No. 2009–73

HOW REAL PEOPLE MAKE LONG-TERM DECISIONS: THE CASE OF RETIREMENT PREPARATION

By Johannes Binswanger, Katherine Grace Carman

September 2009

ISSN 0924-7815

How Real People Make Long-Term Decisions: The Case of Retirement Preparation*

Johannes Binswanger†

Katherine Grace Carman‡

September 9, 2009

Abstract

A canonical but untested assumption in economics is that choices are determined only by preferences and budget constraints, but not by how people approach decision making. In particular, it is believed that people behave "as if they optimized", even if they do not engage in any formal planning. We test this empirically in the domain of retirement saving using a specifically designed survey. We find that people who rely on a rule of thumb indeed behave like literal planners/optimizers. However, people without any systematic approach save substantially less. We discuss the implications of this finding.

Key words: Decision process, planning, rule of thumb, retirement saving, household finance.

JEL classification: D03, D91, H55.

*We would like to thank Tim Colvin at the RAND institution for programming our questionnaire. We are also very grateful to Arie Kapteyn, Miles Kimball, Tobias Klein, Martin Salm, Daniel Schunk, Jonathan Skinner, Arthur van Soest, Charles Sprenger, and Joachim Winter, as well as to many seminar audiences for very helpful comments. Financial support from Netspar and the RAND institution is gratefully acknowledged. All errors are our own.

†Department of Economics, CentER and Netspar, Tilburg University, P.O. Box 90153, 5000 LE Tilburg, The Netherlands; J.Binswanger@uvt.nl.

‡Department of Economics, CentER and Netspar, Tilburg University, P.O. Box 90153, 5000 LE Tilburg, The Netherlands; K.G.Carman@uvt.nl

1 Introduction

Economists typically assume that choices are the outcome of optimization over consumption in the presence of a budget constraint. Agents are assumed to identify the choice that leads to the highest satisfaction out of all feasible choices. In many domains, this optimization process is fairly straightforward, most notably for choices that do not involve long time horizons or substantial uncertainty. In contrast, in the domain of life cycle saving, literal optimization requires engaging in contingent planning and backward induction. Indeed, most economists agree that people do not literally engage in optimizing in this domain. Rather, there is consensus that people's behavior should be understood "as if" determined by an optimization process. This intriguing idea has been a powerful justification for understanding individuals' life cycle savings by means of the classical life cycle model. Interestingly, though, economists have remained surprisingly vague about what "as-if" optimizing would mean in practice.

The first aim of this paper is to fill this gap from an empirical perspective. We consider three potential prototypes of *decision processes* that may underlie the logic of the "as-if" optimizing perspective on life cycle saving. We dub the first prototype the planning approach. While real individuals are unlikely to engage in backward induction and contingent planning, their plan may well come close to literal optimization by making scenario-based budget calculations, based on financial software or expert advice. We dub the second prototype the rule-of-thumb approach. In contrast to the planning approach, some individuals may not actually engage in any formal planning process. Rather, they may follow some simple rules of thumb such as putting aside a fixed percentage of their monthly earnings. Finally, some individuals may not engage in any planning at all nor consciously follow any specific rule. We dub the latter non-systematic approach to retirement saving the random approach.

The second aim of the paper is to contribute to the explanation of the huge variation in retirement wealth among U.S. households. It has been observed by Bernheim et al.

(2001) that it is rather difficult to explain this pattern with a variation in variables that serve as inputs of the canonical life cycle model. Our aim is to explore whether part of the variation in retirement wealth can be explained by heterogeneity in decision processes.

Bernheim et. al. (2001) posit that observed variation in wealth at retirement is likely to be caused by deviations from "rational, farsighted optimization" and that differences are more consistent with a rule of thumb. However, previous research has not had access to data that could directly measure whether individuals follow a plan based on farsighted optimization or instead follow a simple rule of thumb or even exhibit a random approach to life cycle saving. For our analysis, we use a novel data set that has been collected for the purpose of this study. These data allows us to categorize individuals according to the three prototypes mentioned above by means of specifically designed survey questions. We first examine whether all of the three prototypes can actually be observed. We investigate their relative frequency as well as the determinants that lead individuals to adopt either prototype. The main topic of the paper is then to explore whether all three prototypes of decision processes lead to comparable savings outcomes or whether they are associated with systematic differences in outcomes. In particular, we examine whether these approaches to decision making have a causal effect on accumulated retirement wealth.

We define a *decision process* to consist of a series of steps that one takes to make a choice. According to the three prototype decision processes, this could include complicated calculations akin to the life cycle model, adopting simple rules of thumb, or no systematic approach. Crucially, decision processes differ in terms of the degree of their sophistication and therefore how costly they are to implement. Gathering detailed information for working out a careful plan may require a substantial amount of time. In contrast, copying a simple rule of thumb from a friend does not require any time investment. Importantly, the costs of working out a careful plan my differ across individuals. It may require little effort for someone with substantial mathematical or accounting skills. On the other hand, it may be very burdensome to people with low planning skills and to those with a high

disutility from thinking about economic issues.

Decision processes should be distinguished from *preferences* over consumption profiles. Intertemporal preferences determine the optimal choice of lifetime consumption profiles. However, since decision processes may be costly, some individuals may make choices that differ from the *first-best* choice that they would make if decision making were costless.

To understand the logic of this view, consider a person's income profile and preferences over intertemporal consumption streams which imply a unique first-best retirement savings choice. Suppose, however, that this first-best choice is unobserved by the person, due to bounded rationality. Instead, the person can invest motivational and cognitive resources and spend time in order to learn about the optimal savings choice. It is the amount of time and effort invested in finding an approximation to the first-best savings choice that relates to someone's decision process. Different decision processes may lead to different retirement savings choices. According to this logic, individuals with identical preferences over intertemporal consumption streams may easily make different choices if they differ in terms of cognitive abilities or the propensity to plan. An interesting question is, therefore, whether different decision processes will lead to systematic differences in choice outcomes.[1]

The classical argument against the relevance of decision processes is due to Milton Friedman (1953). As is well known, Friedman invented the metaphor of a billiard player who may have an excellent intuition about the movements of balls without being able to solve the differential equations describing these movements. Instead, he hits the balls "as if" he knew these equations. In a similar way, people may have a good intuition about the distribution of financial returns, inflation, the effect of compound interest, as well as their desired expenditures while retired. As a result, they may behave "as if" they optimized

[1]It is important to stress that we do not aim to dispense with the view that observed choices should be understood as the outcome of an optimization process. Rather, we adopt the perspective that choices should be understood as originating from optimization over both intertemporal consumption streams and over decision processes. Our data allow us to investigate whether different decision processes lead to different outcomes.

by means of a careful plan, even if the do not engage in any explicit planning at all. This essentially pins down to the view that bounded rationality is not an issue for life cycle saving. Put differently, it would mean that there are no meaningful differences in the costs of implementing different decision processes or there is no meaningful heterogeneity in those costs across individuals, contrary to the view spelled out above.

