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9 Year-Apart Estimates of Household Net Worth from the Survey of Income and Program Participation

John M. McNeil and Enrique J. Lamas

9.1 Introduction

The difficulty of collecting accurate data on wealth in a household survey has long been recognized. The modern history of wealth surveys began with a 1946 survey sponsored by the Federal Reserve Board (FRB) and continued with the annual surveys of consumer finances conducted by the Survey Research Center at the University of Michigan during the period 1947–70. In the 1960–61 Survey of Consumer Expeditures, sponsored by the Bureau of Labor Statistics (BLS), data on assets and liabilities were collected one year apart, enabling the BLS to calculate the net change in assets and liabilities. In 1963 and 1964, the FRB sponsored what might be viewed as the most ambitious effort ever to obtain wealth and saving estimates from a household survey. The 1963 survey collected very detailed asset and liability data from a sample of approximately 2,500 households (Projector and Weiss 1966). The households were visited again one year later to obtain the data that were used in producing estimates of household saving (Projector 1968). A special feature of the 1963–64 survey was a design that sampled high-income households at a higher rate than other households. Other household surveys that collected a significant amount of data on household wealth included the FRB's 1977 Consumer Credit Survey (Durkin and Elliehausen 1978), the 1979

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Survey of the President's Commission on Pension Policy (Cartwright and Friedland 1985), and the 1979 Income and Survey Development Program (Pearl and Frankel 1982; Radner 1984).

More recently, data from two major wealth surveys have received a considerable amount of attention. The 1983 Survey of Consumer Finances (SCF) was conducted by the University of Michigan's Survey Research Center and was sponsored by several federal agencies, including the Federal Reserve Board. The survey collected data from a basic representative sample of about 3,800 families and from a special high-income sample of 438 families. Estimates are available from a sampling frame that excludes the high-income families and from a frame that includes them (Avery et al. 1984a, 1984b; Avery and Elliehausen 1986). The survey received a good deal of attention when the results were used to estimate the change in wealth inequality (Joint Economic Committee 1986). The second major survey was the Survey of Income and Program Participation (SIPP). SIPP is an ongoing panel survey sponsored by the Bureau of the Census. Each panel remains in sample for two and a half years, and interviews are conducted every four months. The source of the data for the SIPP wealth report was the asset and liability questions that were asked in the fourth wave of the 1984 panel.[1] The interviews were conducted during the period September–December 1984, and the sample of 20,000 households was the largest for any survey containing a detailed set of wealth questions. SIPP wealth data have been presented in a report and in several papers (U.S. Bureau of the Census 1986; Lamas and McNeil 1984, 1985, 1986).

The design of the first four panels of SIPP calls for the collection of wealth data twice each panel. The same questions that were asked in wave 4 of the 1984 panel were repeated one year later in wave 7. This design allows us to examine changes in net worth over a one-year period. The major purpose of this paper is to present the wave 4 and wave 7 estimates and to offer some conclusions about what the comparisons show about the reliability of the estimates.

Asset and liability data are collected in SIPP because a certain amount of asset data is required to determine program eligibility, because such information makes the SIPP data base more useful to those who want to model the effect of tax and transfer policies, and because net worth provides a dimension of economic status that is not fully captured by income. The design of the asset questions is based on the core questions about income recipiency. In some sense, the marginal cost of SIPP asset questions is small because the ownership of various categories of assets is established in the core of each wave as part of the method of measuring income. Information about the value of certain major assets is collected as a composite amount. For example, the amount held in the following four forms is collected as a single figure: regular

savings accounts, money-market deposit accounts, certificates of deposit, and interest-earning checking accounts. Another single-amount question is asked about four other assets: money-market funds, U.S. government securities, municipal or corporate bonds, and other interest-earning assets, excluding mortgages and U.S. savings bonds. The assets are grouped in this way to measure income, and the grouping is maintained to minimize the cost of the additional questions about asset value. For other assets, amounts were collected for each type, including stocks and mutual fund shares, own home, rental property, other real estate, mortgages held from the sale of property, regular checking accounts, U.S. savings bonds, and other financial assets.

The major asset categories not covered in SIPP are pension plan assets, cash surrender value of life insurance, and consumer durables other than vehicles. SIPP does collect information on whether persons are covered by or vested in a pension plan and information on the face value and type of life insurance policies.

The next section compares SIPP and SCF estimates of net worth. The third section compares SIPP net worth estimates from waves 4 and 7. The fourth section compares SIPP estimates with those from the flow-of funds-accounts (FFAs). The fifth section examines the change in SIPP net worth at the individual household level. The sixth section fits a saving model to the SIPP data. The seventh and final section responds to several points raised by the discussant, Martin H. David.

9.2 Comparison of SIPP and SCF Estimates of Net Worth

Because the 1983 SCF was designed as a wealth survey, it provides a useful reference for examining some of the basic wealth estimates from SIPP. There are minor differences between SIPP and SCF in the timing of the survey (SIPP interviews were conducted from September to December 1984 and SCF interviews from February to July 1983) and in the coverage of the household population (SCF did not obtain data for secondary unrelated individuals or for unrelated subfamilies). The major differences have to do with the amount of detail collected and, perhaps most important, with the availability of a high-income sample for the SCF. The comparisons in table 9.1 distinguish between SCF estimates based on the representative sample and those based on the merged sample. The SCF representative sample was selected in approximately the same manner as the SIPP sample was. The SCF merged sample combines the high-income sample with the representative sample. The comparisons in table 9.1 show SCF data as published in the *Federal Reserve Bulletin* as well as revised estimates (Avery and Elliehausen 1986). The revisions essentially reflect the correction of a very large error on a single questionnaire.

Table 9.1 Comparisons of SIPP and SCF Estimates of Net Worth (in dollars)

Net Worth	SCF before Revision[a]		SCF after Revision[b]		SIPP
	Representative Sample	Merged Sample	Representative Sample	Merged Sample	
Excluding equity in motor vehicle and own business:					
Mean	66,050	N.A.	N.A.	N.A.	65,801
Median	24,574	N.A.	N.A.	N.A.	N.A.
Including equity in motor vehicles and own business:					
Mean	N.A.	133,502	103,463	119,898	78,574
Median	N.A.	30,553	N.A.	N.A.	32,455

Note: The SCF estimates include forms of wealth not included in the SIPP estimates, including the cash value of life insurance and the value of employer-sponsored thrift, profit-sharing, stock option, and tax-deferred savings plans. In addition, the SCF and the SIPP differ in their measures of business equity. The SCF estimate includes equity in nonpublic businesses in which the person had no management responsibilities. The SIPP questionnaire had no specific questions on such arrangements and probably did not count most of the wealth held in this form. N.A. = not available.

[a]From the September and December 1984 *Federal Reserve Bulletin.*

[b]Obtained from the Federal Reserve Board.

The first row in table 9.1 shows mean net worth when motor vehicle and business equity are excluded. This is a measure of net worth that was published in the *Federal Reserve Bulletin,* and we have chosen to show it here because it offers an opportunity to examine the effect of business equity on the SIPP and SCF estimates. The SIPP and SCF estimates shown in the first row are very close. The second row is based on a more comprehensive measure of net worth and shows the following. (1) The SCF merged sample estimate of mean net worth is much higher than the SCF representative sample estimate (about 16 percent higher). (2) The SCF revision had a large effect on the estimate of net worth (it lowered the estimate of the mean by about 11 percent and the estimate of total net worth by about $1.1 trillion). (3) When business equity is included, the SIPP estimate of mean net worth is much lower than the SCF figures, but the SIPP estimate of median net worth is higher than the SCF estimate even when the comparison is with the SCF estimate that would be expected to produce the highest figure (the merged sample before revision).

Judged on the basis of a comparison of medians, the SIPP wealth estimates are clearly no worse than the SCF estimates and might be considered slightly better. This conclusion is reinforced when one con-

siders that the SCF estimates include forms of wealth that are not included in the SIPP estimates.[2] A comparison of means seems to show a much different result, but the measurement issues are complex, and the comparison must be approached with caution. Two major measurement issues are the stability of measures of business equity and the effect of including 438 high-income families in the SCF sample. Table 9.1 shows that the SIPP and SCF estimates of mean net worth are virtually identical when equity in own business is excluded from the net worth measure and when the SCF estimate is based on the representative sample (the SIPP estimate was $65,801 and the SCF estimate $66,050). When business equity is included, the difference between the SIPP and SCF estimates becomes sizable. The SIPP estimate of mean net worth when business equity is included is $78,574, and the SCF revised estimate based on the representative sample is $103,463. The SCF revised estimate rises to $119,898 when it is based on the merged sample.

The data in table 9.1 show that relatively high SCF estimates of business equity and the addition of 438 high-income families to the SCF sample result in SCF estimates of mean net worth that are substantially above the SIPP estimates. Does this mean that the SCF estimates are superior to the SIPP estimates? The proper answer to this question is that the choice of the data set depends on the intended use of the data. Because of its larger sample size, and because it produces an estimate of median net worth that is slightly higher than any SCF estimate, it seems reasonable to select the SIPP data set when comparing the wealth status of various subgroups of the population. The dramatic effect a single questionnaire can have on mean values makes it prudent to use medians rather than means when making comparisons among demographic, social, or ethnic groups. In fact, the very large effect of "outliers" raises questions about any analysis that depends on means or aggregates. Curtin, Juster, and Morgan (chap. 10, in this vol.) describe the problems of "outliers" and cite three cases in the SCF sample and one case in the SIPP sample. The first SCF case they cite is the case that led to the major revision in the SCF estimates. An entry of $200,000,000 was subsequently changed to $2,000,000 on the basis of information obtained in 1986. The original value, when weighted, had accounted for approximately 10 percent of U.S. household wealth. Curtin, Juster, and Morgan also cite an SCF case in which reported net worth was about $1 billion. This case was not included in the final SCF sample because of a lack of information on income, but its inclusion would have approximately doubled the SCF estimate of total U.S. household wealth. The SIPP case involved a questionnaire showing a business equity of $50,000,000. This case was not included in the final SIPP file because the 1984 wealth data appeared to be inconsistent with

other data obtained for this household, including information on wealth holdings in 1985.

