Center for Financial Security

April 2010 Symposium

Family Financial Security

Financial Literacy: Evidence from the Cusp of Retirement

Jason S. Seligman

John Glenn School of Public Affairs

The Ohio State University

Abstract:

Following a survey of employees estimated to be one year from retirement I analyze responses to a twelve item financial literacy quiz relating scores to evidence of planning exercises, self-assessed proficiency with economics, education, wealth, IRA ownership and a battery of demographic controls. I find evidence of difficulty self-assessing understanding of economics and concepts related to financial literacy. Measures of satisfaction with finances and with health are each better predictors of score than self-assessed ability. Remarkably, higher level wealth & education groups show evidence of being least self-aware, and are remarkably overconfident when considering the distance between their self assessed proficiency and actual performance on the quiz. Based on evidence I conclude that reported self-assessment is of limited use. I find exercises related to compound interest are important building blocks for understanding financial decisions regarding lump-sums. Because some of those who might benefit the most from education may not be aware of their needs, and because evidence of a strong cluster of this type is observed to exist among the most well off, as well as making informed decisions on their own, surveyed participants are likely to benefit from educational tools that help them engage and assess work with financial managers.

Keywords:

Survey Research, Retirement, Financial Literacy, Educational Curricula Development

1.0   **Introduction:**

It is currently thought that modern workers are likely to require more education and assistance in planning for retirement because they must allocate assets not only through work years but also through the drawdown phase--retirement.[1] This paper reports broadly on topics related to retirement readiness for a population of workers who all face decisions regarding the handling of a lump-sum distribution from an employer savings or pension plan.

Currently the likelihood of facing these decisions is increasing for two reasons. First, Defined Contribution retirement programs offer participants lump-sums – in many cases as a default option. Second, Defined Benefit pension programs increasingly offer participants the option of cashing out some or all of their accrued pension benefits. By either path, it is evident that this new development requires workers to make major financial decisions as they exit the workforce and through the later years of their life.

To address the problem methodically in I engage approximately 350 subjects across three employer-sites with distinct pension plans and workforce attributes. Both the pragmatic pedagogical and broader empirical findings that I present here are relevant to financial decisions at the cusp of retirement. Pragmatic pedagogical

---

[1] Individual asset management risks are described methodically in Richardson and Seligman.

results are identified by natural breaks by which to segment a population into two or more variants of methodologically developed educational offerings.[2]

This paper is meant to facilitate thinking regarding the development of educational offerings. Findings show this population to be in good financial shape at time of interview. This is predominantly attributable to two factors: (1) by design the survey participants are currently employed, and (2) they are employed in sectors of the economy that possess relatively high-skilled labor forces (education and healthcare). This is evident, not only by way of their education and asset positions, but also by way of their answers to a battery of questions gauged to ascertain their financial literacy. Nonetheless, the population is fragile in the sense that they, like many modern American workers, will predominantly retire from employers with Defined Contribution retirement savings programs in place of the traditional Defined Benefits afforded most of their previous colleagues in the latter 20th Century. Additionally, those workers in the sample who hold Defined Benefit pensions all have the option of taking a partial lump-sum withdrawal of up to three years of accrued benefits which then acts to reduce realized monthly pension payments.

From the survey it is possible to uncover retirement motives and the extent of respondents concern regarding their pending retirement plans. The analysis of these surveys is useful, because the risks associated with the development of educational

---

[2] For example, one might envision a demonstration environment wherein each balanced random sample is designed to be matched with an in-sample control group, gleaned from pre-assignment survey.

materials exist in many dimensions. For example, tools can be either too specific, or too generic to be useful for the bulk of U.S. workers. Additionally exercises can be too rudimentary or too advanced to engage those they are meant to address. Developed curricula must take into account both the target audience for any developed materials, and as well the best way to engage them. Summary findings of this paper can be characterized as follows:

Addressing goals is important to help people construct their retirement decisions. Planning for the transition to retirement is contingent on goals. And yet, goals are not enough. Incremental increases in the "amount thought about retirement" even when coupled with reports of estimates of need in retirement do not lift scores more than a few percentage points on average, and fail to do so with any consistency (as measured by statistical significance).

Natural breaks in the sample appear to occur at the median asset level and at an education level of Bachelors degree. Those who are below either threshold are found to do significantly worse on the financial literacy quiz. Those in the top decile of the wealth distribution also do worse on the quiz. An opportunity thus exists to develop educational offerings tailored to remedy shortcomings in these sub-populations.

The sample population is not good at self-assessing their financial knowledge. What's more, higher level wealth & education groups show evidence of being least self-aware. It is of additional interest that increases in risk aversion are strongly

related to mild increases in both risk tolerance and quiz scores. Taken together these facts suggest an opportunity may exist to develop educational offerings that highlight vulnerability in retirement and that assist those with assets in selecting and managing relationships with financial managers.

Exercises related to compound interest are important building blocks for understanding a variety of other financial topics, and for making decisions regarding lump-sums. Success in answering compound interest questions correlates to large and consistent gains elsewhere on the financial literacy quiz--thus improving performance in this area should be a core of any developed curricula.

Continuing, Section 2 of this paper introduces the data developed and discusses it in the context of other, near-samples. While Section 3 reports on uni- and bivariate relations in the data, Section 4 highlights key results from multivariate analyses against the backdrop of previous sections. Section 5 concludes.

2.0   Data and Previous Literature in Context

These data engage 353 subjects across three employer-sites with distinct pension plans and workforce attributes. Face-to-face Computer Aided Personal Interviews (CAPI) document survey population attributes, preferences, and outlooks as respondents approach retirement, at the participants worksite. Interviews were

collected using Ci3 instrument field recording software in accord with University of Georgia IRB protocols.

The survey instrument is designed to be comparable to large segments of the Heath and Retirement Survey (HRS); which provides an out-of-sample control for comparative purposes. The HRS is a biannual survey conducted by the NIA and administered by the University of Michigan's Survey Research Center. Conducted biannually, and comprising birth cohorts from 1923 forward, it is a central data resource in the study of aging work and retiree populations. Financial literacy questions are based on the Netspar CentER Panel Survey –"Financial (il)literacy project" and Lusardi & Mitchell's 2004 HRS Module, allowing for better comparison to two relevant out-of-sample populations.[3] A copy of the full survey instrument are available from the author as a supplement to this paper upon request.

2.1 Other Data Samples and Literature in the context of this work

The bulk of this sample is between 58 and 64 years of age as predicted in the original research design. By comparison, Lusardi and Mitchell have focused on a sub-sample of the HRS population aged 51 – 54 at time of survey. While having experienced a great number of financial transactions relating to retirement savings, home mortgage, equity market participation, etc. the 2004 Module population is

---

[3] The main differences in the fuller Seligman data from 2004 module and Netspar CentER questions regards construction of preference questions on the administration of hypothetical lottery winnings. The change in design is meant to better facilitate consideration of latent annuitization preferences.

younger than the targeted population here by several years. The general HRS population holds several cohorts older than, younger than, and similar in age to those surveyed here--again in line with the original survey design. The HRS cohorts, both in general as well as within the subsample most likely to retire at a similar time, are very different in terms of education income and assets – this sample composition outperforms in the HRS in all areas. In short this sample is in a much better position overall.

The bulk of the sample reporting an expected retirement date hold expectations for a date of retirement within the next few years. Figure 1 depicts the distribution of birth cohorts (top) and expected retirement ages (bottom) across this sample. The gray bar within the lower chat marks the percentage reporting dates in the past at date of interview expected to already be retired by this time as 12 percent (equivalent to 15 percent of those reporting dates), 50 percent report expected retirement by the end of 2010 (60 percent of those reporting dates), 58 percent report expected retirement dates by the end of 2011 (70 percent of those reporting dates), A significant subsample report not knowing when they will retire (17 percent), or decline to answer (3 percent). While to be selected into the study participants had to report that they were contemplating retiring within the next year, quite clearly a number of them are looking to be informed regarding the timing of their retirement, either because the announce dates in the past, in the far future, or cannot answer the question with a specific date.

Remarkably then, when compared to results described by Lusardi and Mitchell (2007), this sample is very well informed.   However, closer inspection reveals that many of the vulnerabilities found therein are present here as well.   In general vulnerable groups can be characterized as follows: either they know they lack information and expertise by which to manage their financial assets as they retire, or they display overconfidence (observable by the discrepancy between their self reported capability and responses to financial literacy and numeracy questions).   The remedies that emerge for these distinct groups are likely to be different.   For the first group, opportunities to be informed are more likely to be appreciated.   Further, whereas for the first group it is clear that materials must begin with basic concepts and build from that level, the second group may or may not require the same foundational skill set, depending on the nature of their overconfidence.   Indeed, it is even possible that members of the overconfident group would simultaneously benefit from foundational education, and be off-put by it.   Technically speaking while both groups are poised to benefit from education, it is likely that demand in the second group is rather more latent.

In order to further understand the population it is important to consider their motives and concerns regarding retirement.   While the full list is interesting, most important for the development of curricula are motives and concerns raised regarding health and financial wellbeing.   Across respondents, 55-60 percent report that their health and/or the health of family members is a meaningful factor in their retirement timing decision. When compared to recent work by Lachance and Seligman on retired

populations using the HRS through 2008 these figures appear high, but the response frame here is likely quite different; this sample is pre-retirement and so the question is hypothetical, whereas for retired populations the frame is more likely experiential.[4] Notably the percentages here lie between those reported by voluntary and involuntary retirees in Lachance and Seligman. This is promising in as much as within the hypothetical frame it appears that this sort of contingency is an important concern for individuals—suggestive of demand for insurance offerings as identified among workers of similar age within in the job-lock literature in papers by Blau and Gilleskie, and Gruber and Mandrian.

