Retrospective Reporting of Household Wealth:

Evidence from the 1983-89 Survey of Consumer Finances

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Abstract

One way to obtain panel-like information on household wealth is to ask households about changes in their asset holdings. Yet the reliability of retrospective data is unclear, considering the potential for recall error. This paper examines the reliability of retrospective reporting, using data from the 1983-89 Survey of Consumer Finances. We find substantial inconsistencies between reported net investments in assets with measured changes in holdings. Inconsistencies are less severe for salient transactions like home sales, and more severe for aggregated items like financial assets.

Key words: Survey data, retrospective reporting, wealth

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1. INTRODUCTION

In principle, there are two ways to collect information on changes in household wealth. In a panel study, households are contacted periodically and asked about their current assets and liabilities. In retrospective reporting, a cross-section of households is asked directly about changes in their finances over a defined period of time. For example, the Consumer Expenditure Survey asks about changes in checking and savings account balances over the past year. Retrospective reporting has a number of potential advantages. It yields panel-type information at relatively low-cost, and avoids problems of differential attrition from an original panel sample. It can provide greater insight into the dynamics of household finances, including the timing of asset sales and purchases, and the realization of gains and losses.

However, retrospective reporting of wealth may be less accurate than current reporting, because it is inherently more difficult to recall information about the past. A considerable body of previous research points to potential problems. First, memory tends to fade with time, so respondents may forget to report relevant events, especially as the recall period lengthens (Sudman and Bradburn 1973). Second, even when events are remembered, their dates may be remembered or reported inaccurately. Notably, when asked about events in some period leading up to the present, respondents often "telescope", or include events that occurred prior to the reference period (see Neter and Waksburg 1965, for evidence related to consumer expenditures). Third, rare, salient events are remembered more easily than events that are frequent or mundane (Mathiowetz and Duncan 1988). Thus, for example, respondents may report fairly accurately on home sales in the past few years, but may have to guess about past checking account transactions. Finally, the extent of recall problems may vary across sociodemographic groups. For example, older respondents have a greater tendency to omit events than younger respondents, and more reporting problems occur among married versus single-respondent households (Duncan and Mathiowetz 1984; Sudman and Bradburn 1973). Overall, recall problems tend to bias results downward relative to true values.

While there is a fairly large literature on wealth measurement (Avery, Elliehausen and Kennickell 1988; Curtin, Juster and Morgan 1989), there is little prior work specifically on retrospective reporting of changes in household wealth, apart from some early exploratory studies (Lansing, Ginsburg and Braaten 1961). Consequently, little is known about the magnitude or types

of bias such problems may introduce. This paper uses data from the 1983-1989 Survey of Consumer Finances (SCF) to investigate the consistency of retrospective information on changes in asset holdings. In 1983, the SCF collected detailed data on assets, liabilities and income from a sample of 4,103 households. In 1989, 1,497 of the original cases were re-interviewed, providing information on their current wealth, as well as major changes in asset holdings since 1983. Thus, we can evaluate the quality of the retrospective reporting by checking its consistency with the information on current wealth in 1983 and 1989. It is important to note that this evaluation is not the same as validation, where respondents' recollections of events are checked against external records (e.g. Ferber 1965; Ferber, Forsythe, Gutherie and Maynes 1969a, 1969b; Lansing et al. 1961). Here respondents' recollections of changes are checked against their own descriptions, so inconsistencies could result from cross-section response errors as well as recall problems. However, the SCF data are cleaned and edited with unusual care, so errors resulting from cross-section inconsistencies should be relatively low (see Curtin et al. 1989, for a comparison of the SCF with other survey data on household wealth).

The key findings of this study are as follows. First, retrospective information on asset ownership is often inconsistent with information on current holdings. In some cases, a change in ownership status occurs but the household does not report transactions consistent with the transition; in other cases, ownership status remains the same but the household reports transactions indicating a transition. We identify factors that underlie inconsistent reporting, and show how they differ across asset types. Second, the quality of retrospective data on asset values is also problematic. For most assets, reported investments in the asset are only weakly correlated with the measured change in holdings. Apparently, the difficulty of recalling and aggregating transactions promotes rough guessing, and overreporting of responses like "no change." Third, we find that inconsistencies are not random but rather vary with respondent characteristics, indicating the potential for econometric problems in analysis of retrospective data. Of course, the SCF data cover a six year period, and reporting problems may not be as severe for shorter reporting intervals. But given the extent of reporting problems, coupled with evidence from other surveys, it seems unlikely that such problems result solely from the long recall period.

The remainder of this paper is structured as follows. Section 2 describes the data used for comparing current and retrospective information. Section 3 analyzes inconsistencies in ownership information for several financial and nonfinancial assets. Section 4 describes inconsistencies in reporting of asset values among observations with consistent and complete ownership information. Section 5 investigates inconsistencies in reporting of contributions to employer-sponsored retirement accounts. Section 6 presents econometric analysis of factors that might explain variation in the consistency of retrospective reporting. Section 7 summarizes and concludes.

2. DESCRIPTION OF THE 1983-89 SCF PANEL

The 1983 SCF interviewed a sample of 4,103 households, including an oversample of 438 high-income households intended to improve representation of the distribution of wealth (Avery and Elliehausen 1986). In 1989, 1,497 of the original cases were re- interviewed, using a somewhat longer questionnaire (see Kennickell and Starr-McCluer 1996, for a general description of the 1983-89 SCF panel). Of the original households, many had significant changes in composition over the period, such as a divorce or the death of a spouse. Because such changes are likely to complicate reporting problems, we confine the analysis to a subsample of 1,180 cases where the household head's marital status did not change over the period, and where the same individual responded to the survey in 1983 and 1989. Not surprisingly, these sample restrictions reduce the extent of apparent data inconsistencies. The analysis was also conducted using the 818 cases with no change in household composition, with results that are qualitatively similar to those presented here.

In addition to the questions on current holdings of assets and liabilities, the 1989 SCF also asked households to report major changes in asset holdings since January 1983. The retrospective questions covered purchases and sales of property, financial assets, and business interests, as well as contributions to IRA and Keogh accounts and to employer-sponsored retirement accounts. When purchases, sales or contributions were reported, households provided information on the dollar values involved, and in some cases on the timing of the transactions.

The following describes the information collected for each asset type:

2.1 Primary residence

In the retrospective section of the survey, households were asked whether, since January 1983, they had bought or sold a home that was the family's primary residence. Households reporting a purchase or sale were asked whether they had only bought, only sold or both bought and sold homes. Households that had sold homes were asked the year and price of the sale, as well as the year the house was purchased and its purchase price. In the cross-section portions of the 1983 and 1989 surveys, households were asked if they owned their current residence, and if so, the purchase price and date of purchase of the home.

