

The Effect of Unfolding Brackets on the Quality of Wealth Data in HRS

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Abstract

A characteristic feature of survey data on household wealth is the high incidence of missing data—roughly one in three respondents who report owning an asset are unable or unwilling to provide an estimate of the exact amount of their holding. A partial solution to that problem is to devise a series of questions that put the respondent's holdings into a quantitative range (less than x , more than x , or what?). These quantitative ranges are called unfolding brackets, and they represent a survey innovation that aims to improve the quality of wealth data by substituting range data for completely missing data. In this paper, we examine the effect of unfolding brackets on the quality of HRS wealth data. Special attention is given to the impact of unfolding bracket entry points on the distribution of asset holdings in HRS 1998. Although there is a small positive relationship between mean asset holdings and entry point, there are many cases where that relationship does not hold. In general, our conclusion is that entry point bias problems are not a major concern in the evaluation of quality in the 1998 HRS wealth data.

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The Effect of Unfolding Brackets on the Quality of Wealth Data in HRS

I. Overview

One of the major innovations of the Health and Retirement Study (HRS) is the addition of an unfolding bracket question sequence for those respondents who own an asset but who are unwilling or unable to provide an estimate of the amount. (See Appendix 1 for the basic structure of an unfolding bracket question sequence.) The unfolding brackets idea originated in the wealth module of the Panel Study of Income Dynamics (PSID) in 1984, when a very short wealth sequence was first asked in an ISR/SRC survey. It turns out that the missing data rate (the R owns an asset but is not willing or able to provide a dollar amount) is very sizeable in both HRS and AHEAD—much larger than had proved to be the case for PSID. The typical missing data rate in the HRS and AHEAD studies is of the order of the low thirty percent, a missing data rate that can be reduced to mainly single digits by using the unfolding bracket question sequence.

If it were the case that respondents who did not or could not provide point estimates of their asset holdings (or of other financial flows) did not behave differently, relative to demographic and other characteristics, than respondents who provided point estimates (continuous data cases), then how the missing data cases are treated would make relatively little difference. There would be no systematic bias associated with respondents placing themselves in an unfolding bracket category rather than reporting an exact data number. But if it turned out that missing data cases had values that were systematically high or low relative to personal characteristics of the respondent, then taking that into account might well make a substantial difference in estimates of the distribution of asset holdings, or in the mean levels of such holdings. It would be quite important to find an estimate of the size of that bias and to correct the data for it. In effect, if the imputation program used to convert missing data to imputed data

produces the result that there is no systematic difference between continuous (exact) data and missing data, then the gains from using unfolding brackets would be miniscule. On the other hand, if it turned out that missing data cases were systematically very different than continuous data cases, then developing a proper imputation program that corrects for that bias would be quite important.

Initial exploration of this problem produced the not unexpected result that missing data cases were in fact quite different than continuous data cases, and that the appropriate adjustment would involve a substantial increase in the level of asset holdings. Two early papers made this point clearly. One was a paper by Juster and Smith, published in JASA in 1997, which adopted the strategy of imputing missing data cases by random draws from the bracket category that respondents placed themselves into. That is, if a respondent said that their asset holdings were more than \$5000 but less than \$50,000, an estimate of the respondent's holdings could be calculated by making a random draw from continuous data cases located in that particular bracket category—in this case, in the category \$5000 to \$50,000. Roughly the same results were obtained in another study, authored by Hurd and published in the Journal of Risk and Uncertainty in 1999. Both of these studies used data collected in Wave 1 of HRS and Wave 1 of AHEAD; the Hurd study also used Wave 2 HRS data.

Table 1 below shows the results of the imputations from these two studies. The top panel has mean values for each category of HRS 1992 asset holdings, while the second panel has HRS 1992 median values. The third panel has 1994 HRS data. The column labeled “RAND-H” represents work done on the imputation of asset holdings by RAND staff working with Hurd, while the category labeled “RAND-S” represents work done by RAND staff working with Smith.

Table 1

The Impact of Unfolding Brackets on Estimates of the Level and Distribution of Wealth

A. Mean Values, HRS Wave 1 Data (000)						
Asset Component	<u>RAND-H^a</u>			<u>RAND-S^b</u>		
	Continuous	Bracket	Bracket Δ	Continuous	Bracket	Bracket Δ
Real Estate	149	219	+70	129	222	+93
Business/Farm	168	294	+126	166	349	+183
IRAs	45	45	0	44	56	+12
Stock	59	73	+14	57	74	+17
Bonds	48	73	+25	47	68	+21
Ck/Saving/MM	16	21	+5	16	23	+7
CDs, T-Bills	27	45	+18	27	48	+21
Transportation	13	22	+9	13	18	+5
B: Median Values, HRS Wave 1 Data (000)						
Asset Component	<u>RAND-H</u>			<u>RAND-S</u>		
	Continuous	Bracket	Bracket Δ	Continuous	Bracket	Bracket Δ
Real Estate	45	75	+30	42	70	+28
Business/Farm	25	95	+70	24	98	+74
IRAs	20	25	+5	20	30	+10
Stock	18	20	+2	17	23	+6
Bonds	12	20	+8	14	24	+10
Ck/Saving/MM	5	5	0	5	7	+2
CDs, T-Bills	8	10	+2	10	10	0
Transportation	7	10	+3	8	10	+2
C: HRS Wave 2 RAND-H Data (000)						
Asset Component	Median			Mean		
	Continuous	Bracket	Bracket Δ	Continuous	Bracket	Bracket Δ
Real Estate	50	90	+40	98	229	+131
Business/Farm	55	75	+20	112	197	+82
IRAs	28	30	+2	55	60	+5
Stock	26	25	-1	66	74	+8
Bonds	20	20	0	69	69	0
Ck/Saving/MM	5	10	+5	16	30	+14
CDs, T-Bills	8	20	+12	24	64	+40
Transportation	8	10	+2	12	18	+6

a) From Michael D. Hurd, "Anchoring and Acquiescence Bias in Measuring Assets in Household Surveys," *Journal of Risk and Uncertainty*, 1999.

b) From Juster and Smith, "Improving the Quality of Economic Data: Lessons from the HRS and AHEAD," *JASA*, 1997.

Looking at the values in Table 1, it is quite clear that there is virtually no difference in the mean or median values for the categories labeled RAND-H and those labeled RAND-S. In all cases bracketed data cases yield a significantly higher mean and median value than continuous data cases, while the RAND-H and RAND-S estimates are essentially identical. The small differences that exist between the RAND-H data and the RAND-S data are probably due to the fact that the work done by Hurd treats Range Card cases as if they were continuous data cases, while the work done by Juster and Smith treats these cases as if they were unfolding bracket cases. This difference in treatment produces slightly higher values for RAND-H than for RAND-S because the Range Cards have substantially more detail in the highest categories than do the unfolding brackets—as a consequence, imputation using random draws is likely to produce a few very high values for the Range Card cases, and thus a higher mean.

It might be useful to spell out exactly why there are a set of cases derived from Range Cards in a study where the missing data estimates are basically derived from unfolding brackets. The reason that there are Range Card cases in this study is that the original HRS design was based on measures developed for the PSID. In the PSID, housing values are asked about before either assets or income, and missing data on housing values was obtained from Range Cards rather than from unfolding brackets.¹ Since the 1992 HRS survey was a personal interview survey, it was feasible to use a Range Card for missing data cases on house value. Thus the respondent had physical control of the Range Card while the housing section was being administered, and some respondents continued to use the Range Card when the survey shifted to other forms of assets. Of the roughly 30% of cases with missing data that had to be imputed,

¹ The Range Card that is used for both the HRS and the PSID consisted of 10 categories denoted by a letter (A through J), with amount categories as follows: A = Less Than \$500, B = \$500-1000, C = \$1001-2500, D = \$2501-10,000, E = \$10,001-50,000, F = \$50,001-250,000, G = \$250,001-999,999, H = \$1 Million - \$9,999,999, I = \$10 Million - \$100 Million, J = More than \$100 Million.

roughly six percentage points are cases where Range Cards were used rather than the unfolding bracket sequence. The Hurd paper uses these Range Card cases after converting them to continuous data cases (using random draws of continuous data cases falling in each of the specific Range Card categories).

There are other characteristics of the bracket data than need to be taken into account in any imputation process, and these seem to have been handled somewhat differently in the Juster and Smith paper than in the Hurd paper. For example, it is unambiguously clear that missing data cases that represent refusals (REF) are really quite different than missing data cases where respondents say they don't know (DK). One major difference is that REF cases show a different distribution among bracket categories than DK cases, and the imputation process produces substantially higher mean and median values for REF cases than for DK cases.² Another major difference is that REF cases typically do not complete the unfolding bracket sequences but continue to refuse, while the DK cases generally go through the unfolding bracket sequence.³

II. Unfolding Bracket Bias

In recent years, analysis of the unfolding bracket categories and their relationship to the continuous data category has undergone a substantial change. What has basically taken place is that some researchers have become persuaded that various types of potential biases in the treatment of unfolding bracket cases need to be corrected if the data are to be regarded as unbiased (Hurd, 1999; Soest and Hurd, 2003). The kinds of considerations that these researchers

² This analysis is based on REF or DK cases where the original response was a DK or REF, but the response to the next (bracket) question was one of the bracket categories. That is, if a DK or REF response was followed by the selection of a bracket category, the imputation was based on a random draw from continuous data cases falling into that bracket category. Cases where the only response is a DK or REF are imputed by selecting a random draw from cases where there is both a DK or REF response and a subsequent bracket selection.

³ About 40% of REF cases are followed by a bracket response, while about 90% of DK cases are followed by a bracket response.

worry about are known as “entry point” or “anchoring” bias, or as “acquiescence” bias. The entry point phenomenon is basically concerned with what difference it makes where the unfolding bracket categories are entered--on the low side (e.g., “is it less than \$2500, greater than \$2500, or what?”), on the high side (e.g., “is it less than half a million, more than half a million, or what?”), or somewhere in the middle (e.g., “is it less than \$125,000, more than \$125,000, or what?”). Depending on where the respondent enters into this bracket sequence, entry point bias would mean that the distribution of responses would be shifted toward the initial entry point. That is, if the initial entry point is the lowest possible bracket category, the true distribution of assets will be higher than the imputed distribution because the question sequence will generate a bias in the direction of the entry point.

The second type of bias, acquiescence bias, is associated with a respondent preference to agree with the way the question is framed by the survey designer—e.g., is it more than \$25,000? More than \$50,000? In this type of question sequence, one possible answer is “yes”, and it is widely thought that questions of that type produce biased responses because respondents are more apt to say “yes” than not to say “yes”—a yea-saying bias. We do not examine acquiescence bias in this paper because the question wording was changed in HRS 1996 to a balanced version that eliminated the possibility of acquiescence bias (e.g., is it less than x, more than x, or what?).