There are three main justifications of Friedman's view. First, people may, like a billiard player, have had the opportunity to learn about retirement saving by means of trial and error. However, in the domain of retirement saving, feedback on the quality of one's decisions comes with a substantial lag, limiting the scope for learning. Second, people may simply observe the actions of others who have had the skills to derive a careful plan and copy them. Third, those incapable of working out an appropriate plan may simply seek expert advice.

Whether the simple cost-benefit model that we have described above or rather Friedman's view better corresponds to reality is, ultimately, an empirical question. Our survey allows us to compare households that follow a plan similar to life cycle maximization to those who do not. We can thus investigate whether individuals who do not follow such a plan actually end up making similar choices, thus behaving "as if" they were optimizing.

Our data come from a detailed survey module on decision behavior that we fielded with the American Life Panel at the RAND institution. Our module consists of questions on how individuals proceeded when making their retirement savings decisions, as well as questions on choice outcomes and individual characteristics. In contrast to our module, traditional economic data sets typically contain only the latter two.

We present two main findings. First, the planning and rule-of-thumb approaches are associated with substantially higher retirement wealth accumulation than the random approach. We also provide evidence that this reflects a causal effect of decision processes on wealth accumulation. Second, we do not find any statistically significant difference between the outcomes for planners and rule-of-thumb savers. Thus, rule-of-thumb types

behave as if they were planners. This suggests that a rule of thumb may be a very effective devise for retirement saving for individuals who find working out a careful plan too demanding.

Our analysis relates to the paper of Bernheim et al. (2001) which investigates to what degree the variables that serve as input for the standard life cycle model can explain observed variation in retirement wealth. They find that these variables explain only a little of the variation in retirement wealth and suggest that it may be explained by heterogeneous decision processes, instead. In our paper we directly address this issue.

Our paper is also related to the papers of Ameriks et al. (2003), and Lusardi and Mitchell (2007). Both investigate the role of planning for wealth accumulation and find that planning does indeed have an economically significant effect on wealth accumulation. The main difference between these two papers and our own is our aim to investigate multiple decision processes rather than just "planning." In particular, we address the question whether adopting a simple rule of thumb leads to a similar amount of wealth accumulation as working out a careful plan. This question is important from a policy perspective. The reason is that advice in the form of a simple rule of thumb may be easier for some people to adopt than the advice to derive a sophisticated plan. Second, our analysis allows us to take a stand on whether people behave "as if" they optimized even if they do not engage in planning. Although central to theoretical and methodological debates, this issue has not been addressed from an empirical perspective, so far.

Rodepeter and Winter (2003) provide an in-depth discussions of the literature on rule-of-thumb behavior in the domain of life cycle saving and simulate the outcomes resulting from various rules of thumb. While many authors have considered the use of a rule of thumb for savings[2], to our knowledge we are the first to measure their prevalence or their effect on wealth accumulation using micro-data. The importance of planning has been discussed in the psychological literature, in particular by Gollwitzer (1999) and Gollwitzer

[2]See, for example, Simon (1955), Hall (1978), Deaton (1991, 1992), Browning and Crossley (2001).

et al., (2004).

The rest of the paper is organized as follows. Section 2 presents our data and outlines the definitions of decision making types used for analyzing the data. Section 3 investigates the relationship between types and retirement wealth accumulation and retirement savings flows. Section 4 concludes.

2 The Data

2.1 The American Life Panel

Our data come from a survey module conducted with the RAND American Life Panel (ALP). Our module was fielded in August 2008. All respondents in our sample participate in the labor market.

The ALP provides us with information on respondents' background characteristics such as age, gender, education etc. Our measure of income is top-coded at $200,000; five percent of observations fall into this category. In the regression analysis reported below we use a dummy variable as an indicator for those observations.

Table 1 includes information about the main demographic variables. Our sample is slightly older and better educated than the general population. However, this may be a more relevant group for understanding retirement planning and wealth accumulation.

2.2 The Measurement of Types and Retirement Wealth

As already mentioned in the introduction, we categorize individuals into three types of decision behavior. The categorization is based on four questions that are stated below.[3]

[3]As mentioned in the introduction, there are two further papers that analyze how planning affects wealth accumulation. Ameriks et al. (2003) use a definition of planning that is based on the question: *I have spent a great deal of time developing a financial plan.* (Responses are stated on a 6-point Likert scale.) Alternatively, they also use the question: *Have you personally gathered together your household's financial information, reviewed it in detail, and formulated a specific financial plan for your household's long-term future?* (The answer is *yes* or *no*). Lusardi and Mitchell (2007) use as their measure of planning

(PLAN1) *I've tried to determine my financial needs during retirement.* (Responses: 5-point Likert scale.[4])

(PLAN2) *Have you ever tried to find out how much you should save in total today and in the coming years in order to finance your target needs during retirement?* (Responses: *yes, no.*)

(ROT1) *I have a saving target of regularly saving some percentage of my income, e.g. 5, 10, 15, or ... percent.* (Responses: 5-point Likert scale.)

(ROT2) *I have a saving target of regularly saving some amount of money, e.g. $100, $500, $1000, or ... per month.* (Responses: 5-point Likert scale.)

According to the responses to these questions, we define the following types:

- **Planner type:** Answer to *PLAN1* is either somewhat or fully agree and answer to *PLAN2* is yes.
- **Rule-of-thumb type:** Answer to *ROT1* or *ROT2* is either somewhat or fully agree and respondent is not a planner type.
- **Random type:** The residual category, not qualifying for either the planner or rule-or-thumb type.