2.2 Other real estate

Respondents were asked whether, since January 1983, they had bought or sold any real estate other than their primary residence, such as a vacation home, land or a rental or investment property. If they reported purchases or sales, they also gave prices and dates of transactions. (If there was more than one purchase or more than one sale, respondents gave information for the most recent transaction of each type). In 1983, households were asked about the same types of real estate, but were asked to exclude properties related to their business interests to avoid double-counting. Because there was nonetheless some tendency to mix personal and business-related property, the related questions in the 1989 survey were re-ordered and re-worded to reduce chances for mis-classification. Thus, one might expect the "other real estate" category to have response problems, due to both the difficulties in classification and the changes in question format.

2.3 Financial assets

In the retrospective section of the survey, households were asked whether they had bought or sold any publicly-traded stock, or put money into mutual funds, managed investment accounts or

trusts since January 1983. (The specific wording of the question was, "Not counting any IRAs, Keoghs or pension accounts, since January 1983, did you (or anyone in your family living here) buy any shares of stock in publicly held corporations, or put money into mutual funds, managed investment accounts or trusts, including any automatic reinvestments?"). If they reported buying or selling such assets, they were asked whether they put more money in than they took out, took out more than they put in, or put in about the same amount of money as they took out. Finally, those who reported putting money in or taking money out indicated the net dollar value of their transactions, including automatic re-investments. One might expect reporting problems in this asset category, since it aggregates several assets and lacks detailed cues. In contrast, the questions about current wealth ask separately about current holdings of each asset, using carefully constructed cues. (Curtin et al. 1989 document the importance of detailed cues in minimizing omissions).

2.4 Business interests

Again concerning the period since January 1983, households were asked whether they put personal funds into a privately-held business, professional practice, partnership or farm. If so, they reported how much new money was put in, including any funds that were personally borrowed. They also reported any sales of such interests, including the price paid, and the date of the sale. In 1983, households were asked to report the amount of their holdings in businesses in which they had either active or inactive management roles. The 1989 survey collected similar information, but on a more disaggregated basis.

2.5 IRA and Keogh accounts

The retrospective section of the survey asked households whether they had put money into or taken money out of an IRA or Keogh account since January 1983, and the total net amount of any such transactions. In 1983, households reported whether they had any IRA or Keogh accounts, and if so, the total amount in such accounts. The questions asked in 1989 were considerably more detailed, with information collected for each account owner within the household (the respondent,

spouse, and other household members). Other things being equal, one would expect the detailed cues to reduce omission of accounts, although this effect may be masked by the substantial growth in IRA ownership over the period.

2.6 Contributions to employer-sponsored retirement plans.

Respondents who reported in 1989 that they had worked for pay since January 1983 were asked whether they were included in any employer-sponsored pension plans during that time. If so, they reported whether they made any contributions to these plans. Respondents who contributed reported the amounts of their contributions, either on a year-by-year basis or as an estimated total for the period. In 1983, respondents reported whether they were covered by a pension or other savings plan on their current job, and if so, whether they had made any contributions under such plans in the previous year. While respondents' descriptions in 1989 of contributions in 1983 can be checked against the descriptions provided in 1983, the comparison is not a clean one, because the contribution information in the 1983 survey refers to 1982, not the time of the interview. An additional problem is that respondents often have only partial knowledge of their pension coverage (Mitchell 1988).

3. CONSISTENCY OF REPORTING OF ASSET OWNERSHIP

The first question to be addressed is whether descriptions of changes in ownership of particular assets over the 1983-89 period are consistent with the current information in the 1983 and 1989 Surveys. Information is considered to be inconsistent if a change in ownership status occurs but the household does not report transactions consistent with the transition, or ownership status remains the same but the household reports transactions indicating a transition. For example, it is considered inconsistent when the household reports buying a home in the 1983-89 period and not selling one, while reporting homeownership in both the 1983 and 1989 surveys. Of course, some cases identified as 'inconsistent' may reflect complicated situations, such as when a family moves out of a primary residence and then rents out that home. From our review of the data, such situations appeared to account for a small number of cases only.

Table 1 provides details of combinations of ownership and transactions that are considered to be inconsistent. Three types of inconsistencies occur in the data. First, there are cases where the pattern of transactions reported for the 1983-89 period implies a change from owner to non-owner, or vice versa, but information on current ownership indicates the same status for 1983 and 1989. Second, in other cases, transactions reported for the 1983-89 period imply no change in status, but information on current ownership indicates a status in 1989 that differs from the status in 1983. Finally, there are infrequent cases where the retrospective information is not consistent with what the respondent reports elsewhere in the 1989 interview.

Because our current interest is response problems other than non-response, the analysis is confined to cases without missing ownership data. This exclusion may underrepresent households with complications in describing ownership, for example, those with unclear boundaries between business and personal assets. However, nonresponse on ownership questions is generally very low (see Juster and Kuester 1991). Details on the availability of ownership information are given in Appendix Table A.1.

Table 2 summarizes information on inconsistencies in asset ownership. Detailed frequencies are given in Appendix Table A.2, which is modelled after Alessie and Zandvliet (1993). There is important variation in the rate of inconsistency across asset types. For the primary residence, only 5.4% of observations report transactions that are inconsistent with cross-sectional information on ownership. The proportion of cases with inconsistent data on IRA and Keogh accounts is also low at 6.5%. Inconsistencies for financial assets, businesses, and other real estate are considerably higher, at 11.4%, 11.6%, and 12.8% respectively.

Because ownership and transactions are more widespread for some assets than for others, table 2 also reports inconsistencies relative not to all observations, but rather to those reporting ownership or transactions for the relevant asset over the 1983-89 period. Not surprisingly, reporting problems look considerably worse when households that never own, buy or sell the asset are excluded from the analysis. The inconsistency rates remain fairly low for homes and IRA and Keogh accounts

-- 6.2% and 13.2% respectively. But for the less-widely owned assets, the rates rise substantially, to 21.5% for financial assets, 27.7% for other real estate and 30.3% for businesses. The differences across assets are statistically significant, with one exception (business interests versus other real estate).

The low inconsistency rate for homes conforms to expectations. Home purchases and sales tend to be well-defined, highly salient events. They have large implications for household finances; dates and numbers are much-discussed and subject to legal formalities; and all family members are likely to be drawn into key decisions and events. Alessie and Zandvliet (1993) also find relatively low inconsistencies for homes, using annual data from the Dutch Socioeconomic Panel. The low inconsistency rate for IRA and Keogh accounts is somewhat surprising, since such accounts are less important for family finances. However, this was a period of rapid expansion of IRA/Keogh ownership, with many households setting up accounts for the first time. Thus, inconsistencies may be low for this period, simply because setting up an account is relatively memorable, and relatively few households would have closed an account.

The higher inconsistency rates for the remaining assets also conform to expectations. As discussed above, in many cases, the retrospective questions aggregate several assets and lack detailed cues. Thus, respondents have to decide whether to include or exclude particular items, increasing the potential for inconsistent re- classification. In addition, transactions for these types of assets may be inherently less salient, either because many of them are conducted (e.g. stock purchases and sales) or because they are complicated and hard to date precisely (e.g. setting up a family business).