There are some characteristics of entry point bias that represent what seem to us puzzling features of the data. The theory underlying the psychology that generates these types of biases is that the way the question is framed will influence the way the question is answered. A number of well known and highly regarded papers by Kahneman and Tversky (e.g., Tversky and Kahneman, 1974, 1981; and Kahneman and Tversky, 1986) examine this framing bias. It must be the case that this type of bias is much more important, and clearly more common, when we

are dealing with questions that the respondent does not or may not know the answer to. For example, it is not difficult to understand why there might be an entry point bias if the survey question was something like: “How many African tribes are there in the continent of Africa?” and if the respondent said “don’t know”, that question might be followed by one that said: “Are there more than 50 such tribes, less than 50 such tribes, or what?” Since the interviewer, and the respondent, can be presumed to know absolutely nothing about the true number of tribes in the continent of Africa, it would not be surprising if there were substantial bias in favor of producing a number that was close to the number specified in the question, on the grounds that the questionnaire designer knew what was a foolish question and what was not, while the respondent didn’t know either and was best off relying on the implicit judgment of the interviewer and the question designer.

But what if the question, as in the case of HRS and AHEAD, has to do with checking, saving, or money market accounts, which the respondent must know quite a lot about, but may not be perfectly certain about the exact amounts in those accounts? It is hard to believe that respondents who say they own checking accounts, saving accounts, or money market accounts, wouldn’t know approximately the amount of assets in those accounts—whether the accounts add up to “more than \$50,000, less than \$50,000, or what?” The major difficulty in answering this question is very likely to be that the respondent doesn’t know how to interpret “accounts”. Over the last decades or so, there has been a veritable explosion of financial instruments that have an accounts flavor, and a typical respondent who has a large number of such accounts might be unclear about which ones should be counted and which ones should be ignored.⁴

⁴ There must be many households where the answer to this question is simple and straightforward and where the entry point makes absolutely no difference. Take a household that owns only a single checking account, has no saving accounts, no money market accounts, and no other assets. Is it really plausible to suppose that it matters whether the first question in the sequence asks whether such an account adds to up to less or more than \$1000, the

How difficult is it to demonstrate that there really is entry point bias, and that this bias needs to be taken care of before the data can be shown to be an unbiased representation of the true distribution of assets? The idea of entry point bias, as noted above, is that low entry points produce estimates of amounts that are biased downward, high entry points produce estimates of amounts that are biased upward, and entry points in the middle produce estimates that have relatively modest bias. If that were the case, one would expect to find that the mean value of assets of a particular type should be increased from entry point one (on the low side) and entry point two (in the middle), and there should also be increases in the mean value of assets when moving from entry point two (in the middle) to entry point three (on the high side). That is, entry point bias basically says that the respondent will be moved toward the entry point in responding to any question about assets where the respondent lacks perfect certainty about the amount. Finally, picking an entry point around the mean or median may well give better results than picking an entry point at either end of the distribution.

III. Entry Point Bias: The Empirical Evidence

There have been enough data generated by a variety of entry point experiments in both the HRS and AHEAD survey designs so that we can look at the actual results of entry point differences. Entry point bias ought to mean that going from entry point one (low) to entry point two (higher than entry point one) would show an increase in the mean, and going from entry point two to entry point three (highest) would also show an increase in mean value. If, on the other hand, entry point bias is not present, we should find that the difference in means between entry points

next question asks about less or more than \$25,000, and the third question asks about less or more than \$125,000? It is hard to see why an estimate of the amount in the respondent's checking account is going to be affected by which of those three numbers (\$1000, \$25,000, or \$125,000) shows up first in the question sequence.

one and two or two and three is basically a random process and is just as likely to show a decrease as an increase.

The data in Appendixes 2, 3 and 4 show the distribution of bracket cases for those who responded DK or REF when asked about the amount of money in the various asset categories. The HRS 1998 sample was used in the analysis. Appendix 2 has counts of households in the various bracket categories, and has a complete set of tabulations for each of the ten net worth components. These include real estate properties, businesses and farms, IRAs, stocks and mutual funds, checking/savings/money market accounts, bonds, certificates of deposit and T-bills, transportation vehicles, other assets, and debts. These tabulations are organized by entry point, which varies from asset to asset and is pre-determined according to an algorithm described in Hill (1999).

Parallel to Appendix 2, Appendix 3 shows the mean values for each bracket category, along with the mean for all the cases corresponding to each entry point and the mean for all the households who responded DK or RF. A condensed version of Appendix 3 is in Appendix 4, which provides a direct, numeric foundation for Tables 2 and 3 below.

The data in Appendix 3 are based on the unweighted means for asset owners. For example, the unweighted means for those who own a real estate asset, and who responded DK when asked about the amount of their real estate asset, is \$168,006 for those with a low entry point (\$2,500), \$205,737 for those with a medium entry point (\$125,000), and \$238,004 for those with a high entry point (\$500,000). The data also show that the mean values of their real estate assets increase going from the low to middle entry point, and from the middle to the high entry point. This pattern shows up for the DK cases, for the REF cases, and for the sum of the two types of cases.

Table 2 below details the incidence of asset increases (+) or decreases (-) for respondents in each of the possible entry points for each of the ten net worth components in the HRS study. DK responses are distinguished from REF responses. Thus, REF respondents showed an increase in Real Estate assets between entry points 1 and 2 for those who refused to give an amount of their Real Estate holdings; these respondents also showed an increase in Real Estate assets between entry points 2 and 3.

Table 2

Increases (+) and Decreases (-) in Mean Asset Values as a Function of Response Bracket Entry Points, Where 1 is the lowest of the Entry Points, 3 is the Highest

ASSET:	DK		REF		DK, REF	
	1-2	2-3	1-2	2-3	$\Sigma+$	$\Sigma-$
Real Estate	+	+	+	+	4	0
Business/Farm	+	+	-	+	3	1
IRA	-	+	+	-	2	2
Stock	+	-	-	+	2	2
Checking/Saving	+	+	+	+	4	0
Bonds	-	+	-	-	1	3
CDs	+	-	-	+	2	2
Vehicle	+	-	+	-	2	2
Other	-	+	+	-	2	2
Debt	+	-	-	+	2	2
$\Sigma+$	7	6	5	6	24	
$\Sigma-$	3	4	5	4		16
$\Sigma++$	3		2		5	
Σ Other	7		8		15	

The summary statistics at the bottom of Table 2 indicate that, of the ten net worth components, increases in the means between entry points one and two or two and three (for DK respondents) can be found in seven or six cases, while decreases show up in three or four cases. For REF cases, increases show up in five of the ten categories between entry points one and two,

and in six categories between entry points two and three. What if we ask a somewhat more demanding question—do differences in means between entry points one, two and three follow the pattern where both entry points 1-2 and 2-3 always show increases? In that test, DK cases show up as continuous increases in three of the net worth categories (Real Estate, Business/Farm, and Checking/Saving and Money Market accounts), while the other seven categories do not show continuous increases. For the REF cases, two asset categories show continuous increases (Real Estate and Checking/Saving and Money Market accounts) while eight do not. Of the sum of the DK and REF cases, five show continuous increases as entry points increase, fifteen do not.

The data in Table 3 summarizes the results shown in Appendixes 2-4, and examine the consistency of the differences in mean values for the three entry points selected for each of the assets. A strong entry point bias would show up as a consistent increase in the means for each asset as we move from entry point one to entry point two, and from entry point two to entry point three. For example, owners of Real Estate show up as having entry point bias because the mean values show consistent increases from the lowest entry point to the middle point and then to the highest point. Thus the highest entry point (designated as H) also shows the highest mean (designated as 3), and the lowest entry point (L) shows the lowest mean (1). But in IRAs, the lowest entry point (L) shows the highest mean (3).

Table 3 compares the rank order of means, for all net worth components and for the four types of financial assets—stocks and mutual funds, checking/savings/money market accounts, bonds, and CDs/T-bills—for respondents who entered the bracket sequence from a DK response to the amount question, and the rank order of means for respondents who entered the bracket sequence from a REF response to the amount question.

Table 3

Entry Point Rank Order L, M, H (low, middle, high) For Asset Owners classified as Don't Know (DK) or Refuse (REF)						
	DK			REF		
	Entry Point			Entry Point		
	L	M	H	L	M	H
Real Estate	1	2	3	1	2	3
Business/Farm	1	2	3	2	1	3
IRAs	3	1	2	1	3	2
Stock	1	3	2	3	1	2
Chk/Sav/MM	1	2	3	1	2	3
Bonds	2	1	3	3	2	1
CDs, T-Bills	1	3	2	2	1	3
Vehicles	1	3	2	1	3	2
Other Assets	3	1	2	1	3	2
Debts	1	3	2	1	2	3
Entry point						
observed	15	21	24	16	20	24
predicted	10	20	30	10	20	30
Observed-predicted	+5	+1	-6	+6	0	-6
Financial Assets						
observed	5	9	10	9	6	9
predicted	4	8	12	4	8	12
Observed-predicted	+1	+1	-2	+5	-2	-3

Note: Financial assets include stocks, checking/savings/money market accounts, bonds, and CDs/T-Bills.

Overall, these tables suggest that entry point bias has some influence on the responses to these asset questions, but the influence is modest and entry point selection may not be a major source of bias. The financial asset patterns, especially those for REF cases, do not show any systematic relation between entry point and mean. While the theory calls for the highest mean to be associated with the highest entry point, and the lowest mean associated with the lowest entry

point, the quantitative differences in the entry point patterns for REF cases are effectively zero—summing the rank order values for the lowest and highest entry points shows them to be equal.

The analysis so far has been concerned with relatively crude measures of association—comparisons of means, the direction of change (up or down), and so forth. It seems useful to apply somewhat more rigorous statistical tests to these data, in order to determine whether any clear cut statistical signals come across from the analysis. For this purpose, we pooled together all the ten types of net worth data for those who either gave a don't know answer to the question or refused to give an answer at all. We estimated a set of simple regression models of asset level on asset type, a don't know/refusal dummy (DK/RF), dummies for two entry point categories, and interactions between DK/RF and entry points. The results (Table 4) suggest that there were no statistically significant differences in asset level between DK and RF responses, or among different entry point categories.

Results were not drastically different when the models were estimated for each type of net worth component separately (Table 5). Of the ten individual models (nine assets and debt), entry point effects appeared only in the models for checking/savings/money market accounts and debts. In these two models, the lowest entry points were generally associated with low asset values compared to the other entry points. The DK/RF effect showed statistical significance only in the model for debts.

Is there a refinement of the entry point bias model that is more consistent with the data than the original entry point bias model? Several features of the data in Table 3 suggests a useful modification of the original model as it applies to the analysis of asset holdings. These modifications are basically driven by noting the degree of certainty associated with the response patterns.

