
UNITED STATES NAVAL ACADEMY
DEPARTMENT OF ECONOMICS
WORKING PAPER 2013-41

# "'Open line of credit:' Under no borrowing constraints, how do young adults invest?"

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# "Open line of credit:" Under no borrowing constraints, how do young adults invest?

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**Abstract:** Students at the United States Naval Academy have the opportunity to take a "Career Starter Loan." Two military-oriented banks provide these loans exogenously at a low interest rate that does not depend on individual credit scores. Using survey data, this paper examines investment behavior in relation to risk profiles, self-reported planning horizons, and other individual characteristics. The data offers novel insights into the investment behavior of college-aged individuals, an infrequently studied group in behavioral finance. Simple OLS and Tobit models reveal that: (1) cognitive ability is strongly and positively associated with more investment and riskier choices; (2) demographic background characteristics relate to investment behavior, as respondents from wealthier backgrounds invest more and with more risk; (3) individuals with superior financial literacy tend to invest more, typically in equity markets; (4) personality traits, such as the Myers-Briggs Type Indicator and planning horizon length, can also predict investment behavior. Lastly, we explore a notion of "investment exuberance" to see which factors might relate to young investors' confidence in their choices.

*JEL classification:* C83; D03; D14; G11

*Keywords:* Survey Methods, Behavioral Economics, Personal Finance, Investment Decisions

Acknowledgements: We would like to thank Lou Cox for her expertise in programming the survey. We would also like to thank participants at the 2012 Southern Economic Association Meetings in New Orleans for helpful comments, especially Kurtis Swope. IRB human subject's approval received September 12, 2012 under HRPP Approval #USNA.2012.0004-AM03-EP7-A.

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## 1 Introduction

Exploring a unique data opportunity, we examine the financial behavior of college students who take out a sizeable ($32,000 or $36,000), no-collateral, low-interest, non-credit dependent loan. The loan is *exogenously provided* to all students at the United States Naval Academy (USNA). We collect survey data on students' loan allocations, that is, how much they consume, save, or invest. For those that invest, we examine the characteristics of the individuals that invest in stocks, mutual funds, and bonds. Then we create a simple measure of portfolio risk and investigate its relation to individuals' personal characteristics as well as their financial status and literacy. Finally, we examine the various factors underlying loan-takers' self-reported expected gains from their investments, which we connect to a notion of "investment exuberance," or optimism. The data includes demographic information (gender, grade point average (GPA), SAT scores, major, Myers-Briggs Type Indicator (MBTI)), cognitive ability (as measured by Frederick's (2005) Cognitive Reflection Test[1] (CRT, hereafter)), self-reported financial literacy (an indicator of confidence), financial literacy based on questions proposed by Pingue (2011),[2] self-reported family education levels and income, self-reported information on sources of financial advice, and future expectations about starting a family and purchasing a house.

[1] The CRT consists of three basic questions: (1) A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost? ___cents; (2) If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets? ____minutes; and (3) In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake? ___days. The intention of the CRT is to test two decision making characteristics: time preference and risk preference. The "intuitive" answers to these three questions are generally incorrect, and people who answer them incorrectly tend to believe they are easier than those who answer correctly. Frederick (2005) finds the correlation of CRT score to SAT, ACT, and other tests to be weak. He hypothesizes that, more than any of the tests the CRT is compared to, it measures the need for resisting the first "intuitive" answer and instead solving for the correct solution to a problem and therefore it functions as a test of cognitive ability.

[2] The two questions from Pingue (2011) are: (1) Amanda has $5,000 saved up from working at different jobs. She puts her money in a savings account that pays four percent a year in interest. How much money will be in her account at the end of the first year and at the end of the second year? Answer options: (a) End of first year: $5,100; end of second year: $5,400; (b) End of first year: $5,200; end of second year: $5,400; (c) End of first year: $5,200; end of second year: $5,408; (d) I don't know. (2) Which of the following best describes the relationship between the interest rate charged to a person for a loan and that person's risk of nonpayment of the loan? Answer options: (a) Lower interest rates are charged on loans with a lower risk of nonpayment; (b) Higher interest rates are charged on loans with a lower risk of nonpayment; (c) Lower interest rates are charged on loans with a higher risk of nonpayment; (d) I don't know.

According to a 2011 Gallup poll, 54 percent of American households own stocks, either individually or through mutual funds, 401(k) accounts, and IRA's. Newport (2012) states that 53 percent of households participate in the stock market, a figure that has fallen substantially from a high of 67 percent in 1998. He further indicates that, in addition to having less money to invest, Americans under 30 do not consider stocks as readily and are more likely to use savings accounts or CDs. The investment behavior of young adults is of particular importance today. Student loan balances—both federal and private—have reached all-time highs (Armao, 2012); some suggest the debt holdings of young adults may form the next major "asset bubble," and even if not, debt burdens faced by so many "twenty-somethings" may harm aggregate demand in the U.S. economy (Sivy, 2012). In addition, youth unemployment has also remained elevated since 2008.[3] Consequentially, few young adults are able to purchase a home, take out personal loans, invest for future consumption, or relocate to more expensive locations for better job opportunities. While we do not propose to solve all financial challenges facing young Americans today, our data on this unique loan opportunity offers a novel glimpse of how such individuals' choose to allocate their assets. A better understanding of young Americans' investment behavior has implications for important public policy issues: What personality traits of young individuals most strongly relate to consumption, savings, or investment decisions? Such information may be useful in considering legislative changes to bankruptcy laws for debt-burdened college graduates; if granted debt relief, would beneficiaries simply continue to exhibit poor financial planning? Additionally, we find a strong link between young adults' financial literacy and their investment decisions; our results have implications for potential policy interventions to improve financial education.

Using a group of employees whose employers match 401(k) contributions, Choi et al. (2005) discover that pre-existing financial literacy is strongly correlated to matching rates; employees with lower contribution rates tend to be far less knowledgeable about their 401(k) plans and about equity participation. Less financially-literate employees also tend to display time-inconsistent preferences and decisions to invest. However, the researchers are unable to identify a causal link between financial

[3] See http://www.dol.gov/odep/categories/youth/youthemployment.htm

literacy and investment allocations because they do not find that financial training interventions necessarily alter investment decisions.[4] Our results reveal that students with superior financial knowhow tend to invest rather than save or consume.

Previous research also suggests that confidence and financial literacy influence investment decisions. Surveying a set of finance professors, Doran et al. (2010) determine that confidence in one's ability to beat the market impacts investment behavior. Coincidentally, we find that when financially literate students invest, they tend to be more optimistic about their potential returns, in part "subjectively" because of additional exuberance and in part "objectively" because they participate more in equity markets.

We speculate that the link between financial literacy and investment behavior may work through cognitive ability traits, a notion that has foundations in the literature. Christelos et al. (2006) test the impact of cognitive ability on stock market participation decisions. They find that investors with lower cognitive ability scores tend to be worse at assessing risk and picking outcomes with higher expected values.[5] After controlling for age and education, the authors still calculate positive effects of cognitive ability on stock market participation. Our data provides three metrics for cognition: SAT score, GPA, and CRT results (mentioned above). We find that of the three measures, the CRT is the most significant predictor of investment, equity participation, and portfolio risk in general.