3.0 Further Univariate and Bivariate Analysis

Table 1 reports summary statistics for the survey population of 353 persons. Starting with variables relating to performance on the quiz, average performance is 8.7 correct out of a possible 12, or roughly 72.5 percent. Performance on compound interest type questions, averages 1.58 out of a possible 2 (roughly 79 percent), though there is a relatively high degree of deviation about this mean. For the remaining 10 questions performance is roughly 7.1 correct out of a possible 10. The survey population is over half female (56 percent), and just under one quarter derived from non-white populations (23 percent). The population is comprised of workers at three distinct employers concentrated in healthcare and educational fields, of which one

---

[4] Lachance and Seligman find voluntary retirement is not likely to be associated with self- or family-health. Among the involuntary population observations are very much in line with those reported here.

provides 48 percent and the remaining two provide 27, and 25 percent respectively. Only four percent of the population has failed to complete high school, and 70 percent have a bachelor's degree or better. Remarkably, slightly greater than half have advanced degrees--53 percent have a master's or doctorate degree. When asked to self-assess their proficiency with "economics" on a scale from 1 - 7, the mean reported assessment is a 4.6. An unfolding series of questions is meant to estimate Arrow-Pratt measures of Constant Relative Risk Aversion (CRRA). Light & Ahn (2008) adopt a scaled 4 point ordinal measure from this frame, which is useful for consolidating the question for use in multivariate regression, and otherwise. I adopt this method here, the mean value for the Light-Ahn measure is 1.63, or somewhere between the most and second most risk adverse categories, the standard deviation about this mean is roughly one full category (0.99). Among such a highly educated population employed in leading industries it is perhaps less surprising that average assets close to retirement are quite robust at $2,843,748. As shown in the distribution detail (bottom panel) the distribution is however quite skewed. Median assets are much lower but still quite robust, at $536,000. Lusardi and Mitchell have compared the HRS early boomer group to the original cohort of HRS participants (born between 1931 and 1941) and noted that the early boomer population tends to be better off financially than their elders but that economic vulnerability for the lower end of their (younger) population is greater. They speculate that the volatility of certain aspects of wealth for the mid-section of their sample is greater as well, with the help of a few simulation exercises. The population studied here is somewhere in between the experiences of the original HRS, and the Early Boomer cohorts. Herein Assets are computed as

$$A_{hh} = H + H' + B + IRA + Risky + Safe + C + I - D$$

Where: A_{hh} = Household assets
H = Housing wealth net of outstanding mortgage(s)
H' = Net value of other real estate holdings
B = Net value of any business owned within the household
IRA = Value of IRA-type accounts
$Risky$ = Net value of Stock and Bond holdings
$Safe$ = Value of Checking and Money Market accounts
  + Value of CDs, and US Treasury holdings
C = Value of any collections
I = Value of annuities held
D = Other obligations or unsecured debt.

The only substantive difference between these survey data as collected and those collected for the HRS cohorts is with respect to a second residence which is coded within H' here, but are not coded consistently within the HRS over several biennial surveys, and without respect to cohort. St. Clair et al, (2008) documents this as part of the RAND HRS Data Documentation. Few in this sample find themselves in debt.

The vast majority of this sample has a defined contribution retirement savings plan, and reports having the opportunity to select how their assets are invested. Slightly more than half of the sample report having participated in retirement planning meetings. As described in Seligman and Bose, 2006, the HRS population that report active participation in retirement savings plans and participation in financial seminars shares this attribute and a generally strong positive asset position. While average asset levels are large, perhaps more remarkable is the variation about this mean (close to five times the mean value itself). Employing a log-transform goes

a long way towards standardizing these data, but regrettably discards a few observations (four) with negative net assets.   Notably 77 percent of the survey population has access to an individual retirement account (IRA) either uniquely or through a spouse, facilitating the move of a DC balance or an incremental increase in retirement savings, and important for tax planning when realizing a lump-sum distribution at retirement. Figure 2 provides the full distribution of reported assets.

When queried about other retirement planning related activities, of the sort found to be important in Lusardi (2000), 58 percent report having estimated their retirement needs at some point in the past. When queried on a four-point scale, the population as a whole reports having thought about retirement somewhere between "a lot" (1) and "some" (2), the mean value being 1.7. Fifty-four percent of the population reports having attended meetings on retirement, 78 percent plan to work part-time in retirement, and 58 percent report having a savings plan for retirement. When asked about budgeting, the population as a whole reports keeping track of spending somewhere between "always" (1) and "mostly" (2), the mean value being 1.85. Overall the population reports being between just better than "somewhat" (2) satisfied with their financial situation at a mean value of 1.99, When asked about their planning period, they report somewhere between "the next few years" (3) and the "next five to ten years" (4), the mean value being 3.22. The bottom panel of Table 1, offers fuller information on the distribution of score, self assessment, and assets to give a better appreciation of these fundamental aspects of the data.

Table 2 provides detail on retirement motives and concerns. Beginning with motives it is apparent that Health is an important motivator overall. While the health of family members is reportedly of a lesser degree than one's own (22.9 percent rank family member health a "very important" consideration as compared to 32.8 percent who rank their own health similarly) over half (54 percent) believe this to be an at least somewhat important trigger. Related concern (see the top of the bottom panel) regarding the "prospect of illness or disability" impacts 70.7 percent of respondents.   Roughly 20 percent report that they "worry a lot" about these prospects – suggesting a role for informing them on health insurance and long term care options. It is perhaps natural for this concern to be more expansive than related health motives, for while retirement occurs over a relatively brief moment of time, the state of retirement is more persistent, so that the impact of aging is more likely to eventually impact moribundity.

Most respondents evidence plans and goals for retirement, 88 percent report wanting to "do other things" as being an important motivator, to some or other degree. When considered along with the asset data presented below, a reasonable interpretation of the full set of responses to this query is simply that income criteria are not binding when persons enjoy their work. Given interpretation of the "Don't need to work…" responses, a then closely related query worth considering is, "Wanted to do other things." Since respondents' answers to these questions are non-exclusive, a further interpretation is that there is an interest in part time work in the period traditionally referred to as retirement. Just over two-thirds (67.2 percent)

attach some importance to income adequacy in formulating their retirement decision. Coordination of retirement with a spouse motivates roughly a third of respondents to a degree (33.7 percent). Moving to likeminded concerns (presented at the middle of the lower panel), over 40 percent of respondents express a degree of concern with "having too much time on their hands," (42.9 percent) and "not doing anything productive or useful," (41.4 percent). A great majority of respondents express some degree of concern about missing people they work with (73.1 percent). Taken together these feed into goal planning and framing – a popular introductory topic for the first module of some current life-planning tools, both in the private sector, for example as offered by ING (2006), or more public initiatives, such as CJE's "Mapping Your Future" (2003) or the more recent CLOI's "Designing Your Future" (2009). Traditionally, the academic personal finance literature refers to this as a 'needs estimation' exercise, as in Kapoor, Dlabay and Huhes (2009), for example.

Regarding less positive motivators (bottom of the top panel), 35.6 percent are motivated to a degree by distaste for their work, 34.6 by a perceived lack of appreciation for their work, and 29.1 percent by a distasted for their boss. Motives related to employability are at least "somewhat important" for 17 .2 percent of the population responding to "can't find work" and 32.3 percent as regards perceived employer policies towards older workers. Related concerns (bottom of bottom panel) are important regardless of whether they are well founded, because they form the basis for decision making. Indeed a primary objective of research in financial security should be to increase comfort with decisions regarding asset management and labor

force exit paths, and thus ill-founded concerns form one important basis for opportunity along these lines. More than 70 percent of the sample reports some degree of concern regarding income adequacy (72.3 percent), and more than 80 percent report a degree of some concern regarding inflation and the cost of living (82.8 percent). Approximately a third of the sample report that they "worry a lot" about income erosion due to inflation. The sample thus can be said to be aware of their needs for information, and have demand for tools that help them to understand and address health and financial risks in later life.

Table 3 presents results for cross tabulations of test performance by education and wealth. Regarding education, there is an observable natural break in test performance at the Bachelors degree level. Those with a bachelors on average perform 30 percentage points better than those without (79.1 percent versus 57.4) a difference that is highly statistically significant (well past the 99.9 percent confidence level) as reported by a calculated t-statistic for unequal samples of -9.17. Looking at achievement in terms of thresholds for performance, 41.8 percent of those with a bachelors degree (BA) score 90 percent or better on the test as compared to just 9.7 percent of those without. [5] Considering the 80 percent achievement level, the less-than-BA sample achieves at that level slightly less than one-fifth as often as the BA-or-greater sample (14.6 percent versus 64.7). In additional exploratory counts not

---

[5] The advanced degree population does not do significantly better on tests that the larger BA-or-better group. Regression results found later in this report will confirm thhis. (See: Tables 4-6, specifications 2 & 5 wherein breaks associated with advanced degrees are reported to be roughly a half-point, or approximately five percent overall, and closer to two percent excluding compound interest questions--standard errors often overwhelm reported point-estimates.)

included within the table, the lower education population is found more likely to report not knowing the answer to one or more questions. For those without a BA, 60 percent answer "don't know" at least once, the comparable frequency is about half that, or 30 percent for those with a BA.

Table 3 next affords the reader an opportunity to consider test scores by level of assets (less than, greater than median assets). Means score differences (68.8 percent for those below median assets and 75.9 percent for above) are closer together than when segregating by education but again strongly statistically significant (the t-statistic yields -2.98, well over the 99 percent confidence level). While nearly two-thirds of those with above median assets score 80 percent or better on the test (64.7 percent), just over one-third of those with asset levels below the median achieve this level of competency (34.5 percent). At the 90 percent achievement threshold, 18.8 percent of the below median asset group as compared to 45.1 percent of the above median asset group achieves this level of performance. Denoting cut offs at higher asset sensitivity check using an alternate asset cut-off at the 66th percentile suggests that the median cut-off is a natural one to consider in group comparisons. Remarkably, when groups are separated at the 90th percentile achievement among the high asset group declines tremendously; mean scores by group are 75.8 percent for the lower wealth group, but only 46.2 percent for the highest wealth group--the largest disparity across groups documented. The t-test for this difference yields a 8.18 value, well over the 99.9 percent confidence level. The vulnerabili1y of this high wealth group is seen across performance thresholds as well, 10.3 percent of the high asset

group receive an 80 or better, while only 5.1 percent achieves a 90 or better on the test

(as compared to 54.8 percent: breaking an 80, and 35.7 percent: breaking a 90 below

the 90th percentile in the wealth distribution).   Thus significant educational

vulnerability exists among the highest asset holding group.