Table 4

Effects of Entry Point and Missing Value Type on HRS 1998 Asset Holdings In Pooled Data Models		
	<u>Baseline Model</u>	<u>Full Model</u>
Don't Know (DK)	-	-2.94 (-0.35)
Low-Entry-Point (L)	-	-7.21 (-0.81)
Middle-Entry-Point (M)	-	1.89 (0.15)
Low-Entry-Point x DK	-	-4.50 (-0.39)
Middle Entry-Point x RF	-	-7.99 (-0.53)
Real Estate	203.84** (9.34)	204.01** (11.10)
Business/Farm	282.55** (12.19)	282.32** (10.15)
IRAs	57.26** (3.04)	56.55** (11.36)
Stocks	157.65** (8.71)	156.94** (6.86)
Bonds	75.50** (3.07)	75.15** (7.44)
Chk/Sav/MM	14.43 (0.86)	13.84** (5.65)
CDs, T-Bills	36.71 (1.91)	36.15** (10.54)
Vehicles	2.51 (0.14)	2.60 (1.34)
Other Assets	36.30 (1.56)	36.19** (7.36)
Constant	11.80 (0.76)	17.92** (2.56)
Adjusted R^2	.040	.041

Note: The dependent variable was (the imputed asset value)/1000. The omitted (reference) groups were Refusal (RF), High-Entry-Point (H), and Debts. The "cluster" option was used when the models were estimated, with a cluster variable "HHID" + "FSUBHH". In the "Full Model", not all the possible interaction terms were included because of collinearity. The joint effect of entry points was statistically insignificant ($F=.71$). $N=11,723$. t -values in parentheses. **= $p<.01$. *= $p<.05$.

Table 5

Effects of Entry Points and Missing Value Types on HRS 1998 Asset Holdings In Single Asset Models								
	DK (<i>t</i> - value)	Entry Point		Entry Point and DK/RF Interaction		Joint Effect of Entry Points (<i>F</i> - value)	Joint Effect of Entry Points and Interactions (<i>F</i> -value)	<i>N</i>
		L (<i>t</i> -value)	M (<i>t</i> - value)	L*DK (<i>t</i> - value)	M*RF (<i>t</i> - value)			
Real Estate	-1.07	-.79	-.74	.21	.20	.58	.72	571
Business/Farm	.32	-.01	-.10	-.42	-.29	.01	.33	454
IRAs	-.08	-.51	-.86	.68	1.30	.50	1.01	1191
Stocks	.03	.16	.78	-.17	-.52	.32	.24	1560
Bonds	.77	1.48	-.98	-1.40	1.22	1.57	.80	371
Chk/Sav/MM	-.73	-2.74**	-.38	.29	-1.29	3.82*	4.77**	3147
CDs, T-Bills	-.82	-.74	.61	.34	-1.74	.46	1.03	1053
Vehicles	-.36	-1.30	-1.38	.38	.77	1.80	3.05*	2378
Other Assets	.20	-.33	-.17	.25	.50	.07	.18	444
Debts	-3.24**	-2.46	-.01	1.92	-1.68	3.03*	1.78	554

Note: DK = Don't Know. L = Low-Entry-Point. M = Middle-Entry-Point. The omitted (reference) groups were Refusal (RF), and High-Entry-Point (H). "Joint Effect of Entry Points" denotes an *F*-test that the coefficients on L and M are both zeros. "Joint Effect of Entry Points and Interactions" denotes an *F*-test that the coefficients on L, M, L*DK, M*RF are all zeros. **= $p < .01$. *= $p < .05$.

First, it appears to be the case that holdings of real assets are more consistent with the original entry point model than holdings of financial assets. The reason may be that the market values of real assets (the two most important being Real Estate assets and Business/Farm assets) are subject to more uncertainty than holdings of other assets. The greater uncertainty in turn might be due to the greater market volatility of these assets.

Second, it appears to be the case that REF respondents are much more random in the pattern of their mean asset holdings than DK households. That result is probably explained by the fact that REF respondents are not uncertain about the value of their asset holdings, but are

simply unwilling to reveal them. In contrast, DK respondents, almost by definition, are very likely to be uncertain about the value of their holdings.

Next, the asset category of Checking, Saving, and Money Market accounts tends to show asset holding patterns that are consistent with the original entry point model. As noted earlier, the reason may be the uncertainty associated with the definition of “account,” which may confuse many respondents who have multiple accounts and are unclear about which ones to include.

Finally, the fact that the debt category shows a significant relation to both the DK variable and the entry point variables may be due to the way in which the debt variable was measured. Each of the asset questions had a potential debt component. The specific asset question was: “If you sold all those and paid off anything you owed on them, about how much would you have?” The specific debt question was: “Aside from any debt that you have already told me about, do you have any outstanding debt?” It would not be surprising if many respondents didn’t remember how they handled the asset-linked debt component, with the result that the explicit debt question might be quite unreliable.

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Appendix 1. Structure of Unfolding Bracket Question Sequence

Unfolding brackets as a survey technique aiming to reduce item non-responses have been used widely in HRS in questions related to income, assets, and health care expenditures. A complete unfolding bracket question sequence generally consists of three sets of questions: ownership, amount or open-ended question, and bracket questions, as illustrated in the following example for stocks/mutual funds holdings (Table A1).

Table A1. Unfolding Bracket Question Sequence for Stocks/Mutual Funds Holdings

Panel 1. For Low Entry Point Group

(Ownership Question)

A). (Aside from anything you have already told me about,) Do you (or your [husband/wife/partner]) have any shares of stock or stock mutual funds?

1. YES	5. NO	8. DK	9. RF
	_____ _____		
⇓	SKIP OUT		

(Amount or Open-Ended Question)

B. If you sold all those and paid off anything you owed on them, about how much would you have?

\$-----	DK	RF
AMOUNT [SKIP OUT]	-----	
	⇓	

(Bracket Questions)

C1. Would it amount to less than \$2,500, more than \$2,500, or what?

1. Less than \$2,500 [SKIP OUT]	3. About \$2,500 [SKIP OUT]
5. More than \$2,500 [Go to C2]	8. DK 9. RF
	|____SKIP OUT____|

C2. Would it amount to less than \$25,000, more than \$25,000, or what?

1. Less than \$25,000 [SKIP OUT]	3. About \$25,000 [SKIP OUT]
5. More than \$25,000 [Go to C3]	8. DK 9. RF
	|____SKIP OUT____|

C3. Would it amount to less than \$125,000, more than \$125,000, or what?

1. Less than \$125,000 [SKIP OUT]	3. About \$125,000 [SKIP OUT]
5. More than \$125,000 [Go to C4]	8. DK 9. RF
	|____SKIP OUT____|

C4. Would it amount to less than \$400,000, more than \$400,000, or what?

- | | |
|-----------------------------------|----------------------------------|
| 1. Less than \$400,000 [SKIP OUT] | 3. About \$400,000 [SKIP OUT] |
| 5. More than \$400,000 [SKIP OUT] | 8. DK 9. RF |
|  | \|___SKIP OUT___\| |

Panel 2. For Middle Entry Point Group

(Ownership Question)

A). (Aside from anything you have already told me about,) Do you (or your [husband/wife/partner]) have any shares of stock or stock mutual funds?

- | | | | |
|--------|-------|----------|-------|
| 1. YES | 5. NO | 8. DK | 9. RF |
| | _____ | _____ | |
| ↓ | | | |
| | | SKIP OUT | |

(Amount or Open-Ended Question)

B. If you sold all those and paid off anything you owed on them, about how much would you have?

- | | | |
|-------------------|-------|----|
| \$----- | DK | RF |
| AMOUNT [SKIP OUT] | ----- | |
| | ↓ | |

(Bracket Questions)

C2. Would it amount to less than \$25,000, more than \$25,000, or what?

- | | |
|----------------------------------|----------------------------------|
| 1. Less than \$25,000 [Go to C1] | 3. About \$25,000 [SKIP OUT] |
| 5. More than \$25,000 [Go to C3] | 8. DK 9. RF |
|  | \|___SKIP OUT___\| |

C1. Would it amount to less than \$2,500, more than \$2,500, or what?

- | | |
|---------------------------------|----------------------------------|
| 1. Less than \$2,500 [SKIP OUT] | 3. About \$2,500 [SKIP OUT] |
| 5. More than \$2,500 [SKIP OUT] | 8. DK 9. RF |
|  | \|___SKIP OUT___\| |

C3. Would it amount to less than \$125,000, more than \$125,000, or what?

- | | |
|-----------------------------------|----------------------------------|
| 1. Less than \$125,000 [SKIP OUT] | 3. About \$125,000 [SKIP OUT] |
| 5. More than \$125,000 [Go to C4] | 8. DK 9. RF |
|  | \|___SKIP OUT___\| |

C4. Would it amount to less than \$400,000, more than \$400,000, or what?

- | | |
|-----------------------------------|----------------------------------|
| 1. Less than \$400,000 [SKIP OUT] | 3. About \$400,000 [SKIP OUT] |
| 5. More than \$400,000 [SKIP OUT] | 8. DK 9. RF |
|  | \|___SKIP OUT___\| |

Panel 3. For High Entry Point Group

(Ownership Question)

A). (Aside from anything you have already told me about,) Do you (or your [husband/wife/partner]) have any shares of stock or stock mutual funds?

1. YES 5. NO 8. DK 9. RF
- |-----|-----|
- SKIP OUT



(Amount or Open-Ended Question)

B. If you sold all those and paid off anything you owed on them, about how much would you have?

\$-----

DK RF

AMOUNT [SKIP OUT]



(Bracket Questions)

C3. Would it amount to less than \$125,000, more than \$125,000, or what?

- | | |
|-----------------------------------|----------------------------------|
| 1. Less than \$125,000 [Go to C2] | 3. About \$125,000 [SKIP OUT] |
| 5. More than \$125,000 [Go to C4] | 8. DK 9. RF |
|  | \|___SKIP OUT___\| |

C2. Would it amount to less than \$25,000, more than \$25,000, or what?

- | | |
|----------------------------------|----------------------------------|
| 1. Less than \$25,000 [Go to C1] | 3. About \$25,000 [SKIP OUT] |
| 5. More than \$25,000 [SKIP OUT] | 8. DK 9. RF |
|  | \|___SKIP OUT___\| |

C1. Would it amount to less than \$2,500, more than \$2,500, or what?

- | | |
|---------------------------------|----------------------------------|
| 1. Less than \$2,500 [SKIP OUT] | 3. About \$2,500 [SKIP OUT] |
| 5. More than \$2,500 [SKIP OUT] | 8. DK 9. RF |
|  | \|___SKIP OUT___\| |

C4. Would it amount to less than \$400,000, more than \$400,000, or what?