In addition to cognition, behavioral finance studies supports that various demographic factors impact investment decisions and risk tolerance. Specifically, Jianakoplos and Bernasek (1998) and Pålsson (1996) find that single women are more risk averse in managing their portfolios. Pålsson (1996) also argues that risk aversion increases with age. Using a field experiment, Eckel et al. (2005) agree that older people and women are more risk averse when making decisions to either take a smaller sum of money immediately or wait for a higher sum of money in the (short or long term) future. Additionally,

[4] This is also consistent with the results of Gerrans and Clark-Murphy (2004).
[5] The authors used cognitive ability as an indicator for the ability to process information. Their determinants of cognitive ability come from the 2004 Survey of Health, Aging and Retirement in Europe (SHARE). The respondents were asked questions to determine their ability to perform numerical operations (numeracy), planning and executive function (fluency), and memory.

they conclude that those with lower income are less patient. According to Riley and Chow (1992), risk aversion decreases with age (unless close to retirement) and risk tolerance increases with education, income, and wealth. Schooley and Worden (1999) find that more educated households invest in securities and that predictions with age are consistent to Riley and Chow. Our data provides a major advantage in this context: Since our survey's respondents are very close in age, earn the same wages,[6] and have very similar expected earnings (in the short and medium term),[7] we are able to automatically hold these characteristics constant. The sample's homogeneity stems from the nature of our survey: We interview juniors and seniors in college (all are between 19-26 years of age and unmarried) who will all serve as officers in the United States Navy or Marine Corps after graduation, and they all receive the same loan opportunity with the same interest rate (i.e. they have identical borrowing costs and constraints[8]). A potential benefit of studying a relatively homogeneous subject pool is that we can better isolate the roles of gender, personality, cognitive ability, confidence, and planning (anticipations of home ownership, marriage, and children) as they relate to investment decisions. Interestingly, despite such strong similarities amongst our survey respondents, we observe striking variation in not only their savings, consumption, and investment decisions, but also in their risk tolerance, as exhibited by their portfolios.

The literature reveals that financial literacy, cognitive ability, age, gender, personality, income, wealth, marital status, and education are connected to investment decisions. Equipped with a novel opportunity to study the investment behavior of college-aged individuals, we extend previous results to confirm that young investors' choices are driven by similar factors, including: (1) cognitive ability, as measured by CRT score, which is strongly and positively associated with more investment and riskier choices; (2) demographic background characteristics, such as family wealth, as students from wealthier backgrounds invest more and with more risk; (3) financial literacy, as more literate students tend to invest

[6] Midshipmen receive identical pay that starts at $100 per month for freshmen and increases yearly, see http://www.usna.edu/geninfo.htm , we also control for transfers to and from their family.

[7] Upon graduation, students will be commissioned as O-1s in either the Navy (as an Ensign) or the Marine Corps (2nd Lieutenant). Barring extenuating circumstances, all USNA graduates are committed to at least five years as a commissioned officer, with a pay raise every year. Military pay tables are available at www.dfas.mil/militarymembers.html

[8] See Section 2 below for details on the students' loan opportunity.

more, typically in equity markets; (4) personality traits, such as the Myers-Briggs Type Indicator and planning horizon, which can also predict investment behavior. Lastly, we explore a notion of "subjective investment exuberance" to see which factors might relate to young investors' confidence in their choices. We do not find that cognitive ability measures are associated with students' optimism about their gains, nor do we find that MBTI or family income categories significantly relate to our notion of exuberance. We obtain strong evidence that economics majors are more optimistic than their STEM and humanities major peers, and we also see that students with higher levels of financial literacy and those who consulted a financial advisor expect higher returns to their investments, holding portfolio makeup fixed.

The paper proceeds as follows. Section 2 provides background on the loan. Section 3 describes the data. Section 4 presents our methods and results, and Section 5 concludes.

## 2 Background

Students at USNA may take a "Career Starter Loan" once they sign a seven-plus year contract with the Navy at the beginning of their junior year. The Navy Federal Credit Union (NFCU) and United Services Automobile Association (USAA) offered this loan, for the classes of 2013 and 2014, in slightly different forms. Table 1 presents a comparison of each bank's offering, with the specific terms given to the class of 2013. This loan is not government subsidized; NFCU and USAA provide it privately, as they hope to build and maintain banking relationships with newly minted Naval and Marine Corps officers and their families.

After accepting the loan, recipients must direct-deposit their military paycheck at their lender's bank, which precludes accepting both loans and ensures (for the bank) at least a minimal financial relationship. Repayments start three months after graduation/commissioning.[9] If a student or officer separates from the Naval Academy or the Navy/Marine Corps before repaying the loan, the loan rate

[9] At graduation virtually all graduates are also commissioned as officers in the Navy or Marine Corps, so the terms are used interchangeably.

reverts to the prevailing signature loan rate at the time.[10] Although the USAA loan provides a larger principal at a lower rate, many students take the NFCU loan because it is available earlier. Loan repayment is virtually guaranteed because lenders garnish monthly payments directly from graduates' paychecks as soon as the loan enters repayment.

While our findings show that students commit loan dollars to a mixture of investments, consumption, and payment of debt, about 10 percent of students do not take the loan (see Insler et al., 2013). This is surprising, as students can invest at a nearly risk-free rate and still return more than the cost of the loan. According to the U.S. Treasury in February 2013, the annual yield on a 5-year security was roughly 0.9 percent; investing $36,000 at 0.9 percent for five years, compounded annually, would return $37,649. But in that time, cumulative interest payments for the 0.75 percent USAA loan would only total about $670. Thus students can profit nearly $1000, virtually risk-free.

All students receive basic financial training via mandatory bi-annual briefs at USNA, although anecdotal evidence suggests that students may not "retain" all information from these sessions. Our survey questionnaire delves into respondents' idiosyncratic financial literacy to gain a better understanding of this important trait.

Because of the unique features of the Career Starter Loan (size; extraordinarily low borrowing cost; independent of credit or collateral; nearly-guaranteed repayment), we do not anticipate that recipients' usage of loan dollars will be identical to typical individuals' usage of standard personal loans. Rather, we prefer to view the Career Starter Loan as a substantial, exogenous windfall rarely experienced by a college-aged individual. Past studies have examined the connection between borrowing costs and investment decisions, but there is not extensive existing knowledge on actual investment decisions of young adults. Some evidence comes from Davis et al. (2005), who determine that younger families may hold small equity positions, financed by borrowing if borrowing costs are small (lower than the expected rate of return on equity, as in our study). However, they find that households typically do not accumulate equity until they have positive net wealth. Guo (2001) studies barriers to entry in equity markets,

[10] For the class of 2012 and 2011, 96% and 95% of those eligible for the loan graduated.

suggesting that there is a threshold level of wealth required for participation. Such a barrier could be overcome by a bequest from the previous generation or, in our case, a Career Starter Loan. Constantinides et al. (2002) argue that younger individuals do not participate in equity markets because they cannot obtain the necessary credit to do so. Thus our data provides a novel opportunity to study a set of young adults (with generally low debt holdings and substantial investment options via the Career Starter Loan), permitting us to characterize their consumption and investment decisions. Typically, college-aged adults do not have such investment opportunities. Since banks exogenously offer the loan to all individuals in the sample, we may (without nearly as much concern for selection bias) ascertain the personal characteristics, demographics, and financial backgrounds that best predict their choices.

## 3 Data Description

### 3.1 Survey Administration

Students in the graduating classes of 2013 and 2014 took the survey online in the fall of 2012.[11] To incentivize participation, a random and anonymous drawing selected two survey-takers to win a $100 gift card. The survey began with the three CRT questions, which we aggregate into an integer from 0 to 3, counting the number of questions answered correctly. A greater CRT score generally indicates higher cognitive ability (Frederick, 2005). Students then reported their "subjective" financial literacy (on a scale of 1 to 10), followed by self-reports detailing their prior investments (i.e. investment allocation, for example: amount in stocks, amount in mutual funds, amount in bonds, etc.), prior debt, and their lender (USAA or NFCU). The students then detailed the specific allocation of their Career Starter Loan (CSL), their repayment plans, their sources of financial advice, and their expected returns (or losses). Next, students answered two "objective" financial literacy questions proposed by Pingue (2011) and then replied to socio-economic questions about their family backgrounds (parents' education, family income, and financial support given/received to/from parents). Finally, respondents reported their planning horizons (their expected tenure in the military, as well as the timing of their intentions to purchase a home

[11] The complete survey is available from the authors by request.

and have children). In all, the survey contained 35 questions, and it concluded with a fill-in box to provide any additional relevant information.

In addition to the self-reported questionnaire, the Office of Institutional Research at USNA linked official information for each respondent on gender, major, home state, verbal SAT, math SAT, grade point average (GPA), MBTI, and class year. These additions helped to minimize reporting errors and survey fatigue. The office also created the online survey, collected the data, randomly distributed two $100 gift cards to incentivize survey completion, and merged the self-reported data with the official information. In this way, the researchers were minimally associated with data collection and were at no point involved with identified data.