In another series of additional exploratory counts, the data show the below

median asset group answers "don't know" to at least one question slightly less than

half of the time, whereas for the above median asset group the comparable figure is

roughly 30 percent. If groups are divided at the 90th percentile, the lower nine deciles

report "don't know" at least once about 40 percent of the time whereas within the top

10 percent report frequency is roughly 35 percent.[6]

The bottom panel of Table 3 replicates the test performance exercises for self-

assessment. Comparisons by education are interesting in as much as those with a BA

have both somewhat higher reports, and more consistent reports. When coupled with

the top panel this describes an observably lower risk of over-confidence among those

with a BA. Comparisons by asset level yield weakly statistically significant differences

in self-assessment scores across the median asset threshold, and no discernable

difference across the 66th percentile wealth distribution threshold. However while the

top decile threshold fails to identify significant differences in mean scores, those in the

top ten percent of the wealth distribution are most likely to report a self assessed

---

[6] Full tables of the additional work with "don't know" responses are available from the author by request.

proficiency at the 90 percent level or higher (15.9 percent), this is the only group found that over-predicts performance on the test by way of self-assessment, by more than 20 percentage points in mean value (46.2 average test performance versus 66.4 percent self-assessed proficiency), and self-assessed proficiency at either the 80th or 90th percent level are more than three times the rates of observed threshold crossing in the test. All of these differences are statistically significant at the 99th confidence level or higher. To summerize, the sample is not all that good or confident when attempting to self-assess their financial knowledge, and those with the greatest assets display over-confidence.

Final bivariate results are presented graphically in figures 3 – 5. Figure 3 presents a topographical density of raw test scores by reported self-assessment of economics, overlaid with readings of average, minimum and maximum self-assessment by score. Of note mean values for each score group are seldom less than "4" the middle level of self assessment, and overall correlation between self-assessment and score is roughly 4 percent—less than one might hope for. Additionally, those that answer "don't know" or who "refused" to self-assess perform very poorly on the test, scoring at a level of 25 percent or lower on the exam. This reaffirms the notion that self assessment, as reported is a remarkably weak indicator of capacity for independent financial decision making at the individual level. By comparison Figure 4 uses reported level of satisfaction with finances as an alternate predictor of test performance, This predictor does a better job – with a raw correlation of 26 percent. To place these results in perspective a final figure, Figure 5, describes

the relationship between test scores and reported level of satisfaction with health, While one does not readily expect this relationship to be stronger than that of the previous two figures, in fact it outperforms both. This suggests that people have trouble in self-assessing, or in announcing their true self assessment, either of which may bode poorly for the idea that those who need help seek it openly. It is possible that stigma (real or perceived) plays a role in self assessment as reported. Of course the great concern is that this carries over to the likelihood to uptake financial or life counseling, perhaps especially in peer group environments.[7]

Taken together the uni- and bi-vatiate data analysis above lends some degree of support for the idea of developing tools for two or more separate educational use groups. However it is likely the case that each group would benefit from interaction with the other. It is further unclear that the persons naturally seek information and help in accordance to their needs. Additionally, the idea that assets alone can identify informed or knowingly-uninformed populations does not appear to hold up very well. To better understand relationships between test scores and population characteristics it is best to consider multifactor analysis, such as is afforded in a regression setting. This is provided in our next section.

4.0   Multivariate Data Analysis

---

[7] Moffit's leading work on stigma and uptake of benefits among the eligible (1984) details concerns relating to stigma in a somewhat different context.

The value of the regression model is its ability to control for all included variables, thereby isolating correlations for each unique independent variable. Within the regression framework the risk of spurious correlation is much-reduced. Further, because one finds participants who score at both extremes of the possible distribution, the two-sided Tobit is the appropriate model for analysis. Tables 4 and 5 report regression results for 10 closely related specifications, in numeric score (Figure 4 - Tobit limits are $\{0, 12\}$) or percentage terms (Figure 5, Tobit limits are $\{0, 1\}$).

The total of included factors across all specifications includes {gender, race, employer of record (employed mostly as a fixed-effect-type control), educational attainment (considered in several steps to reaffirm the observed natural break at the BA level), self reported proficiency in economics, understanding of compound interest, risk preferences, assets (considered in several steps to identify a natural break at the median-or-above level, and to generally offer enhanced perspective), and several self reported behaviors associated with self control and improved financial management documented elsewhere in the literature as described earlier herein. Generally, results reveal that female and nonwhite participants score lower than other participants. Losses for nonwhites are larger, generally ranging from 2 to roughly 2.5 times those reported for females. Results for both groups are statistically robust so as to be within the 99 percent confidence level.

Differences across employers are generally small (within half-a-point) and fail to be statistically significant, though in one specification our alternate educational

employer sample is found to test about half-a-point higher at the 5 percent level (Table 6), and in another about three percentage points better at the 10 percent significance level (Table 7). Taken together the results suggest the alternate educational employer may be slightly better informed, or numerate. These differences appear slight.[8]

Education is considered in a number of ways. The first specification of Table 6 reports a baseline linear rate that suggests each additional 5-6 years of education is worth an extra point on the test. Moving to discrete measures, results suggest that those with less than a bachelors degree have average scores that are lower by roughly 3/4ths of a point when considered in tandem with other discrete measures, or about a point when considered uniquely. Statistical significance at the 5 percent and 1 percent levels are the norm across both regression result tables. By Table 7 we see the difference is in the range of 6-to-9 percentage points after controlling for other included factors.

We next focus on two variables which are quite interesting, the self-report of economic proficiency, and two questions where subjects are asked to perform relatively simple compound interest tasks (Table 6). Both of these variables are granted focus in specifications undertaken within Lusardi and Mitchell (2007).

---

[8] Outside of these data, differences in opportunity across types of employer have been observed. Through work collecting these data I found private employers to be less willing to have employees participate in financial education during working hours. This result may be limited either to particular industries, may be particular to this protocol, or may be particular to time in which the work is done, a time of rapid experiential change in retirement for both employers and employees alike.

Results with the first variable, self assessment of economic proficiency, is rather stunning in that it then appears to be an unreliable proxy for or predictor of test score—in line with evidence from figures 3-5. In no regression is this variable found to be statistically significant after controlling for other factors. Again this suggests people near retirement have a very poor sense of their economic proficiency, or that what they think of as economic proficiency is different from the concepts relating to their ability to answer questions pertaining to finances. The result is in line with that reported in Lusardi and Mitchell (2007) who find evidence of overconfidence (read as a negative coefficient in their regressions).

Table 6 provides insight on the second, the compound-interest-type questions. It appears high scores among the remaining ten questions are quite strongly correlated with correct answers to questions pertaining to compound interest. The coefficients imply that for each compound interest question answered correctly scores increase by almost an additional full point for each of the compound interest questions answered correctly (0.8 - 0.9 points per successful response, at the 99 percent confidence interval or better) Compound interest problems are useful because they require a person to manage several changing elements in their calculation. Additionally worthwhile to point out here in a paper devoted to the study of persons so near retirement, is that compound interest is more important to understand during drawdown than accumulation. Indeed, a lack of understanding most naturally leads to an underestimation of returns during the accumulation phase, and thereby greater

savings, but the reverse is true during periods of draw-down. In particular, because annuity valuation calculations require an understanding of compounding; this is an important component of any educational offering targeted at a population wishing to inform purchase of these contracts.[9]

Risk aversion is strongly associated with better scores on the test. Magnitudes of impact are roughly 0.2 to 0.3 points consistently per up-tick in the constructed four point scale, whether or not compound interest questions are lumped in with all other question types. In general then the most risk adverse are expected to do about a point or so better on the exam, and given the apportionment in improvements roughly four-fifths to five-sixths of this yield comes from questions outside of the compound interest type. Assets are explored in a variety of ways, as is usually the case the log-asset value is found to be a more robust predictor than level measures of assets. For each increment log increase (generally near to a factor increase), test scores improve by 0.28 to 0.34 points, and comparing Table 4 and 6, roughly 0.24 to 0.29 of this point increase occurs outside of the compound interest question type. Specifications 8 and 9 in tables 4 and 5 provide some evidence that the median asset level is a natural break, and outperforms log-asset values as a predictor, by Table 6 it

---

[9] A natural further exercise for those thinking about managing either their drawdown, or living on the fixed income an annuity provides is an exercise on budgeting. Two academic pieces are worth noting here, the first is by Mastrobuoni and Weinberg, who find that a significant portion of those with low savings fail to budget their Social Security checks effectively month after month. This impacts their well being in significant ways. The second paper by Aguiar and Hurst (2005) won the Samuelson prize in 2006, it finds that income needs of seniors fell after retirement as seniors substituted home production and saved money on purchases relative to their working counterparts though strategies akin to coupon-clipping and the like. Together these papers emphasize the value of organization and budgeting for well-being in retirement.

appears that much of the difference in the two in terms of statistical power regards the compound interest questions. Within Table 4 being above the median asset level is correlated with about a 0.7 point increase in score (significant at the 90 percent confidence level), in Table 6 the relationship weakens to a half a point and the statistical power fall below standard reliability thresholds (90 percent or better).

IRA ownership which is important for proper tax management of a lump-sum payout at retirement fails to yield statistically significant correlation with test scores, and magnitudes of impact flip from positive to negative if compound interest questions are treated as independent predictors of score as in Table 6.