- | | |
|-----------------------------------|----------------------------------|
| 1. Less than \$400,000 [SKIP OUT] | 3. About \$400,000 [SKIP OUT] |
| 5. More than \$400,000 [SKIP OUT] | 8. DK 9. RF |
|  | \|___SKIP OUT___\| |

What distinguishes an unfolding bracket sequence from traditional survey questions is its inclusion of range questions (less than x , about x , more than x), which become necessary for those who give a positive answer to the ownership question but fail to provide a specific amount to the open-ended question.

An unfolding bracket sequence can be characterized by the number of breakpoints and the values of these breakpoints, which in HRS are pre-determined based on an algorithm described in Hill (1999). In the above example, the unfolding bracket sequence has four breakpoints, valued at \$2,500, \$25,000, \$125, 000, and \$400,000, respectively. Different bracket sequences may have a different number of breakpoints, and/or different breakpoint values. The bracket sequence for transportation vehicles in HRS 1998, for example, has only three breakpoints, with breakpoint values at \$5,000, \$50,000, and \$100,000.

Another feature of an HRS unfolding bracket sequence is that the sequence stops whenever a DK or RF answer is given to a bracket question. Thus, many stock-owning households do not provide any definitive information at all regarding the value of their stock holdings even when prompted with bracket questions.⁵ The sequence also stops when bracket questions are at an upper or lower limit (e.g., less than the lowest breakpoint, or more than the highest breakpoint), when an “about” answer is given, or when a lower and upper bracket limit is identified.

Entry points become an issue in the unfolding bracket sequence because the distribution of respondents among bracket categories may depend on the entry bracket. Prior to interview and since HRS 1998, each HRS household is assigned to one of three randomly selected groups, which may conveniently be called a low-entry-point group, a middle-entry-point group, and a high-entry-point group, respectively.

Households assigned to the low-entry-point group will get bracket questions starting with lowest breakpoint—in this case, \$2,500. They will first be asked question C1, then C2, and C3, and conclude the bracket sequence with C4 if needed (See Table A1, Panel 1). In contrast, households assigned to the middle-entry-point group will get bracket questions starting with the

⁵ That is, they give a DK/RF answer to the entry bracket question, and the bracket sequence stops right there.

second lowest breakpoint—in this case, \$25,000. They will first be asked question C2, and then—depending on their answers to the question—C1, or C3 and C4 (See Table A1, Panel 2). The bracket question sequence for households assigned to the high-entry-point group is determined in a similar way: starting with C3, and then C4, or C2 and C1—depending on their answers to a previous question (See Table A1, Panel 3).

“Unfolding range” is a term used for characterizing respondent answers to the entire sequence of bracket questions. In combination with entry-point, unfolding range uniquely determines a respondent’s response pattern to various bracket questions. For a stock-owning household who belongs to the low-entry-point group and who fails to reveal the exact value of its stock holdings, for example, its answers to the bracket questions may be as follows: C1 = 5, C2 = 5, and C3 = 1. We know that this household’s holdings are greater than \$25,000 and less than \$125,000, and denote its unfolding range as “> \$25,000 and < \$125,000.” Similarly, the unfolding range for a household in the high-entry-point group with bracket answers C3 = 1, C2=1, and C1= 5 is “> \$2,500 and < \$25,000.”

Table A2 lists all the possible unfolding ranges for stock-owning households in the four breakpoint unfolding sequence illustrated above. Readers may find it useful for understanding the data in Appendixes 2 and 3 of this paper.

Appendices 2 and 3: A Summary

Appendix 2 provides the details of the imputation results for each of the 10 net worth components in the HRS study (nine assets and debt). The top half of the table shows the raw counts of numbers of household respondents by unfolding bracket range, while the bottom half of the table shows the distribution of household respondents by unfolding bracket categories.

Table A2. Possible Unfolding Ranges for Stocks/Mutual Funds Holdings

Bracket Pattern	Entry-Point Group	Why Bracket Sequence Stops	Unfolding Range
C1=1	Low-entry-point	1	< \$2,500
C1=3	Low-entry-point	2	About \$2,500
C1=8 or 9	Low-entry-point	3	DK/RF if <> \$2,500
C1=5, C2=1	Low-entry-point	4	> \$2,500 & < \$25,000
C1=5, C2=3	Low-entry-point	2	About \$25,000
C1=5, C2= 8 or 9	Low-entry-point	3	DK/RF if <> \$25,000
C1=5, C2=5, C3=1	Low-entry-point	4	> \$25,000 & < \$125,000
C1=5, C2=5, C3=3	Low-entry-point	2	About \$125,000
C1=5, C2=5, C3=8 or 9	Low-entry-point	3	DK/RF if <> \$125,000
C1=5, C2=5, C3=5, C4=1	Low-entry-point	4	> \$125,000 & < \$400,000
C1=5, C2=5, C3=5, C4=3	Low-entry-point	2	About \$400,000
C1=5, C2=5, C3=5, C4=8 or 9	Low-entry-point	3	DK/RF if <> \$400,000
C1=5, C2=5, C3=5, C5=5	Low-entry-point	1	> \$400,000
C2=1, C1=1	Middle-entry-point	1	< \$2,500
C2=1, C1=3	Middle-entry-point	2	About \$2,500
C2=1, C1=8 or 9	Middle-entry-point	3	DK/RF if <> \$2,500
C2=1, C1=5	Middle-entry-point	4	> \$2,500 & < \$25,000
C2=3	Middle-entry-point	2	About \$25,000
C2=8 or 9	Middle-entry-point	3	DK/RF if <> \$25,000
C2=5, C3=1	Middle-entry-point	4	> \$25,000 & < \$125,000
C2=5, C3=3	Middle-entry-point	2	About \$125,000
C2=5, C3=8 or 9	Middle-entry-point	3	DK/RF if <> \$125,000
C2=5, C3=5, C4=1	Middle-entry-point	4	> \$125,000 & < \$400,000
C2=5, C3=5, C4=3	Middle-entry-point	2	About \$400,000
C2=5, C3=5, C4= 8 or 9	Middle-entry-point	3	DK/RF if <> \$400,000
C2=5, C3=5, C4=5	Middle-entry-point	1	> \$400,000
C3=1, C2=1, C1=1	High-entry-point	1	< \$2,500
C3=1, C2=1, C1=3	High-entry-point	2	About \$2,500
C3=1, C2=1, C1=8 or 9	High-entry-point	3	DK/RF if <> \$2,500
C3=1, C2=1, C1=5	High-entry-point	4	> \$2,500 & < \$25,000
C3=1, C2=3	High-entry-point	2	About \$25,000
C3=1, C2=8 or 9	High-entry-point	3	DK/RF if <> \$25,000
C3=1, C2=5	High-entry-point	4	> \$25,000 & < \$125,000
C3=3	High-entry-point	2	About \$125,000
C3=8 or 9	High-entry-point	3	DK/RF if <> \$125,000
C3=5, C4=1	High-entry-point	4	> \$125,000 & < \$400,000
C3=5, C4=3	High-entry-point	2	About \$400,000
C3=5, C4=8 or 9	High-entry-point	3	DK/RF if <> \$400,000
C3=5, C4=5	High-entry-point	1	> \$400,000

Note: 1) The unfolding sequence has four breakpoints valued at \$2,500, \$25,000, \$125,000, and \$400,000. 2) Bracket pattern is arranged in the order of bracket questions answered. 2) Households from the low-entry-point group always start with question C1. Households from the middle-entry-point group always start with question C2. Households from the high-entry-point group always start with question C3. 3) Reason why bracket sequence stops: 1 = bracket question is at an upper or lower limit; 2 = an “about” answer is given; 3 = a “DK” or “RF” answer is given; 4 = a lower and upper bracket limit is identified (e.g., the amount is less than \$50,000 and greater than \$5000).

The table is divided into 10 panels (one panel for each net worth component); three major components for each panel (respondents who reported don't know (DK) when asked asset amount, those who reported refuse (RF) when asked about asset amount, and the sum of the don't know and refuse respondents); and three randomly selected entry points which vary by type of asset. Thus, for example, Panel 1 deals with Real Estate holdings, shows the numbers of households who replied don't know or refused for each of the three entry points (2.5 K, 125 K, and 500K) and for each of the 13 unfolding bracket ranges. The bottom half of the table shows the percent distribution of households in each of six bracket categories.

The largest and most consistent difference in the data shown in Appendix 2 is in the distributions of DK cases and RF cases. For DK cases, only about ten percent of households could not provide a bracket amount when asked the entry bracket question, and another roughly 8-9 percent could not provide a response when asked the bracket question somewhere other than in the entry bracket sequence. (These numbers are taken from Panel 1 of Appendix 2, which asks about Real Estate assets.) In contrast, fully sixty percent of households refused to provide a bracket response when asked the entry bracket question, and another roughly 15% would not provide a bracket response when asked the bracket question somewhere other than in the entry bracket sequence. Comparable numbers are found for other assets, with the general pattern being that the refusal rate for the entry bracket questions is even higher—more like 70% than sixty.

Appendix 3 contains mean amounts for each of the bracket categories, with the amount being obtained by random draws for each household in each of the bracket categories. That is, if 50 households wound up in the bracket category “< \$50K > \$5K”, the program would search the data for continuous amount cases in that category, then assign a randomly selected case for each of the 50 households. In cases where the respondent said that their asset was worth “about 10K”,

when asked whether it was worth “< \$10 K, > \$10K, or what?”, the program would assign \$10 K to each of the households in the “about \$10 K” category.

Appendix 2

Distribution of HRS 1998 sample by unfolding bracket Range, Entry Point, and whether DK or REF
in Response to questions about Asset holdings (unweighted N)

Panel 1: Real Estate Holdings

HRS 1998: Value of Real Estate Holdings

Unfolding range	DK to open-ended question			Refusal to open-ended question			Refusal to open-ended question					
	Random entry point:			Random entry point:			Random entry point:					
	\$2,500	\$125,000	\$500,000	\$2,500	\$125,000	\$500,000	\$2,500	\$125,000	\$500,000			
< \$2,500	9	7	9	1	0	1	10	7	10			
About \$2,500	10	3	2				10	3	2			
DK/RF if <> \$2,500	16	5	7	12	0	2	28	5	9			
> \$2,500 & < \$125,000	74	67	59	3	1	3	77	68	62			
About \$125,000	13	6	5	2	0	1	15	6	6			
DK/RF if <> \$125,000	9	24	6	3	23	3	12	47	9			
> \$125,000 & < \$500,000	29	16	33	0	2	0	29	18	33			
About \$500,000	1	6	2				1	6	2			
DK/RF if <> \$500,000	4	3	17	1	2	14	5	5	31			
> \$500,000 & < \$1,000,000	8	11	8	0	1	1	8	12	9			
About \$1,000,000	3	2	4				3	2	4			
DK/RF if <> \$1,000,000	0	2	1	0	2	0	0	4	1			
> \$1,000,000	2	4	4	1	0	1	3	4	5			
Total Case Number	178	156	157	23	31	26	201	187	183			
Percentage Distribution by Bracket Category												
DK/RF to entry-bracket question	9.0%	15.4%	10.8%	11.6%	52.2%	74.2%	53.8%	61.3%	13.9%	25.1%	16.9%	18.6%
DK/RF to non-entry-bracket question	7.3%	6.4%	8.9%		17.4%	12.9%	19.2%		8.5%	7.5%	10.4%	
< \$2,500	5.1%	4.5%	5.7%		4.3%	0.0%	3.8%		5.0%	3.7%	5.5%	
>= \$2,500 & < \$125,000	47.2%	44.9%	38.9%		13.0%	3.2%	11.5%		43.3%	38.0%	35.0%	
>= \$125,000 & < \$500,000	23.6%	14.1%	24.2%		8.7%	6.5%	3.8%		21.9%	12.8%	21.3%	
>= \$500,000	7.9%	14.7%	11.5%		4.3%	3.2%	7.7%		7.5%	12.8%	10.9%	
Total	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	

Note: 1) Entry bracket categories are highlighted. 2) "DK/RF to entry-bracket question" is calculated as ratio of the highlighted cell to the total case number.