### 3.2 Myers-Briggs Type Indicator

As most of the variables are self-explanatory, the main one requiring more detail is the Myers-Briggs Type Indicator. The MBTI comes from a self-reported questionnaire designed to identify which orientation and functions that an individual prefers. The MBTI is based on Carl G. Jung's (1923) theory of psychological types, which argues that certain psychological preferences perform certain tasks. The MBTI is structured into four dichotomous categories that identify personality "types;" it identifies an individual as having a preference for extroversion (E) or introversion (I) in *orientation*, a preference for sensing (S) or intuition (N) in *perception*, and a preference for thinking (T) or feeling (F) in *judgment*. The MBTI also adds a fourth dichotomy not explicitly mentioned by Jung. The fourth dichotomy reflects whether a person prefers to use a judgment (J) attitude or a perception (P) attitude when "interacting with the outside, extroverted world" (Myers et al., 1998, p. 26).

Before starting their freshman year,[12] students take the MBTI exam. Unlike in Yang, Coble, and Hudson (2009), students do not take the exam in connection with the survey, so survey respondents do not associate their exam responses with financial decisions. The Office of Institutional Research collects

[12] Freshmen participate in "plebe summer" for approximately two months prior to the start of academic year in August. During this time, students receive the MBTI and other class placement exams.

and saves MBTI results for every student, allowing us to merge this information with our main survey results. MBTI has been shown to be generally stable over time; that is, it captures individual specific traits that tend to be time invariant (Myers et al., 1998).[13]

For our purposes, previous studies link MBTI to financial behavior. Using MBTI scores, Li and Liu (2008) find that "extroverts" (E) and "intuitors" (N) are more risk tolerant. Su-li and Ke-fan (2010) determine that perceiving (P) types are willing to take higher risks in group decision-making. Filbeck et al. (2005) find that individuals with a preference for thinking (T) and judging (J) are more risk-tolerant. Therefore, from the literature, we would anticipate more equity market participation for individuals preferring extroversion (E), intuition (N), thinking (T), and judging (J). Our analyses confirm these results for judging (J) and intuition (I). We do not find significant results for the remaining types, but coefficient estimates possess the expected signs.

Using a laboratory experiment, Yang et al. (2009) find that choices under uncertainty depend on personality traits more than on results from standard experimental risk assessment procedures, such as the Holt and Laury (2002) risk procedure.[14] Specifically, individuals preferring extroversion (E), intuition (N), thinking (T) and judging (J) more accurately solve problems in the subjective probability estimation portion of the experiment. This is useful information, because we are unable to use the Holt and Laury risk procedure (we could not pay students for participation), but we do observe accurate data on MBTI. Also in the area of personality traits, Charness and Gneezy (2003) examine the impact of psychological bias, rather than MBTI, on risk tolerance for portfolio choice. The psychological biases they use were ambiguity aversion (Ellsburg, 1961), the illusion of control (Langer, 1975) and myopic loss aversion (Benartiz and Thaler, 1995). They find no clear connection for risk attitude and empirical choice. In light of these findings, along with those of Yang et al. (2009), we are comfortable with our ability to use MBTI

[13] Specifically, Myers et al. 1998 find that when retested, people have three to four types the same 75 – 90% of the time and the change occurred when preference clarity was low. The type that has the lowest reliability is the preference for thinking/feeling.

[14] The Holt-Laury risk procedure allows students an opportunity to choose between two options (A and B) in which the expected value of a gamble changes for each of ten decisions; the number of safe choices is used for risk preference classification. For example, for question 3 the choice is between "Option A: 30% chance of $10.00, 70% chance of $8.00" or "Option B: 30% of $19.00, 40% chance of $1.00."

in the absence of more standard risk assessment measures. In addition to our results regarding equity market participation and MBTI (cited in the previous paragraph), we find some limited evidence that "extroverts" (E), "intuitors" (N), and "judgers" (J) cho0se riskier portfolios.

### 3.3 Sample Restrictions

In total, 609 students completed the survey. Our response rate was quite high (28 percent), given that the total number of students in the classes of 2013 and 2014 in the fall of 2012 was 2,182. To construct our final sample, we discard respondents for whom we could detect critical reporting errors or omissions: We drop 24 respondents who indicated that they planned to invest later or purchase a car later if they also implied that their responses did not reflect "best guesses" for those decisions.[15] We omit, in sequence, four subjects who did not specify whether they took the loan and 40 respondents whose answers possessed severe inconsistencies in their prior investment reports.[16] We drop eight individuals who did not indicate whether they held any debt and 20 individuals who did not report their choice of the NFCU or the USAA loan option.[17] We also omit 26 individuals who did not respond to the three financial literacy questions, ten respondents who did not report on transfers to or from their family, and seven students who did not report their expectation to gain, lose, or break even.[18] Lastly, we discard information from four severe outliers, with respect to their finances.[19]

For the purposes of this study, we do not consider information from the 46 remaining students who did not accept the CSL.[20] Ultimately, we received 420 usable survey submissions. Although the number of discarded observations may seem relatively large, our final sample passes a number of simple

[15] We gleaned this information from a fill-in blank for general comments at the end of the survey.
[16] For instance, some students claimed to have nonzero prior investments in one section, but then claimed to have zero prior investments in a subsequent, more detailed, section.
[17] The discrepancy between the two loans, although relatively small, affects the accuracy of our calculations of investment, savings, and consumption ratios.
[18] The accounting of discarded observations is reported *sequentially*. We have recounted the omitted responses in the same order as the survey's questions. Thus, recalling that the survey was administered online, the drops predominantly represent submissions of incomplete surveys at various stages of completion.
[19] One student reported a transfer to his or her family far greater than the size of the loan; one student reported debt holdings far greater than the size of the loan; two students reported prior investments well over $100,000.
[20] See Insler et al. (2013) for an analysis of the loan-acceptance decision.

robustness checks for sample selection bias. As previously mentioned, the Office of Institutional Research merged official USNA data on respondents' gender, major, home state, SAT, GPA, and MBTI with our survey data; we observe the official data even for "discarded respondents." Comparisons of basic summary statistics of these variables for the original 609 respondents to the final group of 420 do not reveal any notable discrepancies.[21]

**3.4 Summary Statistics**

Table 2 contains sample means and standard deviations for demographics and personality traits of the final sample. Only 21 percent of our sample is female, which is true to recent historical records at USNA. We observe that 65 percent of the sample majors in a STEM (science, technology, engineering, mathematics) discipline, and we code the remaining 35 percent as either majoring in economics or any other field in the College of Humanities and Social Sciences. These estimates reflect historical averages at USNA. Forty-three percent of the sample reports family income over $100,000. The mean CRT score is 1.8. As shown in Frederick (2005), this places our respondents between students from Princeton University (1.63) and the Massachusetts Institute of Technology (2.18), suggesting that their cognitive ability, as measured by the CRT, is higher than the "average" population. Frederick (2005) finds that individuals with greater CRT scores are more willing to gamble, and Dohmen et al. (2007) determine that individuals with greater cognitive ability are less risk averse and more patient with investment decisions; our results in Section 4 bolster their findings. Compared to the general population (as found in Hammer and Mitchell (1996)), USNA is overrepresented by E, N, and T types.

Table 3 presents both unconditional and conditional means and standard deviations for financial literacy variables as well as loan and investment allocations. Nearly three-quarters of the sample received a nonzero transfer from their family, while 122 respondents (about one-quarter) provided transfers to their families. We can track the share of those transfers that came from students' CSLs; 72 of those 122 students used loan funds for this purpose. Less than ten percent of students entered their junior or senior

[21] These results are available upon request.

year with debt; debt-holders averaged $3,470 of personal debt. Detailed information on respondents' previous investments shows that over one-quarter possessed assets (prior to accepting their loans), allocated amongst a uniform mixture of stocks, mutual funds, and savings. Students engaged in a wide variety of activities with their loan funds, but investment was the largest (44 percent of all loan dollars went to investments). The survey instrument required students to input their allocation values one-by-one and ensured that their entries summed to the total amount borrowed. Amounts allocated in specific investments also summed to the total amount invested. Thus there is no double counting of loan dollars; a dollar invested (stocks, mutual funds, etc.) is not a dollar saved (savings account, checking account). 42 percent of students financed, at least in part, the purchase of a vehicle with their CSL.[22] Detailed investment data shows that stocks and mutual funds were much more popular than their more (or less) risky counterparts.

