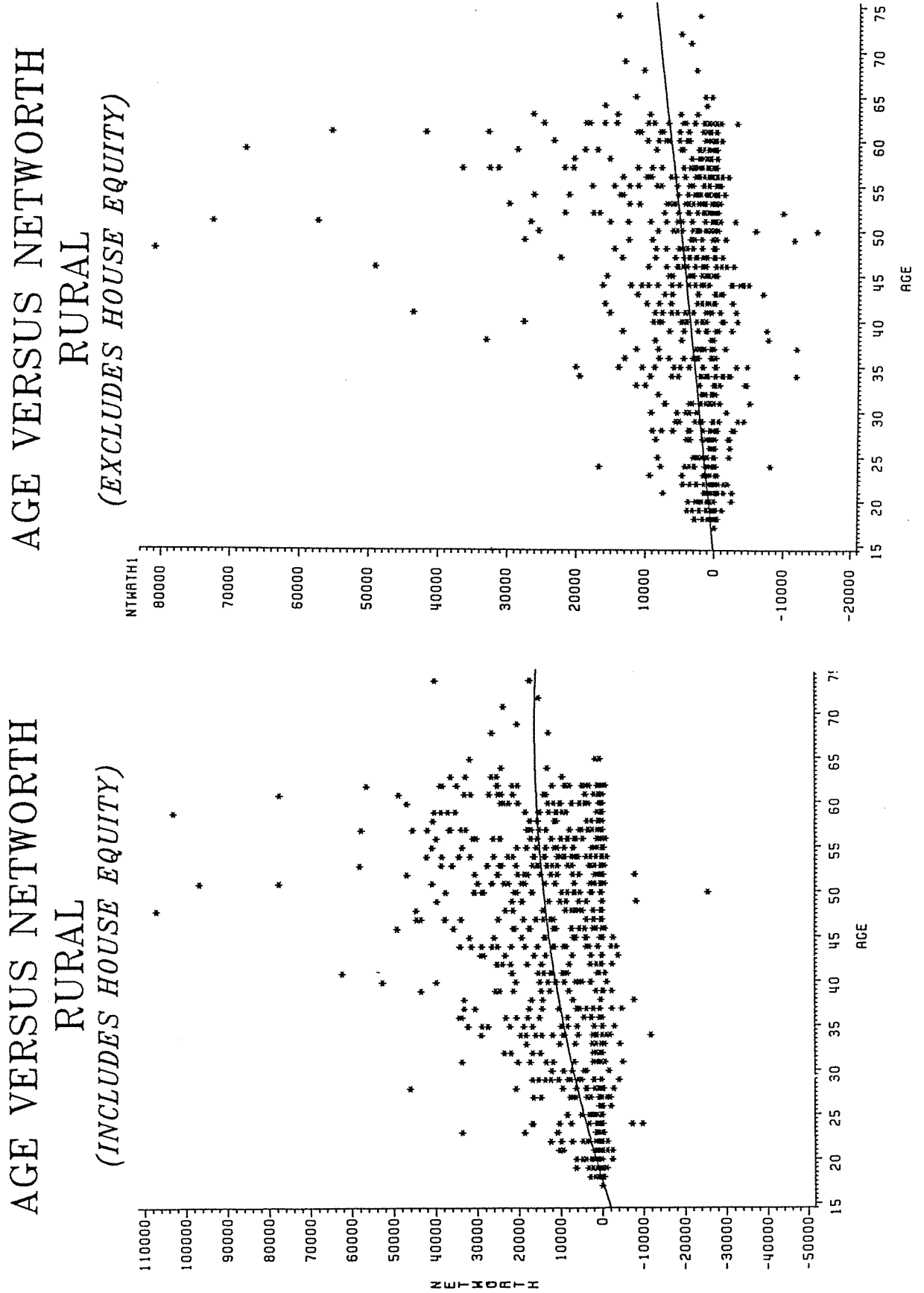


Figure 9



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