4. CONSISTENCY OF REPORTING OF ASSET VALUES

Reporting of asset values is known to be more problematic than reporting of ownership. Values are more difficult to retain than the fact of ownership (Juster and Kuester 1991). Recall is especially poor for items whose values fluctuate, compared to items whose values are fixed and

subject to repetition (Lansing et al 1961). Moreover, respondents may consider it more threatening to reveal asset values, especially when the values involved are large (Ferber 1966).

4.1 Purchase Price of Primary Residence

The data on primary residences provide a relatively good test of respondents' ability to recall value. In 1983, homeowners reported the purchase price of their house; the same information was reported by households that sold homes in the 1983-89 period. If we can be sure that the prices refer to the same home, any divergence between the two values is due to a reporting problem.

To examine divergences between reported house values, we limit the sample in a variety of ways. Considering only those observations that have consistent and complete data on home ownership (as described above), we take the observations that (a) report in 1983 that they own a home purchased prior to that year, (b) provide the purchase price and date for that home, (c) report selling a home between 1983 and 1989, and (d) provide the purchase price and date for the home that was sold. Cases reporting more than one home sale over the period are also dropped, to reduce chances that reported prices refer to different homes. These restrictions leave a total of 86 observations.

Figure 1 shows a plot of the purchase price reported in 1983 and that reported in 1989, with both prices given in natural logs. The correspondence between the two reported prices is reasonably good, as indicated by the fact that the observations cluster along the 45 degree line. The Spearman correlation between the two prices is also high, at 0.81. This suggests that retention of value information is relatively good for a salient item like home price. Interestingly, the cases with large price divergences also tend to report a different year of purchase in 1989, versus 1983, possibly because the house sold over the period is not the same as the house on which the household reported in 1983.

4.2 Values of Assets Other than Homes

For assets other than homes, the consistency of reported values is more difficult to assess. Households report the amount of money they have put into the asset in the 1983-89 period, net of any money they have taken out. We refer to this amount as the household's "net investment" to the asset category, and compare it to the observed change in value of the assets in the two years. Respondents were not asked directly about changes in asset values, since it seemed unlikely that they would remember values at arbitrarily-selected points in the past (Ferber 1966). However, they will more likely remember values of transactions since the latter have practical implications, such as entries on tax returns. Nonetheless, comparing net investment to changes in value is not a clean test of reporting problems, because changes in value can reflect other factors, notably capital gains and losses, interhousehold transfers, and classification problems.

To be included in the analysis for each asset type, observations had to have consistent and complete information on ownership of that asset; they also had to report owning assets of the relevant type in 1983 or 1989, or both. Observations must also have complete information on the current values of holdings in 1983 and 1989, and on net investment in the 1983-89 period. These limitations substantially reduce the numbers of observations available for analysis. For example, among observations with complete and consistent information on ownership of financial assets, one-third lack some component of the value of their holdings (see Appendix Table A.4 for details). Thus, the analysis probably understates recall problems related to value, since observations with complete data may have simpler situations than similar households with missing data.

For the observations used in analysis, Figures 2(a)-(d) plot the value of holdings in 1983 against the value in 1989. A log scale is used for positive values, while zeroes are shown as such. Among households having a particular type of asset in both years, there is a fairly strong positive correlation between the value in 1983 and the value in 1989. For example, among observations owning the asset in both years, the Spearman correlations between the values of 1983 and 1989 holdings are 0.82 for financial assets, 0.77 for business interests, 0.61 for IRA and Keogh accounts,

and 0.72 for other real estate. Many households apparently became asset owners between 1983 and 1989, as represented by the points along the vertical axis. Other households apparently liquidated their holdings between the two years, as represented by the points along the horizontal axis. It is worth noting that the sample is not representative, due to the high-income oversample and the deletion of observations with missing data.

In Figures 3(a)-(d), the reported net investment in the asset is plotted against the first-difference of the two cross-section values, with the net investment shown on the vertical axis. In each figure, 10 to 20 outliers are omitted, since the scale required to show them obscures patterns in the rest of the data. The figures illustrate that the net investment is only weakly related to the actual change between years. Observations are scattered all over the plots, with little tendency toward the expected positive association. Depending on the asset, 20% to 40% of the observations report no net investment over the period, though the cross-sectional data show wide ranges of asset changes for these observations. Scalar measures of correlation confirm the impression of a weak relationship. For example, the Spearman correlation coefficient between the net investment and the actual change is 0.36 for financial assets, 0.27 for business interests, 0.38 for IRA and Keogh accounts, and 0.36 for other real estate.

Capital gains and other factors undoubtedly contribute to these low correlations, though it is difficult to determine their exact role. To estimate the potential contribution of capital gains, we took the value of an asset as reported in 1983, and calculated what it might be expected to be worth in 1989, given the household's reported net investment in the asset, and various assumptions about investment timing and rates of return. Specifically, we used price series that would reflect average returns to assets typical of each asset category, namely, the S&P 500 for financial assets and IRAs, the producer price index for capital equipment for business assets, and the median sales price of existing one-family homes for other real estate (the series are taken from the Federal Reserve's FAME data base). The price series were used to compute the expected value of the household's asset holdings in 1989, given its 1983 holdings and assuming that its net investments were made in six installments over the 1983-89 period. We also tried a number of alternative assumptions about asset

returns and investment timing. While alternative assumptions affect the magnitudes of the estimated values, they do not fundamentally change the results reported below.

To focus attention on the quality of the net investment data, analysis is confined to the cases reporting that they owned the asset in both years. As Table 3 shows, the observed movements in asset holdings are sometimes very different from those that would be expected based on reported net investment and typical rates of return. For example, among households owning financial assets in both 1983 and 1989, the median holding was $80,000 in 1983, and the median reported net investment in financial assets was $0; since the S&P 500 more than doubled over the period, the median estimated holding for 1989 is $208,393. In fact, the actual median holding in 1989 is only $113,000. This would suggest that many households took money out of stock as stock prices were rising, but failed to report an outflow. Similar problems arise for the other types of assets, although the magnitudes of the discrepancies are not as large. Nonetheless, for all asset categories, only half of all cases have actual values between 50% and 150% of the value estimated by applying average rates of return.

It seems doubtful that capital gains alone explain the weak relationship between net investment and changes in asset values. While other factors could be involved, at least part of the explanation seems to be the generally poor quality of the data on net investment. To report on money put into or taken out of an asset between 1983 and 1989, respondents are expected to recall all transactions conducted during the period, approximate the dollar value of each, and then sum the dollar values. Many respondents may not remember all transactions during the six-year period, and/or may not perform the necessary computations in a quick and accurate manner (see also Means, Swan, Jobe and Esposito 1994). The difficulty of the recall task appears to promote rough guessing, and overreporting of responses like "no change." Thus, while the net investment data may have some information content, the news-to-noise ratio seems relatively unfavorable.