The message for data users is that household survey estimates of aggregate and mean wealth are potentially highly unstable. We advise caution when using either the SCF or the SIPP if conclusions are to be based primarily on cross-section or time-series differences in aggregate or mean wealth.

We do regard household survey estimates of median wealth as useful and valid. This judgment is based on comparisons of medians between SIPP and SCF and between the SIPP estimates from the wave 4 and 7 interviews.

9.3 Comparison of SIPP Net Worth Estimates from Wave 4 and Wave 7

Tables 9.2 and 9.3 provide basic estimates of median, mean, and aggregate household net worth for both wave 4 and wave 7. The data have been weighted to represent all U.S. households. The wave 7 figures have been adjusted by the change in the consumer price index to allow for a constant dollar comparison. Over the twelve-month period, the estimates show a $818 decline in household median net worth (from $32,455 to $31,637), a $34 decline in mean net worth (from $78,574 to $78,540), and a $121 billion dollar increase in aggregate net worth (from $6.825 trillion to $6.946 trillion). These estimates of change, however, are not statistically significant.

When comparing net worth estimates, either in the cross section or over time, both sampling and nonsampling errors must be taken into consideration. The standard errors for each of the net worth estimates in table 9.2 are shown in parentheses. For the population subgroups shown in the table, the relatively large sample size of SIPP produces standard errors small enough so that it is possible to identify those race, age, family-type, and income groups with relatively high or low levels of net worth. The data also show a certain stability in the net worth estimates between wave 4 and wave 7. For example, consider the following ratios of median net worth: the white to black ratio was twelve to one in both wave 4 and wave 7; the old to young (sixty-five and over to under thirty-five) ratio was eleven to one in both waves; the married-couple family to female householder family ratio was nine to one in wave 4 and eleven to one in wave 7; and the highest-income quintile to lowest-income quintile ratio was about twenty to one in both wave 4 and wave 7. Table 9.2 shows very few statistically significant year-to-year changes in net worth. The three changes that were significant at the 95 percent confidence level are marked with a single asterisk, and the one change that was significant at the 90 percent

Table 9.2 **Median and Mean Household Net Worth by Selected Household Characteristics: Wave 4 and Wave 7 (in constant dollars, with standard errors in parentheses)**

Characteristic	Median Net Worth			Mean Net Worth		
	Wave 4	Wave 7	Wave 7 Minus Wave 4	Wave 4	Wave 7	Wave 7 Minus Wave 4
All households	32,455	31,637	−818	78,574	78,540	−34
	(685)	(677)		(1,951)	(1,747)	
Race and Hispanic origin:						
White	38,915	37,472	−1,443**	86,153	86,068	−85
	(798)	(716)		(2,222)	(1,984)	
Black	3,342	3,241	−101	20,180	21,292	1,112
	(247)	(312)		(1,009)	(1,360)	
Hispanic origin	4,871	4,573	−298	35,827	33,917	−1,910
	(936)	(806)		(3,626)	(3,976)	
Age of householder:						
Under 35 years	5,622	5,129	−493	22,548	21,575	−973
	(303)	(284)		(1,076)	(892)	
35–44 years	35,311	34,507	−804	68,555	73,454	4,899
	(1,344)	(1,184)		(2,528)	(4,034)	
45–54 years	56,461	51,431	−5,030*	114,491	98,046	−16,445*
	(1,764)	(1,965)		(8,268)	(5,705)	
55–64 years	73,454	70,455	−2,999	132,279	129,686	−2,593
	(2,006)	(2,044)		(5,536)	(5,668)	
65 years and over	60,061	58,145	−1,916	104,596	112,773	8,177
	(1,629)	(1,828)		(5,239)	(4,203)	

(continued)

Table 9.2 (continued)

Characteristic	Median Net Worth			Mean Net Worth		
	Wave 4	Wave 7	Wave 7 Minus Wave 4	Wave 4	Wave 7	Wave 7 Minus Wave 4
Type of household:						
Family:	40,653	39,647	−1,006	90,319	90,394	75
	(904)	(874)		(2,603)	(2,301)	
Married couple	49,715	48,599	−1,116	101,689	102,523	834
	(1,076)	(1,017)		(3,166)	(2,796)	
Female householder	5,620	4,522	−1,098	37,379	35,424	−1,955
	(841)	(839)		(2,117)	(2,201)	
Male householder	20,269	22,537	2,268	66,960	62,711	−4,249
	(3,351)	(3,385)		(8,097)	(6,171)	
Nonfamily	14,295	13,650	−645	47,820	48,104	284
	(1,032)	(928)		(1,740)	(1,897)	
Income quintile:[a]						
Lowest	4,119	3,916	−203	27,802	27,899	97
	(618)	(573)		(1,273)	(1,481)	
Second lowest	18,692	17,171	−1,521	46,499	43,813	−2,686
	(1,370)	(1,616)		(1,593)	(1,807)	
Middle	24,695	24,673	−22	53,672	59,307	5,635*
	(1,364)	(1,423)		(1,674)	(2,493)	
Second highest	39,262	37,934	−1,328	72,263	72,895	632
	(1,403)	(1,322)		(2,197)	(2,055)	
Highest	82,199	84,118	1,919	173,432	177,128	3,696
	(1,941)	(1,970)		(7,840)	(6,941)	

[a]Income quintile groups are approximate.

*Change is statistically significant at the 95 percent confidence level.

**Change is statistically significant at the 90 percent confidence level.

Table 9.3 **Number of Households and Aggregate Household Net Worth: Wave 4 and Wave 7**

Characteristic	Number of Households (in thousands)		Aggregate Net Worth (in billions of constant dollars)		
	Wave 4	Wave 7	Wave 4	Wave 7	Wave 7 Minus Wave 4
All households	86,871	88,443	6,825.8	6,946.3	120.5
Race and Hispanic origin:					
White	75,419	76,629	6,497.6	6,595.3	97.7
Black	9,515	9,862	192.0	210.0	18.0
Hispanic origin	4,173	4,339	149.5	147.2	−2.3
Age of householder:					
Under 35 years	25,788	25,742	581.5	555.4	−26.1
35–44 years	17,404	18,162	1,193.1	1,334.1	141.0
45–54 years	12,605	12,838	1,443.2	1,258.7	−184.5
55–64 years	12,924	13,191	1,709.6	1,710.7	1.1
65 years and over	18,151	18,510	1,898.5	2,087.4	188.9
Type of household:					
Family:	62,864	63,651	5,677.8	5,753.7	75.9
Married couple	50,690	51,168	5,154.6	5,245.9	91.3
Female householder	9,861	10,081	368.3	357.1	−11.2
Male householder	2,312	2,402	154.8	150.6	−4.2
Nonfamily	24,008	24,792	1,148.1	1,192.6	44.5
Income quintile:					
Lowest	17,374	17,689	483.0	493.5	10.5
Second lowest	17,374	17,689	807.9	775.0	−32.9
Middle	17,374	17,689	932.5	1,049.1	116.6
Second highest	17,374	17,689	1,255.5	1,289.4	33.9
Highest	17,374	17,689	3,013.2	3,133.2	120.0

confidence level is marked with a double asterisk. As we examine the data more closely, we are likely to conclude that these "significant changes" probably reflect measurement problems.

Sampling error becomes more important as the base of the estimate declines. Table 9.4 shows the mean net worth of households by income quintile cross-classified by household type and age of householder for both wave 4 and wave 7. The data show a positive relation between income and wealth for most types of households by age groups, and there is evidence that net worth increases with age for most types of households by income groups, but the standard errors for most of the cells are very large. Many of the cross-section comparisons have to be carefully qualified, and little can be said about year-to-year changes.