Note that, by construction, the three types are mutually exclusive. Table 1 shows that roughly one third of the observations falls within each category. Table 2 shows summary statistics for the four variables above separately for each of the three types. As expected, the mean of *PLAN1* is lowest for random types and highest for planners. The

the question: *How much have you thought about retirement? A lot, some, a little, or hardly at all?* In comparison to both studies' measures of planning, our measures zoom in into the decision process in somewhat more detail. In addition, our measure of rule-of-thumb decision making is novel.

[4]A 5-point Likert scale consists of the response categories: *fully disagree, somewhat disagree, neither agree nor disagree, somewhat agree, fully agree.*

three means are significantly different from each other at either the five- or one-percent level, as indicated in the right part of Table 2. The average for rule-of-thumb types is 3; on average, they are neutral with respect to the question whether they have determined their financial needs during retirement. Thus, the evidence points clearly to the fact that rule-of-thumb types have thought less about their retirement than planners.

By construction, the means of *PLAN2* are zero for random and rule-of-thumb types. Both planners and rule of thumb savers tend to agree that they have some regular savings target (variables *ROT1* and *ROT2*). There is thus evidence that planners may use their plan to derive a well-founded rule of thumb. Thus, for planners, a rule-of-thumb can be seen as the outcome of a careful plan, while for rule-or-thumb types it cannot. Interestingly, a t-test for equality of means points to no significant difference between planners and rule-of-thumb types for *ROT1*. The difference is significant only at the 10-percent level for *ROT2*.

Table 3 shows a correlation matrix for the variables *PLAN1*, *PLAN2*, *ROT1*, *ROT2*. The correlation is highest for *PLAN1* and *PLAN2*, amounting to .58. While this correlation is substantive, it is clearly far lower than one. This points to the fact that *PLAN1* and *PLAN2* measure different things. In fact, it is relatively easy to try to determine financial needs during retirement by using current expenditures as a starting point. It is much harder to calculate how much one would have to save in order to finance those retirement needs. This is consistent with the pattern in our data that, among those who either somewhat or fully agree to the *PLAN1* question, only 56 percent answer yes to the *PLAN2* question.

Our most important decision outcome variable is accumulated retirement wealth. Information about retirement wealth is obtained from the answer to the following question:[5]

(Wealth) *What is the total amount of wealth you have accumulated so far*

[5]Thirty nine out of the 443 observations of our regression sample did not provide a direct answer to this question but provided an answer through follow-up questions using unfolding brackets. Exclusion of these observations does not affect our results.

for the purpose of retirement preparation, including both accounts like 401k or IRA and also any other types of accounts or forms of retirement saving?

Note that this question refers exclusively to retirement wealth, not overall wealth. Table 1 shows that the mean balance of retirement wealth is equal to 188,000 whereas the median is equal to 62,500. Wealth holdings are thus skewed, as is usually the case.

Our analysis makes use of additional variables measuring the flow of savings, time and risk preferences and other characteristics. More information about those variables can be found in the Appendix.

2.3 Characteristics of Decision Types

We conclude this section on our data with a descriptive analysis of the determinants of decision types. Table 4 shows the results from a multinomial regression with the type categorization as the dependent variable. We find that individuals who took any economics courses during high school or college are more likely to fall into the rule-of-thumb or planner category. The positive coefficients for the variable *health research* indicate that respondents who engage in more research when making a health decision are also significantly more likely to fall into the rule-of-thumb or the planner category.[6] The variable *Health research* is intended to measure to what degree someone is a "proactive" decision maker in general. This variable is comparable to similar one on the attitudes towards vacation planning used by Ameriks et al. (2003).

We also find that having access to a DC plan is associated with a higher probability of having a rule of thumb. It is conceivable that having access to a 401(k) plan induces people to adopt a rule of thumb since contributions to 401(k) plans are often framed as a fixed percentage of pay. Men and higher income individuals are more likely to fall into both the rule-of-thumb and planner categories. It is interesting to observe that college or

[6]See the Appendix for the wording of the *health research* question.

graduate level education do not have any significant influence on types, everything else equal. The same holds for time and risk preferences.

3 Decision Types and Saving for Retirement

This section presents our results. The first column in Table 5 shows an OLS regression with the log of retirement wealth as the dependent variable. The main explanatory variables of interest are dummies for planners and rule-of-thumb types. The excluded category is the random type. The coefficients for planners and rule-of-thumb types are both significantly different from zero at the one-percent level. An important result is that equality of the coefficients for planners and rule-of-thumb types cannot be rejected at conventional significance levels. The magnitude of both coefficients is very large. The estimates imply that rule-of-thumb types are associated with a 2.5 times higher level of retirement wealth than random types. For planners, the respective figure is 3.7.

Looking at the control variables, we find that having access to a DC plan has a substantial effect on wealth accumulation. Interestingly, also the coefficient for DB plans is positive.[7] It may be that merely having access to a pension plan of any type leads people to prepare for their retirement as it makes the need to do so more salient. Alternatively, individuals with a DB pension may have an unobserved taste for retirement preparation. Further significant variables are age, income, home ownership, being male, and having a college or advance degree beyond college. Our measures for time and risk preferences are not significant. This is consistent with similar findings of Ameriks et al. (2003) and Bernheim et al. (2001).

One possible concern is that retirement wealth and decision types may be determined by a third factor: the need to privately prepare for retirement. This need is crucially affected by the magnitude of the replacement rates that someone can expect from Social

[7]Our results are robust to excluding individuals who have access to DB plans. Tables are available from the authors.

Security. Some individuals may be entitled to high replacement rates and, as a result, there is no need to accumulate much private wealth. Thus, there may also be no need to engage in planning or to follow a rule-of-thumb. The opposite may hold for individuals facing low Social Security replacement rates.

In order to filter out the confounding influence of Social Security replacement rates, the regression reported in the second column of Table 5 includes a proxy for the Social Security replacement rate. The calculation of this proxy follows the procedure applied by Scholz et al. (2006).[8] As expected, the coefficients for planners and rule-of-thumb types become smaller. However, their magnitude is still substantial. The estimates imply that rule-of-thumb types are associated with a 2.3 times higher level of retirement wealth than random types. For planners, the respective figure is 3.4. Equality of the two coefficients again cannot be rejected. The coefficient on the Social Security replacement rate is negative and highly significant. The coefficient on income becomes smaller, due to the fact that income is correlated with Social Security replacement rates.