5. CONSISTENCY OF REPORTING ON CONTRIBUTIONS TO EMPLOYER-SPONSORED RETIREMENT ACCOUNTS

As mentioned, respondents reported in 1983 whether they were covered by a pension or savings plan on their current job, and if so, whether they had made any contributions under such plans in the previous year. This information can be checked against respondents' description in 1989 of their contributions in 1983, with the caveat that the reference periods may be slightly different (see Section 2.6 above). In practice, inconsistencies in pension reporting can also result from mis-dating of other events affecting pension coverage (e.g. retirement, or a transition into self-employment). To emphasize recollection of account contributions, we confine the sample to respondents who reported working for pay in both 1983 and 1989, excluding those who were self-employed in either year (self-employed individuals were not asked all of the pension questions in 1983). As before, cases with missing information on account contributions are also excluded from analysis (see Appendix Table A.4 for details).

Of the 395 cases with complete employment data, 201 reported contributing to an employer-sponsored retirement account at some point between 1983 and 1989. Of the 201, just over three-quarters (153) were able to provide a year-by-year breakdown of their contributions, with the remaining cases giving an estimate for the whole period. In what follows, we refer to the cases reporting an overall estimate as "possibly contributing" in 1983.

Table 4 compares retrospective and current information on contributions. The data indicate a considerable amount of mis- reporting of past account contributions. Of the cases reporting in 1989 that they contributed in 1983, 29.0% (31) did not report contributing in the previous year when interviewed in 1983. Of the cases reporting in 1989 that they did not contribute in 1983, 31.2% (60) reported contributing when interviewed in 1983. Of the "possibly contributing" cases, 40.5% (17) reported not contributing when interviewed in 1983.

While some inconsistency may be due to timing issues, it is also likely that account contributions are difficult to report accurately, because the process of contributing is not particularly memorable. The pattern of inconsistencies supports a finding from previous research that, with mundane items, respondents often use their current behavior to make reasonable guesses about the past (see e.g. Schwarz 1990). Table 5 disaggregates the inconsistent cases by the type of inconsistency and the reported contribution in 1989. Of those who inconsistently reported in 1989 that they contributed in 1983, 83.9% (26) reported contributing to a pension when interviewed in 1989. Of those who inconsistently reported in 1989 that they did not contribute in 1983, 70% (42) were not contributing to a pension when interviewed in 1989. This phenomenon implies that retrospective reporting will tend to overstate the persistence of a behavior. For example, in the retrospective data, 87.3% of observations had the same contribution status in 1983 as in 1989, versus 59.5% in the cross- sectional information.

6. DETERMINANTS OF INCONSISTENCIES

Thus far, we have examined how inconsistencies vary across types of assets. Previous research also suggests that inconsistent reporting may be more common among some types of respondents than others. If inconsistencies are not completely random, it may be problematic to use the retrospective data for econometric analysis. Curtin et al. (1989) discuss this point with reference to wealth data (see also Duncan and Mathiowetz 1984, on labor market data).

6.1 Inconsistencies in ownership

To check the consistency of reporting on ownership of the asset types examined, we estimate probit models of the probability of an inconsistent response, as defined in Section 3 above. Analysis is confined to the subset of observations owning the asset in 1983 or 1989 or reporting transactions over the period. Previous studies suggest that higher income and better education are associated with more accurate response (Ferber 1966; Lansing et al. 1961). Thus, the explanatory variables for the probit models include the years of education in 1989 of the household head, and a dummy variable

equal to one if the household was in the "high-income" sample in 1983. We also include the age of the household head in 1989, because one might expect the relationship between memory and age to lead to response problems among older respondents. Nonetheless, it is worth noting that previous work on wealth reporting does not find any systematic effects related to age. Conceivably, older respondents may monitor their assets more carefully than younger respondents, offsetting effects of memory per se.

Earlier studies point to a role of respondent motivation in the accuracy of response (e.g. Lansing et al. 1961). We use several dummy variables to capture interviewers' perceptions of respondents' motivation, namely whether the respondent showed a high level of interest in the survey, consulted documents during the interview, was somewhat or highly suspicious, or had a poor or bad understanding of the survey. Finally, reporting problems may be worse in households with complicated structures or that underwent large changes in composition between 1983 and 1989 (Sudman and Bradburn 1973). Thus, we include a dummy variable indicating whether there was a change in household composition between 1983 and 1989, and another indicating whether the household contained adults other than the respondent, spouse and their children in either survey year. As before, the analysis is limited to cases where the household head's marital status did not change over the period, and where the same individual responded to the survey in 1983 and 1989.

Table 6 presents the results. The estimated effects of covariates on the probability of an inconsistency vary across asset types, in ways that sometimes lack a clear interpretation. Being in the high-income sample lowers the probability of an inconsistency for financial assets, IRA and Keogh accounts, and business interests; however, it raises this probability for contributions to employer-sponsored retirement accounts. The effect of age on inconsistencies is negative for homes, financial assets and other real estate, while it is positive for IRA/Keogh accounts and for business interests. For IRA/Keogh accounts, older households may have a greater potential for inconsistency since they may have both deposits and withdrawals from such accounts, while younger households tend to have deposits only. Greater education is associated with significantly lower inconsistencies for homes, financial assets, IRA/Keogh accounts, and other real estate, while it has no significant effect on

business interests or contributions to employer-sponsored retirement accounts. The variables reflecting respondent motivation have few significant effects, once other factors are taken into account. There is no systematic evidence of higher inconsistencies among households where the composition changed, or among those with other adult members.

In short, there are some significant correlations between reporting problems and household characteristics, though apart from the effect of education, they are not necessarily easy to interpret. This finding is consistent with previous studies using wealth and labor market data (Curtin et al. 1989; Duncan and Mathiowetz 1984). It is also in line with prior research suggesting that the complexity of the recall task is often more important than respondent characteristics in determining the extent of recall problems (e.g. Schaeffer 1994).

6.2 Inconsistencies in value

It is also interesting to examine whether inconsistencies in reported values vary with household characteristics. For each type of asset, we estimate regressions in which the dependent variable is the difference between the observed change in holdings between 1983 and 1989, and the estimated change based on reported net contributions over the period, as described above. To focus on inconsistencies in value, the analysis is confined to households with complete and consistent information on ownership of the asset and no missing information on values, and who owned the asset in both years. We use the same explanatory variables as before, and estimate the models using robust and median regression to ensure that results are not overly sensitive to influential observations. The robust regression is estimated by the Rousseeuw-Leroy method in Stata 4.0.

Results are presented in Table 7. Very few coefficients are statistically significant, and the models generally have low explanatory power. However, in almost all cases, the value of the holding in 1983 had a significant, negative effect on the difference between the observed and estimated change in value. While several factors may contribute to this finding, much of the effect seems to come from implausible descriptions of net investments over the 1983-89 period, particularly the

tendency to report taking out as much money as was put in. Households with large initial holdings are not necessarily more likely to answer this way, but when they do, it creates a large absolute discrepancy between the observed and estimated change. This finding indicates the potential for bias in econometric analysis of retrospective data. Notably, while reported net investment might seem to be acceptable as a dependent variable, the error in its measurement may be correlated with true net investment, in which case OLS estimates of regression coefficients are not unbiased. See Bound, Brown, Duncan, and Rodgers (1994) for an analysis of this problem using validation data on earnings and hours.