Lusardi (2000) and others have focused on variables like the reported existence of a savings plan, whether people keep track of spending, and the amount people have thought about retirement. The last battery of included variables addresses these behavioral factors. Two closely related variables are most promising, estimated retirement needs, and having a savings plan for retirement, but none are found to yield statistically significant relationships and the magnitude of point estimates for yield are everywhere lower than a single point across the spectrum of possible responses, so that none appear outstanding enough to warrant further individual attention.

5.0   Summary and Conclusions

In summary the objective of this work has been to improve understanding of a unique sample population with a generally enviable endowment of occupation, industry, assets and education with the potential to inform developing educational curricula. While this sample appears to be well educated and reports assets in line with financial preparedness for retirement, we see by way of univariate, bivariate, and multivariate analysis that these populations have identifiable and predictable shortfalls in their capacity to manage their finances in retirement. By that standard they are vulnerable. Moreover, the vulnerabilities can be identified both by reported habits, and through responses to test questions. There is a strong current in the literature that suggests that those who can not perform the more rudimentary financial calculations and estimations, and that can't or don't budget, are at a significant disadvantage late in life (Lusardi (2000) for example). When coupled with the increased responsibility of managing a lump-sum retirement benefit, this suggests that educational offerings should have a strong grounding in the basics.

Beyond that which is presented here, work by Julie Agnew, et al on annuity purchasing behavior suggests that framing is a very important factor in influencing purchase behavior. This suggests that the purchases are not made entirely rationally. In a frame-dependent environment each client is likely to identify with the set of tools they feel to be tailored to their situation. Thereby an older worker is arguably more likely to engage and learn from a product they feel is appropriate to their point in life, and by extension it seems useful to tailor education to cohort-peer groups across the lifecycle, even when fundamental problem solving skills are otherwise similar. But

frame effects are not necessarily benevolent. While attention to frame can help assist a purchaser in comfort with decisions, that comfort may be more or less warranted by product fundamentals. Thus again in the context of these results I conclude that grounding in basics which help an individual manage frame affects is likely to be very important. Finally, it bears repetition that many in the sample are at the higher end of the education and wealth distribution, where individuals are more likely to purchase personal financial planning services. Particular vulnerabilities for this group likely involve informational services that help them feel comfortable with their ability to assess the merit and effort of agents work on their behalf. Educational offerings tailored to advisor selection and relationship management when tied to basic information on finance and insurance may be of greater marginal valuable than higher level finance or highly specific financial product education. In short many across the savings and drawdown lifecycle may be more interested in education that improves their ability to monitor, evaluate, and manage relationships with their planers than in directly managing their finances.

Bibliography

Agnew, Julie, Lisa Anderson, Jeff Gerlach and Lisa Szykman. "Who Chooses Annuities?: An Experimental Investigation of Gender, Framing and Defaults," *The American Economic Review*, 2008, 98 (2), 418-422.

Aguiar, Mark, and Erik Hurst, "Consumption versus Expenditure" *Journal of Political Economy*,(2005).

Blau, David, and Donna B Gilleskie "The Role of Retiree Health Insurance in the Employment Behavior of Older Men", NBER Working Paper 10100 Cambridge MA., November 2003

Ci3 CAPI system, Sawtooh Software, 2007. (http://www.sawtoothsoftware.com)

Gruber, Jonathan, and Brigitte C. Madrian "Health Insurance, Labor Supply, and Job
Mobility: A Critical Review of the Literature, NBER Working Paper 8817, Cambridge MA, March 2002. – *need newer cite*

Juster, *F*. Thomas *(*Primary Investigator), *Health and Retirement Study*, public use dataset. Produced and distributed by the University of Michigan with funding from the National Institute on Aging (grant number NIA U01AG009740). Ann Arbor, MI, (2006)."

Kapoor, Jack R., Les R. Dlabay, and Robert J. Hughes, *Personal Finance*, *9th Edition*, McGraw-Hill Irwin, 2009

Lachance, Marie-Eve and Jason S. Seligman, "Involuntary Retirements: Prevalence, Causes and Impacts," Working paper, under submission, available from authors by request.

Lusardi, Annamaria. "Saving for Retirement: the Importance of Planning,", *Research Dialogue*, TIAA-CREF Institute, 66, December 2000.

Lusardi, Annamaria and Olivia S. Mitchell. "Baby Boomer retirement security: The roles of planning, financial literacy, and housing wealth." *Journal of Monetary Economics*, 54 (2007) 205-224

Mastrobuoni, Giovanni and Matthew Wienburg "Heterogeneity in Intra-Monthly Consumption Patterns: Self-Control and Savings," *American Economic Journal: Economic Policy, 1:2 (2009) 163-189*.

Moffit, Robert,   "An Economic Model of Welfare Stigma." *American Economic Review*, December 1983.

Netspar CentER Panel Survey –"Financial (il)literacy project"

St.Clair, Patricia, Darlene Blake, Delia Bugliari, Sandy Chien, Orla Hayden, Michael Hurd, Serhii Ilchuk, Fuan-Yue Kung, Angela Miu, Constantijn Panis, Philip Pantoja, Afshin Rastegar, Susann Rohwedder, Elizabeth Roth, Joanna Wedell, Julie Zissimopoulos.   *RAND HRS Data, Version H Data Documentation.* Produced by the RAND Center for the Study of Aging, with funding from the National Institute on Aging and the Social Security Administration. Santa Monica, CA (February 2008).

Richardson, David P., and Jason S. Seligman. "Optimal Retirement Portfolios: Social Security Personal Accounts within the Context of the Four Pillars." *The Geneva Papers,* 30(4): 565-580.

Seligman, Jason S. and Rana Bose, "Pension Design, Retirement Wellbeing, and the Residual Public Burden." *Policy Notes,* Carl Vinson Institute of Government, University of Georgia, 2006

Various, *"Financial Strategies For Successful Retirment"* ING North American Insurance Corporation, 2006

Various, *"Designing your Future,"* Chicago Life Opportunities Initiative, CLOI, 2009-2010

Various, *Mapping your Future Your Way!* Council for Jewish Elderly, 2003, Chicago Il, 60645

Table 1: Summary Statistics:

Variable	Obs	Mean	Std.Dev.	Min	Max
financial literacy quiz score (out of 12)	353	8.70	2.74	0.00	12.00
" in percentage terms (proportion: 1)	353	0.73	0.23	0.00	1.00
performance on compound interest questions (0,1,2)	353	1.58	0.67	0.00	2.00
score (without compound interest questions, : 10)	353	7.12	2.32	0.00	10.00
female (proportion: 1)	353	0.56	0.50	0.00	1.00
nonwhite (proportion: 1)	353	0.23	0.42	0.00	1.00
alternate private employer (proportion: 1)	353	0.27	0.44	0.00	1.00
alternate educational employer (proportion: 1)	353	0.25	0.43	0.00	1.00
Education	352	12.28	2.69	1.00	15.00
less than high school (proportion: 1)	352	0.04	0.20	0.00	1.00
less than bachelors degree (proportion: 1)	352	0.30	0.46	0.00	1.00
less than advanced deggree (proportion: 1)	352	0.47	0.50	0.00	1.00
self assessed proficiency with economics {(min)0, ...,7(max)}	344	4.60	1.50	1.00	7.00
Light-Ahn CRRA measure {most risk adverse 1, ...4 least}	326	1.63	0.99	1.00	4.00
assets (in tens of thousands of dollars)	317	284.37	931.67	-7.50	10,689.00
log value of assets	313	13.30	1.56	9.21	18.49
IRA ownership (self &/or spouse)	346	0.77	0.42	0.00	1.00
report having estimated retirement need (proportion: 1)	349	0.58	0.49	0.00	1.00
amount thought about retirement {a lot 1,...4 hardly at all}	351	1.70	0.85	1.00	4.00
attended meetings on retirement (proportion: 1)	351	0.54	0.50	0.00	1.00
plan to work part time in retirment (proportion: 1)	339	0.78	0.41	0.00	1.00
have a savings plan for retirement (proportion: 1)	349	0.58	0.44	0.00	1.00
keep track of spending {always 1, ...,never 4}	348	1.85	0.92	1.00	4.00
satisfied with financial situation {most 1, ...,5 least satisfied}	349	1.99	0.98	1.00	5.00
planning period: {the next month 1, ...,5 more than ten yrs}	339	3.22	1.21	1.00	5.00
satisfied with health {most 1, ...,5 least satisfied}	349	1.74	0.90	1.00	5.00

distribution detail -- distribution percentiles	1	5	10	25	50	75	90	95	99
score (with compound interest questions)	0.0	3.6	5.0	7.0	9.0	11.0	12.0	12.0	12.0
" in percentage terms	0.0	0.3	0.4	0.6	0.8	0.9	1.0	1.0	1.0
score (without compound interest questions)	0.0	3.0	4.0	6.0	8.0	9.0	10.0	10.0	10.0
self assessed proficiency with economics (0,7(max))	1.0	1.0	3.0	4.0	5.0	6.0	6.0	7.0	7.0
assets (in tens of thousands of dollars)	0.0	5.2	9.2	21.0	53.6	126.2	385.6	1,529.1	4,598.0
log value of assets	9.7	11.0	11.6	12.3	13.2	14.1	15.2	16.5	17.6

Table 2: Reported Motives For and Concerns About Retirement:

Retirement Motives	Very important	Moderately important	Somewhat important	Not important at all	Don't know	Total
Poor health	32.8%	12.8%	12.0%	41.3%	1.1%	351
The health of family members	22.9%	16.0%	15.1%	44.9%	1.1%	350
Want to do other things	40.2%	32.8%	15.1%	11.7%	0.3%	351
Don't need to work - have enough income	28.8%	19.7%	18.8%	31.9%	0.9%	351
Coordinate retirement with spouse	13.4%	8.9%	11.4%	66.3%	-	246
Don't like the work	10.3%	10.0%	15.4%	64.1%	0.3%	351
Don't get along with the boss	11.1%	8.5%	9.4%	70.7%	0.3%	351
My work is not appreciated	11.4%	9.1%	14.0%	65.4%	-	350
Can't find work	9.2%	3.7%	4.3%	79.7%	3.2%	349
Employer policy toward older workers	15.1%	8.3%	8.9%	66.9%	0.9%	350