Controlling for Social Security replacement rates is likely to bring us closer towards identifying a causal effect from decision types on wealth accumulation. However, one may still be concerned about a potential endogeneity problem for several reasons. First, there may be reverse causality. This may occur because higher levels of wealth trigger interest in planning or because financial advisors target clients with higher levels of wealth. Second, we do not observe whether a respondent anticipates a large bequest. Expecting a major bequest would reduce the need to accumulate retirement wealth and hence the need for working out a retirement preparation plan or for following a strict rule-of-thumb. According to this logic, our random types may be exactly those who anticipate high bequests. Third, our time and risk preferences may not fully measure individuals' true risk and time preferences. Thus, an individual with a particularly high discount rate, in an unmeasured dimension, may wish to accumulate a high amount of wealth and, as a result,

[8]See their Appendix C.

work out a careful plan. This plan is then only instrumental and should not be taken as causing high wealth. In order to address these issues, we apply an instrumental variable strategy and treat the variables planner and rule of thumb as endogenous variables.[9]

Valid instruments should be variables that are correlated with decision types but that do not have any direct effect on the accumulation of retirement wealth. In other words, the correlation of the instruments with retirement wealth should be fully "explained" by the decision type variables. We use four variables as instruments: a dummy if they took *economics courses*, the *number of economic courses*, self-assessed *math confidence*, and *health research*. (See the Appendix for the definition of these variables.) The two economics courses variables are proxies for interest in economics and financial issues and thus negatively related to the disutility – and hence the subjective costs – of planning. Most people in our survey completed their education long ago, but retirement savings choices are more recent. This reduces any potential problems arising from simultaneity. A higher level of confidence in one's mathematical abilities is also likely to lower the costs of planning and makes it less painful. The latter instrument has also been used by Ameriks et al. (2003). Finally, we take the variable *health research* as a proxy for measuring a "proactive" approach to decision making.

One concern with the variable math confidence may be that this measures, to some degree, mathematical ability. One may argue that mathematical ability may have a direct effect on wealth accumulation in that someone with high math skills may figure out the optimal wealth accumulation strategy without any formal planning. However, the retirement savings decision is a very complex one and even people with high mathematical skills find it nearly impossible to master involved compound interest rate calculations in their mind. We therefore believe that if mathematical ability has an effect on wealth, this effect materializes through planning. Thus, confidence in one's mathematical skills may

[9]Our endogenous variables are dummy variables. It should be noted, however, that the instrumental variable approach leads to consistent estimates independent of the fact whether the endogenous variables are binary variables or not. See Wooldridge (2002, Ch. 5). As a robustness check, we consider a continuous score variable which does not qualitatively affect our results.

reduce the disutility of planning but because of the complexity of retirement planning, mathematical skills are unlikely to directly impact wealth. Hence, we take math confidence as a valid instrument, even if it may be correlated with math ability.

The instrumental variable regressions are reported in the third and fourth column of Table 5. (The respective first-step regressions are reported in Table 6.) The null-hypothesis of joint insignificance of the instruments in the first-stage regressions is rejected at least at the five-percent level. Furthermore, Wooldridge's (1995) robust score test of overidentifying restrictions indicates that the instruments are valid. The IV results are very similar to the OLS results, except that the coefficients on the decision variables are even larger. As in the OLS regressions, equality of the coefficients for planners and rule-of-thumb types cannot be rejected.

In sum, our analysis leads to two main results. First, individuals without any systematic approach towards decision making save substantially less than the other types. Second, rule-of-thumb types behave as if they were planners. Thus, following a simple rule of thumb is, on average, as effective for wealth accumulation as following a sophisticated plan. In light of Table 2, the latter finding comes as a surprise. Clearly, rule-of-thumb types have invested significantly less time in retirement planning than have planner types. Thus, there is a real underlying difference in the way both types approach retirement saving. However, this does not lead to any difference in decision outcomes, contrary to what one would expect from a more psychological perspective on decision making.

The finding that rule-of-thumb types behave as if they were planners complements the earlier results of Ameriks et al. (2003) and Lusardi and Mitchell (2007) who found that *literal* planning (in the sense of our *planner* variable) causes higher wealth accumulation.[10]

[10]Our findings concerning literal planning are very much in line with the ones reported by Ameriks et al. (2003). These authors also report OLS and IV estimations for the effect of planning on wealth accumulation. As in our case, they also find that the coefficient for their planning variable is larger for IV estimations than for OLS estimations. The similarity of their results with respect to planning strongly suggests that their findings from their highly educated TIAA-CREF sample extend to samples that are more representative for the general population such as ours. In contrast to our study, Ameriks et al. (2003) do not have any information about rule-of-thumb behavior.

Given that many people may lack the cognitive skills to work out sophisticated plans, our novel finding that a simple rule of thumb may be as effective for wealth accumulation is very welcome. It suggests that the capacity of accumulating a high amount of retirement wealth is not a privilege of only particularly cognitively able individuals who are likely to represent a minority of the population. Recall that planner types make up only about one third of our sample.[11]

The finding that rule-of-thumb types behave as if they were planners or optimizers is also highly important with regard to economists' methodological approach of viewing individual choices as if they were the outcome of a careful planning/optimization process (Friedman, 1953). Our results show that, empirically, this is true for a substantial fraction of the population. The channel through which this occurs may be the following. Planner types may actually use their plan to *calibrate* simple savings rules for monthly or annual saving. Planners may talk about their savings rules to their friends and colleagues. In this way, the use of these rules may spread to people who have not themselves worked out a plan. Our data indicate that 82 percent of planners do save a fixed percentage of their income or a fixed absolute amount per month or year. Furthermore, Table 2 indicates that the differences in means of the variable *ROT1* is not significantly different for planners and rule-of-thumb types. This is fully consistent with the channel described above.

Our evidence in favor of Friedman's view is only partial, however, since decision types do matter. Planners and rule-of-thumb types accumulate substantially more wealth than random types. Thus, taking decision types into account is indeed important for explaining the variation in observed retirement wealth.

In addition to looking at the stock of retirement wealth, it is also valuable to consider the flow of retirement savings. Savings may fluctuate more over time and ultimately what will matter is the total wealth accumulated. However, savings rates can shed light on the more immediate effects of decision processes. The results are shown in the fifth to eighth

[11] Of course, our results do not allow us to take any stand on the adequacy of individual decisions. Thus, it is conceivable that both planners and rule-of-thumb types save too much.

column in Table 5. The fifth and sixth column report OLS estimations – without and with controlling for Social Security replacement rates –, whereas the seventh and eighth column report IV estimations – again without and with controlling for Social Security replacement rates. (See the right half of Table 6 for the respective first-step regressions.)