## 4 Empirical Methods and Analysis of Results

This section presents empirical analysis of three levels of decision making: (1) The allocation of CSL dollars amongst investment, savings, or consumption; (2) the allocation of investment dollars from the loan amongst stocks, mutual funds, bonds, and CDs; and (3) the total risk borne by subjects' entire portfolios, including both loan dollars and previous investments. Lastly, we examine the factors correlated to respondents' self-reported expected returns; by holding their "objective" portfolio breakdowns constant, we observe which variables explain "subjective" investment optimism or "exuberance."

### 4.1 Investment/Savings/Consumption Decision

In this subsection, we analyze data from all 420 individuals in our final sample.[23] As a starting point, some basic cuts of the data yield several stylized facts that coincide with results from the literature. Collectively, loan-takers appropriated a plurality of their loan dollars into investment (44 percent),

[22] Using the CSL to finance a vehicle purchase is an effective option, as it carries a much lower rate per dollar borrowed than a traditional automobile loan.
[23] Recall that all 420 respondents accepted the Career Starter Loan, but not all chose to invest.

followed by savings (23 percent), and vehicle purchases (16 percent). Splitting the data by gender reveals that men were more likely to invest than women (46 percent to 39 percent), with the difference made up by additional savings by women (i.e. all other categories are similar for both genders). Sample averages conditional on family income indicate that students from wealthier backgrounds (families earning more than $100,000 annually) cumulatively invested 50 percent of their loans, while their less wealthy counterparts only invested 40 percent. The discrepancy is explained by the less wealthy group's extra transfers to family (6.2 percent compared to 1.9 percent for the wealthy group), spending on durable goods (5.9 percent to 4.3 percent), and spending on nondurable goods (4.2 percent to 3.6 percent). We also find that the 122 respondents who held prior assets invested far more of their loan dollars than those with none (55 percent to 40 percent), with the difference made up primarily by extra savings, transfers, and consumption. Similar data stratifications by other categories show that individuals with a greater CRT score, GPA, and SAT invest more and save less. The only notable difference in the sample averages for MBTI is that "judgers" (J) invested 44 percent of their loans, while "perceivers" (P) invested only 37 percent.

The descriptive statistics provide limited conclusions. For example, it is quite likely that students holding prior assets are also those from wealthier backgrounds. Next, we aim to see which characteristics continue to explain investment behavior after conditioning on all relevant observable information. Here, we calculate three mutually exclusive percentages categorizing students' usage of loan funds:

1. Investment (percentage of USAA loan ($36,000) invested, or percentage of NFCU loan ($32,000) invested)
2. Savings (percentage of loan deposited in a savings or a checking account)
3. Consumption (percentage of loan spent on a vehicle, durable goods, or nondurables)

These percentages are the dependent variables in simple regressions specified by Equation (1) below. In the specifications, $LoanPct_i$ is one of the three items from the list above; $Demo_i$ is the set of personal characteristics and family background variables for respondent *i*; $FinBack_i$ is the respondent's financial background information, such as financial literacy and advice sources; $LoanDetail_i$ includes other

important details regarding the individual's loan, such as USAA versus NFCU; $u_i$ contains all unobserved factors correlated with $LoanDetail_i$. We assume a linear model of the form:

$$LoanPct_i = \alpha Demo_i + \beta FinBack_i + \gamma LoanDetail_i + u_i \qquad (1)$$

Table 4 presents coefficient estimates and standard errors for the full set of covariates from six different specifications. We estimate Tobit models (with a lower bound of zero) for each of the three dependent variables. We consider Tobit models in addition to basic OLS because, as seen in Figure 1, many respondents chose the extreme values for their allocations (invested all of the loan, consumed none of the loan, etc.). Thus while OLS coefficients may be easier to interpret, they are likely biased because the outcome variables are, in essence, truncated from below. All standard errors account for the known, finite size of our population.

Personal traits and demographic background characteristics remain important predictors of loan usage, conditional on the full set of observables. Of our three cognitive ability measures, CRT is the most significant, but only for the investment and consumption models. On average, individuals who answer an additional CRT question correctly invest about three more percentage points of their loans, holding other covariates fixed. Note that the discrepancy between OLS and Tobit estimates (3.1 to 3.7) is relatively small, so hereafter, for estimates with only small discrepancies (between OLS and Tobit), we adopt the much simpler OLS interpretation.[24] Aside from SAT score, which maintains a small, negative association with savings, other cognitive ability measures are not significant. Most previous studies examine adults, and therefore do not use SAT or GPA as controls. The result on CRT is consistent with Christelos et al. (2006).

MBTI results suggest that "thinkers" (T) invest less (and save more) than "feelers" (F). Investment coefficients for "judgers" (J) are positive, as the literature suggests, but insignificant. The simple averages mentioned at the beginning of this subsection had suggested such an effect, but it

[24] In this particular case, we cannot claim that the OLS estimate is biased downwards, because the Tobit coefficient has a more nuanced interpretation. As guided by McDonald and Moffitt (1980), given a one point change in the CRT score, the Tobit coefficient represents an *additive combination* of: (1) the change in $LoanPct_i$ for those with nonzero $LoanPct_i$, weighted by the probability of having nonzero $LoanPct_i$, and (2) the change in probability of having nonzero $LoanPct_i$, weighted by the expected $LoanPct_i$ for those with nonzero $LoanPct_i$.

vanishes after controlling for other characteristics. We also observe no statistically significant differences in the investment, savings, or consumption behavior of women versus men, despite the discrepancy in the descriptive statistics. It is possible that these estimates are insignificant due to the particularly small sample of women. Notably, although still insignificant, the gender coefficients in the savings models are the largest of the six, indicating that women may indeed save more, as suggested by Pålsson (1996) and Eckel et al. (2005). In line with the stylized facts, we continue to see that students from wealthier backgrounds tend to invest greater proportions (and save or consume smaller proportions of their loans); estimates are not precise enough to state whether these effects are increasing in family wealth. This is consistent with Riley and Chow (1992) and Eckel et al. (2005).

Similar to the findings of Doran et al. (2010), several financial background characteristics are strongly related to loan usage decisions. Percentage invested increases as the "objective" financial literacy score increases. This coefficient is comparable in size to that of "subjective" self-reported literacy, which is on a much larger ten point scale. This suggests that although both are important, confidence in one's financial ability may more strongly drive one's choice to invest rather than objective financial knowledge. The opposite effects hold for the savings decision but not for consumption. Additionally, we find strong evidence that students receiving professional financial advice and those performing their own research invest a much higher percentage of their loan that those who do not.

We estimate significant differences for juniors versus seniors, likely reflecting the timing of loan allocation decisions. USAA loan-takers invest more and save less, compared to NFCU loan-takers, likely due to both the larger size of the USAA loan and the idea that students who are willing to wait three months to obtain the superior loan may also be more likely to invest it.[25] Also from the results in Table 4, it is not clear if individuals holding prior debt use the loan to pay down that debt, as we find that they invest and save less (by 6 and 13 percentage points, respectively), but also spend more (by about 15 percentage points) than their non-indebted counterparts. In other words, the individuals who spent to the point of indebtedness before the loan also tend to spend more after.

[25] Recall the information in Table 1 on the two offerings' timing differences.

**4.2 Investment Allocation Decision**

The data allows us to decompose respondents' investments into more specific categories. In this subsection, we analyze data only from individuals who chose to invest a nonzero amount of their CSLs (318 respondents). We begin with some basic descriptive statistics, as in the previous subsection.