Retirement Concerns	Worry a lot	Worry somewhat	Worry a little	Worry not at all	Don't know	Total
The prospect of illness or disability	20.1%	28.7%	21.8%	29.3%	-	348
Having too much time on your hands	12.6%	16.9%	13.4%	57.1%	-	350
Not doing anything productive or useful	14.3%	17.1%	10.0%	58.3%	0.3%	350
Missing people you work with	10.6%	40.9%	21.7%	26.9%	-	350
Not having enough income to get by	22.6%	29.1%	20.6%	27.7%	-	350
Inflation and the cost of living	32.7%	27.2%	22.9%	17.2%	-	349

Table 3: Test Performance and Self-Assessment by Education, and Assets:

Test Performance **by group characteristics**	mean score	sample variance	t-test unequal $\{N,\sigma^2\}$	percent scoring above 80%	90%
Overall:	72.5%	5.1%		50.0%	32.4%
By Education:					
less than Bachelors degree	57.4%	4.1%		14.6%	9.7%
Bachelors degree or greater	79.1%	4.1%	-9.17	64.7%	41.8%
By Assets:					
lower than Median	68.8%	3.7%		34.5%	18.8%
Median level or greater	75.9%	6.2%	-2.98	64.7%	45.1%
lower two treciles	73.3%	3.7%		48.7%	29.1%
top thrid	71.4%	8.4%	0.62	53.9%	40.0%
lower nine deciles	75.8%	4.0%		54.8%	35.7%
top decile	46.2%	7.4%	8.18	10.3%	5.1%

Self-Assessment **by group characteristics**	mean score	sample variance	t-test unequal $\{N,\sigma^2\}$	percent reporting above 80%	90%
Overall:	64.9%	4.5%		26.4%	8.6%
By Education:					
less than Bachelors degree	61.8%	6.0%		25.7%	11.4%
Bachelors degree or greater	66.3%	3.9%	-1.66	26.7%	7.4%
By Assets:					
lower than Median	63.8%	20.1%		25.2%	7.7%
Median level or greater	66.0%	21.5%	-0.45	28.0%	9.5%
lower two treciles	63.9%	19.9%		23.1%	6.8%
top thrid	67.3%	22.9%	-0.62	34.5%	12.7%
lower nine deciles	64.6%	20.2%		23.9%	7.0%
top decile	66.4%	23.5%	-0.28	38.1%	15.9%

Table 4: Tobit – Dependent Variable: Score on 12 Item Financial Literacy Quiz

specification:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
female	-0.723**	-0.676**	-0.742**	-0.819***	-0.692**	-0.870***	-0.830***	-0.872***	-0.864***	-0.819***
	(0.300)	(0.302)	(0.299)	(0.291)	(0.301)	(0.290)	(0.280)	(0.289)	(0.289)	(0.290)
nonwhite	-1.756***	-1.754***	-1.706***	-1.689***	-1.744***	-1.810***	-2.057***	-1.684***	-1.722***	-1.658***
	(0.383)	(0.385)	(0.382)	(0.385)	(0.383)	(0.373)	(0.365)	(0.386)	(0.380)	(0.388)
alternate private employer	0.438	0.468	0.428	0.383	0.501	0.348	0.649*	0.454	0.463	0.371
(base group is public employer)	(0.361)	(0.357)	(0.359)	(0.356)	(0.359)	(0.354)	(0.344)	(0.356)	(0.356)	(0.355)
alternate educational employer	0.537	0.543	0.533	0.505	0.594*	0.676**	0.967***	0.597*	0.595*	0.504
(")	(0.338)	(0.334)	(0.336)	(0.335)	(0.339)	(0.337)	(0.321)	(0.336)	(0.337)	(0.335)
education	0.201***		0.0821							
	(0.0677)		(0.0953)							
less than high school degree		-0.333		-0.358						
(binary {0,1})		(0.939)		(0.944)						
less than bachelors degree		-0.761*	-0.827*	-1.091***	-0.755*	-1.247***	-1.539***	-1.073***	-1.098***	-1.079***
(binary {0,1})		(0.388)	(0.468)	(0.336)	(0.385)	(0.325)	(0.316)	(0.332)	(0.329)	(0.334)
less than advanced degree		-0.587*		-0.580						
(binary {0,1})		(0.353)		(0.353)						
economics - proficiency	-0.0554	-0.0575	-0.0528	-0.0534	-0.0560	-0.0368	0.0243	-0.0433	-0.0497	-0.0474
(self report {0, 7})	(0.0907)	(0.0900)	(0.0902)	(0.0905)	(0.0898)	(0.0900)	(0.0844)	(0.0905)	(0.0897)	(0.0910)
compound interest - proficiency	-	-	-	-	-	-	-	-	-	-
(2 questions {0,2})										
Light - Ahn CRRA measure	-0.313**	-0.315**	-0.304**	-0.308**	-0.297**	-0.302**	-0.353***	-0.256**	-0.255**	-0.307**
{most risk adverse 1, ..,4 least}	(0.127)	(0.126)	(0.126)	(0.126)	(0.127)	(0.128)	(0.125)	(0.128)	(0.128)	(0.126)
assets					-0.000163	9.10e-05				
(in $ 10,000)					(0.000176)	(0.000146)				
assets	0.282**	0.265**	0.275**	0.288**	0.340**			0.0910	0.117	0.250*
(as log value)	(0.117)	(0.116)	(0.116)	(0.116)	(0.140)			(0.155)	(0.147)	(0.129)
assets greater than median								0.699*	0.716*	
(binary {0,1})								(0.384)	(0.383)	
assets in top quartile								0.215		0.277
(binary {0,1})								(0.404)		(0.405)
IRA ownership	0.322	0.223	0.227	0.211	0.163	0.471	0.458	0.147	0.154	0.192
(binary {0,1})	(0.338)	(0.338)	(0.340)	(0.340)	(0.342)	(0.318)	(0.304)	(0.338)	(0.338)	(0.339)
estimated retirement need	0.186	0.208	0.206	0.242	0.215	0.266	0.260	0.233	0.232	0.249
(in $ 10,000)	(0.289)	(0.283)	(0.288)	(0.284)	(0.283)	(0.283)	(0.280)	(0.282)	(0.282)	(0.283)
amount thought about retirement	-0.0977	-0.0823	-0.0836	-0.0774	-0.0873	-0.0199	-0.0686	-0.0544	-0.0463	-0.0800
({1,4} 4 least)	(0.160)	(0.159)	(0.159)	(0.160)	(0.159)	(0.158)	(0.155)	(0.159)	(0.158)	(0.159)
attended meetings on retirement	-0.139	-0.151	-0.124	-0.135	-0.144	-0.125	-0.190	-0.0836	-0.0764	-0.144
(binary {0,1})	(0.269)	(0.266)	(0.268)	(0.268)	(0.266)	(0.266)	(0.262)	(0.268)	(0.268)	(0.268)
plan to work part-time in ret	0.262	0.337	0.291	0.298	0.325	0.242	0.252	0.258	0.255	0.298
(binary {0,1})	(0.298)	(0.297)	(0.297)	(0.298)	(0.297)	(0.297)	(0.295)	(0.296)	(0.296)	(0.297)
have a savings plan for retirement	0.299	0.233	0.211	0.200	0.173	0.275	0.0964	0.118	0.130	0.172
({1:yes, 3: more or less, 5: no})	(0.331)	(0.332)	(0.332)	(0.333)	(0.335)	(0.323)	(0.320)	(0.332)	(0.332)	(0.333)
keeping track of spending - freq.	-0.000876	0.00768	-0.0228	-0.0313	0.00106	-0.0282	-0.00753	-0.0474	-0.0507	-0.0266
({1,4}: 4 least)	(0.141)	(0.141)	(0.140)	(0.140)	(0.142)	(0.139)	(0.136)	(0.140)	(0.140)	(0.140)
satisfied with finacial situation	-0.0636	-0.0594	-0.0636	-0.0679	-0.0489	-0.202	-0.211	-0.0213	-0.0346	-0.0537
({1,5}: 5 least)	(0.152)	(0.151)	(0.152)	(0.152)	(0.151)	(0.141)	(0.134)	(0.154)	(0.152)	(0.154)
planning period	0.111	0.118	0.112	0.111	0.121	0.0984	0.0851	0.113	0.115	0.110
{the next few months 1, ..,5 longer than ten years}	(0.107)	(0.106)	(0.106)	(0.106)	(0.106)	(0.106)	(0.106)	(0.106)	(0.106)	(0.106)
Constant	3.648**	6.834***	5.531***	6.551***	5.902***	10.28***	10.20***	8.506***	8.345***	6.812***
	(1.832)	(1.744)	(2.107)	(1.747)	(2.011)	(0.914)	(0.885)	(2.003)	(1.981)	(1.787)
Observations	278	278	278	278	278	282	307	278	278	278
r^2 - predicted from p-score	0.396	0.408	0.404	0.402	0.409	0.401	0.434	0.409	0.409	0.403

censored obs - 0 LHS (0%) 37 RHS (100%)   Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 5: Tobit – Dependent Variable: Percent Score on 12 Item Financial Literacy