3) "DK/RF to non-entry-bracket question" is calculated as ratio of all the non-highlighted cells ending in DK/RF to the total case number.

Panel 2: Business/Farm Asset Holdings

HRS 1998: Business/Farm Asset Holding

Unfolding range	DK to open-ended question				Refusal to open-ended question							
	Random entry point:				Random entry point:				Random entry point:			
	\$5,000	\$10,000	\$100,000		\$5,000	\$10,000	\$100,000		\$5,000	\$10,000	\$100,000	
< \$5,000	13	6	6						13	6	6	
About \$5,000	4	2	3		1	0	0		5	2	3	
DK/RF if <> \$5,000	25	0	0		21	0	0		46	0	0	
> \$5,000 & < \$10,000	3	5	2						3	5	2	
About \$10,000	4	5	4		1	0	0		5	5	4	
DK/RF if <> \$10,000	3	22	1		1	14	0		4	36	1	
> \$10,000 & < \$100,000	30	25	28		3	2	2		33	27	30	
About \$100,000	9	9	2		0	1	0		9	10	2	
DK/RF if <> \$100,000	5	7	30		3	1	22		8	8	52	
> \$100,000 & < \$1,000,000	22	39	33		2	3	0		24	42	33	
About \$1,000,000	1	3	3						1	3	3	
DK/RF if <> \$1,000,000	1	1	0		1	2	1		2	3	1	
> \$1,000,000	3	3	10		0	0	1		3	3	11	
Total Case Number	123	127	122		33	23	26		156	150	148	
Percentage Distribution by Bracket Category												
DK/RF to entry-bracket question	20.3%	17.3%	24.6%	20.7%	63.6%	60.9%	84.6%	69.5%	29.5%	24.0%	35.1%	29.5%
DK/RF to non-entry-bracket question	7.3%	6.3%	0.8%		15.2%	13.0%	3.8%		9.0%	7.3%	1.4%	
< \$5,000	10.6%	4.7%	4.9%		0.0%	0.0%	0.0%		8.3%	4.0%	4.1%	
>= \$5,000 & < \$10,000	5.7%	5.5%	4.1%		3.0%	0.0%	0.0%		5.1%	4.7%	3.4%	
>= \$10,000 & < \$100,000	27.6%	23.6%	26.2%		12.1%	8.7%	7.7%		24.4%	21.3%	23.0%	
>= \$100,000	28.5%	42.5%	39.3%		6.1%	17.4%	3.8%		23.7%	38.7%	33.1%	
Total	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	

Note: 1) Entry bracket categories are highlighted. 2) "DK/RF to entry-bracket question" is calculated as ratio of the highlighted cell to the total case number. 3) "DK/RF to non-entry-bracket question" is calculated as ratio of all the non-highlighted cells ending in DK/RF to the total case number.

Panel 3: IRA - 1 Holdings

HRS 1998: IRA - 1 Holdings

Unfolding range	DK to open-ended question			Refusal to open-ended question			Refusal to open-ended question					
	Random entry point:			Random entry point:			Random entry point:					
	\$10,000	\$25,000	\$100,000	\$10,000	\$25,000	\$100,000	\$10,000	\$25,000	\$100,000			
< \$10,000	48	40	29	12	6	5	60	46	34			
About \$10,000	15	13	7	2	0	3	17	13	10			
DK/RF if <> \$10,000	41	4	2	85	3	2	126	7	4			
> \$10,000 & < \$25,000	36	44	22	4	6	8	40	50	30			
About \$25,000	12	13	23	1	3	3	13	16	26			
DK/RF if <> \$25,000	9	45	13	10	97	13	19	142	26			
> \$25,000 & < \$100,000	42	68	62	12	17	23	54	85	85			
About \$100,000	3	8	4				3	8	4			
DK/RF if <> \$100,000	6	4	53	7	4	85	13	8	138			
> \$100,000 & < \$400,000	21	19	21	5	5	8	26	24	29			
About \$400,000	2	0	2	0	1	0	2	1	2			
DK/RF if <> \$400,000	1	2	2	1	3	2	2	5	4			
> \$400,000	6	6	2	2	0	3	8	6	5			
Total Case Number	242	266	242	141	145	155	383	411	397			
Percentage Distribution by Bracket Category												
DK/RF to entry-bracket question	16.9%	16.9%	21.9%	18.5%	60.3%	66.9%	54.8%	60.5%	32.9%	34.5%	34.8%	34.1%
DK/RF to non-entry-bracket question	6.6%	3.8%	7.0%		12.8%	6.9%	11.0%		8.9%	4.9%	8.6%	
< \$10,000	19.8%	15.0%	12.0%		8.5%	4.1%	3.2%		15.7%	11.2%	8.6%	
>= \$10,000 & < \$25,000	21.1%	21.4%	12.0%		4.3%	4.1%	7.1%		14.9%	15.3%	10.1%	
>= \$25,000 & < \$100,000	22.3%	30.5%	35.1%		9.2%	13.8%	16.8%		17.5%	24.6%	28.0%	
>= \$100,000	13.2%	12.4%	12.0%		5.0%	4.1%	7.1%		10.2%	9.5%	10.1%	
Total	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	

Note: 1) Entry bracket categories are highlighted. 2) "DK/RF to entry-bracket question" is calculated as ratio of the highlighted cell to the total case number. 3) "DK/RF to non-entry-bracket question" is calculated as ratio of all the non-highlighted cells ending in DK/RF to the total case number.

Panel 4: Stock Holdings

HRS 1998: Value of Stock Holdings

Unfolding range	DK to open-ended question			Refusal to open-ended question			Refusal to open-ended question					
	Random entry point:			Random entry point:			Random entry point:					
	\$2,500	\$25,000	\$125,000	\$2,500	\$25,000	\$125,000	\$2,500	\$25,000	\$125,000			
< \$2,500	46	25	37	2	0	0	48	25	37			
About \$2,500	12	11	9				12	11	9			
DK/RF if <> \$2,500	58	11	2	69	2	0	127	13	2			
> \$2,500 & < \$25,000	71	91	68	7	10	6	78	101	74			
About \$25,000	18	19	16	1	4	1	19	23	17			
DK/RF if <> \$25,000	12	68	26	11	88	2	23	156	28			
> \$25,000 & < \$125,000	61	71	96	7	14	9	68	85	105			
About \$125,000	11	12	13	2	0	5	13	12	18			
DK/RF if <> \$125,000	10	12	78	3	9	86	13	21	164			
> \$125,000 & < \$400,000	27	49	48	1	5	10	28	54	58			
About \$400,000	0	4	8	0	2	0	0	6	8			
DK/RF if <> \$400,000	7	2	5	0	2	7	7	4	12			
> \$400,000	17	26	24	3	6	5	20	32	29			
Total Case Number	350	401	430	106	142	131	456	543	561			
Percentage Distribution by Bracket Category												
DK/RF to entry-bracket question	16.6%	17.0%	18.1%	17.3%	65.1%	62.0%	65.6%	64.1%	27.9%	28.7%	29.2%	28.7%
DK/RF to non-entry-bracket question	8.3%	6.2%	7.7%		13.2%	9.2%	6.9%		9.4%	7.0%	7.5%	
< \$2,500	13.1%	6.2%	8.6%		1.9%	0.0%	0.0%		10.5%	4.6%	6.6%	
>= \$2,500 & < \$25,000	23.7%	25.4%	17.9%		6.6%	7.0%	4.6%		19.7%	20.6%	14.8%	
>= \$25,000 & < \$125,000	22.6%	22.4%	26.0%		7.5%	12.7%	7.6%		19.1%	19.9%	21.7%	
>= \$125,000	15.7%	22.7%	21.6%		5.7%	9.2%	15.3%		13.4%	19.2%	20.1%	
Total	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	

Note: 1) Entry bracket categories are highlighted. 2) "DK/RF to entry-bracket question" is calculated as ratio of the highlighted cell to the total case number. 3) "DK/RF to non-entry-bracket question" is calculated as ratio of all the non-highlighted cells ending in DK/RF to the total case number.

Panel 5: Checking and Saving Accounts Holdings

HRS 1998: Value of Checking and Savings Accounts Holdings

Unfolding range	DK to open-ended question			Refusal to open-ended question			Refusal to open-ended question					
	Random entry point:			Random entry point:			Random entry point:					
	\$5,000	\$50,000	\$150,000	\$5,000	\$50,000	\$150,000	\$5,000	\$50,000	\$150,000			
< \$5,000	254	244	214	50	45	33	304	289	247			
About \$5,000	41	48	51	10	10	10	51	58	61			
DK/RF if <> \$5,000	94	32	12	264	21	13	358	53	25			
> \$5,000 & < \$50,000	185	187	159	37	45	35	222	232	194			
About \$50,000	10	19	27	3	4	6	13	23	33			
DK/RF if <> \$50,000	16	73	27	17	247	20	33	320	47			
> \$50,000 & < \$150,000	33	45	58	5	13	7	38	58	65			
About \$150,000	4	4	6	0	1	2	4	5	8			
DK/RF if <> \$150,000	4	4	68	2	5	246	6	9	314			
> \$150,000 & < \$300,000	6	8	13	3	3	4	9	11	17			
About \$300,000	2	2	2				2	2	2			
DK/RF if <> \$300,000	2	3	2	0	1	4	2	4	6			
> \$300,000	0	8	8	1	2	3	1	10	11			
Total Case Number	651	677	647	392	397	383	1043	1074	1030			
Percentage Distribution by Bracket Category												
DK/RF to entry-bracket question	14.4%	10.8%	10.5%	11.9%	67.3%	62.2%	64.2%	64.6%	34.3%	29.8%	30.5%	31.5%
DK/RF to non-entry-bracket question	3.4%	5.8%	6.3%	4.8%	4.8%	6.8%	9.7%	3.9%	6.1%	7.6%		
< \$5,000	39.0%	36.0%	33.1%	12.8%	11.3%	8.6%	29.1%	26.9%	24.0%			
>= \$5,000 & < \$50,000	34.7%	34.7%	32.5%	12.0%	13.9%	11.7%	26.2%	27.0%	24.8%			
>= \$50,000 & < \$150,000	6.6%	9.5%	13.1%	2.0%	4.3%	3.4%	4.9%	7.5%	9.5%			
>= \$150,000	1.8%	3.2%	4.5%	1.0%	1.5%	2.3%	1.5%	2.6%	3.7%			
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		

Note: 1) Entry bracket categories are highlighted. 2) "DK/RF to entry-bracket question" is calculated as ratio of the highlighted cell to the total case number. 3) "DK/RF to non-entry-bracket question" is calculated as ratio of all the non-highlighted cells ending in DK/RF to the total case number.