Students appropriated a clear majority of loan investments in mutual funds (54 percent), followed by stocks (22 percent), "other" (7.8 percent),[26] bonds (6.4 percent), CDs (6.4 percent), options (3 percent), and penny stocks (0.24 percent). Simple cuts of the data reveal that men and women invested similarly in mutual funds, but men allocated more investment dollars into stocks than women (23 percent of all investment dollars for men, 16 percent of all investment dollars for women). We do not observe notable differences in investment choices with respect to family income, but students with investments prior to the loan invested much more of it in stocks (32 percent for those with prior investments to 16 percent for those without). For both SAT and GPA, students above the sample median allocated about ten additional percentage points into mutual funds (rather than stocks) compared to their counterparts below the median. We find no differences in the sample averages of investment types for students who scored differently on the CRT. Likewise, we find only small discrepancies in mutual fund investment proportions for the four MBTI dichotomies, but we do observe that those who favor intuition (N) invest in proportionately more stocks than those who favor sensing (S), by about ten percentage points. As in the previous subsection, it is quite likely that many of these characteristics are interrelated, so we next condition on the full set of characteristics to disentangle any selection on observables.

As before, we consider six regression specifications; we estimate OLS and Tobit models for three different dependent variables:[27]

1. Percent of CSL investments invested stocks

[26] Students indicated in an open fill-in blank for "other" that these types of investments predominantly included IRAs, real estate, or ETFs,

[27] It is important to highlight that the denominator is the same for each of the three dependent variables. It is *not* the total amount borrowed; it is the total amount of the CSL that was invested.

2. Percent of CSL investments invested in mutual funds

3. Percent of CSL investments invested in Bonds or CDs

Figure 1 displays distributions of the three variables. For stocks and mutual funds, there is substantial grouping at both extremes, so we estimate Tobit models with both upper and lower bounds. Additionally, these distributions depict a wide dispersion of investment allocations despite the similarities inherent to individuals in our sample (age, education level, income, and career). Such homogeneity may enable our simple reduced form estimation strategy to tease out important factors that previous studies may have missed.

Table 5 displays results from the regressions of the following form, where $InvestPct_i$ refers to one of the three dependent variables from the list above and the remaining variables are as defined in Equation (1):

$$InvestPct_i = \alpha Demo_i + \beta FinBack_i + \gamma LoanDetail_i + u_i \qquad (2)$$

We do not observe statistically significant differences in investment choices with respect to cognitive ability measures, although coefficients are predominantly negative for stocks' specifications and positive for mutual funds'. Economics majors tend to invest move heavily in stocks and less heavily in bonds and CDs, particularly compared to those majoring in the humanities and social sciences.

We find strong evidence that respondents with an orientation for sensing (S) invest a smaller proportion of their loan in stocks and a larger proportion in bonds and CDs (in these cases the Tobit estimates are much larger than OLS estimates). We also observe that "judgers" (J) choose a larger percentage of stocks than their counterparts, but it is unclear if their additional equity comes at the expense of mutual funds or bonds and CDs.[28] Lastly, we find weak evidence that "thinkers" (T) invest smaller proportions in mutual funds, but again it is unclear if they choose stocks or bonds and CDs instead. It is not surprising that this result is weaker, as the previous section noted that "thinkers" were, in general, less likely to invest their money.

[28] In the previous subsection, we obtained statistically insignificant but positive estimates for "judgers," implying that they tend to invest in greater proportions, versus savings or consumption.

Other notable background characteristics include family income and planning horizon information (as captured by "expected years to having kids"). We see that students from families earning under $80,000 select much larger proportions of bonds or CDs (45 to 63 percentage points in the Tobit model), but there are no similar trends for stocks or mutual funds. We also find that those with an uncertain or longer planning horizon invest larger percentages in mutual funds and smaller percentages in bonds and CDs (also coefficients for stocks' models are all positive, but insignificant). In other words, those who plan to have children soon are less likely to invest in riskier assets.

Financial literacy does not play as large a role as in the previous subsection. In these models, most literacy variables' coefficients are insignificant; conditional on having invested, our two indicators do not capture any major differences in investors' ensuing choices. We do, however, continue to see that sources of financial advice are very important. Those who consulted financial advisors strongly favor mutual fund investments over picking stocks, as do those who consulted friends or family. Lastly, it is not surprising to see stock-heavy investors more frequently obtaining guidance from the news or personal market research.

**4.3 Analysis of Portfolio Risk Preferences**

This subsection analyzes the overall risk of individuals' investment portfolios. We consider the sample of 335 respondents who either invested via the CSL or possessed prior asset holdings (or both). To capture "general risk" of a portfolio, we calculate a simple weighted sum of investment dollars for each respondent. The weighting scheme is as follows:

1. We calculate respondents' complete portfolios by combining investment categories (stocks, bonds, etc.) from the CSL with investment categories from prior investments.
2. In each respondent's complete portfolio, we calculate the ratio of "high risk investments" (penny stocks and options) to total investments (let this be $HighRiskRatio_i$), the ratio of stocks

to total investments ($StocksRatio_i$), the ratio of mutual funds to total investments ($MutFundsRatio_i$), and the ratio of bonds and CDs to total investments ($BondsCDsRatio_i$).

3. We define and calculate a "risk weight" for each individual:

$$RiskWeight_i = (2 \times HighRiskRatio_i) + (1 \times StocksRatio_i) + (0.5 \times MutFundsRatio_i) + (0 \times BondsCDsRatio_i)$$

4. We define and calculate *portfolio risk* by multiplying $RiskWeight_i$ by the size of each individual's complete portfolio (in dollars).

There are two main caveats related to the *portfolio risk* metric. First, we can at best interpret its units as the number of "risk-weighted dollars invested." This draws attention to the second caveat, that the weighting scheme is subjective. We believe, however, that these weights are natural, particularly in their simplicity.[29] We have checked the sensitivity of all forthcoming results to reasonable changes in the weighting scheme; we find very few qualitative differences. As one would expect, coefficients' magnitudes change as the weighting scheme changes. The top panel of Figure 2 presents the distribution of the $RiskWeight_i$ variable defined above, and the bottom panel displays the distribution of our *portfolio risk* measure. Similar to the other measures of investment behavior, we continue to observe substantial variation in these metrics, despite respondents' individual similarities.

Table 6 presents estimation results from three pairs of models, all with *portfolio risk* as the dependent variable. The first pair contains OLS and Tobit models of *portfolio risk* regressed on only background and demographic characteristics ($Demo_i$ in Equations (1) and (2)). The second pair adds controls for financial information ($FinBack_i$ and $LoanDetail_i$), and the third pair adds variables on respondents' subjective expectations to gain, lose, or break even[30] (Table 3 shows their summary statistics). Of the cognitive ability measures, CRT is strongly significant and positive in all models. This

[29] With the weighting scheme, we force penny stocks and options to be twice as risky as regular stocks, and regular stocks to be twice as risky as mutual funds. It is reasonable to assign some risk to mutual funds; while they are typically considered safe investments, (1) students in our sample have a short (five year) repayment horizon, so they bear more risk than a long term mutual fund investor, and (2) there are many types of mutual funds at various risk levels. We assign zero risk to bonds and CDs.

[30] If "break even" equals one, then the gain and loss variables are zero. If, for instance, reported gain percentage is 3 percent, then loss percentage and the break even dummy are equal to zero.

is consistent with Christelos et al. (2006), who find that individuals with higher cognitive ability are better at assessing risk, and with Dohmen et al. (2007), who link greater cognition to less risk aversion. Family income indicators are also significant, with dummy coefficients generally decreasing in magnitude as income increases. We do not find statistically significant results for MBTI categories, but the signs of estimates agree with previous results; individuals oriented towards sensing (S) take on 1,525 fewer risk-weighted dollars, on average, and those oriented towards judging (J) take on 1,920 more risk-weighted dollars, on average. In the specifications with financial controls, financial literacy and advice information are no longer crucial explanatory variables. Students' planning horizons, if either uncertain or long, are strongly associated with riskier portfolios.