Quiz

specification:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
female	-0.0603**	-0.0563**	-0.0619**	-0.0683***	-0.0577**	-0.0725***	-0.0692***	-0.0726***	-0.0720***	-0.0683***
	(0.0250)	(0.0251)	(0.0249)	(0.0242)	(0.0251)	(0.0242)	(0.0234)	(0.0241)	(0.0241)	(0.0241)
nonwhite	-0.146***	-0.146***	-0.142***	-0.141***	-0.145***	-0.151***	-0.171***	-0.140***	-0.143***	-0.138***
	(0.0319)	(0.0321)	(0.0318)	(0.0321)	(0.0319)	(0.0311)	(0.0304)	(0.0322)	(0.0317)	(0.0324)
alternate private employer	0.0365	0.0390	0.0356	0.0320	0.0418	0.0290	0.0541*	0.0378	0.0385	0.0309
(base group is public employer)	(0.0301)	(0.0298)	(0.0299)	(0.0296)	(0.0299)	(0.0295)	(0.0287)	(0.0297)	(0.0297)	(0.0296)
alternate educational employer	0.0448	0.0452	0.0445	0.0421	0.0495*	0.0563**	0.0806***	0.0497*	0.0496*	0.0420
(")	(0.0282)	(0.0278)	(0.0280)	(0.0279)	(0.0282)	(0.0281)	(0.0268)	(0.0280)	(0.0281)	(0.0279)
education	0.0168***		0.00684							
	(0.00564)		(0.00794)							
less than high school degree		-0.0278		-0.0298						
(binary {0,1})		(0.0782)		(0.0787)						
less than bachelors degree		-0.0634*	-0.0689*	-0.0909***	-0.0629*	-0.104***	-0.128***	-0.0894***	-0.0915***	-0.0899***
(binary {0,1})		(0.0323)	(0.0390)	(0.0280)	(0.0321)	(0.0271)	(0.0263)	(0.0277)	(0.0274)	(0.0278)
less than advanced degree		-0.0489*		-0.0483						
(binary {0,1})		(0.0294)		(0.0294)						
economics - proficiency	-0.00461	-0.00480	-0.00440	-0.00445	-0.00467	-0.00307	0.00202	-0.00361	-0.00414	-0.00395
(self report {0, 7})	(0.00756)	(0.00750)	(0.00752)	(0.00754)	(0.00749)	(0.00750)	(0.00704)	(0.00754)	(0.00748)	(0.00759)
compound interest - proficiency	-	-	-	-	-	-	-	-	-	-
(2 questions {0,2})										
Light-Ahn CRRA measure	-0.0261**	-0.0263**	-0.0254**	-0.0257**	-0.0247**	-0.0251**	-0.0295***	-0.0214**	-0.0212**	-0.0256**
{most risk adverse 1,...,4 least}	(0.0106)	(0.0105)	(0.0105)	(0.0105)	(0.0106)	(0.0106)	(0.0104)	(0.0107)	(0.0107)	(0.0105)
assets					-1.36e-05	7.59e-06				
(in $ 10,000)					(1.46e-05)	(1.21e-05)				
assets	0.0235**	0.0221**	0.0229**	0.0240**	0.0284**			0.00758	0.00978	0.0208*
(as log value)	(0.00976)	(0.00964)	(0.00971)	(0.00964)	(0.0117)			(0.0129)	(0.0122)	(0.0108)
assets greater than median								0.0583*	0.0597*	
(binary {0,1})								(0.0320)	(0.0319)	
assets in top quartile								0.0179		0.0231
(binary {0,1})								(0.0337)		(0.0338)
IRA ownership	0.0269	0.0186	0.0189	0.0176	0.0135	0.0393	0.0382	0.0123	0.0129	0.0160
(binary {0,1})	(0.0281)	(0.0282)	(0.0283)	(0.0283)	(0.0285)	(0.0265)	(0.0253)	(0.0282)	(0.0282)	(0.0283)
estimated retirement need	0.0155	0.0173	0.0171	0.0201	0.0180	0.0222	0.0216	0.0194	0.0193	0.0207
(in $ 10,000)	(0.0241)	(0.0236)	(0.0240)	(0.0237)	(0.0236)	(0.0235)	(0.0233)	(0.0235)	(0.0235)	(0.0236)
amount thought about retirement	-0.00814	-0.00686	-0.00697	-0.00645	-0.00727	-0.00165	-0.00572	-0.00454	-0.00386	-0.00667
({1,4} 4 least)	(0.0134)	(0.0133)	(0.0133)	(0.0133)	(0.0132)	(0.0132)	(0.0129)	(0.0133)	(0.0132)	(0.0133)
attended meetings on retirement	-0.0116	-0.0126	-0.0103	-0.0113	-0.0120	-0.0104	-0.0158	-0.00697	-0.00637	-0.0120
(binary {0,1})	(0.0224)	(0.0222)	(0.0223)	(0.0223)	(0.0222)	(0.0222)	(0.0218)	(0.0223)	(0.0223)	(0.0223)
plan to work part-time in ret	0.0218	0.0281	0.0242	0.0249	0.0271	0.0202	0.0210	0.0215	0.0212	0.0248
(binary {0,1})	(0.0249)	(0.0247)	(0.0247)	(0.0248)	(0.0247)	(0.0248)	(0.0246)	(0.0247)	(0.0247)	(0.0248)
have a savings plan for retirement	0.0250	0.0194	0.0176	0.0167	0.0144	0.0229	0.00803	0.00982	0.0108	0.0144
({1:yes, 3: more or less, 5: no})	(0.0276)	(0.0276)	(0.0277)	(0.0277)	(0.0279)	(0.0269)	(0.0266)	(0.0277)	(0.0276)	(0.0277)
keeping track of spending - freq.	-7.30e-05	0.000640	-0.00190	-0.00261	8.81e-05	-0.00235	-0.000628	-0.00395	-0.00422	-0.00222
({1,4}: 4 least)	(0.0117)	(0.0118)	(0.0117)	(0.0117)	(0.0118)	(0.0115)	(0.0113)	(0.0117)	(0.0116)	(0.0117)
satisfied with finacial situation	-0.00530	-0.00495	-0.00530	-0.00566	-0.00408	-0.0169	-0.0176	-0.00178	-0.00288	-0.00448
({1,5}: 5 least)	(0.0127)	(0.0126)	(0.0126)	(0.0127)	(0.0126)	(0.0117)	(0.0111)	(0.0128)	(0.0127)	(0.0128)
planning period	0.00923	0.00985	0.00937	0.00924	0.0101	0.00820	0.00709	0.00944	0.00957	0.00916
{the next few months 1,...,5 longer than ten years}	(0.00891)	(0.00883)	(0.00885)	(0.00887)	(0.00882)	(0.00884)	(0.00880)	(0.00881)	(0.00881)	(0.00886)
Constant	0.304**	0.569***	0.461***	0.546***	0.492***	0.857***	0.850***	0.709***	0.695***	0.568***
	(0.153)	(0.145)	(0.176)	(0.146)	(0.168)	(0.0762)	(0.0737)	(0.167)	(0.165)	(0.149)
Observations	278	278	278	278	278	282	307	278	278	278
r^2 - predicted from p-score	0.396	0.408	0.404	0.402	0.409	0.401	0.434	0.409	0.409	0.403

censored obs - 0 LHS (0%) 37 RHS (100%)   Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 6: Tobit – Dependent Variable: Score on 10 Item Financial Literacy Quiz