The results are similar to the regressions for retirement wealth. In general, fewer variables are significant. This is consistent with the view that savings flows are more volatile and it is therefore harder to achieve significance than in the case of retirement wealth. The coefficients for planners and rule-of-thumb types are always significant at the five- or one-percent level and quantitatively substantial. As in the case for retirement wealth, the coefficients for the decision variables are higher for the IV estimations than for the OLS estimations. In none of the regressions can equality between the coefficients for planners and rule-of-thumb types be rejected. These results confirm the earlier findings, that planners and rule of thumb types are significantly different from the random savers, but have similar outcomes to each other.

In order to test the robustness of our results, several other measures of planning and decision making were used. These included the raw variables used to identify planners and rule-of-thumb types, a score based on those variables, and other variables contained in the data set. For example, individuals were asked if they "planned very carefully in order to prevent any avoidable changes in [their] standard of living." The results of these other estimations are qualitatively similar to those presented here and are available from the authors upon request.

4 Conclusion

In this paper we have addressed whether the adoption of different decision making processes leads to systematically different levels of accumulated retirement wealth. Interest in this question arises for two main reasons. First, previous research has found that vari-

ables related to the classical life cycle model do not explain much of the observed variation in retirement wealth. Second, addressing this question relates to a fundamental methodological issue in economics: whether or not decision processes are relevant for decision outcomes. Famously, Milton Friedman suggested that decision processes are irrelevant. He argued that, even if some (or the majority of) people did not literally optimize by means of a careful planning process, their behavior would nevertheless look "as if" they had made a careful plan.

Our results provide a partial justification of Friedman's view. We have found that rule-of-thumb types accumulate an amount of wealth that is statistically indistinguishable from the amount accumulated by planner types. Thus, the behavior of rule-of-thumb types indeed looks "as if" it were derived from a careful plan. This finding is novel and may be very welcome since, for a substantial part of the population, understanding the logic of a sophisticated plan may be rather difficult. On the other hand, we find that planner and rule-of-thumb types accumulate substantially more retirement wealth than the remaining category that we have dubbed random. Thus, decision processes do matter. The random type category counts for about one third of our sample. Hence, the behavior of a substantial fraction of the population does not look "as if" it is derived from a careful plan. Because of this, variation in decision behavior does indeed contribute to explaining part of the variation in observed retirement wealth.

Our results suggest two main implications for policy making. First, it is important to be aware that people use different processes to make retirement savings decisions. In particular, random types may react to changes in pension policy differently from the other types. Economists should try to account for heterogeneous decision types in their theoretical models. This is all the more an issue given that all three decision making categories are substantial in size. In particular, the category of random savers amounts to at least one third. Second, our results show that simple rules of thumb are a powerful device for accumulating retirement wealth. This suggests that it may be very helpful

to spread information about simple rules of thumb that lead to an adequate level of retirement wealth for a range of representative cases. This may lead to a spread of adequate levels of retirement saving among the population by means of a non-intrusive policy measure.

References

Ameriks, John, Caplin, Andrew, and Leahy, John (2003), "Wealth Accumulation and the Propensity to Plan," *Quarterly Journal of Economics*, 118(3), 1007-1047.

Barsky, Robert B., Juster, Thomas F., Kimball, Miles S., and Shapiro, Matthew D. (1997), "Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and Retirement Study", *Quarterly Journal of Economics*, 112(2), 537-579.

Bernheim, B. Douglas, Skinner, Jonathan, and Weinberg, Steven (2001), "What Accounts for the Variation in Retirement Wealth among U.S. Households?", *American Economic Review*, 91(4), 832-857.

Binswanger, Johannes, and Schunk, Daniel (2008), "What Is an Adequate Standard of Living during Retirement?" Working Paper.

Browning, Martin, and Crossley, Thomas F. (2001), "The Life-Cycle Model of Consumption and Saving," *Journal of Economic Perspectives*, 15(3), 3-22.

Deaton, Angus (1991) "Saving and Liquidity Constraints," *Econometrica,* 59(5), 1221-1248.

Deaton, Angus (1992), "Household Saving in LDCs: Credit Markets, Insurance and Welfare," *Scandinavian Journal of Economics,* 94(2), 253-273.

Friedman, Milton (1953), "The Methodology of Positive Economics," in: *Essays in Positive Economics*, Chicago University Press, pp. 3-43.

Gollwitzer, Peter M. (1999). "Implementation Intentions: Strong Effects of Simple Plans," *American Psychologist*, 54(7), 493-503.

Gollwitzer, Peter, M., Fujita, Kentaro, and Oettingen, Gabriele (2004), "Planning and the Implementation of Goals," in: Baumeister, R. F., and Vohs, K.D. (Eds.), *Handbook of Self-Regulation: Research,Theory and Applications*, New York: Guilford Press, 211-228.

Hall, Robert E. (1978), "Stochastic Implications of the Life Cycle-Permanent Income Hypothesis: Theory and Evidence," *Journal of Political Economy*, 86(6), 971-987.

Kapteyn, Arie, and Teppa, Federica (2003), "Hypothetical Intertemporal Consumption Choices," *Economic Journal*, 113, C140-C152.

Lusardi, Annamaria, and Mitchell, Olivia S. (2007), "Baby Boomer Retirement Security: The Roles of Planning, Financial Literacy, and Housing Wealth," *Journal of Monetary Economics*, 54(1), 205-224.

Rodepeter, Ralf and Winter, Joachim (2003), "Rules of Thumb in Life-Cycle Saving Decisions," unpublished manuscript.

Scholz, John K., Seshadri, Ananth, and Khitatrakun, Surachai (2006), "Are Americans Saving 'Optimally' for Retirement?", *Journal of Political Economy,* 114(4), 607-643.

Simon, Herbert A. (1955), "A Behavioral Model of Rational Choice," *Quarterly Journal of Economics,* 69(1), 99-118.

Wooldridge, Jeffrey M. (1995), "Score Diagnostics for Linear Models Estimated by Two Stage Least Squares," in: Maddala, G.S., Phillips, P. C. B., and Srinivasan, T. N. (eds.), *Advances in Econometrics and Quantitative Economics: Essays in Honor of Professor C. R. Rao*, Blackwell, Oxford, 66-87.