Another interesting exercise is to view the changes in estimates as we add more controls. The variables for individuals' expected annual gain, loss, and the break even dummy likely contain both "subjective" information on individuals' "exuberance" regarding their investment choices and "objective" information on such choices' historical returns. With these variables' inclusion, estimates of CRT's coefficient decrease by about 25 percent, suggesting that financial background and reported expected returns explain only about one-quarter of CRT's relationship to portfolio risk. Previously significant effects from college major choice vanish, but there are no other noteworthy differences among the three pairs of models.

Table 7 presents an alternate technique to study the factors affecting respondents' general portfolio risk preferences, where the dependent variable (in all six models) is individuals' expected annual gain percentage.[31] The first pair of models presents OLS and Tobit results controlling only for demographic and personality variables, and the second pair adds financial controls. The third of models pair adds covariates—$HighRiskPct_i$, $StocksPct_i$, $MutFundsPct_i$, $BondsCDsPct_i$—in order to condition out the "objective" component of expected gain that is naturally associated with portfolio risk. In other

[31] If an individual expects to break even or lose, then this variable is set equal to zero, so again, we estimate Tobit models with a lower bound of zero.

words, in the final pair of models, since we hold the "objective" part of expected gain constant,[32] all other coefficient estimates reflect relationships between variables and *only* the "subjective" component of respondents' expected gains (i.e. their "exuberance" about their portfolios). We do not find that students with higher CRT scores are more optimistic about their gains, nor do we find any significant MBTI or family income categories. We obtain strong evidence that economics majors are more exuberant than their STEM and humanities major peers, and we also see that students with higher levels of (both objective and subjective) financial literacy and those who consulted a financial advisor subjectively expect higher returns to their investments.

## 5 Conclusion

In this paper, we study novel data on the investment behavior of young adults. Students at USNA may accept a large, low interest rate, no-collateral, non-credit constrained personal loan during their junior or senior years. This provides us with a rare opportunity to study college-aged individuals' investment decisions, as most comparable young adults do not have assets to invest due to poor credit or low earnings. Another unique aspect of our data is that we naturally condition on characteristics that, if unobserved, typically confound results; age, income, education level, and marital status are constant because all survey respondents are unmarried juniors and seniors at USNA and all have nearly identical income streams and job security. Additionally, the source of students' investments funds—the CSL—is exogenously provided in equal size to all recipients. We obtain a broad range of data, including students' demographic backgrounds, personal characteristics, financial backgrounds, investment histories, and detailed information on their loan allocation decisions. We examine the relationships of these factors to (1) the initial decision on how much to invest, save, or consume, (2) the decision on how to allocate investments once the choice to invest has been made, and (3) the overall risk carried by individuals' portfolios.

[32] Individuals' portfolio breakdown variables proxy for the "objective" part of expected gain.

To summarize our main results, we find that standard measures of cognitive ability, such as SAT and GPA, are not significant predictors of investment decisions. CRT score, however, is strongly and positively associated with more investment and more risky choices, but it is not tied to our subjective measure of "portfolio exuberance." Students from wealthier backgrounds invest more and with more risk, while students with superior financial literacy also tend to invest more—typically in mutual funds—and they are more optimistic, on average, about potential investment returns. Students with shorter planning horizons are more likely to choose less risky assets. Lastly, using MBTI scores, we find that those oriented towards thinking (T) invest less, holding all other characteristics constant, and those oriented towards intuition (I) and judging (J) are more likely to pick stocks.

In general, our results are very consistent throughout the series of analyses, with no notable examples of conflicting relationships. There are, however, a number of cases where we may not have enough power in our hypothesis tests. For instance, we observe that "judgers" (J) tend to pick more stocks, but we do not obtain a comparable result in our analyses of *portfolio risk*. Another important caveat is that many of the regression parameters, although significant, have large confidence intervals, so interpretations of their magnitudes may be tenuous. We believe that the most interesting results herein are behavioral in scope, which is reflected by sign and significance of parameters, but it is reasonable to think that we have missed a number of effects. Currently, we do not have enough data to tease out subtler relationships, but we hope to continue to collect it for future cohorts of students at USNA. Additional waves of data would open a number of new avenues for future research. Panel data analyses would permit us to observe short-term portfolio changes, as students transition from their junior to senior year. With more data, we could search for interactions between cognition, personality traits, demographics, and financial background, and we could check for changing trends over time in investment behavior.

A unifying theme of our findings is that "better preparation" (i.e. higher cognitive ability, more financial training, more specific life-event planning) is associated with "more optimal investing," in the sense that young investors "should be" maximizing their returns by investing in equity markets and other assets with high long-term yields. In other words, we concretely observe that college-age individuals

invest effectively when given the tools to do so. Ideally, this research will help to inform policy on how to target, assist, and improve financial planning for young adults.

**References**

Armao, A. *Broke in America: Are record high student loan debts the next mortgage crisis?!?* July 18, 2012. Available at: http://globalgrind.com/news/record-high-student-loan-debts-next-mortgage-crisis-details

Charness, G., Gneezy, U. 2003. Portfolio choice and risk attitudes: An experiment. *UC Santa Barbara Working paper 02-20-2003.* http://www.escholarship.org/uc/item/7vz7w609

Choi, J., Laibson, D., Madrian, B. 2005. $100 bills on the sidewalks: Suboptimal investment in 401(K) plans. *NBER Working Paper* 11554.

Christelos, D., Jappelli, T., Padula, M. 2006. Cognitive abilities and portfolio choice. *CSEF Working Paper* 157 (Centre for Studies in Economics and Finance).

Constantinides, G., Donaldson, J., Mehra, R. 2002. Junior can't borrow: A new perspective on the equity premium puzzle. *Quarterly Journal of Economics* 117, 269-296.

Davis, S., Kubler F., Willen, P. 2005. Borrowing costs and the demand for equity over the life cycle. *Federal Reserve Bank of Boston Working Papers* 2005-7 (Federal Reserve Bank of Boston).

Dohmen, T., Falk, A., Huffman, D., Sunde, U. 2007. Are risk aversion and impatience related to cognitive ability? *IZA Discussion Paper* 2735.

Doran, J., Peterson, D., Wright C. 2010. Confidence, opinions, market efficiency, and investment behavior of finance professors. *Journal of Financial Markets* 13, 174-195.

Eckel, C., Johnson, C., Montmarquette, C. 2005. Saving decisions of the working poor: Short- and long-term horizons. *Field Experiments in Economics: Research in Experimental Economics* 10, 219-260.

Eckel, C, Johnson, C., Montmarquette, C., Rojas C. 2007. Debt aversion and the demand for loans for postsecondary education. *Public Finance Review*, 35(2), 232-262.

Filbeck, G., Hatfield, P., Horvath, P. 2005. Risk aversion and personality type. *Journal of Behavioral Finance* 6(4), 170-180.

Frederick, S. 2006. Cognitive reflection and decision making. *Journal of Economic Perspectives* 19(4), 25-42.

Gallup News Service. "Best investment." *Gallup Poll Social Series: Economy and Personal Finance.* April 7-11, 2011.

Gerrans, P., Clark-Murphy, M.. 2004. Gender differences in retirement savings. *Journal of Pension Economics and Finance* 3(1), 145-164.

Guo, H. 2001. A simple model of limited stock market participation. *Federal Reserve Bank of St. Louis Working Paper.*

Hammer, A., Mitchell, W. 1996. The distribution of MBTI types in the U.S. by gender and ethnic group. *Journal of Psychological Type* 37, 2-15.

Holt C., Laury S. 2002. Risk aversion and incentive effects. *American Economic Review*, 95(5), 1644-55.

Insler, M., Compton, J., Schmitt, P. 2013. Does everyone accept a free lunch? Decision making under (almost) zero cost borrowing. Unpublished manuscript.

Jianakoplos, A., Bernasek, A. 1998. Are Women More Risk Averse? *Economic Inquiry* 36, 620-630.

Jung, C.G, 1923. *Psychological Types*. Princeton, NJ: Princeton University Press.

Langer, E. 1975. The illusion of control. *Journal of Personality and Social Psychology* 32, 311-328.

Li, S., Liu, C. 2008. Individual differences in a switch from risk-averse preferences for gains to risk-seeking preferences for losses: Can personality variables predict the risk preferences? *Journal of Risk Research* 11(5), 367-686.