7. SUMMARY AND DISCUSSION

The main results of this study can be summarized as follows. First, there is a fair amount of inconsistency between retrospective and current information on asset ownership. Inconsistency rates are relatively low for salient transactions like home sales, while they are higher for aggregated items like financial assets. Second, the quality of retrospective data on asset values appears to be fairly poor, with reported net investments in individual assets only weakly related to observed changes in holdings. Third, reporting problems can vary with household characteristics, indicating the potential for bias in econometric analysis of retrospective data.

Thus, the experience of the 1983-89 SCF suggests that, while retrospective data on wealth changes have some information content, such data are relatively noisy, and probably provide a poor substitute for panel data. Of course, the SCF data cover a six year period, and it is possible that reporting problems would not be as severe for shorter reporting intervals. However, other research documents problems with retrospective reporting even for fairly short periods. For example, Alessie and Zandvliet (1993) find similar inconsistencies in asset changes over a one-year period, using the Dutch Socioeconomic Panel. Analysis of expenditure data shows important recall problems in periods as short as three months (Silberstein and Jacobs 1989). Thus, it seems unlikely that the reporting problems described in this paper are solely the result of the recall period.

The level of inconsistency in the retrospective data is disappointing. On one hand, data on changes in wealth are useful for characterizing household saving in a broad way, including the role of capital gains. On the other hand, the costs of collecting detailed information on current wealth from a panel sample are likely to be high, with wealthy respondents--who account for a disproportionate share of total saving--unlikely to submit to regular, lengthy interviews. As an alternative, it may be preferable to ask respondents to characterize generally their recent savings behavior. For example, the 1992 and 1995 SCFs asked the question, "Over the past year, would you say that your family's spending exceeded its income, was about the same as its income, or that you spent less than your income?" This question does not impose an unrealistic recall task, and while there is a risk that respondents misclassify themselves, the 1992 data show responses to be quite consistent with expected patterns of saving behavior (Kennickell 1995). Such information would be especially useful if collected in a panel setting, but would also be valuable if collected from repeated cross-section samples.

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Appendix Table A.1. Availability of Data on Asset Ownership (Number of Cases)

Type of asset	*Current Ownership Information* 1983	1989	*Retrospective Information:* Yes	No	Total
Primary residence	Yes	Yes	1,082	17	1,099
	Yes	No	0	0	0
	No	Yes	0	0	0
	No	No	0	0	0
	T O T A L		1,082	22	1,099
Financial assets	Yes	Yes	1,136	20	1,156
	Yes	No	3	6	9
	No	Yes	15	0	15
	No	No	0	0	0
	T O T A L		1,154	26	1,180
IRA/Keogh accts	Yes	Yes	1,126	45	1,171
	Yes	No	0	5	5
	No	Yes	4	0	4
	No	No	0	0	0
	T O T A L		1,130	50	1,180
Business interests	Yes	Yes	1,155	16	1,171
	Yes	No	0	3	3
	No	Yes	5	1	6
	No	No	0	0	0
	T O T A L		1,160	20	1,180
Other real estate	Yes	Yes	1,146	29	1,175
	Yes	No	0	0	0
	No	Yes	4	1	5
	No	No	0	0	0
	T O T A L		1,150	30	1,180

Appendix Table A.2. Patterns of Transactions, Cases with Complete Ownership Data (Number of Cases)

	Current Ownership Status		*Retrospective Information*				
	1983	*1989*	*No trans-actions*	*Only bought*	*Only sold*	*Bought & sold*	*Total*
Primary residence	Yes	Yes	737	20	5	93	855
	Yes	No	13	0	11	2	26
	No	Yes	19	28	0	6	53
	No	No	145	0	1	2	148
	Total		914	48	17	103	1082
Financial assets	Yes	Yes	70	60	21	237	388
	Yes	No	58	1	11	12	82
	No	Yes	56	27	6	28	117
	No	No	532	2	7	8	549
	Total		716	90	45	285	1136
IRA & Keogh accounts	Yes	Yes	88	221	37	23	369
	Yes	No	26	1	10	3	40
	No	Yes	30	92	10	5	137
	No	No	571	0	6	3	580
	Total		715	314	63	34	1126
Business interests	Yes	Yes	110	86	16	27	239
	Yes	No	87	11	12	5	115
	No	Yes	32	37	3	5	77
	No	No	713	8	1	2	724
	Total		942	142	32	39	1155
Other real estate	Yes	Yes	152	52	35	58	297
	Yes	No	54	4	19	3	80
	No	Yes	67	49	4	11	131
	No	No	616	11	7	4	638
	Total		889	116	65	76	1146

Appendix Table A.3. Availability of Data on Values, Cases with Consistent and Complete Ownership Data, Excluding Cases that Neither Owned Nor Transacted (Number of Cases)

	Information on Current Value		*Retrospective Data*		
Asset type	*1983*	*1989*	*Yes*	*No*	*Total*
Financial assets	Yes	Yes	269	28	297
	Yes	No	97	16	113
	No	Yes	32	1	33
	No	No	15	8	23
	Total		413	53	466
IRA & Keogh accts	Yes	Yes	395	28	423
	Yes	No	33	2	35
	No	Yes	15	1	16
	No	No	5	0	5
	Total		448	31	479
Business interests	Yes	Yes	176	7	183
	Yes	No	42	5	47
	No	Yes	38	2	40
	No	No	28	0	28
	Total		284	14	298
Other real estate	Yes	Yes	339	9	348
	Yes	No	17	1	18
	No	Yes	11	2	13
	No	No	0	0	0
	Total		367	12	379

Appendix Table A.4. Availability of Data on Pension Contributions, Household Heads Working for Someone Else in 1983 and 1989 (Number of Cases)

Information on Current Value		*Retrospective Data*		
1983	*1989*	*Yes*	*No*	*Total*
Yes	Yes	341	8	349
Yes	No	10	0	10
No	Yes	34	0	34
No	No	2	0	2
Total		387	8	395

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Table 1. Definitions of Inconsistent Ownership Patterns

Reported Ownership In:		*Transactions Reported in 1989 for 1983-89 period*			
1983	*1989*	*Neither bought nor sold*	*Only bought*	*Only sold*	*Both bought and sold*
Yes	Yes	OK	<OK>	<OK>	OK
Yes	No	*	*	OK	OK
No	Yes	*	OK	*	OK
No	No	OK	*	*	OK

NOTE: The symbols used in the table are as follows:
OK = Information on current ownership in 1983 and 1989 is consistent with transactions reported in 1989 for the 1983-89 period.
<OK> = Information is consistent for assets other than primary residence, inconsistent for primary residence.
* = Information on current ownership is not consistent with transitions reported in 1989 for the 1983-89 period.