Wooldridge, Jeffrey M. (2002), *Econometric Analysis of Cross Section and Panel Data*, MIT Press, Cambridge, Mass.

Appendix: Additional Variable Definitions

Savings Flow

We measure the annual flow of savings by means of the following question.

> **(Savings)** *In the last year, how much did you save in total for the purpose of retirement preparation? Please include both accounts like 401k or IRA and also any other types of accounts or forms of saving for retirement (e.g. bank accounts or mutual funds).*

Respondents are then ask to report their answer in one of three possible formats of their choice: (*i*) as a percentage of income; (*ii*) as an amount of money per month; (*iii*) as an amount of money per year. Since we know individuals' income, we convert the answer into a percentage of income for all observations. The mean savings rate amounts to 9 percent, whereas the median savings rate is 6 percent (see Table 1). The standard deviation is equal to 17 percent. Thus, the variation of savings rates is substantial.

Time Preferences

Following Barsky et al. (1997), Kapteyn and Teppa (2003) and Binswanger and Schunk (2008), we measure time preferences as the preferred slope of a consumption profile when comparing working-age with retirement consumption. Specifically, respondents are presented with the following question and a table similar to the one below, customized for each respondent.

> **(Time preferences)** *Suppose you would have a choice between the following options of how to spend the money you earn during lifetime. Which option would you like most? (Please answer the question as if prices remained constant, i.e. if there were no inflation.)*

	Monthly spending during working life (age 25 until retirement) in U.S. dollars	*Monthly spending during retirement in U.S. dollars)*
Option A	2950	1900
Option B	2900	2200
Option C	2800	2500
Option D	2750	2750
Option E	2650	3200
Option F	2600	3600

The numbers in the above table are just an example as they are calculated based on each respondent's total household income.[12] Here, they correspond to a monthly income after taxes of $3,000. For all respondents, the ratio of retirement spending relative to working-age spending is constant within a given row. Specifically, the ratios are equal to 64, 76, 88, 100, 120, and 140 percent, respectively, up to rounding. The order of the options were randomized with half of respondents seeing the options arranged with the ratios in increasing order – as in the table above – and half of respondents seeing them arranged in decreasing order. For a given respondent, our variable *time preference* takes on the value of the ratio of old-age to working life consumption. For instance, it takes on a value of one if a respondent has chosen option D. The mean of the variable time preferences amounts to .98, the median to 1 and the standard deviation to .24.

Risk Aversion

The questions on relative risk aversion stem from another module that has been fielded with the ALP in 2009, the so-called Cognitive Economics Survey.[13] Relative risk aversion

[12]See Binswanger and Schunk (2008) for details.

[13]The Cognitive Economics (CogEcon) Survey has been designed by a team of economists led by Robert J. Willis (University of Michigan), and is administered by John McArdle (University of Southern California). The CogEcon survey aims to collect data that allow for studying the link between cognitive factors and economic behavior. It has been fielded with the American Life Panel at the RAND institution, among other platforms. See https://mmicdata.rand.org/alp/index.php/Data ("Well Being 48" and "Well Being 50") for the respective codebook.

is inferred from a series of questions that read as follows.

> **(Relative Risk Aversion)** *Suppose that you unexpectedly inherited one million dollars from a distant relative. You are immediately faced with the opportunity to take a one-time risky, but possibly rewarding, investment option that has a 50-50 chance of doubling the money to two million dollars within a month and a 50-50 chance of reducing the money by [α] to X thousand dollars, within a month. Would you take the risky investment option or not?*

On a first screen, α is equal to one third and, hence, $X = 667$. If a respondent answers *yes*, then she is faced with the same question again, except that α is reduced to one half. If the answer to this follow-up question is *no*, then no further question is asked. If the answer is *yes*, then the question is asked again with α set to two thirds. If the answer to the first question (with α equal to one third) is *no*, then α is increased first to .8 and finally – if the risky option is declined again – to .9. The answers to these questions can be used to infer upper and lower bounds for the coefficient of relative risk aversion. We set relative risk aversion equal to the mid-point between the upper and lower bound. For those respondents that accept even the riskiest option (i.e. when α is equal to two thirds) no exact lower bound on risk aversion can be inferred. We set the lower bound for these observations to zero. Similarly, no upper bound can be inferred for those who decline even the least risky option (i.e. when α is equal to .9). We set relative risk aversion to 10 for these observations, since this is considered as an upper bound for reasonable values for this parameter. The mean of the resulting variable amounts to 5.23, the median to 5.7, and the standard deviation to 3.24.

Other variables

The remaining variables measure confidence in one's mathematical skills, the researching attitude in the domain of health decisions, and economics education. The question on confidence in one's mathematical skills reads as follows.

(Math confidence) *I am highly confident in my mathematical skills.* (Responses: 5-point Likert scale.)

This question is taken from Ameriks et al. (2003). The mean of the math confidence variable is 3.68, the median is 4, and the standard deviation 1.10. The question about health research is intended to measure the degree to which someone is "proactive." The question reads as follows.

(Health research) *When I have to make a decision about health care, I do a lot of research to find out what all of the options are, e.g. on the internet or in the library.* (Responses: 5-point Likert scale.)

The mean of *health research* is 3.86, the median 4, the standard deviation 1.06. The questions on economics education are borrowed from the CogEcon survey.

(Econ courses) *During your school education (high school, college or graduate school) did you take any courses in economics or finance?*

(N Econ courses) *How many courses did you take?*

The mean, median and standard deviation for the first question are 0.61, 1, and 0.49, respectively. For the second question they amount to 2.05, 1, and 2.55, respectively.

For the wording of the additional questions used in our analysis, see https://mmicdata.rand.org/alp/index.php/Data under "household information."