McDonald, J., Moffitt, R. 1980. The uses of Tobit analysis. *Review of Economics and Statistics* 62(2), 318-321.

Myers, I., McCaulley, M., Quenk, N., Hammer, A. 1998. *MBTI Manual: A Guide to the Development and Use of the Myers-Briggs Type Indicator*. Palo Alto, CA: Consulting Psychologists Press.

Newport, F., interview by Ryssdal, K.. *Where Today's Americans are Investing their Money*. Marketplace. April 19, 2012.

Pålsson, A. 1996. Does the degree of relative risk aversion vary with household characteristics? *Journal of Economic Psychology* 17, 771-787.

Pingue, L. *Can you pass a high school financial literacy test?* March 9, 2011. Reuters.

Riley, W., Chow, K. 1992. Asset allocation and individual risk aversion. *Financial Analysts Journal* 48(6), 32-37.

Schooley, D., Worden, D. 1999. Investors' asset allocation versus life-cycle funds. *Financial Analysts Journal* 55, 37-43.

Sivy, M. *Do We Have Another Financial Bubble On Our Hands? Or Three?* Dec. 19, 2012. Available at: http://business.time.com/2012/12/19/do-we-have-another-financial-bubble-on-our-hands-or-three/

Su-li, Z. Ke-fan, X. 2010. Research on entrepreneurial team members' personality traits influence on group decision-making. *2010 International Conference on Management Science and Engineering (ICMSE)*14, 24-26.

U.S. Department of the Treasury. *Daily Treasury Yield Rate Curves.* 2012. Available online.

Yang, Z., Coble, K., Hudson, M. 2009. The roles of individual personality types in subjective risk elicitation outcome. *Journal of Risk Research* 12(2), 209-222.

Table 1: Career Starter Loan Details

| Lender: | NFCU | USAA |
|---|---|---|
| Availability: | August of junior year | October-November of junior year |
| Principal Amount: | $32,000 | $36,000 |
| Rate: | 1.25% APR | 0.75% APR |
| Monthly Repayment: | $564.97 | $619.80 |
| Terms: | 60 months | 60 months |
| Total Repayment: | $33,898.20 | $37,636.20 |
| Offer Window: | Closes at graduation | Closes one year after graduation |

Table 2: Summary Statistics (Background Information)

| Variable | Mean | Standard Deviation |
|---|---|---|
| Class of 2013 (alternative: 2014)* | 0.46 | 0.50 |
| Female* | 0.21 | 0.41 |
| SAT (combined math and verbal) | 1327 | 137 |
| GPA | 3.1 | 0.6 |
| CRT* | 1.8 | 1.1 |
| Major: Economics* | 0.14 | 0.35 |
| Major: STEM* | 0.65 | 0.48 |
| Major: Other* | 0.20 | 0.40 |
| MBTI: Extrovert (vs. introvert)* | 0.53 | 0.50 |
| MBTI: Sensing (vs. intuition)* | 0.70 | 0.46 |
| MBTI: Thinking (vs. feeling)* | 0.81 | 0.39 |
| MBTI: Judging (vs. perceiving)* | 0.63 | 0.48 |
| Family Income* | | |
| $40,000 or less | 0.08 | 0.27 |
| $40,001 to $60,000 | 0.11 | 0.31 |
| $60,001 to $80,000 | 0.11 | 0.31 |
| $80,001 to $100,000 | 0.13 | 0.34 |
| $101,001 to $120,000 | 0.14 | 0.34 |
| $120,001 or more | 0.29 | 0.45 |
| No response | 0.15 | 0.36 |
| Expected years to having kids** | 6.6 | 2.5 |
| Self-reported financial literacy (1-10 scale) | 5.9 | 1.8 |
| Financial literacy questions score (0-2 scale) | 1.7 | 0.6 |
| USAA loan (alternative: NFCU loan)* | 0.88 | 0.32 |
| Advice: Financial advisor* | 0.52 | 0.50 |
| Advice: Friends/family* | 0.51 | 0.50 |
| Advice: News sources* | 0.12 | 0.33 |
| Advice: Personal research* | 0.41 | 0.49 |
| Advice: Other* | 0.06 | 0.23 |
| Number of Observations: | | 420 |

Note: *Binary variable: denotes sample proportion. **Conditional on not reporting "uncertain" (317 respondents did not report "uncertain"). Standard deviations account for the finite, known population size. Section 3 provides descriptions of the data and the sample restrictions.

Table 3: Summary Statistics (Financial Information)

| Variable | Unconditional | | Conditional (on being > 0 ) | | |
|---|---|---|---|---|---|
| | Mean | Standard Deviation | Mean | Standard Deviation | Count > 0 |
| Expects to break even* | 0.31 | 0.46 | | | |
| Expected annual gain (%) | 4.8 | 5.3 | 7.7 | 4.8 | 265 |
| Expected annual loss (%) | 0.4 | 2.0 | 7.0 | 4.9 | 25 |
| Annual transfer from family ($) | 1,097 | 1,718 | 1,530 | 1,860 | 301 |
| Annual transfer to family ($) | 385 | 1,936 | 1,325 | 3,424 | 122 |
| Debt holdings prior to loan offer ($) | 270 | 1,340 | 2,980 | 3,470 | 38 |
| Prior Investments: Total (all in $) | 3,405 | 8,996 | 11,723 | 13,488 | 122 |
| Stocks | 714 | 4,128 | 5,764 | 10,503 | 52 |
| Penny stocks | 18 | 190 | 1,283 | 1,040 | 6 |
| Options | 74 | 816 | 5,167 | 4,916 | 6 |
| Bonds | 93 | 1,068 | 6,500 | 6,753 | 6 |
| Mutual funds | 1,173 | 4,620 | 9,292 | 9,752 | 53 |
| CDs | 312 | 1,893 | 5,240 | 5,970 | 25 |
| Savings account | 501 | 2,035 | 4,474 | 4,423 | 47 |
| Checking account | 155 | 874 | 2,100 | 2,541 | 31 |
| Other | 317 | 2,765 | 10,240 | 12,523 | 13 |
| Career Starter Loan Allocation (all in $) | | | | | |
| Invested | 15,574 | 12,302 | 20,570 | 9,847 | 318 |
| Saved | 7,953 | 9,045 | 10,471 | 9,019 | 319 |
| Debt payment | 405 | 1,338 | 2,658 | 2,412 | 64 |
| Vehicle purchase | 5,757 | 8,103 | 13,584 | 6,966 | 178 |
| Other durable goods | 1,868 | 2,610 | 3,114 | 2,735 | 252 |
| Nondurable goods | 1,354 | 2,328 | 2,871 | 2,674 | 198 |
| Transfer to family | 1,486 | 5,415 | 8,551 | 10,461 | 73 |
| Other | 815 | 3,101 | 5,107 | 6,228 | 67 |
| Career Starter Loan's Investment Component's Breakdown (all in $) | | | | | |
| Stocks | 4,411 | 8,680 | 12,636 | 10,594 | 111 |
| Penny stocks | 47 | 388 | 1,881 | 1,698 | 8 |
| Options | 605 | 3,033 | 9,625 | 7,882 | 20 |
| Bonds | 1,284 | 4,177 | 9,279 | 7,260 | 44 |
| Mutual funds | 10,866 | 10,970 | 16,071 | 9,707 | 215 |
| CDs | 1,275 | 4,016 | 7,649 | 6,974 | 53 |
| Other | 1,560 | 4,351 | 8,704 | 6,622 | 57 |
| Number of Observations: | | 420 | | | |

Note: *Binary variable: denotes sample proportion. Standard deviations account for the finite, known population size. Section 3 provides descriptions of the data and the sample restrictions.