Panel 6: Bond Holdings

HRS 1998: Value of Bonds Holdings

Unfolding range	DK to open-ended question			Refusal to open-ended question								
	Random entry point:			Random entry point:			Random entry point:					
	\$2,500	\$10,000	\$100,000	\$2,500	\$10,000	\$100,000	\$2,500	\$10,000	\$100,000			
< \$2,500	8	6	4				8	6	4			
About \$2,500	2	4	1	0	0	1	2	4	2			
DK/RF if <> \$2,500	14	2	1	29	1	0	43	3	1			
> \$2,500 & < \$10,000	17	12	7				17	12	7			
About \$10,000	4	5	3	0	1	0	4	6	3			
DK/RF if <> \$10,000	2	16	6	2	33	0	4	49	6			
> \$10,000 & < \$100,000	19	29	26	6	3	6	25	32	32			
About \$100,000	2	3	2				2	3	2			
DK/RF if <> \$100,000	5	3	21	0	3	24	5	6	45			
> \$100,000 & < \$400,000	8	5	11				8	5	11			
About \$400,000	1	0	0				1	0	0			
DK/RF if <> \$400,000				0	0	2	0	0	2			
> \$400,000	5	1	4	0	1	0	5	2	4			
Total Case Number	87	86	86	37	42	33	124	128	119			
Percentage Distribution by Bracket Category												
DK/RF to entry-bracket question	16.1%	18.6%	24.4%	19.7%	78.4%	78.6%	72.7%	76.8%	34.7%	38.3%	37.8%	36.9%
DK/RF to non-entry-bracket question	8.0%	5.8%	8.1%		5.4%	9.5%	6.1%		7.3%	7.0%	7.6%	
< \$2,500	9.2%	7.0%	4.7%		0.0%	0.0%	0.0%		6.5%	4.7%	3.4%	
>= \$2,500 & < \$10,000	21.8%	18.6%	9.3%		0.0%	0.0%	3.0%		15.3%	12.5%	7.6%	
>= \$10,000 & < \$100,000	26.4%	39.5%	33.7%		16.2%	9.5%	18.2%		23.4%	29.7%	29.4%	
>= \$100,000	18.4%	10.5%	19.8%		0.0%	2.4%	0.0%		12.9%	7.8%	14.3%	
Total	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	

Note: 1) Entry bracket categories are highlighted. 2) "DK/RF to entry-bracket question" is calculated as ratio of the highlighted cell to the total case number. 3) "DK/RF to non-entry-bracket question" is calculated as ratio of all the non-highlighted cells ending in DK/RF to the total case number.

Panel 7: CD Holdings

HRS 1998: Value of CD Accounts Holdings

Unfolding range	DK to open-ended question			Refusal to open-ended question								
	Random entry point:			Random entry point:			Random entry point:					
	\$2,500	\$25,000	\$125,000	\$2,500	\$25,000	\$125,000	\$2,500	\$25,000	\$125,000			
< \$2,500	43	18	17	5	6	1	48	24	18			
About \$2,500	7	11	9	1	1	1	8	12	10			
DK/RF if <> \$2,500	37	3	2	100	2	1	137	5	3			
> \$2,500 & < \$25,000	51	55	41	6	10	7	57	65	48			
About \$25,000	4	11	21	0	2	1	4	13	22			
DK/RF if <> \$25,000	5	44	9	5	116	3	10	160	12			
> \$25,000 & < \$125,000	43	42	50	6	4	9	49	46	59			
About \$125,000	7	3	2	0	2	1	7	5	3			
DK/RF if <> \$125,000	5	5	45	2	5	112	7	10	157			
> \$125,000 & < \$250,000	7	6	6	0	0	2	7	6	8			
About \$250,000	2	2	0	0	0	1	2	2	1			
DK/RF if <> \$250,000	0	0	3	1	1	0	1	1	3			
> \$250,000	6	9	4	2	0	2	8	9	6			
Total Case Number	217	209	209	128	149	141	345	358	350			
Percentage Distribution by Bracket Category												
DK/RF to entry-bracket question	17.1%	21.1%	21.5%	19.8%	78.1%	77.9%	79.4%	78.5%	39.7%	44.7%	44.9%	43.1%
DK/RF to non-entry-bracket question	4.6%	3.8%	6.7%		6.3%	5.4%	2.8%		5.2%	4.5%	5.1%	
< \$2,500	19.8%	8.6%	8.1%		3.9%	4.0%	0.7%		13.9%	6.7%	5.1%	
>= \$2,500 & < \$25,000	26.7%	31.6%	23.9%		5.5%	7.4%	5.7%		18.8%	21.5%	16.6%	
>= \$25,000 & < \$125,000	21.7%	25.4%	34.0%		4.7%	4.0%	7.1%		15.4%	16.5%	23.1%	
>= \$125,000	10.1%	9.6%	5.7%		1.6%	1.3%	4.3%		7.0%	6.1%	5.1%	
Total	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	

Note: 1) Entry bracket categories are highlighted. 2) "DK/RF to entry-bracket question" is calculated as ratio of the highlighted cell to the total case number. 3) "DK/RF to non-entry-bracket question" is calculated as ratio of all the non-highlighted cells ending in DK/RF to the total case number.

Panel 8: Vehicle Holdings

HRS 1998: Value of Vehicles

Unfolding range	DK to open-ended question			Refusal to open-ended question			Refusal to open-ended question					
	Random entry point:			Random entry point:			Random entry point:					
	\$5,000	\$25,000	\$200,000	\$5,000	\$25,000	\$200,000	\$5,000	\$25,000	\$200,000			
< \$5,000	257	193	220	6	1	10	263	194	230			
About \$5,000	76	84	87	3	3	3	79	87	90			
DK/RF if <> \$5,000	80	22	23	49	1	0	129	23	23			
> \$5,000 & < \$25,000	268	272	230	4	8	6	272	280	236			
About \$25,000	19	24	32	0	1	2	19	25	34			
DK/RF if <> \$25,000	5	52	8	2	44	3	7	96	11			
> \$25,000 & < \$200,000	50	66	63	0	2	4	50	68	67			
About \$200,000	1	1	3	0	1	1	1	2	4			
DK/RF if <> \$200,000	0	0	32	0	0	39	0	0	71			
> \$200,000	2	3	12				2	3	12			
Total Case Number	758	717	710	64	61	68	822	778	778			
Percentage Distribution by Bracket Category												
DK/RF to entry-bracket question	10.6%	7.3%	4.5%	7.5%	76.6%	72.1%	57.4%	68.4%	15.7%	12.3%	9.1%	12.4%
DK/RF to non-entry-bracket question	0.7%	3.1%	4.4%		3.1%	1.6%	4.4%		0.9%	3.0%	4.4%	
< \$5,000	33.9%	26.9%	31.0%		9.4%	1.6%	14.7%		32.0%	24.9%	29.6%	
>= \$5,000 & < \$25,000	45.4%	49.7%	44.6%		10.9%	18.0%	13.2%		42.7%	47.2%	41.9%	
>= \$25,000 & < \$200,000	9.1%	12.6%	13.4%		0.0%	4.9%	8.8%		8.4%	12.0%	13.0%	
>= \$200,000	0.4%	0.6%	2.1%		0.0%	1.6%	1.5%		0.4%	0.6%	2.1%	
Total	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	

Note: 1) Entry bracket categories are highlighted. 2) "DK/RF to entry-bracket question" is calculated as ratio of the highlighted cell to the total case number. 3) "DK/RF to non-entry-bracket question" is calculated as ratio of all the non-highlighted cells ending in DK/RF to the total case number.

Panel 9: Other Asset Holdings

HRS 1998: Value of Other Assets

Unfolding range	DK to open-ended question			Refusal to open-ended question			Refusal to open-ended question					
	Random entry point:			Random entry point:			Random entry point:					
	\$5,000	\$50,000	\$100,000	\$5,000	\$50,000	\$100,000	\$5,000	\$50,000	\$100,000			
< \$5,000	24	14	18	3	1	2	27	15	20			
About \$5,000	11	3	9				11	3	9			
DK/RF if <> \$5,000	18	2	1	26	0	0	44	2	1			
> \$5,000 & < \$50,000	39	44	40	3	3	3	42	47	43			
About \$50,000	6	8	7	0	3	0	6	11	7			
DK/RF if <> \$50,000	1	10	8	3	24	0	4	34	8			
> \$50,000 & < \$100,000	3	8	9	1	2	1	4	10	10			
About \$100,000	2	5	4				2	5	4			
DK/RF if <> \$100,000	2	0	13	0	0	23	2	0	36			
> \$100,000	13	10	12	0	0	2	13	10	14			
Total Case Number	119	104	121	36	33	31	155	137	152			
Percentage Distribution by Bracket Category												
DK/RF to entry-bracket question	15.1%	9.6%	10.7%	11.9%	72.2%	72.7%	74.2%	73.0%	28.4%	24.8%	23.7%	25.7%
DK/RF to non-entry-bracket question	2.5%	1.9%	7.4%		8.3%	0.0%	0.0%		3.9%	1.5%	5.9%	
< \$5,000	20.2%	13.5%	14.9%		8.3%	3.0%	6.5%		17.4%	10.9%	13.2%	
>= \$5,000 & < \$50,000	42.0%	45.2%	40.5%		8.3%	9.1%	9.7%		34.2%	36.5%	34.2%	
>= \$50,000 & < \$100,000	7.6%	15.4%	13.2%		2.8%	15.2%	3.2%		6.5%	15.3%	11.2%	
>= \$100,000	12.6%	14.4%	13.2%		0.0%	0.0%	6.5%		9.7%	10.9%	11.8%	
Total	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	

Note: 1) Entry bracket categories are highlighted. 2) "DK/RF to entry-bracket question" is calculated as ratio of the highlighted cell to the total case number. 3) "DK/RF to non-entry-bracket question" is calculated as ratio of all the non-highlighted cells ending in DK/RF to the total case number.