specification:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
female	-0.428*	-0.477*	-0.445*	-0.521**	-0.467*	-0.547**	-0.474**	-0.548**	-0.540**	-0.509**
	(0.257)	(0.258)	(0.256)	(0.249)	(0.259)	(0.248)	(0.234)	(0.249)	(0.249)	(0.248)
nonwhite	-1.641***	-1.587***	-1.603***	-1.565***	-1.611***	-1.671***	-1.884***	-1.576***	-1.615***	-1.557***
	(0.325)	(0.328)	(0.324)	(0.326)	(0.327)	(0.315)	(0.302)	(0.329)	(0.324)	(0.330)
alternate private employer	0.513*	0.500	0.505*	0.475	0.513*	0.465	0.521*	0.516*	0.525*	0.459
(base group is public employer)	(0.307)	(0.305)	(0.306)	(0.302)	(0.307)	(0.300)	(0.285)	(0.304)	(0.304)	(0.303)
alternate educational employer	0.460	0.455	0.457	0.442	0.472	0.539*	0.715***	0.499*	0.497*	0.434
(")	(0.287)	(0.285)	(0.286)	(0.284)	(0.290)	(0.285)	(0.266)	(0.286)	(0.287)	(0.284)
education	0.160***		0.0661							
	(0.0575)		(0.0810)							
less than high school degree		-0.773		-0.784						
(binary {0,1})		(0.800)		(0.800)						
less than bachelors degree		-0.726**	-0.649	-0.830***	-0.757**	-0.962***	-1.113***	-0.845***	-0.871***	-0.847***
(binary {0,1})		(0.331)	(0.398)	(0.286)	(0.329)	(0.276)	(0.263)	(0.283)	(0.281)	(0.284)
less than advanced degree		-0.189		-0.191						
(binary {0,1})		(0.303)		(0.304)						
economics - proficiency	-0.00932	-0.00663	-0.00801	-0.00506	-0.0102	-0.00483	0.0605	-0.000172	-0.00691	-0.00235
(self report {0, 7})	(0.0771)	(0.0769)	(0.0768)	(0.0769)	(0.0769)	(0.0760)	(0.0698)	(0.0772)	(0.0765)	(0.0775)
compound interest - proficiency	0.892***	0.874***	0.876***	0.887***	0.859***	0.895***	0.956***	0.860***	0.860***	0.878***
(2 questions {0,2})	(0.188)	(0.189)	(0.187)	(0.187)	(0.189)	(0.184)	(0.169)	(0.187)	(0.187)	(0.187)
Light-Ahn CRRA measure	-0.259**	-0.260**	-0.253**	-0.257**	-0.248**	-0.257**	-0.290***	-0.220**	-0.219**	-0.255**
{most risk adverse 1, ...,4 least}	(0.108)	(0.107)	(0.107)	(0.107)	(0.109)	(0.108)	(0.103)	(0.109)	(0.109)	(0.107)
assets					-8.71e-05	8.82e-05				
(in $10,000)					(0.000150)	(0.000123)				
assets	0.195*	0.193*	0.191*	0.199**	0.235*			0.0550	0.0823	0.164
(as log value)	(0.0996)	(0.0987)	(0.0992)	(0.0983)	(0.120)			(0.132)	(0.125)	(0.110)
assets greater than median								0.487	0.504	
(binary {0,1})								(0.328)	(0.327)	
assets in top quartile								0.223		0.266
(binary {0,1})								(0.344)		(0.344)
IRA ownership	0.0365	-0.0327	-0.0366	-0.0391	-0.0785	0.103	0.194	-0.0974	-0.0898	-0.0680
(binary {0,1})	(0.288)	(0.290)	(0.290)	(0.290)	(0.294)	(0.271)	(0.252)	(0.289)	(0.289)	(0.290)
estimated retirement need	0.171	0.195	0.187	0.206	0.211	0.244	0.213	0.212	0.212	0.222
(in $10,000)	(0.246)	(0.242)	(0.244)	(0.241)	(0.242)	(0.239)	(0.231)	(0.240)	(0.240)	(0.241)
amount thought about retirement	-0.185	-0.180	-0.173	-0.179	-0.170	-0.145	-0.179	-0.153	-0.145	-0.172
({1,4} 4 least)	(0.136)	(0.136)	(0.136)	(0.136)	(0.136)	(0.134)	(0.128)	(0.136)	(0.135)	(0.136)
attended meetings on retirement	-0.342	-0.341	-0.329	-0.338	-0.339	-0.366	-0.340	-0.303	-0.295	-0.347
(binary {0,1})	(0.230)	(0.228)	(0.228)	(0.228)	(0.229)	(0.226)	(0.217)	(0.230)	(0.229)	(0.229)
plan to work part-time in ret	0.202	0.248	0.226	0.236	0.238	0.199	0.184	0.205	0.202	0.232
(binary {0,1})	(0.253)	(0.253)	(0.252)	(0.252)	(0.253)	(0.251)	(0.244)	(0.252)	(0.252)	(0.252)
have a savings plan for retirement	0.263	0.209	0.194	0.199	0.162	0.286	0.143	0.122	0.135	0.161
({1:yes, 3: more or less, 5: no})	(0.281)	(0.283)	(0.282)	(0.282)	(0.286)	(0.273)	(0.264)	(0.283)	(0.282)	(0.283)
keeping track of spending - freq.	-0.00716	-0.0202	-0.0243	-0.0327	-0.0214	-0.0183	0.00478	-0.0410	-0.0444	-0.0267
({1,4}: 4 least)	(0.119)	(0.120)	(0.119)	(0.119)	(0.121)	(0.117)	(0.112)	(0.119)	(0.119)	(0.119)
satisfied with finacial situation	-0.0188	-0.0143	-0.0191	-0.0166	-0.0158	-0.0969	-0.0952	0.0137	-1.21e-05	-0.00825
({1,5}: 5 least)	(0.129)	(0.129)	(0.129)	(0.129)	(0.129)	(0.119)	(0.111)	(0.131)	(0.129)	(0.131)
planning period	0.140	0.140	0.141	0.138	0.143	0.129	0.120	0.140	0.142	0.138
{the next few months 1, ...,5 longer than ten years}	(0.0909)	(0.0904)	(0.0904)	(0.0905)	(0.0906)	(0.0898)	(0.0874)	(0.0902)	(0.0902)	(0.0905)
Constant	2.070	4.483***	3.562**	4.375***	3.998**	6.978***	6.609***	5.828***	5.661***	4.632***
	(1.562)	(1.506)	(1.802)	(1.499)	(1.731)	(0.838)	(0.796)	(1.726)	(1.709)	(1.535)
Observations	278	278	278	278	278	282	307	278	278	278
r^2 - predicted from p-score	0.543	0.548	0.547	0.547	0.546	0.549	0.590	0.549	0.548	0.546

censored obs - 0 LHS (0%) 44 RHS (100%)   Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Figure 1: Sample Cohort Age and Retirement Date Distributions:

Sample Birthyear Distribution

Reported Retirement Date Distribution

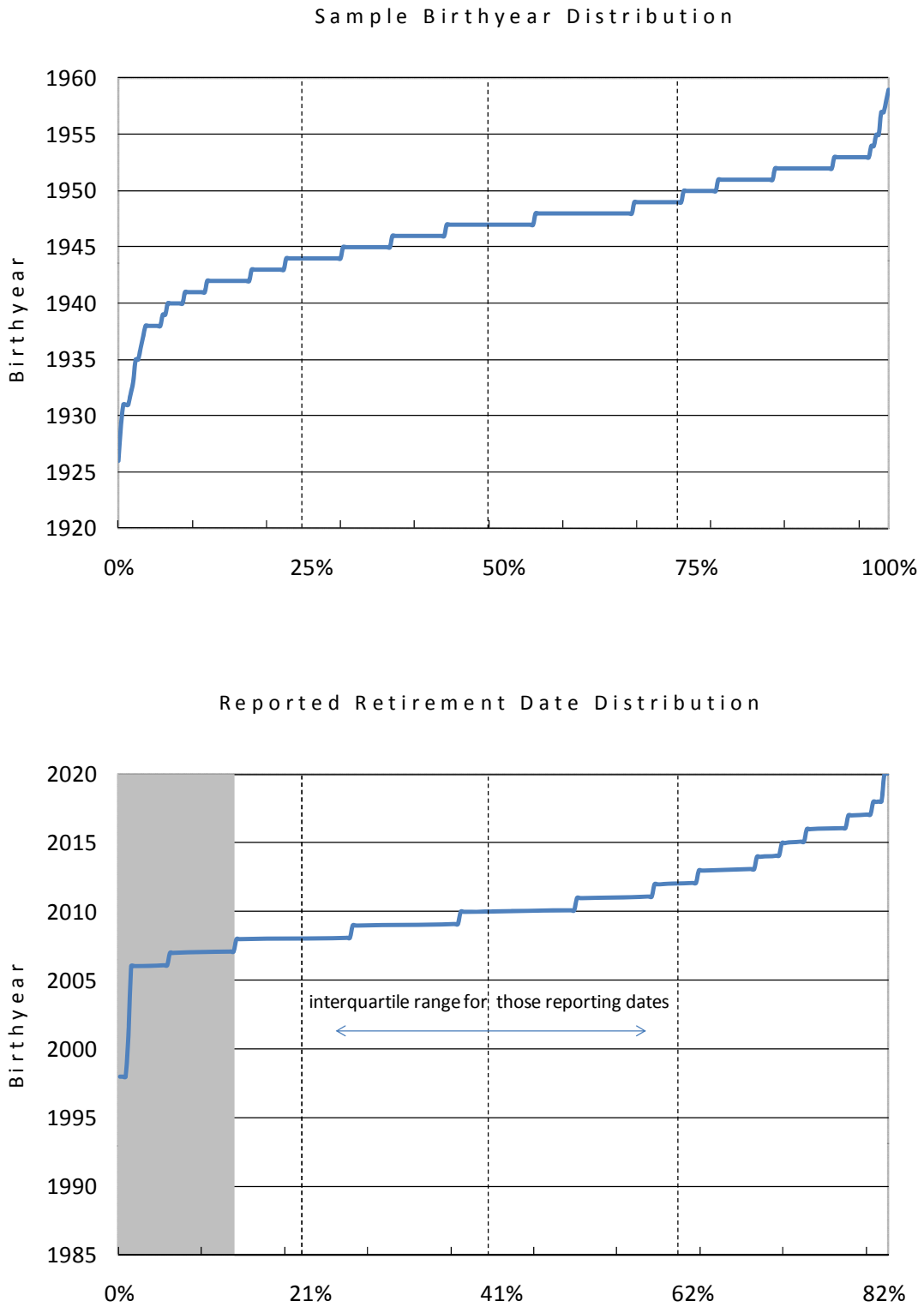
interquartile range for those reporting dates