Table 1: Summary statistics

	Mean	Median	Standard deviation
Age	47.78	49	9.98
Male	0.49	0	0.50
Married	0.67	1	0.47
Children (dummy)	0.68	0	1.05
College	0.29	0	0.45
Advanced degree	0.26	0	0.44
Income	85,300	67,500	49,429
Income>200,000	0.05	0	0.22
House	0.78	1	0.41
Self-assess health	3.92	4	0.77
SS replac rate	0.50	0.45	0.21
DB plan (dummy)	0.49	0	0.50
Access DC plan	0.91	1	0.28
Retirement wealth	187,995	62,500	334,623
Retirement sav rate	9.62	6	17.01
Planner type	0.33	0	0.47
Rule-of-thumb type	0.32	0	0.47
Random type	0.35	0	0.48
Time preferences	0.98	1	0.24
Rel risk aversion	5.23	5.70	3.24
Math confidence	3.68	4	1.10
Health research	3.86	4	1.06
Econ courses	0.61	1	0.49
N econ courses	2.05	1	2.55

NOTE: Number of observations is 443. Self-assessed health, math confidence and health research are measured on a five-point Likert scale.

Table 2: Summary of Classification Variables by Type

Variable	Random	Rule of Thumb	Planner	Total	Random = Rule of Thumb	Random = Planner	Planner = Rule of Thumb
I've tried to determine my financial needs during retirement. (*PLAN1*)	2.76 (1.24)	3.04 (1.12)	4.40 (0.49)	3.40 (1.24)	-1.98**	-15.00***	-13.54***
Have you ever tried to find out how much you should save in total today and in the coming years in order to finance your target needs during retirement? (*PLAN2*)	0 (0)	0 (0)	1 (0)	0.33 (0.47)	–	–	–
I have a savings target of regularly saving some percentage of my income, e.g. 5, 10, 15, or ... percent. (*ROT1*)	2.21 (1.27)	4.08 (1.14)	3.84 (1.36)	3.34 (1.51)	-13.18***	-10.73***	1.62
I have a savings target of regularly saving some amount of money, such as e.g. $100, $500, $1000 or ... per month. (*ROT2*)	2.24 (1.34)	3.71 (1.29)	3.43 (1.42)	3.10 (1.49)	-9.52***	-7.49***	1.72*

NOTE: Standard deviations are indicated in parentheses. The numbers in the three last columns show t-values for a test for equality of means between the two respective types indicated in the column header. One, two, and three asterisks indicate that equality is rejected at the 10-, 5-, and 1-percent significance level, respectively.

Table 3: Correlation matrix for the variables measuring types

	PLAN1	*PLAN2*	*ROT1*	*ROT2*
PLAN1	1			
PLAN2	0.58	1		
ROT1	0.25	0.16	1	
ROT2	0.33	0.23	0.43	1

Table 4: Multinomial logit regressions predicting types

	Role of thumb	Planner
Econ courses	0.81**	0.65*
	(0.35)	(0.37)
N econ courses	-0.13	0.02
	(0.08)	(0.07)
Math confidence	0.11	0.30**
	(0.12)	(0.13)
Health research	0.32***	0.57***
	(0.12)	(0.14)
SS replac rate	0.02	-0.31
	(0.74)	(0.81)
DB plan	0.34	-0.13
	(0.26)	(0.27)
Access DC plan	1.40***	0.82
	(0.52)	(0.53)
Time preferences	-0.35	0.24
	(0.53)	(0.56)
Rel risk aversion	-0.03	-0.06
	(0.04)	(0.04)
Self-assess health	-0.18	-0.25
	(0.17)	(0.18)
Age	-0.16*	-0.03
	(0.09)	(0.11)
Age^2	0.00	0.00
	(0.00)	(0.00)
Income	$8.11 \cdot 10^{-6}$*	$10.60 \cdot 10^{-6}$**
	$(4.31 \cdot 10^{-6})$	$(4.46 \cdot 10^{-6})$
Income > 200,000	-0.68	-0.20
	(0.89)	(0.82)
House ownership	0.32	0.17
	(0.35)	(0.39)
Married	0.03	0.29
	(0.31)	(0.34)
Male	0.64**	0.74***
	(0.27)	(0.28)
Children	-0.16	0.04
	(0.14)	(0.14)
College	-0.09	-0.32
	(0.32)	(0.34)
Advanced degree	0.03	0.24
	(0.36)	(0.37)
Constant	0.62	-4.85*
	(2.29)	(2.72)
N	440	

NOTE: Standard errors are indicated in parentheses. One, two, and three asterisks indicate a p-value less than .1, .05, and .01, respectively.