Panel 10: Debts

HRS 1998: Value of Debts

Unfolding range	DK to open-ended question			Refusal to open-ended question								
	Random entry point:			Random entry point:			Random entry point:					
	\$500	\$5,000	\$50,000	\$500	\$5,000	\$50,000	\$500	\$5,000	\$50,000			
< \$500	23	20	4	1	0	1	24	20	5			
About \$500	7	2	6	0	1	0	7	3	6			
DK/RF if <> \$500	18	2	0	16	1	0	34	3	0			
> \$500 & < \$5,000	47	42	38	11	5	5	58	47	43			
About \$5,000	15	10	9	1	1	2	16	11	11			
DK/RF if <> \$5,000	5	24	5	3	19	1	8	43	6			
> \$5,000 & < \$50,000	41	55	41	5	4	12	46	59	53			
About \$50,000	2	1	3				2	1	3			
DK/RF if <> \$50,000	1	1	10	0	0	14	1	1	24			
> \$50,000	4	5	5	2	1	3	6	6	8			
Total Case Number	163	162	121	39	32	38	202	194	159			
Percentage Distribution by Bracket Category												
DK/RF to entry-bracket question	11.0%	14.8%	8.3%	11.7%	41.0%	59.4%	36.8%	45.0%	16.8%	22.2%	15.1%	18.2%
DK/RF to non-entry-bracket question	3.7%	1.9%	4.1%		7.7%	3.1%	2.6%		4.5%	2.1%	3.8%	
< \$500	14.1%	12.3%	3.3%		2.6%	0.0%	2.6%		11.9%	10.3%	3.1%	
>= \$500 & < \$5,000	33.1%	27.2%	36.4%		28.2%	18.8%	13.2%		32.2%	25.8%	30.8%	
>= \$5,000 & < \$50,000	34.4%	40.1%	41.3%		15.4%	15.6%	36.8%		30.7%	36.1%	40.3%	
>= \$50,000	3.7%	3.7%	6.6%		5.1%	3.1%	7.9%		4.0%	3.6%	6.9%	
Total	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	

Note: 1) Entry bracket categories are highlighted. 2) "DK/RF to entry-bracket question" is calculated as ratio of the highlighted cell to the total case number. 3) "DK/RF to non-entry-bracket question" is calculated as ratio of all the non-highlighted cells ending in DK/RF to the total case number.

Appendix 3

Distribution of HRS 1998 sample by unfolding bracket Range, Entry Point, and whether DK or REF in Response to questions about Asset holdings (unweighted dollars)

Panel 1: Value of Real Estate Holdings

HRS 1998: Value of Real Estate Holdings

Unfolding range	DK to open-ended question			Refusal to open-ended question			Random entry point:		
	Random entry point:			Random entry point:			Random entry point:		
	\$2,500	\$125,000	\$500,000	\$2,500	\$125,000	\$500,000	\$2,500	\$125,000	\$500,000
< \$2,500	1,178	771	856	1,000	.	1,000	1,160	771	870
About \$2,500	2,500	2,500	2,500	.	.	.	2,500	2,500	2,500
DK/RF if <> \$2,500	197,188	67,000	30,857	185,500	.	55,000	192,179	67,000	36,222
> \$2,500 & < \$125,000	43,182	40,872	43,746	28,833	40,000	38,333	42,623	40,859	43,484
About \$125,000	125,000	125,000	125,000	125,000	.	125,000	125,000	125,000	125,000
DK/RF if <> \$125,000	175,667	104,196	72,000	275,000	183,304	49,667	200,500	142,909	64,556
> \$125,000 & < \$500,000	196,552	232,500	245,361	.	250,000	.	196,552	234,444	245,361
About \$500,000	500,000	500,000	500,000	.	.	.	500,000	500,000	500,000
DK/RF if <> \$500,000	492,975	300,000	126,882	100,000	420,000	318,786	414,380	348,000	213,548
> \$500,000 & < \$1,000,000	626,250	709,091	662,500	.	750,000	800,000	626,250	712,500	677,778
About \$1,000,000	1,000,000	1,000,000	1,000,000	.	.	.	1,000,000	1,000,000	1,000,000
DK/RF if <> \$1,000,000	.	725,000	750,000	.	1,875,000	.	.	1,300,000	750,000
> \$1,000,000	2,065,500	1,562,500	3,062,500	2,000,000	.	3,000,000	2,043,667	1,562,500	3,050,000
All Categories	168,006	201,647	238,348	238,630	325,667	337,039	176,087	222,209	252,369

Panel 2: Business/Farm Asset Holding

HRS 1998: Business/Farm Asset Holding

Unfolding range	DK to open-ended question			Refusal to open-ended question			DK to open-ended question			Refusal to open-ended question		
	Random entry point:			Random entry point:			Random entry point:			Random entry point:		
	\$5,000	\$10,000	\$100,000	\$5,000	\$10,000	\$100,000	\$5,000	\$10,000	\$100,000	\$5,000	\$10,000	\$100,000
< \$5,000	346	0	0	.	.	.	346	0	0	.	.	.
About \$5,000	5,000	5,000	5,000	5,000	.	.	5,000	5,000	5,000	.	.	.
DK/RF if <> \$5,000	186,600	.	.	285,648	.	.	231,818	.	.	.	.	.
> \$5,000 & < \$10,000	6,667	8,600	8,500	.	.	.	6,667	8,600	8,500	.	.	.
About \$10,000	10,000	10,000	10,000	10,000	.	.	10,000	10,000	10,000	.	.	.
DK/RF if <> \$10,000	98,333	344,701	10,000	50,000	157,893	.	86,250	272,053	10,000	.	.	.
> \$10,000 & < \$100,000	47,667	42,880	48,250	43,333	65,000	18,500	47,273	44,519	46,267	.	.	.
About \$100,000	100,000	100,000	100,000	.	100,000	.	100,000	100,000	100,000	.	.	.
DK/RF if <> \$100,000	1,256,000	520,000	219,300	668,667	1,000,000	181,386	1,035,750	580,000	203,260	.	.	.
> \$100,000 & < \$1,000,000	344,091	291,487	288,333	450,000	233,333	.	352,917	287,333	288,333	.	.	.
About \$1,000,000	1,000,000	1,000,000	1,000,000	.	.	.	1,000,000	1,000,000	1,000,000	.	.	.
DK/RF if <> \$1,000,000	500,000	700,000	.	300,000	500,000	900,000	400,000	566,667	900,000	.	.	.
> \$1,000,000	2,816,667	4,066,667	1,920,000	.	.	2,500,000	2,816,667	4,066,667	1,972,727	.	.	.
All Categories	253,451	319,421	327,271	284,836	223,500	285,673	260,090	304,713	319,963			

Panel 3: IRA - 1 Holdings

HRS 1998: IRA - 1 Holdings

Unfolding range	DK to open-ended question			Refusal to open-ended question					
	Random entry point:			Random entry point:			Random entry point:		
	\$10,000	\$25,000	\$100,000	\$10,000	\$25,000	\$100,000	\$10,000	\$25,000	\$100,000
< \$10,000	4,545	4,874	4,312	5,383	5,117	3,260	4,713	4,905	4,158
About \$10,000	10,000	10,000	10,000	10,000	.	10,000	10,000	10,000	10,000
DK/RF if <> \$10,000	54,090	8,900	4,000	46,951	10,667	9,500	49,274	9,657	6,750
> \$10,000 & < \$25,000	16,972	16,954	15,818	16,850	17,000	17,500	16,960	16,960	16,267
About \$25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
DK/RF if <> \$25,000	61,111	48,566	35,769	115,530	82,525	23,446	89,753	71,763	29,608
> \$25,000 & < \$100,000	52,633	48,969	50,789	46,333	50,941	53,783	51,233	49,364	51,599
About \$100,000	100,000	100,000	100,000	.	.	.	100,000	100,000	100,000
DK/RF if <> \$100,000	127,000	85,500	55,275	94,571	53,750	54,653	109,539	69,625	54,892
> \$100,000 & < \$400,000	194,191	183,947	230,762	151,066	118,200	240,625	185,897	170,250	233,483
About \$400,000	400,000	.	400,000	.	400,000	.	400,000	400,000	400,000
DK/RF if <> \$400,000	300,000	115,000	230,000	120,000	801,667	175,000	210,000	527,000	202,500
> \$400,000	955,667	557,500	1,250,000	587,500	.	708,333	863,625	557,500	925,000
All Categories	75,337	56,988	68,907	60,933	87,735	70,114	70,034	67,835	69,378

Panel 4: Value of Stock Holdings

HRS 1998: Value of Stock Holdings

Unfolding range	DK to open-ended question			Refusal to open-ended question			Refusal to open-ended question		
	Random entry point:			Random entry point:			Random entry point:		
	\$2,500	\$25,000	\$125,000	\$2,500	\$25,000	\$125,000	\$2,500	\$25,000	\$125,000
< \$2,500	992	1,152	918	1,100	.	.	997	1,152	918
About \$2,500	2,500	2,500	2,500	.	.	.	2,500	2,500	2,500
DK/RF if <> \$2,500	275,373	8,509	625	131,395	6,000	.	197,149	8,123	625
> \$2,500 & < \$25,000	10,310	11,002	11,319	7,500	11,630	10,333	10,058	11,064	11,239
About \$25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
DK/RF if <> \$25,000	52,842	89,910	35,385	103,455	116,733	17,500	77,048	105,041	34,107
> \$25,000 & < \$125,000	61,485	65,400	62,167	49,143	63,500	66,111	60,215	65,087	62,505
About \$125,000	125,000	125,000	125,000	125,000	.	125,000	125,000	125,000	125,000
DK/RF if <> \$125,000	211,100	155,000	93,567	323,343	204,444	135,315	237,002	176,191	115,459
> \$125,000 & < \$400,000	203,333	210,699	216,667	146,000	200,000	196,200	201,286	209,709	213,138
About \$400,000	.	400,000	400,000	.	400,000	.	.	400,000	400,000
DK/RF if <> \$400,000	368,571	250,000	320,000	.	325,000	388,571	368,571	287,500	360,000
> \$400,000	1,225,294	2,112,000	1,504,332	2,177,322	700,000	570,000	1,368,098	1,847,250	1,343,240
All Categories	154,286	207,181	158,936	174,773	139,999	156,573	159,048	189,612	158,384