Table 2. The Consistency of Information on Asset Ownership, by Asset Type

Item	*Homes*	*Financial Assets*	*IRAs & Keoghs*	*Business Interests*	*Real Estate*
Number of cases with complete ownership information	1,082	1,136	1,126	1,155	1,149
Number of inconsistencies	58	130	73	134	147
Inconsistent cases as % of:					
- All cases with complete ownership data	5.4 (0.7)	11.4 (2.8)	6.5 (0.7)	11.6 (0.9)	12.8 (1.0)
- Cases with complete ownership data, and owned or transacted	6.2 (0.8)	21.5 (1.7)	13.2 (1.4)	30.3 (2.2)	27.7 (1.9)
Differences between inconsistency rates, by asset type:					
- Homes	-	15.3 (1.8)	7.0 (1.6)	24.2 (2.3)	10.2 (2.1)
- Financial assets	-	-	-8.3 (2.2)	8.8 (2.7)	6.2 (2.6)
- IRAs & Keoghs	-	-	-	17.1 (4.2)	14.5 (2.4)
- Business interests	-	-	-	-	-2.6 (2.6)

NOTE: Standard errors in parentheses. For comparability, the analysis of homes excluded households living in mobile homes, those living on farms run as businesses, and those that neither rent nor own.

Table 3. Comparison of Actual and Estimated Values (observations with consistent and complete information, and owning the asset in 1983 and 1989)

Item	*Units*	*Financial Assets*	*IRAs & Keoghs*	*Business Interests*	*Real Estate*
Median value in 1983	1983 $	80,000	6,000	391,250	128,000
Median net investment, 1983-89	Self-reported $	0	8,000	0	0
Median estimated value in 1989	1989 $	208,392	30,811	382,813	198,450
Median actual value in 1989	1989 $	113,000	30,000	420,050	200,000
Percent of observations where actual value is between 50% and 150% of the estimated value	Percent	40.2	58.4	33.3	46.4
Number of observations	Number	209	305	120	261
Price series used for estimated value		S&P 500 equip. price--homes	S&P 500	PPI--Cap.	Med. sales
Series value:					
1983=100		100.0	100.0	100.0	100.0
1984		100.1	100.1	102.3	103.0
1985		116.5	116.5	104.6	107.4
1986		147.3	147.3	106.7	114.2
1987		178.8	178.8	108.6	121.7
1988		165.7	165.7	111.2	126.9
1989		201.2	201.2	114.8	132.3

Table 4. Current versus Retrospective Information on Contributions to Employer-Sponsored Retirement Accounts, Numbers of Cases

	1983 Status as Reported in 1989			
1983 Status as Reported in 1983	*Contributed*	*Possibly Did not contributed*	*contribute*	*TOTAL*
Contributed	76	25	60	161
Did not contribute	31	17	132	180
TOTAL	107	42	192	341

Table 5. Types of Inconsistencies in Reported Constributions to Employer-Sponsored Retirement Accounts, Numbers of Inconsistent Cases

	1989 Status as Reported in 1989		
Type of Inconsistency	*Contributing*	*Not contributing*	*TOTAL*
Reported contributing in 1983 when asked in 1989	26	5	31
Did not report contributing in 1983 when asked in 1989	18	42	60
TOTAL	44	47	91

Table 6. Probit Results: Probability of Inconsistent Data on Ownership

Variable	*Homes*	*Financial assets*	*IRA/Keogh Accounts*	*Business Interests*	*Other real estate*	*1983 Pension Contribution*
Intercept	0.16	1.91*	-0.47	-1.37*	1.34*	0.37
	(0.50)	*(0.56)*	*(0.58)*	*(0.56)*	*(0.49)*	*(0.71)*
Age	-0.02*	-0.02*	0.01*	0.02*	-0.01*	-0.00
	(0.01)	*(0.01)*	*(0.01)*	*(0.01)*	*(0.00)*	*(0.01)*
Education	-0.06*	-0.10*	-0.08*	0.00	-0.07*	-0.04
	(0.03)	*(0.03)*	*(0.03)*	*(0.03)*	*(0.02)*	*(0.04)*
High-Income	0.17	-1.00*	-0.53*	-0.54*	-0.17	0.64*
	(0.18)	*(0.17)*	*(0.18)*	*(0.16)*	*(0.14)*	*(0.26)*
High Interest	-0.26	-0.17	-0.05	-0.05	-0.26	0.42+
	(0.21)	*(0.18)*	*(0.20)*	*(0.16)*	*(0.18)*	*(0.25)*
Documents	-0.19	0.02	-0.31	0.00	-0.12	-0.05
	(0.22)	*(0.17)*	*(0.20)*	*(0.16)*	*(0.15)*	*(0.23)*
Poor Understanding	-0.30	0.28	-0.28	0.10	0.01	0.94*
	(0.28)	*(0.29)*	*(0.36)*	*(0.33)*	*(0.29)*	*(0.46)*
Suspicious	0.05	0.36*	-0.09	0.17	-0.04	-0.89*
	(0.21)	*(0.19)*	*(0.24)*	*(0.24)*	*(0.20)*	*(0.36)*
Change in HH comp.	0.01	0.00	0.07	-0.46*	-0.12	-0.06
	(0.15)	*(0.14)*	*(0.16)*	*(0.16)*	*(0.14)*	*(0.18)*
Other Adult	0.11	0.04	-0.10	-0.09	0.06	0.28
	(0.21)	*(0.24)*	*(0.31)*	*(0.29)*	*(0.24)*	*(0.31)*
Pseudo-R2	.046	.198	.084	.066	.051	.056
Log L	-207.5	-252.1	-197.9	-253.3	-296.8	-153.0
Number of obs.	936	604	555	442	530	246

* = significant at 5 percent.
+ = significant at 10 percent.

NOTE: Standard errors in parentheses. For each probit, the sample consists of households with complete data for that asset, and who owned or bought or sold the asset during 1983-89.