Table 9.4 **Mean Net Worth by Type of Household and Income Quintile: Wave 4 and Wave 7 (in constant dollars, with standard errors in parentheses)**

Type of Household, Age of Householder, and SIPP Wave	All Income Levels	Income Quintile				
		Lowest	Second Lowest	Middle	Second Highest	Highest
Married couple:						
Wave 4	$101,689	52,326	54,407	59,266	74,669	183,238
	(3,166)	(4,731)	(2,706)	(2,214)	(2,557)	(9,206)
Wave 7	102,523	42,484	53,781	67,196	75,648	184,779
	(2,796)	(4,056)	(3,491)	(3,405)	(2,434)	(7,945)
Under 35 years:						
Wave 4	30,343	18,504	13,997	19,939	27,178	61,909
	(1,553)	(6,679)	(2,125)	(1,661)	(2,081)	(5,321)
Wave 7	30,845	9,048	13,462	19,123	27,807	67,126
	(1,449)	(2,189)	(1,549)	(1,703)	(1,960)	(5,119)
35–54 years:						
Wave 4	107,213	68,563	51,441	53,402	67,944	163,256
	(5,352)	(11,340)	(7,777)	(3,820)	(3,720)	(11,296)
Wave 7	104,605	55,721	56,133	52,459	67,026	163,372
	(4,740)	(11,108)	(9,964)	(4,231)	(3,540)	(10,230)
55–64 years:						
Wave 4	164,271	77,528	90,780	89,917	115,849	287,941
	(7,997)	(12,771)	(9,330)	(5,534)	(6,993)	(20,506)
Wave 7	161,462	77,445	93,918	109,482	114,293	269,943
	(8,333)	(12,378)	(13,028)	(12,458)	(6,078)	(21,011)
65 years and over:						
Wave 4	146,699	50,881	74,359	119,440	185,849	436,525
	(11,295)	(6,698)	(3,167)	(6,621)	(10,948)	(80,775)
Wave 7	160,444	38,489	69,950	137,733	199,255	455,827
	(8,454)	(3,825)	(3,438)	(10,177)	(10,201)	(47,729)
Female householder:						
Wave 4	44,781	21,652	42,310	51,090	78,570	143,098
	(1,502)	(1,038)	(1,970)	(3,138)	(6,012)	(15,652)
Wave 7	44,442	21,865	38,717	53,408	79,410	149,102
	(1,540)	(1,148)	(2,133)	(3,264)	(5,865)	(17,361)
Under 35 years:						
Wave 4	8,865	2,698	6,639	9,508	16,480	41,907
	(1,421)	(1,009)	(1,093)	(1,261)	(2,745)	(19,577)
Wave 7	8,074	2,157	5,555	9,443	17,839	42,211
	(1,081)	(754)	(836)	(1,384)	(3,252)	(16,067)

Table 9.4 (continued)

Type of Household, Age of Householder, and SIPP Wave	All Income Levels	Income Quintile				
		Lowest	Second Lowest	Middle	Second Highest	Highest
35–54 years:						
Wave 4	41,054	12,934	25,616	39,045	63,799	137,549
	(2,954)	(1,804)	(3,411)	(3,843)	(7,798)	(22,561)
Wave 7	32,975	8,440	23,480	39,123	47,624	94,722
	(2,111)	(1,344)	(3,512)	(4,028)	(5,272)	(14,152)
55–64 years:						
Wave 4	67,726	30,547	64,733	74,896	107,080	176,998
	(4,725)	(3,487)	(6,932)	(9,694)	(18,844)	(31,822)
Wave 7	70,392	26,678	53,355	90,437	113,190	239,248
	(5,107)	(2,928)	(6,487)	(9,544)	(14,247)	(46,158)
65 years and over:						
Wave 4	67,511	33,161	75,057	116,133	190,602	286,882
	(2,910)	(1,737)	(3,248)	(8,692)	(16,975)	(52,578)
Wave 7	71,619	35,576	77,999	116,539	197,768	336,788
	(3,377)	(2,091)	(4,625)	(9,401)	(19,412)	(62,715)
Male householder:						
Wave 4	48,835	19,132	33,966	36,356	49,684	133,977
	(2,853)	(1,943)	(3,683)	(4,095)	(5,940)	(14,209)
Wave 7	47,788	29,538	30,166	40,212	49,077	125,592
	(3,007)	(5,080)	(2,562)	(6,926)	(4,505)	(15,039)
Under 35 years:						
Wave 4	18,924	6,283	9,360	14,509	18,625	63,377
	(2,648)	(1,827)	(1,903)	(3,469)	(3,223)	(16,999)
Wave 7	13,737	8,640	5,361	12,096	17,840	37,987
	(1,349)	(2,383)	(1,136)	(1,371)	(2,789)	(8,995)
35–54 years:						
Wave 4	53,838	16,348	34,035	38,495	47,777	117,638
	(5,214)	(4,313)	(6,784)	(8,767)	(8,296)	(17,735)
Wave 7	52,456	32,055	34,564	51,858	46,991	98,354
	(6,330)	(10,215)	(5,818)	(19,814)	(5,238)	(19,657)
55–64 years:						
Wave 4	85,694	28,144	65,020	58,368	135,394	195,686
	(11,059)	(6,846)	(13,630)	(11,309)	(49,255)	(38,220)
Wave 7	82,483	41,447	42,773	66,086	101,327	205,365
	(10,777)	(17,038)	(8,053)	(17,669)	(26,111)	(39,769)
65 years and over:						
Wave 4	90,067	30,438	68,667	116,933	138,529	509,985
	(9,282)	(3,676)	(11,618)	(17,221)	(21,088)	(91,559)
Wave 7	93,830	42,082	68,106	101,944	179,205	525,739
	(9,589)	(11,225)	(6,811)	(11,389)	(27,227)	(88,702)

Nonsampling errors in the form of reporting errors and nonresponse may be more important than sampling errors. Reporting errors can have a very large effect on estimates, and it is difficult to determine when a serious reporting error has occurred. The controversy surrounding the Joint Economic Committee's report on changes in wealth inequality underlines the dramatic effect a single observation can have on estimates of mean and aggregate net worth. Every household survey faces this problem, and in wave 4 of SIPP we encountered a case that we considered a problem case. One of the sample households in that wave reported a business equity of $50,000,000. A review of the other entries on the questionnaire raised doubts about the accuracy of that figure, but the evidence was not conclusive. We decided to wait until we could examine the responses to the wave 7 questionnaire before making a final decision on the value to adopt for wave 4. The wave 7 responses convinced us that the wave 4 data were incorrect, and the final value adopted for wave 4 was set equal to the wave 7 response: $2,000,000. Given that the household weight was about 6,500, the decision reduced the potential wave 4 estimate of total business equity by approximately $300 billion.

There is a particular kind of reporting error that is frequently important in panel surveys. The error, called time-in-sample bias, is present in Current Population Survey rotation group estimates of income and labor force activity and may very well be present in SIPP estimates. Whether this type of error has a serious effect on SIPP estimates of year-to-year change in net worth can be examined as data from the 1985 and other panels become available.

The problems of noninterviews and nonresponse can be serious for household surveys. Noninterviews occur when a person or household refuses to participate in the survey or when the person or household cannot be located in order to conduct an interview. Approximately 11 percent of the households eligible for the first wave interview were noninterviews in wave 4. The figure was about 17 percent in wave 7. These noninterview rates compare favorably to the rates in other wealth surveys. Nonresponse occurs when a respondent does not know the answer to a question, and questions about the value of assets and debts are difficult to answer in the setting of a relatively brief household interview. The problem is compounded when interviews are conducted with proxy respondents, and the SIPP survey design allows for the interview to be conducted with a "knowledgeable" relative if the sample person is not available at the time of the household interview. Nonresponse also occurs when a respondent refuses to answer a question. This is relatively rare in SIPP, but some of the "don't know" responses may, in fact, be polite refusals. When SIPP questionnaires are processed, missing information is imputed using a procedure that

searches for a donor with similar characteristics and then sets the missing value equal to the value reported in the questionnaire of the donor. It is important to realize that the wave 4 and wave 7 data were processed independently. Except for the single case described above, we did not use information from one wave to fill in missing information or modify responses in the other wave. The importance of this feature of the processing system will become apparent later, when we examine estimates for matched households.

Table 9.5 shows the proportion of total value that was imputed for selected assets. In wave 4, imputations accounted for nearly 40 percent of the value of stocks and mutual fund shares and the value of own businesses. About 30 percent of the value of rental property was imputed and about 20 percent of the wealth held in own homes, other real estate, and individual retirement accounts (IRAs). The wave 7 imputation rates were generally similar except for a large increase in the amount of imputation for the value of own business. The rate was approximately 50 percent in wave 7.

In order to test the theory that knowledge of their earlier response would lead respondents to give improved estimates of change, information about wave 4 responses was given to half the sample at the time of the wave 7 interview. This feedback procedure was similar to the procedure used in the 1964 FRB survey (Projector 1968). Tables 9.6 and 9.7 show median and mean net worth figures by whether the household was in or out of the feedback sample. When the various subgroups are examined, it is difficult to discern any regular effect of the feedback procedure. For example, among the fifty-five- to sixty-four-years-of-age group, those in the feedback sample reported a smaller change than did those in the nonfeedback group, but the relation was reversed for the sixty-five years and over age group.