Table 5: Regressions for retirement wealth accumulation and savings rates

	Log retirement wealth				Retirement savings rate			
	OLS	OLS	IV	IV	OLS	OLS	IV	IV
Planners	1.32***	1.24***	2.88**	2.54**	5.41***	5.37***	18.17**	18.22**
	(0.32)	(0.32)	(1.28)	(1.21)	(1.14)	(1.14)	(7.28)	(7.29)
Rule of thumb	0.91***	0.85***	4.07**	3.35*	7.25***	7.18***	26.22**	25.99**
	(0.33)	(0.32)	(1.92)	(1.84)	(1.75)	(1.74)	(12.80)	(12.51)
SS replac rate		-2.10**		-2.12*		-2.16		-3.11
		(1.06)		(1.08)		(3.35)		(4.25)
DB plan	0.82***	0.78***	0.63**	0.65**	1.78	1.72	-0.35	-0.30
	(0.25)	(0.25)	(0.31)	(0.30)	(1.38)	(1.38)	(2.44)	(2.37)
Access DC plan	2.04***	1.90**	1.39*	1.38*	1.96	1.75	-3.43	-3.73
	(0.72)	(0.74)	(0.81)	(0.80)	(1.62)	(1.78)	(3.93)	(4.05)
Time preferences	0.27	0.25	0.46	0.42	1.92	2.10	2.71	3.02
	(0.57)	(0.56)	(0.62)	(0.58)	(2.94)	(3.03)	(3.26)	(3.32)
Rel. risk aversion	-0.04	-0.03	-0.03	-0.02	0.01	0.04	0.01	0.03
	(0.05)	(0.04)	(0.05)	(0.05)	(0.17)	(0.18)	(0.20)	(0.20)
Self-assess health	0.00	0.04	0.09	0.10	-0.26	-0.18	0.37	0.43
	(0.19)	(0.18)	(0.19)	(0.18)	(0.64)	(0.64)	(0.78)	(0.78)
Age	0.34***	0.30**	0.43***	0.37***	0.32	0.28	0.44	0.39
	(0.12)	(0.12)	(0.14)	(0.14)	(0.22)	(0.21)	(0.32)	(0.30)
Age^2	-0.0031**	-0.0027**	-0.0039**	-0.0033**	-0.0023	-0.0019	-0.0032	-0.0028
	(0.0013)	(0.0013)	(0.0015)	(0.0015)	(0.0025)	(0.0023)	(0.0032)	(0.0030)
Log income	1.42***	1.12***	1.13***	0.89**	-1.00	-1.32	-2.77	-3.23*
	(0.37)	(0.40)	(0.42)	(0.43)	(1.32)	(1.23)	(1.93)	(1.96)
Income > 200,000	0.60	0.65*	0.79	0.79*	15.72**	15.68**	17.02**	17.01**
	(0.38)	(0.38)	(0.48)	(0.45)	(6.97)	(6.96)	(7.59)	(7.54)
House ownership	1.51***	1.44***	1.34***	1.32***	0.17	-0.03	-0.01	-0.22
	(0.45)	(0.45)	(0.48)	(0.46)	(1.99)	(1.98)	(2.24)	(2.21)
Married	-0.23	-0.08	-0.18	-0.06	1.31	1.59	1.72	1.94
	(0.37)	(0.37)	(0.38)	(0.37)	(1.31)	(1.27)	(1.67)	(1.65)
Male	0.69***	0.75***	0.44	0.54	1.24	1.31	-0.05	0.03
	(0.26)	(0.26)	(0.35)	(0.33)	(1.39)	(1.40)	(1.68)	(1.68)
Children	-0.14	-0.14	-0.06	-0.08	0.61	0.64	0.66	0.70
	(0.18)	(0.16)	(0.19)	(0.17)	(0.80)	(0.80)	(0.90)	(0.90)
College	0.58*	0.45	0.55	0.42	1.36	1.36	1.48	1.44
	(0.30)	(0.30)	(0.34)	(0.32)	(1.39)	(1.40)	(1.61)	(1.62)
Advanced degree	0.94***	0.73**	0.92**	0.69**	4.97***	4.92**	4.23**	4.10*
	(0.28)	(0.29)	(0.36)	(0.34)	(1.92)	(1.97)	(2.09)	(2.10)
Constant	-19.52***	-14.33**	-19.70***	-14.43**	-1.94	3.15	6.92	14.57
	(4.68)	(5.69)	(5.05)	(5.92)	(13.56)	(11.14)	(16.78)	(16.78)
N	443	440	443	440	449	447	449	447
R^2	0.510	0.518	0.397	0.445	0.151	0.151	.	.

NOTE: Results for first-stage regressions are shown in Table 6. Robust standard errors are indicated in parentheses. One, two, and three asterisks indicate a p-value less than .1, .05, and .01, respectively.

Table 6: First-step regressions for the instrumental-variable regressions in Table 5

	Retirement wealth regressions				Savings rates regressions			
	Without SS replac rate		With SS replac rate		Without SS replac rate		With SS replac rate	
	Planner	Rule of thumb	Planner	Rule of thumb	Planner	Rule of thumb	Planner	Rule of thumb
Econ courses	0.03	0.11*	0.03	0.11*	0.04	0.02	0.04	0.01
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
N econ courses	0.02**	-0.03***	0.02**	-0.03***	0.03***	-0.03***	0.03***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Math confidence	0.04**	-0.00	0.04	-0.00	0.05**	-0.01	0.05**	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Health research	0.07***	0.01	0.07***	0.01	0.07***	0.03	0.07***	0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
SS replac rate			-0.06	0.06			-0.13	0.15
			(0.11)	(0.12)			(0.12)	(0.13)
DB plan	-0.06	0.09	-0.06	0.09*	-0.03	0.14***	-0.03	0.14***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)	(0.05)
Access DC plan	0.04	0.19**	0.03	0.19**	0.04	0.25***	0.03	0.26***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Time preferences	0.08	-0.09	0.07	-0.10	0.11	-0.11	0.11	-0.12
	(0.08)	(0.10)	(0.09)	(0.10)	(0.09)	(0.10)	(0.09)	(0.10)
Rel risk aversion	-0.01	-0.00	-0.01	-0.00	-0.00	0.00	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Self-assess health	-0.02	-0.02	-0.02	-0.02	-0.01	-0.03	-0.01	-0.03
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Age	0.00	-0.03*	0.00	-0.03*	-0.00	-0.00	-0.01	-0.00
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Age^2	0.0000	0.0002	0.0000	0.0002	0.0001	-0.0000	0.0001	-0.0000
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Log income	0.08**	0.05	0.07**	0.06	0.08**	0.04	0.06	0.06*
	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	0.04	(0.04)	(0.04)
Income > 200,000	0.12	-0.14	0.12	-0.14	0.10	-0.14	0.10	-0.14
	(0.10)	(0.09)	(0.10)	(0.09)	(0.10)	(0.09)	(0.10)	(0.09)
House ownership	-0.00	0.06	-0.01	0.05	0.01	0.00	0.01	0.01
	(0.06)	(0.06)	(0.06)	(0.07)	(0.06)	(0.07)	(0.06)	(0.07)
Married	0.05	-0.03	0.05	-0.03	0.02	0.03	0.02	-0.03
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Male	0.08*	0.04	0.08*	0.05	0.07	0.03	0.07	0.03
	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Children	0.02	-0.03	0.03	-0.03	0.03	-0.02	0.03	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
College	-0.05	0.00	-0.05	0.01	-0.06	0.01	-0.07	0.02
	(0.05)	(0.06)	(0.05)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)
Advanced degree	0.06	-0.04	0.05	-0.03	-0.00	0.01	-0.02	0.03
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Constant	-1.26***	0.39	-1.13**	0.28	-1.24***	0.01	-0.94*	-0.35
	(0.48)	(0.49)	(0.53)	(0.53)	(0.44)	(0.45)	(0.50)	(0.53)
R^2	0.16	0.07	0.16	0.06	0.17	0.08	0.17	0.08
Prob > F	0.00	0.01	0.00	0.03	0.00	0.00	0.00	0.00

NOTE: The first two columns relate to the second-step regression in the third column of Table 4. The third and fourth column relate to the second step-regression in the fourth column in Table 4. The fifth and sixth column relate to the regression in the seventh column in Table 4. The last two columns relate to the last column in Table 4. Robust standard errors are indicated in parentheses. One, two, and three asterisks indicate a p-value less than .1, .05, and .01, respectively. Prob > F indicates the joint significance of the instruments.