Table 7. Regression Results: Difference between Actual and Expected Change in Value

	Financial assets		*IRA/Keogh*		*Business interests*		*Other real estate*	
Variable	*Median*	*Robust*	*Median*	*Robust*	*Median*	*Robust*	*Median*	*Robust*
Intercept	540199+	300041+	52694*	15209	-298798	1560672+	47228	113440
	(283435)	(169837)	(21705)	(14559)	(336841)	(804736)	(72631)	(152151)
Age	-669	-277	319	300*	-2172	5250	-140	431
	(2363)	(1408)	(201)	(135)	(2741)	(6501)	(590)	(1208)
Education	2268	3791	-126	287	12147	18531	100	7454
	(15379)	(9236)	(1024)	(689)	(14692)	(34152)	(2949)	(6237)
High-income	-65645	-60131	2882	-1019	46976	191338	67234*	27459
	(68973)	(40754)	(4607)	(3081)	(82428)	(187958)	(16153)	(33334)
High interest	58600	-33006	1711	2250	34774	71885	10153	1534
	(57735)	(34985)	(4885)	(3231)	(67817)	(157547)	(16351)	(33812)
Documents	-104953+	-57510	118	-195	-79698	-100750	-1329	39129
	(60463)	(35672)	(4644)	(3150)	(70036)	(161804)	(14622)	(30971)
Poor under-	169064	-56057	6245	1982	453288*	481538	-51315	50661
standing	(174013)	(121415)	(12424)	(8773)	(123116)	(299673)	(35686)	(78079)
Suspicious	30161	-4839	-8556	-7032	-3070	-283842	-2459	-11703
	(104489)	(67293)	(7872)	(5420)	(159700)	(437233)	(26248)	(55005)
Change in	-62793	-42174	4761	4049	96017	-258872+	2501	5576
HH comp.	(56746)	(33318)	(4447)	(2982)	(67460)	(155815)	(15287)	(31540)
Other	-74266	42643	-7647	-6282	-8046	-46230	-499	-52501
adult	(109465)	(66349)	(8472)	(5863)	(140065)	(331580)	(27797)	(57906)
Value in	-59089*	-35685*	-8355*	-4455*	21742	-184432*	-4876	-24117*
'83 (log)	(14495)	(8464)	(1483)	(979)	(18106)	(42828)	(4730)	(9845)
Pseudo-R2	.033	-	.016	-	.007	-	.004	-
Prob>F -	.000	-	.001	-	.003	-	.445	
Num. of obs.	209	209	305	305	120	120	261	261

* = significant at 5 percent.
+ = significant at 10 percent.

NOTE: Standard errors in parentheses. For each regression, the sample consists of households with consistent and complete information on ownership of the asset and no missing information on values of the asset, and who owned the asset in both years.

Figure 1. Purchase Price of Home Reported in 1983 versus Purchase Price Reported in 1989, Homes sold in 1983-89

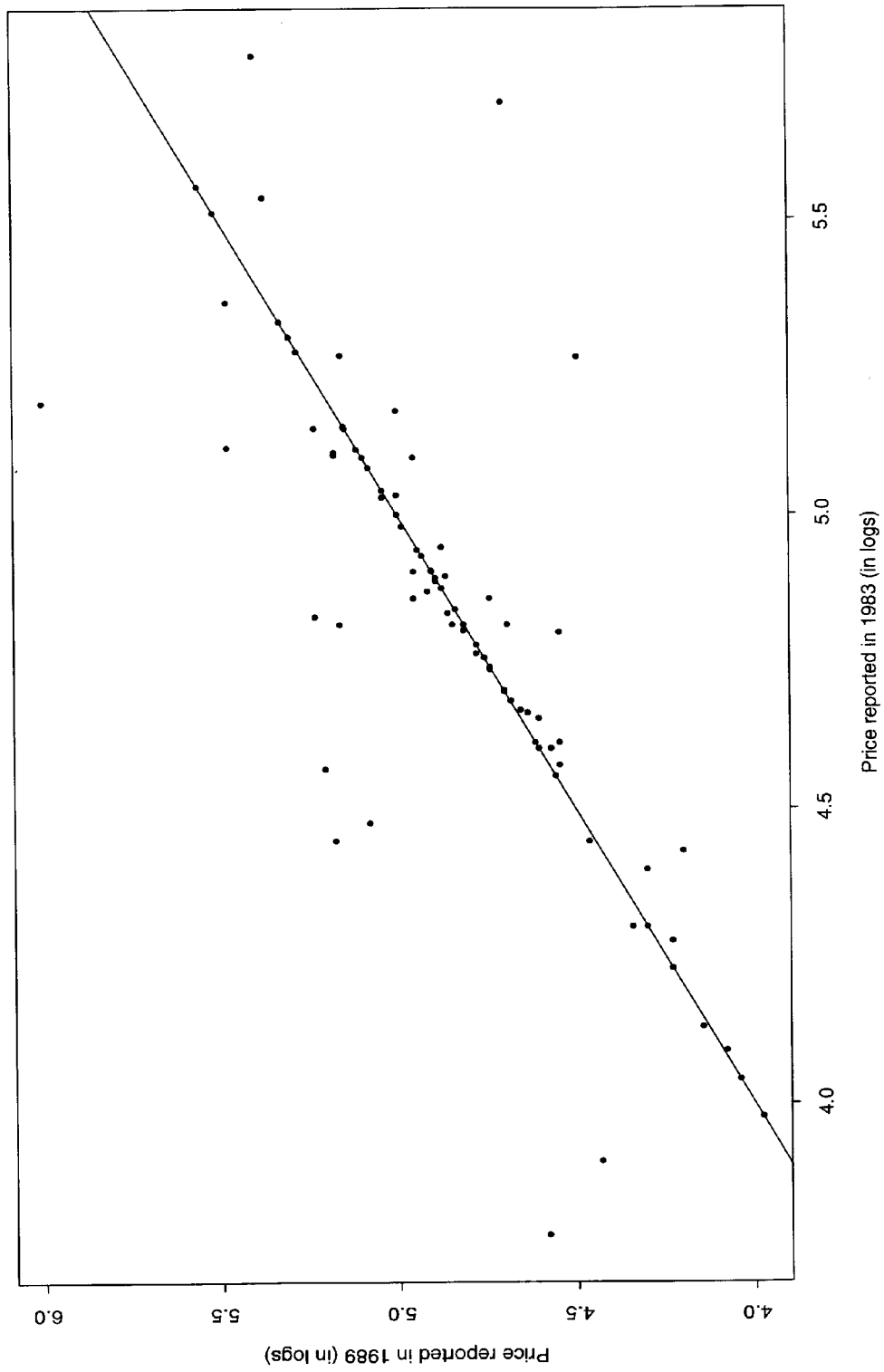

Figure 2. Value of Asset Holdings in 1983 versus 1989, by Asset Type (in logs)