The comparison of wave 4 with wave 7 shows a certain stability in the basic relations. The net worth data in table 9.8 illustrate this stability, and the comparison with the income data shows that net worth data are an important addition to our usual set of income tables. Black

Table 9.5 **Sum of Imputed Values as a Percentage of Total Values: Selected Assets**

Asset	Wave 4	Wave 7
Stocks and mutual fund shares	38.3	39.0
Own business	38.7	49.9
Own home	18.7	16.8
Rental property	28.9	27.8
Other real estate	18.6	14.9
IRAs	18.3	19.2

Table 9.6 **Median Household Net Worth in Wave 4 and Wave 7 by Whether Household Was in Feedback Sample in Wave 7 (in constant dollars)**

Characteristic	In Feedback Sample in Wave 7			Not in Feedback Sample in Wave 7		
	Wave 4	Wave 7	Wave 7 Minus Wave 4	Wave 4	Wave 7	Wave 7 Minus Wave 4
All households	32,944	32,357	−587	32,048	30,890	−1,158
Race and Hispanic origin:						
White	39,268	37,557	−1,711	38,533	37,388	−1,145
Black	3,661	3,418	−243	3,112	3,137	25
Hispanic origin	7,477	7,863	386	2,926	2,963	37
Age of householder:						
Under 35 years	5,719	5,516	−203	5,544	4,781	−763
35–44 years	34,389	33,279	−1,110	36,044	35,647	−370
45–54 years	55,166	49,881	−5,285	57,457	52,450	−5,007
55–64 years	73,065	72,658	−407	73,901	67,298	−6,603
65 years and over	62,763	59,019	−3,744	57,427	57,280	−147
Type of household:						
Family:	40,800	39,694	−1,106	40,523	39,597	−926
Married couple	49,273	46,916	−2,357	50,121	50,076	−45
Female householder	6,041	5,941	−100	5,350	4,105	−1,245
Male householder	19,612	22,031	2,419	20,718	22,769	2,051
Nonfamily	15,996	14,977	−1,019	12,702	11,620	−1,082
Income quintile:[a]						
Lowest	4,380	4,738	358	3,932	3,271	−661
Second lowest	20,083	20,602	519	17,393	13,987	−3,406
Middle	26,278	24,580	−1,698	23,192	24,720	1,528
Second highest	37,706	35,700	−2,006	40,588	40,015	−573
Highest	85,008	86,170	1,162	80,078	82,346	2,268

[a]Income groups are approximate.

households, for example, receive about 7 percent of aggregate income but own only 3 percent of total net worth. On the other hand, families with a householder sixty-five and over received about 13 percent of total income and owned about 30 percent of total net worth. When we examine year-to-year changes in net worth, the results are less encouraging. Among most population subgroups, the change in net worth was not statistically significant. Perhaps more important, those changes that passed the test of statistical significance seem more likely to reflect measurement problems than real economic change. It is difficult to understand, for example, why households with a householder forty-

Table 9.7 **Mean Household Net Worth in Wave 4 and Wave 7 by Whether Household Was in Feedback Sample in Wave 7 (in constant dollars)**

Characteristic	In Feedback Sample in Wave 7			Not in Feedback Sample in Wave 7		
	Wave 4	Wave 7	Wave 7 Minus Wave 4	Wave 4	Wave 7	Wave 7 Minus Wave 4
All households	80,025	79,161	−864	77,223	77,964	741
Race and Hispanic origin:						
White	87,573	86,059	−1,514	84,834	86,075	1,241
Black	19,945	24,609	4,664	20,397	18,383	−2,014
Hispanic origin	35,982	39,320	3,338	35,662	28,128	−7,534
Age of householder:						
Under 35 years	22,247	22,683	436	22,832	20,565	−2,267
35–44 years	65,930	66,245	315	70,793	79,674	8,881
45–54 years	118,462	103,397	−15,065	110,883	93,274	−17,609
55–64 years	130,773	127,859	−2,914	133,770	131,494	−2,276
65 years and over	111,240	115,478	4,238	98,155	110,075	11,920
Type of household:						
Family:	93,241	91,068	−2,173	87,646	89,784	2,138
Married couple	104,257	102,039	−2,218	99,319	102,969	3,650
Female householder	39,338	38,912	−426	35,591	32,479	−3,112
Male householder	76,000	65,141	−10,859	59,083	60,673	1,590
Nonfamily	46,549	49,895	3,346	49,060	46,341	−2,719
Income quintile:[a]						
Lowest	26,100	29,552	3,452	29,449	26,233	−3,216
Second lowest	45,171	43,717	−1,454	47,766	43,904	−3,862
Middle	54,167	58,362	4,195	53,214	60,150	6,936
Second highest	71,064	70,406	−658	73,317	75,065	1,748
Highest	185,715	182,931	−2,784	165,794	171,703	5,909

[a]Income groups are approximate.

five to fifty-four years of age should have experienced a 9 percent drop in median net worth during a twelve-month period.

9.4 Comparison with FFA Estimates

The categories used to collect asset data in SIPP, along with information about the number of owners and the values of the assets, are shown in table 9.9. The wave 4 and wave 7 data are generally similar, although there is some suggestion of a decline in asset ownership (most of the changes in the ownership rate for individual assets were not

Table 9.8 **Percentage Distribution of Aggregate Income and Aggregate Net Worth among Selected Household Groups: Wave 4 and Wave 7**

Characteristic	Aggregate Income		Aggregate Net Worth	
	Wave 4	Wave 7	Wave 4	Wave 7
All households	100.0	100.0	100.0	100.0
Race and Hispanic origin:				
White	90.5	90.1	95.2	94.9
Black	7.0	7.4	2.8	3.0
Hispanic origin	3.8	3.7	2.2	2.1
Age of householder:				
Under 35 years	26.1	24.8	8.5	8.0
35–44 years	24.4	24.6	17.5	19.2
45–54 years	19.3	18.8	21.1	18.1
55–64 years	16.9	18.0	25.0	24.6
65 years and over	13.2	13.7	27.8	30.1
Type of household:				
Family:	83.1	82.8	83.2	82.8
Married couple	73.2	73.1	75.5	75.5
Female householder	7.2	7.0	5.4	5.1
Male householder	2.7	2.7	2.3	2.2
Nonfamily	16.9	17.2	16.8	17.2
Income quintile:				
Lowest	4.1	4.0	6.7	6.8
Second lowest	9.9	9.8	11.5	10.6
Middle	15.8	15.3	12.7	14.2
Second highest	23.1	22.8	18.6	20.0
Highest	47.2	48.1	49.8	48.4

statistically significant, but in ten out of twelve asset categories the measured change was negative). The value of home equity was by far the largest asset category, accounting for nearly $3 trillion out of the aggregate net worth figure of approximately $7 trillion.

The SIPP asset categories are not directly comparable to the categories used by the FRB in their FFA estimates. First, SIPP does not cover all the assets that are included in the FFA estimates. We have mentioned that SIPP excludes pension wealth, the cash value of life insurance, and the value of consumer durables other than vehicles. Cash holdings should be added to the list. There is some ambiguity as to the coverage of estates and personal trusts. SIPP does not have specific questions on these assets, and it seems likely that most of this form of wealth is absent from the SIPP estimates. A second difference between SIPP and the FFAs is the inclusion of holdings of the nonprofit

Table 9.9 **Percentage of Households Owning and Mean and Aggregate Value (in constant dollars) of Asset by Type: Wave 4 and Wave 7**

Asset Type	Percentage of Households Owning		Mean Net Value of Asset		Aggregate Net Value of Asset (in billions of dollars)	
	Wave 4	Wave 7	Wave 4	Wave 7	Wave 4	Wave 7
Interest-earning assets at financial institutions[a]	71.8	71.2	15,806	15,788	985.3	993.4
Other interest-earning assets[b]	8.5	9.3	28,946	32,051	212.9	265.0
Regular checking accounts	53.9	52.8	922	865	43.2	40.4
Stocks and mutual fund shares[c]	20.0	19.8	26,834	29,762	466.8	521.9
Own business or profession[d]	12.9	12.5	63,012	59,731	705.5	660.4
Motor vehicles	85.5	84.8	5,442	5,099	404.0	382.6
Own home	64.3	64.1	50,475	51,692	2,818.6	2,932.3
Rental property	9.8	9.3	71,982	68,555	610.3	563.0
Other real estate	10.0	10.2	34,437	35,185	298.6	317.4
U.S. savings bonds	15.0	14.9	2,490	2,214	32.5	29.2
IRA or Keogh accounts	19.5	21.6	8,877	10,015	150.6	191.1
Other financial assets[e]	7.0	6.5	55,788	50,924	337.1	292.7
Addendum: Unsecured debt	67.1	61.5	4,123	4,493	240.5	244.5

[a]Includes passbook savings accounts, money-market deposit accounts, certificates of deposit, and interest-earning checking accounts.

[b]Includes money-market funds, U.S. government securities (other than savings bonds), municipal or corporate bonds, and other interest-earning assets (other than mortgages held).

[c]Excludes stock held in own company by self-employed persons.

[d]Includes value of corporate stock for persons employed by self-owned corporations. The value of this stock was $271.1 billion in wave 4 and $229.8 billion in wave 7. For purposes of comparisons with FFA data, these values should be added to "stocks and matched fund shares" and subtracted from "own business or profession."

[e]Includes mortgages held from sale of real estate, amount due from sale of business, unit trusts, and other financial investments.

sector in the latter accounts. A rough estimate of the 1984 assets of this sector was $530 billion. A third difference is population coverage; SIPP excludes the institutional and military populations. Finally, it should be noted that the FFA household-sector estimates are essentially the residuals that remain after allocations are made to other sectors and are not free from measurement error.

Table 9.10 compares SIPP and FFA estimates for 1984 by attempting to combine and adjust the categories where necessary. Two categories that are common are equity in own home and motor vehicle equity. The SIPP estimate of home equity is far greater than the FFA estimate ($2.8 trillion vs. $1.9 trillion). The SIPP estimate of $0.4 trillion for vehicle equity was slightly less than the FFA estimate of $0.5 trillion.

In order to compare holdings of financial assets, we must add together two categories from the FFA estimates—"deposits and credit market instruments" and "corporate equities"—shown in table 9.11, adjust this sum for personal trust and nonprofit-sector holdings, and compare the adjusted sum to the sum of certain SIPP categories.