Figure 2: Sample Wealth Distribution
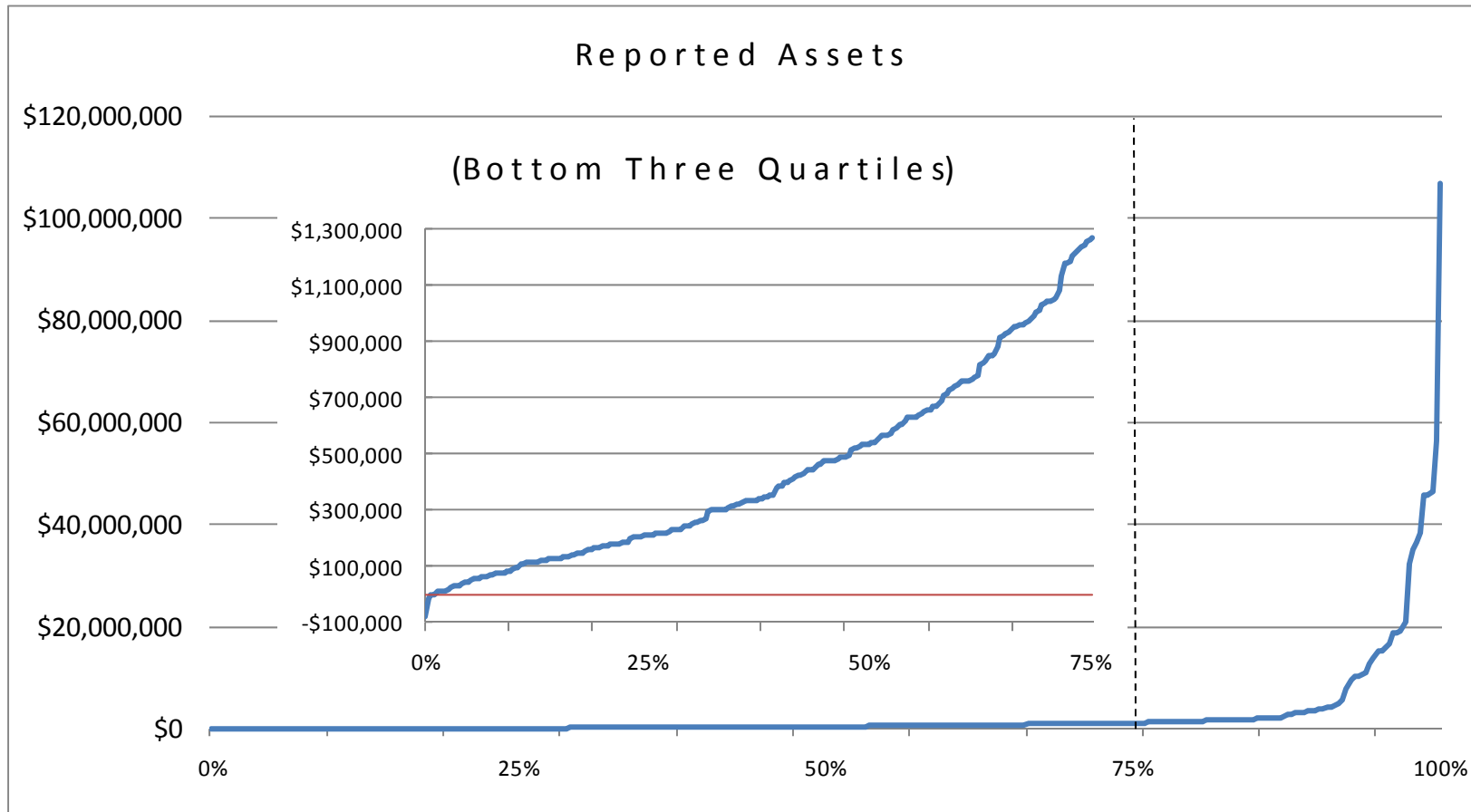
Figure 3: Financial Self Assessment as a Predictor of Score:
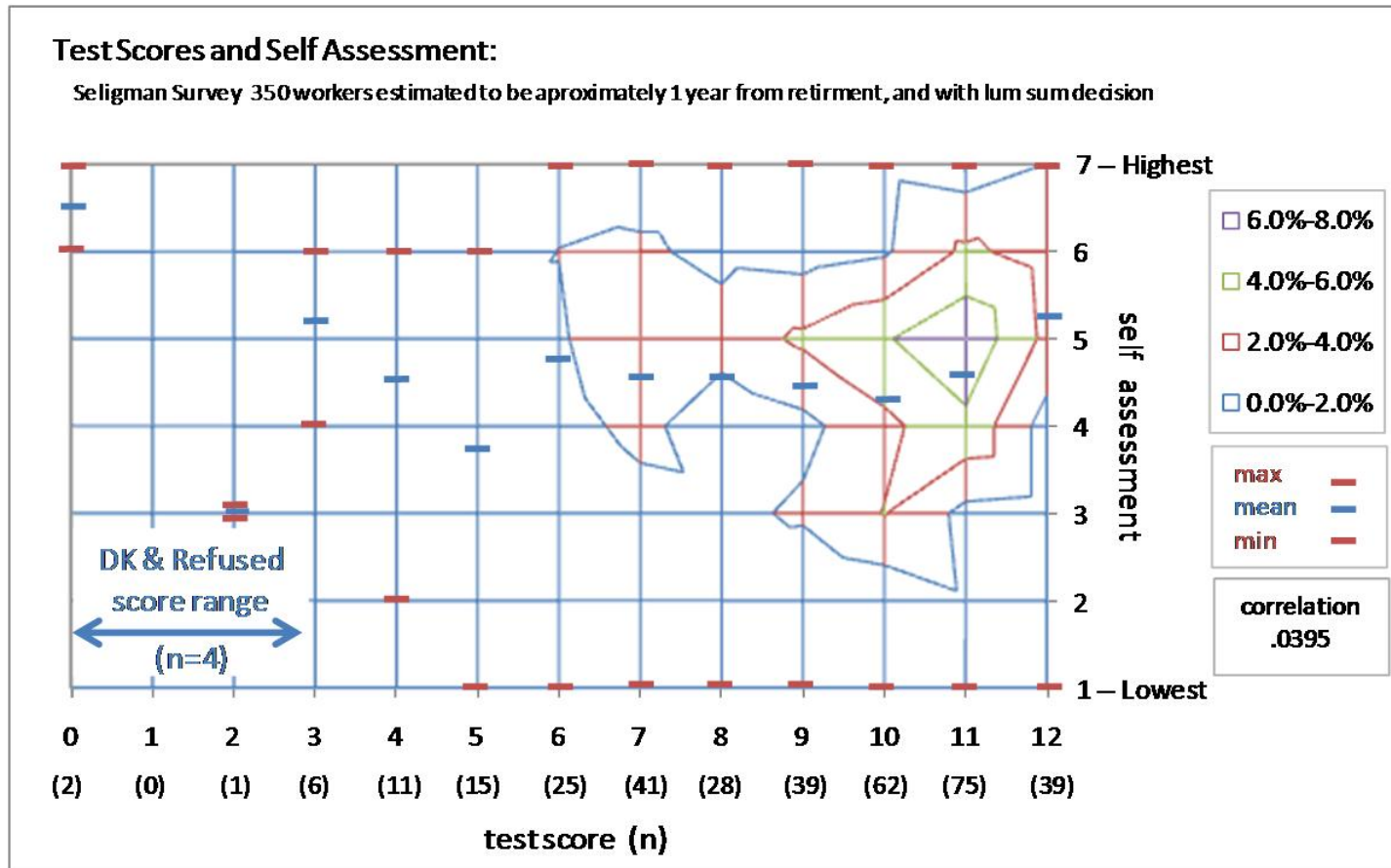
Figure 4: Level of Satisfaction with Finances as a Predictor of Score:

Test Scores and Level of Satisfaction with Finances:
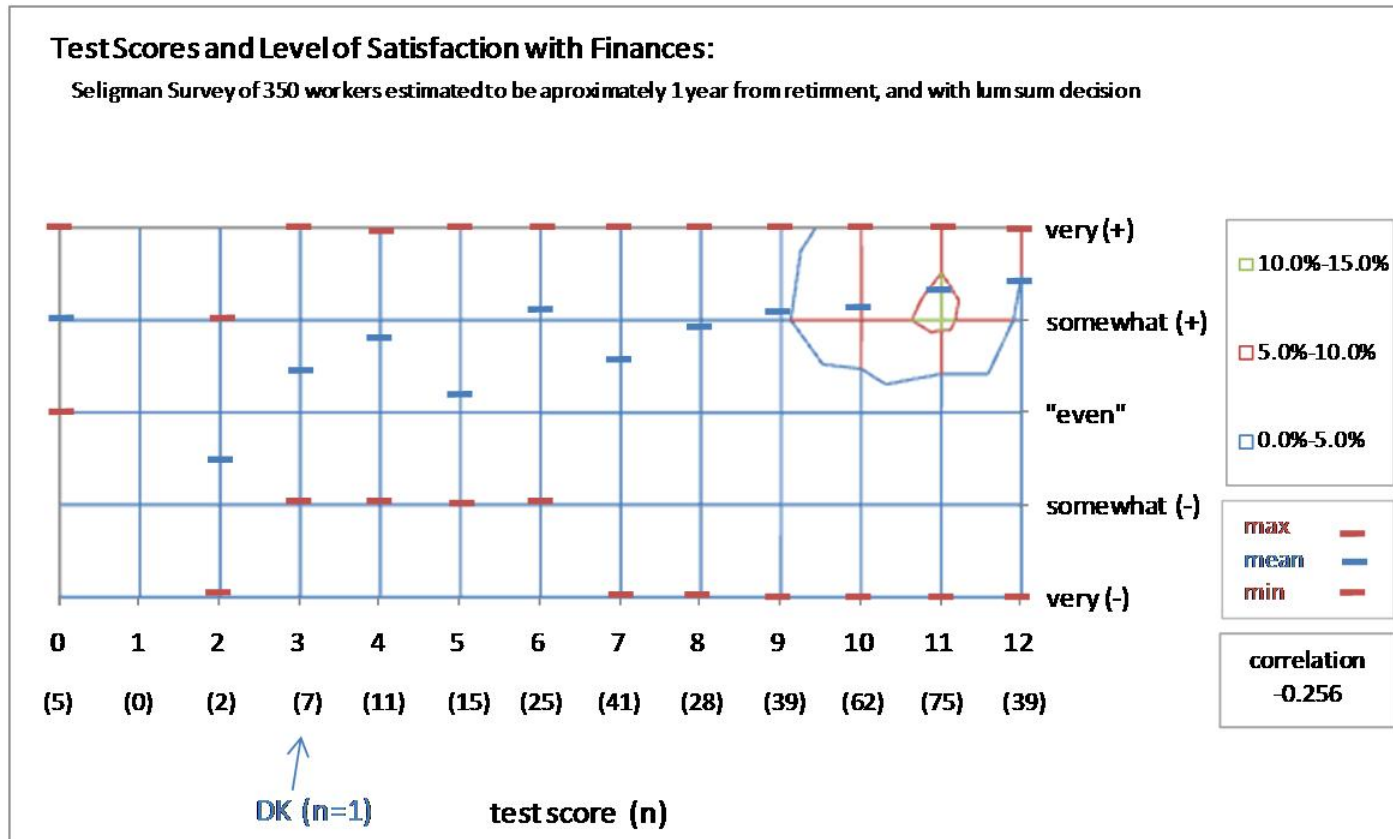Seligman Survey of 350 workers estimated to be aproximately 1 year from retirment, and with lum sum decision

Figure 5: Level of Satisfaction with Health as a Predictor of Score:

Test Scores and Level of Satisfaction with Health:

Seligman Survey of 350 workers estimated to be aproximately 1 year from retirment, and with lum sum decision