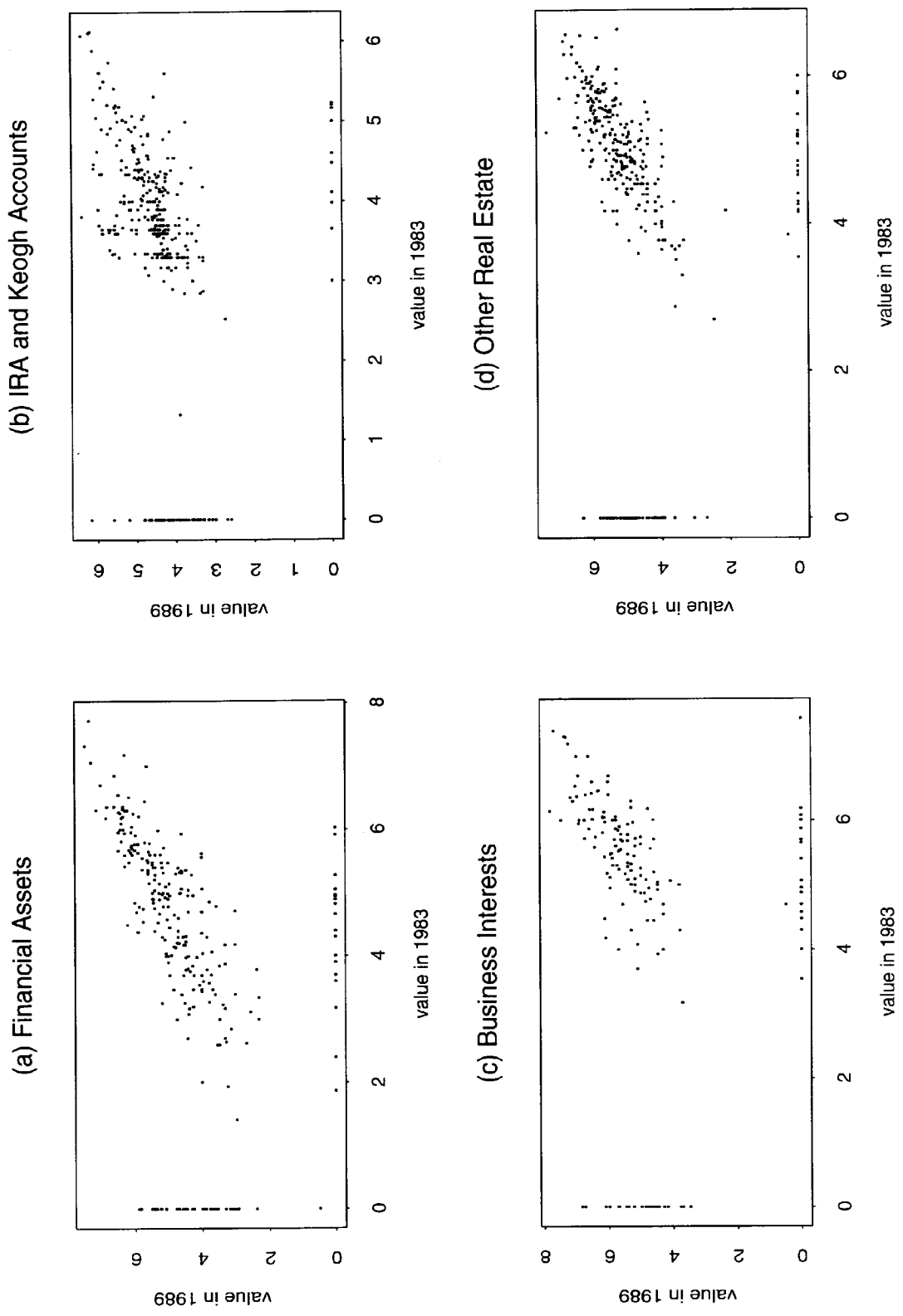
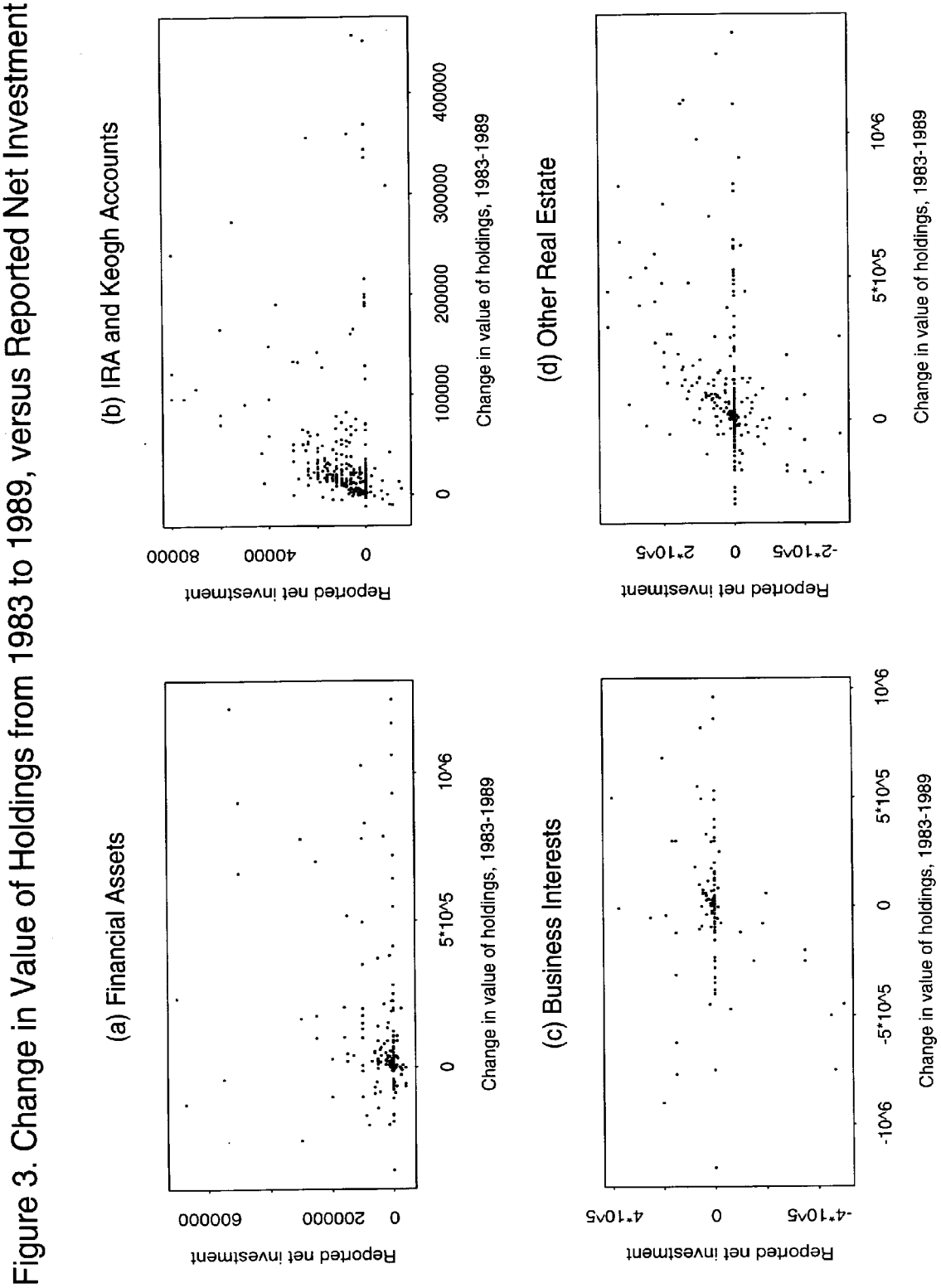
Figure 3. Change in Value of Holdings from 1983 to 1989, versus Reported Net Investment