The SIPP categories that make up the estimate of financial assets include stock and mutual fund shares, interest-earning assets, regular checking accounts, savings bonds, IRA and Keogh accounts, other financial assets, and the amount of corporate stock included in the SIPP category "own business or profession" (certain corporate stock is counted in this category because of the design of the questionnaire). Table 9.10 shows that the FFA estimate of financial assets was $3.4 trillion, compared to a SIPP estimate of $2.5 trillion. The final category to be compared is equity in noncorporate business. The FFA estimate for this category was $2.5 trillion. The SIPP estimate, obtained by

Table 9.10 **Comparison of SIPP and FFA Estimates of Household Wealth (in trillions of dollars)**

Category	SIPP (wave 4)	FFA (fourth quarter 1984)
1. Equity in own home	2.8	1.9
2. Equity in motor vehicles	.4	.5
3. Financial assets	2.5[a]	3.4[b]
4. Equity in noncorporate business	1.0[c]	2.5

[a]Sum of stock and mutual fund shares ($0.5 trillion), interest-earning assets ($1.2 trillion), regular checking accounts ($43 billion), savings bonds ($33 billion), value of IRA and Keogh accounts ($0.2 trillion), other financial assets ($0.3 trillion), and the amount of corporate stock included in the SIPP category of "own business or profession" ($0.3 trillion).

[b]Sum of deposits and credit market instruments ($3.3 trillion) and corporate equities ($1.5 trillion) less estimated value of estates and personal trusts ($0.9 trillion) and nonprofit sector assets ($0.5 trillion).

[c]Sum of equity in own business or profession ($0.8 trillion) less value of corporate stock included in this category ($0.3 trillion) plus equity in rental property ($0.6 trillion).

Table 9.11 **FFA Estimates of Household- and Nonprofit-Sector Net Worth: Fourth Quarter 1984 and Fourth Quarter 1985 (in constant dollars)**

Characteristic	Value of Asset or Liability (in billions)			Value of Asset or Liability per Household		
	1984	1985	Difference	1984	1985	Difference
A. Equity in own home	1,927.5	1,810.8	−116.7	22,188	20,474	−1,714
B. Equity in motor vehicles	473.3	511.8	38.5	5,448	5,787	339
C. Deposits and credit market instruments[a]	3,321.0	3,557.9	236.9	38,229	40,228	1,999
D. Corporate equities[a]	1,493.0	1,880.7	387.7	17,186	21,265	4,079
E. Equity in noncorporate business[a]	2,510.8	2,396.0	−114.8	28,903	27.091	−1,812
F. Consumer debt, excluding mortgages and automobile debt[a]	512.4	571.0	58.6	5,898	6,456	558
G. Sum of A–E minus F	9,213.2	9,586.2	373.0	106,056	108,388	2,332
Addendum: Pension fund reserves	1,435.3	1,659.0	223.7	16,522	18,758	2,236

[a]Includes amounts held in personal trusts and by nonprofit organizations.

adding together own business or profession (less the corporate stock included in this category) and equity in rental property, was $1.0 trillion.

If the FFA estimates are taken at face value, it would appear that SIPP seriously underestimates wealth held in the form of financial assets and business equity and seriously overestimates wealth held in the form of home equity. On the basis of comparisons with other household survey estimates of home equity and of validation studies of survey estimates of home value (Wolters and Woltman 1974), we think it unlikely that the SIPP estimate of home equity is seriously biased. We conclude that the FFA estimate of home equity is not a good reference figure. Validation studies of survey estimates of financial assets show that the failure to report ownership of financial assets is a serious problem (Ferber et al. 1968, 1969), and the evidence seems strong that the SIPP estimates of holdings in the form of financial assets have a serious downward bias. Finally, the SIPP estimate of business equity is well below the FFA estimate. Again, it seems likely that the SIPP estimate has a serious downward bias, but a definitive conclusion could be reached only after some form of validation study.

The above comparison leaves out the SIPP category "other real estate" (about $0.3 trillion). Some of the assets in this category are vacation homes; some probably belong in the "own business" category.

9.5 Changes in Net Worth at the Individual Household Level

The discussion thus far has been concerned with the comparison between cross-section estimates. Because SIPP is a panel survey, it is possible to measure changes in net worth at the individual household level. In order to do so, we began with households as they existed on the wave 7 file and matched back to the wave 4 file. We considered a match to exist if the householder in the wave 7 household was present as a householder or spouse of householder in the wave 4 file. We classified the matched household as "having no change in composition" if each wave 7 adult was present in the wave 4 household and each wave 4 adult was present in the wave 7 household. The "matched household" file produces estimates that are not strictly comparable to the wave 4 and wave 7 files taken separately. Some households were not present in wave 7 because of a sample cut that occurred between the two waves.

In interpreting these matched results shown in tables 9.12 and 9.13, it should be remembered that the imputation procedures used for wave 4 and wave 7 were independent. The imputation procedures give cross-section results that are reasonable, but the estimates of change produced by two independent procedures cannot be expected to be reasonable.

Table 9.12 **Matched Households: Change in Net Worth From Wave 4 to Wave 7 by Imputation Status and by Change in Composition Status of the Household (in current dollars)**

Characteristic	Number	Percentage with Specified Change in Net Worth from Wave 4 to Wave 7							Mean Difference between Wave 4 and Wave 7 ($)
		Decrease			Decrease or Increase: Less Than $1,000	Increase			
		$10,000 or More	$5,000 to $9,999	$1,000 to $4,999		$1,000 to $4,999	$5,000 to $9,999	$10,000 or More	
No imputation:									
Total	34,380	14.6	5.9	13.2	22.8	15.3	8.3	19.9	2,686
No change in composition:									
Married-couple family	16,556	15.0	6.5	12.9	13.4	15.3	10.2	26.7	5,329
Female family householder	3,451	6.9	2.5	11.3	49.1	15.6	5.7	8.9	2,224
Male family householder	615	7.2	2.7	10.1	30.2	15.6	12.2	22.0	5,947
Nonfamily householder	9,187	11.3	5.8	13.5	32.1	15.7	7.0	14.6	2,361
Change in composition:									
Married, husband present in wave 4:									
Widowed in wave 7	155	27.6	9.7	.0	7.7	18.8	4.0	32.2	12,593
Separated or divorced in wave 7	380	27.3	8.7	29.7	16.8	11.9	4.7	.9	−11,481
Some imputation:									
Total	50,672	30.4	6.2	8.1	8.1	9.0	6.2	31.8	−38
No change in composition:									
Married-couple family	27,726	28.9	5.6	7.3	5.6	8.2	6.6	37.6	6,962
Female family householder	3,534	26.0	6.0	10.9	17.7	11.7	4.6	23.1	2,593
Male family householder	923	30.9	6.4	8.6	6.9	9.7	9.7	27.8	−23,240
Nonfamily householder	9,605	27.5	7.8	8.9	12.8	10.1	6.6	26.4	3,462

(*continued*)

Table 9.12 (continued)

Characteristic	Number	Percentage with Specified Change in Net Worth from Wave 4 to Wave 7							Mean Difference between Wave 4 and Wave 7 ($)
		Decrease			Decrease or Increase: Less Than $1,000	Increase			
		$10,000 or More	$5,000 to $9,999	$1,000 to $4,999		$1,000 to $4,999	$5,000 to $9,999	$10,000 or More	
Change in composition: Married, husband present in wave 4:									
Widowed in wave 7	248	34.8	2.9	11.4	12.2	3.8	8.4	26.4	−8,499
Separated or divorced in wave 7	514	39.4	4.4	18.3	8.4	12.5	4.6	12.5	−46,151
No imputation, feedback form used:									
Total	16,752	14.1	5.2	13.2	22.8	16.5	8.9	19.3	1,947
No change in composition:									
Married-couple family	8,149	13.6	6.7	12.3	14.4	16.3	10.4	26.2	5,846
Female family householder	1,499	7.9	1.7	13.2	48.8	17.2	5.6	5.5	−1,001
Male family householder	301	8.1	5.4	10.8	33.1	13.9	10.7	18.0	4,879
Nonfamily householder	4,656	12.2	3.5	14.1	31.3	17.5	8.7	12.8	95
Change in composition: Married, husband present in wave 4:									
Widowed in wave 7	93	36.5	5.6	. . .	7.2	25.5	. . .	25.1	[a]
Separated or divorced in wave 7	168	23.8	15.2	24.6	21.0	4.9	10.5	. . .	[a]

No imputation, feedback form not used:									
Total	17,628	15.2	6.6	13.2	22.7	14.1	7.8	20.5	3,387
No change in composition:									
Married-couple family	8,406	16.3	6.3	13.4	12.4	14.4	10.0	27.2	4,828
Female family householder	1,951	6.2	3.1	9.9	49.3	14.3	5.7	11.5	4,701
Male family householder	314	6.3	. . .	9.5	27.4	17.4	13.7	25.8	6,973
Nonfamily householder	4,531	10.5	8.2	12.8	32.9	13.8	5.3	16.5	4,689
Change in composition:									
Married, husband present in wave 4:									
Widowed in wave 7	61	14.1	15.8	. . .	8.5	8.5	10.1	43.0	[a]
Separated or divorced in wave 7	212	30.1	3.6	33.8	13.5	17.4	. . .	1.6	−13,892
No imputation:									
Income quintile in wave 4:									
Lowest	8,538	7.2	4.8	11.5	49.5	13.0	5.1	8.9	2,050
Second lowest	7,225	12.0	6.0	15.2	23.9	20.5	7.6	14.8	3,485
Middle	6,828	14.6	6.3	17.2	13.8	18.3	10.2	19.7	2,164
Second highest	6,577	19.7	6.5	12.8	9.7	14.1	11.0	26.2	2,422
Highest	5,213	24.2	6.3	8.7	5.6	9.4	8.6	37.3	3,634

[a]Base less than 200,000.