Panel 5: Value of Checking and Savings Accounts Holdings

HRS 1998: Value of Checking and Savings Accounts Holdings

Unfolding range	DK to open-ended question			Refusal to open-ended question					
	Random entry point:			Random entry point:			Random entry point:		
	\$5,000	\$50,000	\$150,000	\$5,000	\$50,000	\$150,000	\$5,000	\$50,000	\$150,000
< \$5,000	1,531	1,532	1,506	1,516	1,359	1,717	1,529	1,505	1,534
About \$5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
DK/RF if <> \$5,000	15,085	8,477	7,550	16,418	10,293	7,835	16,068	9,197	7,698
> \$5,000 & < \$50,000	17,264	17,226	16,901	16,216	20,322	17,031	17,090	17,826	16,924
About \$50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
DK/RF if <> \$50,000	33,000	30,456	18,268	35,900	19,818	16,430	34,494	22,244	17,486
> \$50,000 & < \$150,000	77,545	77,378	81,783	85,000	80,923	97,623	78,526	78,172	83,489
About \$150,000	150,000	150,000	150,000	.	150,000	150,000	150,000	150,000	150,000
DK/RF if <> \$150,000	122,500	352,500	15,492	332,500	79,200	30,376	192,500	200,667	27,152
> \$150,000 & < \$300,000	223,500	204,625	209,539	225,000	233,333	216,000	224,000	212,455	211,059
About \$300,000	300,000	300,000	300,000	.	.	.	300,000	300,000	300,000
DK/RF if <> \$300,000	200,000	211,333	212,500	.	175,000	196,750	200,000	202,250	202,000
> \$300,000	.	521,091	531,250	330,000	425,000	500,000	330,000	501,873	522,727
All Categories	18,777	29,263	30,748	20,193	24,332	34,047	19,309	27,440	31,975

Panel 6: Value of Bonds Holdings

HRS 1998: Value of Bonds Holdings

Unfolding range	DK to open-ended question			Refusal to open-ended question			DK to open-ended question			Refusal to open-ended question		
	Random entry point:			Random entry point:			Random entry point:			Random entry point:		
	\$2,500	\$10,000	\$100,000	\$2,500	\$10,000	\$100,000	\$2,500	\$10,000	\$100,000	\$2,500	\$10,000	\$100,000
< \$2,500	900	1,267	875	.	.	.	900	1,267	875	.	.	.
About \$2,500	2,500	2,500	2,500	.	.	2,500	2,500	2,500	2,500	2,500	2,500	2,500
DK/RF if <> \$2,500	43,643	1,250	9,000	161,452	300,000	.	123,095	100,833	9,000	.	.	.
> \$2,500 & < \$10,000	5,088	5,833	5,429	.	.	.	5,088	5,833	5,429	.	.	.
About \$10,000	10,000	10,000	10,000	.	10,000	.	10,000	10,000	10,000	.	.	.
DK/RF if <> \$10,000	85,500	80,563	37,333	55,000	98,903	.	70,250	92,914	37,333	.	.	.
> \$10,000 & < \$100,000	39,932	38,293	33,577	23,917	33,333	30,333	36,088	37,828	32,969	.	.	.
About \$100,000	100,000	100,000	100,000	.	.	.	100,000	100,000	100,000	.	.	.
DK/RF if <> \$100,000	75,200	298,333	81,090	.	35,000	69,133	75,200	166,667	74,713	.	.	.
> \$100,000 & < \$400,000	169,375	227,000	222,727	.	.	.	169,375	227,000	222,727	.	.	.
About \$400,000	400,000	.	.	.	.	.	400,000	.	.	.	.	.
DK/RF if <> \$400,000	.	.	.	.	.	158,000	.	.	158,000	.	.	.
> \$400,000	680,000	700,000	625,000	.	500,000	.	680,000	600,000	625,000	.	.	.
All Categories	85,177	64,763	93,406	133,395	101,876	65,445	99,564	76,941	85,652			

Panel 7: Value of CD Accounts Holdings

HRS 1998: Value of CD Accounts Holdings

Unfolding range	DK to open-ended question			Refusal to open-ended question					
	Random entry point:			Random entry point:			Random entry point:		
	\$2,500	\$25,000	\$125,000	\$2,500	\$25,000	\$125,000	\$2,500	\$25,000	\$125,000
< \$2,500	1,074	1,406	1,341	1,500	1,200	2,400	1,119	1,354	1,400
About \$2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
DK/RF if <> \$2,500	40,508	13,667	11,025	46,899	1,000	10,000	45,173	8,600	10,683
> \$2,500 & < \$25,000	12,131	11,655	10,220	9,667	11,600	11,000	11,872	11,646	10,333
About \$25,000	25,000	25,000	25,000	.	25,000	25,000	25,000	25,000	25,000
DK/RF if <> \$25,000	71,400	34,161	41,617	22,200	39,445	63,333	46,800	37,992	47,046
> \$25,000 & < \$125,000	56,814	67,762	61,180	64,167	57,500	62,444	57,714	66,870	61,373
About \$125,000	125,000	125,000	125,000	.	125,000	125,000	125,000	125,000	125,000
DK/RF if <> \$125,000	50,000	89,200	45,092	35,500	44,000	49,457	45,857	66,600	48,206
> \$125,000 & < \$250,000	177,143	184,333	187,500	.	.	165,000	177,143	184,333	181,875
About \$250,000	250,000	250,000	.	.	.	250,000	250,000	250,000	250,000
DK/RF if <> \$250,000	.	.	250,000	200,000	300,000	.	200,000	300,000	250,000
> \$250,000	318,333	380,562	387,500	337,500	.	400,000	323,125	380,562	391,667
All Categories	45,420	53,641	48,560	48,437	38,613	56,122	46,539	47,386	51,606

Panel 8: Value of Vehicles

HRS 1998: Value of Vehicles

Unfolding range	DK to open-ended question			Refusal to open-ended question					
	Random entry point:			Random entry point:			Random entry point:		
	\$5,000	\$25,000	\$200,000	\$5,000	\$25,000	\$200,000	\$5,000	\$25,000	\$200,000
< \$5,000	1,900	1,861	1,935	1,250	500	2,405	1,885	1,854	1,956
About \$5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
DK/RF if <> \$5,000	10,334	8,823	9,683	12,220	0	.	11,051	8,439	9,683
> \$5,000 & < \$25,000	12,404	13,044	13,262	14,500	11,125	13,867	12,435	12,989	13,277
About \$25,000	25,000	25,000	25,000	.	25,000	25,000	25,000	25,000	25,000
DK/RF if <> \$25,000	35,800	10,354	14,650	13,500	18,864	9,533	29,429	14,254	13,255
> \$25,000 & < \$200,000	50,040	47,545	44,532	.	30,000	40,000	50,040	47,029	44,261
About \$200,000	200,000	200,000	200,000	.	200,000	200,000	200,000	200,000	200,000
DK/RF if <> \$200,000	.	.	9,248	.	.	16,885	.	.	13,443
> \$200,000	250,000	416,667	248,333	.	.	.	250,000	416,667	248,333
All Categories	11,709	14,292	16,524	11,036	19,992	17,932	11,656	14,739	16,647

Panel 9: Value of Other Assets

HRS 1998: Value of Other Assets

Unfolding range	DK to open-ended question			Refusal to open-ended question					
	Random entry point:			Random entry point:			Random entry point:		
	\$5,000	\$50,000	\$100,000	\$5,000	\$50,000	\$100,000	\$5,000	\$50,000	\$100,000
< \$5,000	2,188	1,891	2,169	2,318	3,000	1,313	2,202	1,965	2,084
About \$5,000	5,000	5,000	5,000	.	.	.	5,000	5,000	5,000
DK/RF if <> \$5,000	20,111	8,500	5,000	44,385	.	.	34,455	8,500	5,000
> \$5,000 & < \$50,000	14,518	20,750	19,530	20,000	19,000	21,667	14,910	20,638	19,679
About \$50,000	50,000	50,000	50,000	.	50,000	.	50,000	50,000	50,000
DK/RF if <> \$50,000	150,000	58,500	15,188	20,000	63,875	.	52,500	62,294	15,188
> \$50,000 & < \$100,000	75,000	69,375	68,778	85,000	68,500	0	77,500	69,200	61,900
About \$100,000	100,000	100,000	100,000	.	.	.	100,000	100,000	100,000
DK/RF if <> \$100,000	80,000	.	32,092	.	.	45,735	80,000	.	40,809
> \$100,000	285,462	191,000	267,667	.	.	147,500	285,462	191,000	250,500
All Categories	48,586	47,322	49,504	37,943	56,970	45,630	46,114	49,646	48,714

Panel 10: Value of Debts

HRS 1998: Value of Debts

Unfolding range	DK to open-ended question			Refusal to open-ended question					
	Random entry point:			Random entry point:			Random entry point:		
	\$500	\$5,000	\$50,000	\$500	\$5,000	\$50,000	\$500	\$5,000	\$50,000
< \$500	193	234	182	100	.	400	190	234	225
About \$500	500	500	500	.	500	.	500	500	500
DK/RF if <> \$500	8,573	600	.	8,695	4,000	.	8,631	1,733	.
> \$500 & < \$5,000	1,989	1,979	1,929	1,814	1,900	1,660	1,956	1,970	1,898
About \$5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
DK/RF if <> \$5,000	3,400	4,689	5,500	1,333	18,271	20,000	2,625	10,690	7,917
> \$5,000 & < \$50,000	14,988	14,661	13,929	13,200	14,500	11,808	14,793	14,650	13,449
About \$50,000	50,000	50,000	50,000	.	.	.	50,000	50,000	50,000
DK/RF if <> \$50,000	6,000	20,000	4,610	.	.	13,079	6,000	20,000	9,550
> \$50,000	57,250	103,002	73,600	125,000	100,000	469,000 ^a	79,833	102,502	186,571 ^a
All Categories	7,959	10,147	10,618	12,415	16,380	35,175 ^a	8,819	11,175	16,388 ^a

Note: ^a One imputed outlier (6,666,733) was removed from the calculation.

Appendix 4

Mean Asset Values Associated with Different Entry Points: Owners Only

Asset	Low Entry Point	Middle Entry Point	High Entry Point
Real Estate	176,087	222,209	252,369
Business/Farm	260,090	304,713	319,963
IRAs	70,034	67,835	69,378
Stock	159,048	189,612	158,384
Chk/Sav/MM	19,309	27,440	31,975
Bonds	99,564	76,941	85,652
CDs, T-Bills	46,539	47,386	51,606
Vehicles	11,656	14,739	16,647
Other Assets	46,114	49,646	48,714
Debt	8,819	11,175	16,388
TOTAL	878,622	989,346	1,018,300
% increase between entry groups	--	12.6%	2.9%

Note: "Total" and "% increase between entry groups" are statistics that may not be sensible conceptually. We include them here only for crude cross-entry-point comparisons.

This table provides an overview of the relation between entry point and mean value of assets. The data are restricted to asset owners, and summarize the mean value of owner assets by entry point. Although the general pattern is that higher entry points are associated with larger means, which is what entry point bias would expect, there are many exceptions to that generalization. For example, while Real Estate, Business/Farm, and checking/savings/money market accounts have the relationship expected by entry point bias, IRAs and Bonds have the largest mean in the lowest entry point group, and stocks have the highest mean in the middle entry point group. As a gross overall measure, the percentage difference in the mean between the middle and high entry point groups is a miniscule 2.9%.