Table 9.13 **Matched Households: Mean Net Worth in Wave 4 and Wave 7 by Imputation Status and Selected Household Characteristics (in current dollars, with standard errors in parentheses)**

Characteristic	Number (in thousands)	Mean Net Worth		
		Wave 4	Wave 7	Wave 7 Minus Wave 4
No Items Imputed in Either Wave 4 or Wave 7				
All households	34,380	49,754 (539)	52,440 (568)	2,686
Composition change status:				
No change in composition:				
Married-couple family	16,556	66,493 (941)	71,821 (967)	5,328
Female family householder	3,451	18,174 (770)	20,397 (961)	2,223
Male family householder	615	37,283 (2,599)	43,229 (2,578)	5,946
Nonfamily householder	9,187	36,249 (788)	38,609 (874)	2,360
Change in composition:				
Married, husband present in wave 4:				
Widowed in wave 7	155	115,456 (17,856)	128,049 (23,455)	12,593 (8,105)
Separated or divorced in wave 7	380	27,076 (1,901)	15,594 (1,196)	−11,482
Race and Hispanic origin:				
White	29,582	54,883 (607)	58,084 (643)	3,201
Black	4,072	11,853 (472)	11,562 (489)	−291
Hispanic origin	1,932	18,513 (1,192)	20,030 (1,227)	1,517
One or More Items Imputed in Either Wave 4 or Wave 7				
All households	50,671	101,118 (1,326)	101,080 (1,116)	−38
Composition change status:				
No change in composition:				
Married-couple family	27,726	122,946 (2,232)	129,908 (1,852)	6,962
Female family householder	3,534	53,450 (1,656)	56,042 (1,995)	2,592
Male family householder	923	105,721 (7,543)	82,481 (4,795)	−23,240

Table 9.13 (continued)

Characteristic	Number (in thousands)	Mean Net Worth		
		Wave 4	Wave 7	Wave 7 Minus Wave 4
	One or More Items Imputed in Either Wave 4 or Wave 7			
Nonfamily householder	9,605	63,945 (1,155)	67,407 (1,507)	3,462
Change in composition:				
Married, husband present in wave 4:				
Widowed in wave 7	248	95,169 (8,010)	86,670 (8,611)	−8,499
Separated or divorced in wave 7	514	78,352 (6,768)	32,201 (2,526)	−46,151
Race and Hispanic origin:				
White	44,268	110,202 (1,505)	109,676 (1,257)	−526
Black	5,282	25,919 (548)	30,668 (1,136)	4,749
Hispanic origin	2,184	48,417	48,396	−21
	No Items Imputed in Either Wave 4 or Wave 7			
Age of householder:				
Under 35 years	12,652	16,982 (390)	16,567 (319)	−415
35–44 years	6,708	47,854 (1,075)	50,812 (1,083)	2,958
45–54 years	3,971	74,978 (2,470)	79,515 (2,611)	4,537
55–64 years	4,285	85,723 (1,934)	92,552 (2,105)	6,829
65 years and over	6,765	75,342 (1,292)	79,846 (1,420)	4,504
Income quintile in wave 4:				
Lowest	8,538	17,249 (453)	19,299 (526)	2,050
Second lowest	7,225	33,859 (712)	37,345 (889)	3,486
Middle	6,828	45,893 (887)	48,057 (958)	2,164
Second highest	6,577	65,316 (1,369)	67,739 (1,384)	2,423
Highest	5,213	110,448 (2,371)	114,082 (2,440)	3,634

(*continued*)

Table 9.13 (continued)

Characteristic	One or More Items Imputed in Either Wave 4 or Wave 7			
		Mean Net Worth		
	Number (in thousands)	Wave 4	Wave 7	Wave 7 Minus Wave 4
Age of householder:				
Under 35 years	13,516	39,807	31,592	−8,215
		(838)	(647)	
35–44 years	10,306	84,698	102,139	17,441
		(1,447)	(2,809)	
45–54 years	8,563	134,401	116,509	−17,892
		(5,062)	(3,170)	
55–64 years	8,189	153,140	157,856	4,716
		(3,007)	(3,375)	
65 years and over	10,098	129,532	133,883	4,351
		(3,945)	(2,575)	
Income quintile in wave 4:				
Lowest	8,428	43,490	47,220	3,730
		(856)	(1,377)	
Second lowest	9,775	55,774	62,307	6,533
		(836)	(1,433)	
Middle	10,186	63,839	71,291	7,452
		(949)	(1,161)	
Second highest	10,432	86,417	94,975	8,558
		(1,246)	(1,769)	
Highest	11,851	224,480	202,339	−22,141
		(5,263)	(3,970)	

Table 9.12 shows the percentage distribution of various household groups by their change in net worth from wave 4 to wave 7. For all matched households without imputations, about 15 percent had a decline of $10,000 or more, 20 percent had an increase of $10,000 or more, 23 percent had an increase or decrease of less than $1,000, and the rest had declines or increases in the $1,000–$9,999 range. It is difficult to determine the extent to which these estimates reflect real changes and the extent to which they represent measurement problems. We can start by considering that only 2 percent of households have annual incomes of $100,000 or more. For 98 percent of households, then, a change in net worth of $10,000 is a very large change. If asset prices were stable, a $10,000 increase in net worth would mean that more than 10 percent of current income had been saved. We know, of course, that asset prices were not stable during our reference period. The value

of the average share of stock listed on the New York Stock Exchange increased by 12 percent from late 1984 to late 1985. Our data from SIPP, however, show that only about 20 percent of households owned stock and that the average value of stock portfolios was about $27,000 in late 1984. Given these considerations, it seems likely that the measured changes in the net worth of individual households has a large error component.

Table 9.12 shows estimates for households with no change in composition and for a certain set of households that did have a change in composition. Households without a change in composition had, on the average, an increase in net worth. Married-couple households had an average increase of $5,329, for example, although 34 percent had a decrease of $1,000 or more, and 15 percent had a decrease of $10,000 or more. The universes for two groups of households that did have a change—wave 7 widows who were married, spouse present in wave 4, and wave 7 divorced or separated women who were married, spouse present in wave 4—are quite small. The data show an average net worth increase of $13,000 for the widows and an average decrease of $11,000 for the divorced and separated.

The "some imputation" panel of table 9.12 shows net worth change data for households that had one or more net worth items imputed in either wave 4 or wave 7. As discussed earlier, the fact that the wave 4 and wave 7 imputation procedures were independent essentially eliminates these households as a data source for analyzing changes in the net worth of individual households. About 62 percent of the households in this group had a change of $10,000 or more. Unfortunately, there are more households in the "imputed" group than in the "nonimputed" group. Sixty percent of all matched households had one more imputed net worth item in either wave 4 or wave 7.

There is some evidence that the feedback procedure reduces the estimates of change. The "no imputation, feedback form used" panel of table 9.12 presents data for those matched households with no imputation who were in the feedback sample. The mean difference in net worth for this group was $1,947, versus $3,387 for matched, nonimputed households who were not in the feedback sample. The proportion of feedback sample households with changes of $10,000 or more was 33 percent for the feedback sample and 36 percent for the nonfeedback sample.

The data in the last panel of table 9.12 show a reasonable relation between income level and change in net worth. One would expect that large changes would be more common for high-income than for low-income households, and the data support this expectation. Approximately 37 percent of households in the highest-income quintile had an

increase of $10,000 or more, 24 percent had a decrease of $10,000 or more, and 6 percent had a change of less than $1,000. In comparison, 9 percent of households in the lowest quintile had an increase of $10,000 or more, 7 percent had a decrease of $10,000 or more, and 50 percent had a change smaller than $1,000.

9.6 Fitting a Savings Model

We have used the SIPP data to fit a simple model of savings in which the change in net worth is a function of the level of total net worth and income at the beginning of the period, the change in income during the period, and certain characteristics of the householder, including age, marital status, and race and ethnicity. The set of observations was limited to those households without a change in composition who had no imputed net worth items.

The results of regressing the change in net worth on the independent variables are summarized in table 9.14. The regression was significant and had an R^2 of 0.08. The income variables had a significant positive effect on savings (the value of their coefficients were more than twice as large as the standard errors), wave 4 net worth had a negative and

Table 9.14 Savings Regression Results for Savings Regression Model

	Coefficient	
Independent Variable	Value	Standard Error
Wave 4 net worth	−.15*	.01
Wave 4 income level	4.55*	.43
Change in income	6.35	.44
Age of householder:[a]		
Under 35 years	−15,301.94*	2,271.51
35–44 years	−12,055.77*	2,481.98
45–54 years	−4,477.93	2,799.11
65 years and over	273.76	2,407.95
Married, spouse present[b]	2,639.80	1,479.36
Black[c]	−4,261.40	2,178.16
Other[c]	−936.43	4,826.76
Spanish[d]	−2,427.58	3,014.06
Constant	9,435.24	

Note: R^2 = .08.

[a]Control group is 55–64 years of age.

[b]Control group is other than married, spouse present.

[c]Control group is white.

[d]Control group is non-Hispanic.

*Significant at the .05 significance level.

significant coefficient, the age groups "less than 35 years" and "45–54 years" had a significant negative effect, and the other variables were not significant. These regressions are consistent with the results obtained by Projector when she regressed 1963 savings on 1963 disposable income and December 1962 net worth. In that study, the coefficient of income was positive, the coefficient of net worth was negative, and the R^2 was 0.04 (Projector 1968).

9.7 Reply to Comment

In his discussion of this paper, Martin H. David has provided an extremely valuable critique of household wealth surveys in general and the SIPP survey in particular. We agree with many of his points, but we also note that the measurement of household wealth per se has not been viewed as a primary purpose of SIPP. We hope that some of the suggested changes can be adopted, but changes that are costly or that impinge on other aspects of the survey are unlikely to occur. In the area of survey procedures, David recommends that an effort be made to interview the household member who is best able to provide financial information. He also recommends that the questionnaire be modified to obtain data on assets held in trust for children, on business investments in which the person does not play an active management role, and on certain other assets not presently covered. A third major recommendation is to ask respondents to examine records when possible. All these recommendations seem useful.

David makes a strong case for conducting validation studies. He notes that previous studies identified the problem of false negatives as a major factor in the tendency of survey estimates to fall short of independent estimates. He suggests that information from validation studies could be used to correct for false negatives (change some of the "no" responses) and would provide a basis for imputing amounts to persons who refuse to answer questions on ownership or value.

We agree completely with his statement that the wealth data should be subjected to longitudinal editing and imputation procedures if the data file is to be used to examine changes in wealth. We have attempted to circumvent this problem in some of our analysis by restricting the universe to cases that did not require imputation in either of the two waves, but this approach sacrifices large amounts of data.

The implementation of any of these changes will depend on a review of the evidence concerning their likely benefit and a comparison of the likely benefit with the likely cost. For example, the suggestion that an attempt be made to interview the household member who is most knowledgeable about finances would be accepted only if it could be

demonstrated that the cost was small in terms of field resources, response rates, and the quality of other types of data.

9.8 Conclusions

The major purpose of this paper was to present an evaluation of SIPP data on household wealth. The major aspect of the evaluation was comparison of the net worth levels of individual households as reported in interviews conducted one year apart. Other methods of evaluation included comparisons with SCF and FFA estimates. The major findings include the following.

1. A comparison of median net worth estimates from wave 4 and wave 7 shows that SIPP estimates of the relative wealth holdings of various population subgroups are remarkably stable.

2. Household survey estimates of aggregate and mean net worth are very sensitive to "outliers" (cases with very high values). These outliers may represent response errors or marking errors, or they may, in fact, be an accurate estimate of the holdings of an individual. In the latter case, the outlier may or may not be multiplied by an appropriate weight when the raw survey data are converted to estimates of the wealth of U.S. households.

3. The problem of outliers is so severe that analyses and evaluations of household survey wealth data that are based solely on aggregate or mean estimates are subject to serious questions about validity.

4. The large differences between wave 4 and wave 7 in the holdings of individual households is additional evidence that household wealth estimates are subject to large reporting or marking errors.

The finding that SIPP produces stable estimates of median net worth suggests that SIPP provides important new data on population subgroup differences in net worth. The relatively large sample size and an estimate of median net worth that is larger than the SCF estimate means that SIPP is the preferred data set for this purpose. The value of SIPP net worth estimates is enhanced by the rich array of demographic, social, and economic data collected during the life of the panel (e.g., personal history characteristics, program participation status, and employer benefit recipiency).

We concur with Martin David that certain questionnaire and procedural changes would improve the quality of SIPP wealth data, but we are cautious about the desirability of major changes. We note that differences between household surveys in estimates of mean and aggregate net worth are strongly influenced by outliers. In the absence of validation studies, we are not prepared to accept an increase in estimated mean or aggregate wealth as evidence that a better source of data has been obtained.

Notes

1. The first wave of interviews with the 1984 panel households was conducted in October, November, and December 1983 and January 1984. In general, a wave is a complete set of interviews with the sample households and is completed over a four-month period.

2. For a description of these forms of wealth, see the note to table 9.1.

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Comment

Martin H. David

What's New?

The McNeil and Lamas paper reports on a measurement design that is new in a number of regards. It is the largest sample for wealth measurement that has been studied in the United States. It is an ongoing effort that will generate annual wealth estimates at least to 1988 because those data collections are in the pipeline. The most interesting innovation is the use of conditioning from a prior interview to aid the recall of the respondent in the "feedback experiment."

Most of the results from these measurements were predicted by previous methodologists working in the field of wealth measurement. All the problems were uncovered in the pilot wealth measurement of the Income Survey Development Program (ISDP; Radner and Vaughn 1987). The Bureau of the Census was publicly advised by its advisory committees (in 1982 and 1983) that a program of wealth measurement must be accompanied by a strong program of validation research and methodological studies if the results were to be credible. That advice still holds—my remarks will concentrate on why we need validation research and why methodological studies will pay off.

Features of the SIPP design

Several features of the Survey of Income and Program Participation (SIPP) design must be noted before I comment on the nature of the data collected.

1. For married couples, jointly held property, income, debt, and wealth is reported by the first spouse to be interviewed. Otherwise, the person who is the owner is to report for himself, except that 35 percent of all reports are given by proxies. No attempt is made to

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identify the member of the household who specializes in financial matters and who is most likely to be informed about nonearned income.

2. The data are collected from a sample that is defined one year prior to the first wealth measurement. Aging of the population implies that some wealth exits the sample as people move into retirement and nursing homes. This loss does not occur in cross-sectional samples.

3. The conduct of prior interviews conditions respondents. After the first wave, income from assets is elicited in four steps. (*a*) Receipt of income from property reported in the previous wave is recalled, and the respondent is asked to verify that receipt. (*b*) The respondent is asked whether receipt of that income continued in the current reference period. (*c*) The respondent is shown a card describing fourteen types of property income and is asked whether receipt of any of those types was initiated during the period. (*d*) At a later stage of the interview, questions on the amount of income and the amount of the asset balance are asked for groups of interest-bearing asset items for which recipiency was previously reported.

4. Assets held in trust for children, control over wealth through powers of attorney, and wealth held in irrevocable trusts are nowhere recorded.

5. Respondents are not asked to check records before reporting income or asset amounts.

6. Ownership of a self-employed business enterprise is elicited through a sequence of questions related to "working." Passive partnership interests, other than rent-producing interests, are elicited from a residual category in the list of fourteen asset types mentioned in point 3*c* above.

What Have We Learned?

Validation Studies of Savings and Common Stock

In their validation studies of common stock holdings and savings account, Ferber et al. (1969a, 1969b) indicate five types of response by the owners of the accounts sampled (see table C9.1). False negatives (group 3) accounted for 20 and 33 percent of the respondents in the two studies. Refusals of amounts have validated means 20 and 80 percent higher than those of reporters (a response likely to be characterized by nonignorable selection). Noninterviews show differences in the two studies, with refusers having substantially larger savings than reporters and noncontacts having somewhat larger share holdings.

The implications of these findings are that it is necessary to find ways to alter false negative reports in addition to imputation and that it may be necessary to use data from validation studies to impute holdings of item refusals rather than using the hot deck imputation from reporters.

Table C9.1

Group	Interviewed?	Ownership	Amount
1. Complete	Yes	Report	Reported
2. Presence	Yes	+ Report	N.A.
3. False negatives	Yes	− Report	N.I.U.
4. Refused:			
a) Interview	Yes	N.A.	N.A.
b) Answers to financial questions	No	N.I.U.	N.I.U.
5. No contract	No	N.I.U.	N.I.U.

Note: N.A. = not ascertained.
N.I.U. = not in universe.

Motivation of Respondents and Use of Records

Extensive work by Ferber (1966), Maynes (1965), Horn (1960), and Claycamp (1963) has established that asking the respondent to check records results in more precise information. While it is obvious that use of a record will increase accuracy for the records retrieved, it is not so obvious that use of records will also reduce the proportion of false negatives. Evidence appears favorable for this latter effect. Lansing, Ginsburg, and Braaten (1961) and Cannell, Miller, and Oksenberg (1981) explain this phenomenon as a process of conditioning the respondent to what is expected of a respondent who is fulfilling the objectives of the survey. Both argue that high-quality response depends on cognitive recognition of the information that is desired in concert with positive motivation to perform the mental work that is required to recall the information.

The experimental work of Cannell, Miller, and Oksenberg (1981) on survey design is a model of what needs to be done to improve the adequacy of financial data reporting. Their experiments include the use of a "contract" to establish an obligation to report, specific instructions incorporated into the question as to the type of response that is needed, and programmed reinforcement of responses that adequately answer the question. (By way of contrast, the SIPP questionnaire approaches the problem of reporting amounts by confounding the reports of several types of assets in one response, when the respondent may think of those assets as distinct and separate classes. This increases the potential for response error [Sudman and Bradburn 1974].)

In related work, Bradburn and Sudman (1980) make it clear that longer, open-ended questions and devices to assure confidentiality of responses assist in reducing the response distortions that arise from revealing threatening information. While economists are not likely to think of reports of balance sheet items as threatening, psychological research has established that respondents are more reluctant to give

out such information than other intimate facts pertaining to their sex life and mild law-breaking behavior (Cannell and Henson 1974).

Evidence of Reporting Adequacy

Few results in the validation research give easily measured correlates of response insufficiency. Three are worthy of further work: respondent rounding of reports, respondents' failure to keep records of money spent, and respondent learning of parental income amounts no earlier than age sixteen (or never). Lansing, Ginsburg, and Braaten (1961) find that each of these three attributes is associated with failures to report savings accounts or inaccuracy as to amount.

Incentives and Panels

Received wisdom is that the mean square error of measurement falls as the number of contacts in a panel increases. Ferber (1966, 212; 1964), Lansing, Ginsburg, and Braaten (1961, 186), and Lansing and Morgan (1971) all affirm a view that attrition of noncooperative respondents early in a panel and the opportunity to check measurements made at a prior time will enhance the precision of a panel relative to cross-sectional results.

How Does SIPP Perform on Asset Measures?

I consider Ferber's five categories in reverse order.

Categories 4–5: Noninterview

McNeil and Lamas report the Bureau's household noninterview rate (11 percent for wave 4). I believe that this is misleading, as the households that are formed in the year since the area probability sample was drawn are added to both the numerator and the denominator of this fraction. These household "splits" do not constitute independent drawings and will have a high intraclass correlation with the original sample members. They do not therefore contribute to representation in the same way as the losses experienced through attrition subtract from representation. Even so, the noninterview rate is undoubtedly less than that of the Survey Research Center, and this fact makes it important to use the SIPP capabilities for wealth measurement.

Category 3: False Negatives

The only evidence for this problem comes from a comparison of ISDP asset data to income aggregates. The amount of dividends and interest, after longitudinal imputation, appears to be near the relevant benchmark aggregate (Vaughn, Whiteman, and Lininger 1984, table 8). The interest and dividend income imputed to assets (which were themselves imputed to the extent of 23–66 percent [U.S. Bureau of the

Census 1986, table D-2]) amounts to 69 percent of the aggregate. While imputation rates on SIPP are 13–42 percent for the same asset types, it is not clear that any changes in the mode of eliciting ownership of property income sources reduced the false negative problem.

This area is an area in which validating studies such as David et al. (1986) need to be done to assess both the quality of reporting and the appropriateness of imputations.

Categories 2 and 4b: Item Nonresponse

Point 3 above, explaining the design, suggests that insufficient effort is made to identify new sources of property income that develop in the course of the panel and that insufficient effort is made at any time in the survey to identify partnership interests that involve silent partners.

Category 2: Item Nonresponse

Curtin, Juster, and Morgan (chap. 10, in this vol.) tabulate the available percentages of nonresponse to recipiency and amount questions. (It would be valuable to have the complete tabulation. It would be even more valuable to differentiate refusals from other types of nonresponse, given the significance of noncooperation as evidence of threat, while incomplete response can occur for a variety of reasons, including deficiencies in questionnaire design, processing, and enumerator ability.) It appears that SIPP item nonresponse levels are larger than those for the Survey Research Center's cross-sectional samples.

The high rates of item nonresponse to amount questions must be correlated with the failure of SIPP to locate the financial recordkeeper in many households (point 1 above). It is a mark of the deficient design of SIPP that nearly one-seventh of respondents fail to report amounts in savings accounts. At a minimum, something could be done to classify the amounts in these accounts into orders of magnitude. The 40 percent of respondents who fail to report debt on stocks and bonds indicates that either respondent motivation or cognition of the desired information is wanting.

A second mark of the deficiency of the design is that McNeil and Lamas's table 9.4 implies that one-quarter of all asset values have been imputed in wave 4. Sixty percent of all matched households in their table 9.11 have at least one wealth item imputed; for the highest income quintile, the proportion is 70 percent. While these imputations may not dominate the values of net worth for most households, the prospect is profoundly unsettling.

What Steps for the Future?

This extended discussion of methodological work on survey design provides a road map for future work with SIPP. Five steps appear to

be high priority for redesign of the wealth measurement. First, the rules for choosing respondents should elicit property income information from the informed members of the household. To ease the cognitive task of assembling that information, I believe the children's assets should also be included so that a parent does not need to make some abstract legal distinctions to report completely.

Second, the prompts for property income following the first wave need to be developed. Most respondents confronted with a list of fourteen items will not pay equal attention to all parts of the list. As a result, some types of income will be missed.

Third, records should be requested and reinforcement given to the responses that exhaustively report an entire portfolio. Qualitative follow-ups should be given to persons who cannot supply exact amounts to establish orders of magnitude.

Fourth, more questions eliciting income from partnership ventures should be included.

Fifth, a carefully orchestrated set of validation studies based on samples of individuals owning assets drawn from the accounts of institutions should be pursued. Armed with calibration functions derived from such studies, the Bureau would be in a position to make sensible imputations to those who refuse to participate and whose nonresponse is likely to be nonignorable (cf. Ferber 1965).

Analysis of the Wealth Data

Equally informative work can be done to exploit the data already available. The SIPP contains the basis for longitudinal imputation. Simple models of the change in asset holding and asset amount can be used to impute item nonresponse that is missing in one period (because a proxy interview was taken) but available in a second (because the interview was taken with the informed respondent). This work is already underway (Kalton and Miller 1986), but the methods should be applied to imputation across years for the wealth data.

A second device that is worth exploiting is the reinterview information that is recovered at every wave of SIPP. Since the recipiency of the prior wave is validated in the current wave, error-correcting functions can be generated, and false negatives can be identified. This will again be important when the respondent in the prior wave was a proxy and the respondent in the current wave reports for herself.

A third device that will assist in better estimation is to use the distributional information in SIPP to estimate the tail, as was done by Aigner and Goldberger (1970). While this technique can never replace a high-income sample, it can stabilize the estimates of the means and produce more informed data for policy analysis.

Analysis of Year-to-Year Change in Wealth

Lamas and McNeil (1986) have fit descriptive regressions to the 1984 asset data. They now report the change in wealth from the year-to-year matched cases. These two efforts are necessarily related. Two points need to be made.

In the interval since Projector (1968), the life-cycle model has been elaborated (e.g., Blinder 1974, 31–33) and leads us to a somewhat different specification. The intertemporal consumption allocation will be a function of inheritance, the human capital endowment, interest rates, and two subjective measures—the rate of time preference and the taste for bequests. This specification differs from the permanent income specifications of the 1960s, and McNeil and Lamas may find it more productive. It would imply, for example, that lifetime earnings should appear on the right-hand side of the equation, and these earnings should be better measured in the SIPP panel than in the two-wave panel used by Projector. It also implies unmeasured individual effects that can be identified only through analysis of panel data on identical individuals.

The more important point comes from Solon (n.d.) and Rogers (1986). Both speculate on the problem created by measurement error that is correlated over time. In panel surveys, we have an opportunity to exploit the data to discover some properties of that correlation. Consider the model underlying McNeil and Lamas's table 9.12:

$$(1) \quad W(7) = aW(4) + bY(7) + cY(4) + dz + f + \epsilon_{it} + (1 - a)\mu_i ,$$

where $W(t)$ is wealth at time t, $Y(t)$ is income for the four months prior to t, and z is a vector of personal characteristics. If $a = 1$, the nuisance parameter describing personal tastes disappears, and unbiased estimates of the parameters b, c, and d can be estimated.

If wealth and income are measured with error, we have

$$(2) \qquad \begin{aligned} W^{\Phi}(t) &= W(t) + u, \\ Y^{\Phi}(t) &= Y(t) + v. \end{aligned}$$

If, in addition, u and v are autocorrelated, the hope that might exist for eliminating μ_i is dashed, and consistent estimation of the parameters is not generally possible. Consider, for example, the simpler problem of estimating the autocorrelation of W, θ_w. Let θ_u represent the autocorrelation of the measurement errors. Then the estimator of θ_w,

$$\operatorname*{plim}_n r_w = \theta_w - [\sigma_u^2(\theta_w - \theta_u)/(\sigma_u^2 + \sigma_w^2)].$$

Unless θ_u and σ_u are measured, it is likely that θ_w cannot be estimated. Such measurements can be made as part of the ongoing SIPP wealth measurements. While this may appear to be a counsel of despair, it

does recognize the dominant message of these remarks—there is correlated error in the measurement of wealth data. Attempts to obtain estimates of that error will make it possible to extract important behavioral parameters from such data as we are now discussing.

The potential for much more informative wealth information from SIPP exists.

Appendix

Review of McNeil-Lamas Tables

Table 9.1

The change estimated reflects different samples; furthermore, identical individuals will be one year older and may have changed marital status and income quintile. Thus, care should be exercised in interpreting these estimates of net change over time. The age group that shows the largest loss is the group that is at highest risk for divorce and for paying college expenses. It will be interesting to see whether this explains the significant differences.

Tables 9.4 and 9.11

These estimates suggest that at least one-fourth of the net worth is imputed.

Table 9.5

This table presents results of the feedback. It is difficult to see any effect (particularly in the absence of sampling errors). However, one might imagine a significant improvement in a small subsample: households in which the same respondent supplied information in both interviews and households characterized by complex property ownership (older or higher-earnings groups). The jury is still out on what benefit we get from this type of experiment.

Tables 9.8 and 9.9

These tables display data for comparison to the flow-of-funds accounts (FFAs). Two comments are in order. The estimates can be improved by estimating the upper tail of the distribution with a Pareto function (Aigner and Goldberger 1970). This would reduce the problem of sampling variability that arises from small proportions of very wealthy people. Second, the FFAs do not produce flawless measures, and it is widely recognized that the sectoral definition does not mesh with the household population. The best indication we have of the difficulties

of the comparison is in the housing estimates. Kish and Lansing (1954) show that homeowners give unbiased estimates of house value. (While this finding is old, it has not been refuted.)

Table 9.10

This table highlights change in net worth at the micro level. The presentation by income quintile for the complete data cases is most noteworthy. Change in net worth of less than $10,000, or less than 10 percent of initial net worth levels, falls dramatically with income level. This is an indication of response error. It would be useful to see the same table for the cases in which the feedback technique was used and respondents reported for themselves.

Table 9.12

This table replicates the Projector savings regression, including a lagged adjustment to net wealth levels and a linear relation between current income and desired net wealth. The result offers promise since the explanatory power is higher and the coefficient on net worth suggests a more plausible rate of adjustment.

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