Table 4: Regression Results for Investment/Savings/Consumption Decision

| Dependent Variable: | Percent of CSL Invested | | Percent of CSL Saved | | Percent of CSL Consumed | |
|---|---|---|---|---|---|---|
| | OLS | Tobit | OLS | Tobit | OLS | Tobit |
| Class of 2013 (alternative: 2014) | -7.240*** | -8.497*** | 1.579 | 0.670 | 8.382*** | 11.70*** |
| | (2.572) | (3.274) | (2.165) | (2.787) | (2.190) | (2.808) |
| Female | 0.184 | 0.0659 | 2.734 | 4.967 | -3.076 | -0.917 |
| | (3.535) | (4.723) | (3.141) | (3.631) | (3.030) | (3.657) |
| SAT | 0.0159 | 0.0216 | -0.0169* | -0.0222* | 0.00458 | 0.0153 |
| | (0.0129) | (0.0174) | (0.00940) | (0.0123) | (0.0113) | (0.0142) |
| GPA | -0.215 | 0.270 | 0.761 | 1.127 | -1.180 | -3.931 |
| | (3.174) | (4.320) | (2.444) | (3.101) | (2.789) | (3.522) |
| CRT | 3.091** | 3.703** | -0.881 | -1.177 | -2.008* | -2.480* |
| | (1.281) | (1.642) | (1.091) | (1.335) | (1.048) | (1.332) |
| Major: STEM | -1.546 | -4.134 | -3.082 | -3.642 | 4.809 | 5.208 |
| | (3.861) | (4.933) | (3.238) | (4.228) | (3.050) | (3.939) |
| Major: Other | 3.913 | 3.347 | -2.852 | -4.421 | -0.602 | -1.633 |
| | (4.556) | (5.769) | (4.038) | (5.158) | (3.771) | (4.830) |
| Major: Economics | ref. group | ref. group | ref. group | ref. group | ref. group | ref. group |
| MBTI: Extrovert (vs. introvert) | 0.642 | -0.0385 | 0.0231 | -0.878 | 1.389 | 2.021 |
| | (2.599) | (3.372) | (2.198) | (2.792) | (2.259) | (2.878) |
| MBTI: Sensing (vs. intuition) | -2.236 | -2.989 | 1.741 | 1.743 | 0.390 | 2.610 |
| | (2.794) | (3.570) | (2.151) | (2.765) | (2.389) | (3.155) |
| MBTI: Thinking (vs. feeling) | -4.178 | -6.917* | 0.675 | 1.627 | 4.040 | 6.951** |
| | (3.191) | (4.096) | (2.700) | (3.432) | (2.675) | (3.463) |
| MBTI: Judging (vs. perceiving) | 3.590 | 5.234 | -1.363 | -1.864 | 0.531 | -0.509 |
| | (2.808) | (3.685) | (2.381) | (2.937) | (2.337) | (2.918) |
| Family Inc.: $40,000 or less | 0.487 | 3.823 | 3.450 | 3.591 | -5.558 | -8.077 |
| | (5.501) | (7.060) | (4.524) | (5.581) | (4.376) | (5.863) |
| Family Inc.: $40,001 to $60,000 | -8.924* | -13.28** | 2.760 | 3.938 | 0.182 | -0.349 |
| | (4.779) | (6.578) | (3.713) | (4.788) | (4.293) | (5.308) |
| Family Inc.: $60,001 to $80,000 | -1.972 | -1.414 | 0.228 | 0.133 | 1.171 | 2.533 |
| | (4.619) | (6.007) | (3.564) | (4.613) | (3.867) | (4.677) |
| Family Inc.: $80,001 to $100,000 | -3.107 | -3.767 | 1.768 | 0.496 | -1.174 | -2.518 |
| | (4.579) | (5.784) | (3.729) | (4.821) | (3.670) | (4.663) |
| Family Inc.: $101,001 to $120,000 | -7.024* | -7.101 | 4.940 | 6.785 | 0.852 | 1.677 |
| | (3.741) | (4.591) | (3.443) | (4.121) | (3.610) | (4.585) |
| Family Inc.: $120,001 or more | ref. group | ref. group | ref. group | ref. group | ref. group | ref. group |
| Family Inc.: No response | -0.981 | -0.0716 | -0.137 | -3.547 | 0.242 | -0.845 |
| | (4.422) | (5.490) | (3.815) | (5.188) | (3.677) | (4.670) |
| Self-reported fin. literacy (1-10 scale) | 2.070** | 2.981*** | -2.590*** | -3.455*** | 0.0517 | -0.162 |
| | (0.860) | (1.133) | (0.779) | (1.000) | (0.746) | (0.952) |
| Fin. Lit. questions score (0-2 scale) | 3.223 | 5.434* | -4.255* | -5.388* | 1.400 | 1.160 |
| | (2.320) | (3.284) | (2.402) | (2.775) | (2.298) | (2.922) |
| USAA loan (vs. NFCU loan) | 13.30*** | 16.51*** | -2.208 | -2.082 | -11.90*** | -15.49*** |
| | (4.184) | (5.929) | (3.607) | (4.467) | (3.655) | (4.270) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Advice: Financial advisor | 23.61*** | 33.16*** | -7.547*** | -8.941*** | -12.79*** | -15.69*** |
| | (2.720) | (3.583) | (2.307) | (2.917) | (2.410) | (2.989) |
| Advice: Friends/family | 1.317 | 2.458 | 3.429 | 4.736* | -4.563** | -6.099** |
| | (2.739) | (3.454) | (2.221) | (2.827) | (2.250) | (2.885) |
| Advice: News sources | 0.343 | 0.563 | -1.280 | -0.308 | 1.998 | 2.904 |
| | (4.259) | (5.088) | (2.905) | (3.871) | (3.707) | (4.914) |
| Advice: Personal research | 9.457*** | 13.35*** | 1.562 | 3.247 | -6.259** | -7.658** |
| | (3.083) | (3.898) | (2.510) | (3.241) | (2.575) | (3.291) |
| Advice: Other | -6.469 | -14.38* | 2.687 | 2.511 | -1.835 | -3.940 |
| | (4.955) | (8.689) | (5.474) | (6.834) | (5.300) | (6.437) |
| No transfer from family | -4.486 | -4.740 | -1.075 | -1.101 | 2.486 | 2.472 |
| | (3.035) | (4.077) | (2.669) | (3.406) | (2.777) | (3.505) |
| Annual x-fer from fam. (hundreds $) | 0.0887 | 0.117 | -0.0407 | -0.108 | 0.0457 | 0.0421 |
| | (0.0976) | (0.116) | (0.0552) | (0.0921) | (0.0800) | (0.105) |
| No transfer to family | 3.513 | 1.544 | 3.260 | 2.265 | -3.816 | -4.736 |
| | (2.999) | (4.411) | (2.428) | (3.170) | (2.658) | (3.374) |
| Annual x-fer to fam. (hundreds $) | -0.0969* | -0.454** | -0.0434 | -0.0807 | -0.112*** | -0.116*** |
| | (0.0522) | (0.229) | (0.0335) | (0.0742) | (0.0315) | (0.0400) |
| Expected yrs. to having kids (unsure) | 10.35** | 12.26* | 3.683 | 5.428 | -9.087** | -12.46** |
| | (4.902) | (6.248) | (3.805) | (4.883) | (4.188) | (5.329) |
| Expected years to having kids | 0.631 | 0.536 | 0.327 | 0.510 | -0.620 | -0.871 |
| | (0.598) | (0.758) | (0.416) | (0.549) | (0.504) | (0.652) |
| Held debt prior to loan offer | -6.194* | -6.372 | -13.14*** | -16.99*** | 14.56*** | 16.78*** |
| | (3.737) | (5.652) | (2.491) | (3.953) | (4.308) | (4.839) |
| Held investments prior to loan offer | 7.089** | 8.928** | -2.785 | -6.436* | -3.950 | -5.109 |
| | (2.970) | (3.592) | (2.446) | (3.350) | (2.609) | (3.314) |
| Constant | -28.76* | -57.64*** | 67.35*** | 77.72*** | 42.18*** | 37.85** |
| | (15.87) | (21.59) | (12.12) | (15.88) | (12.68) | (16.02) |
| Number of Observations: | 420 | 420 | 420 | 420 | 420 | 420 |

Note: * p<.10, ** p<.05, *** p<.01. Results are from the full sample of loan-takers. Standard errors account for the finite, known population size.

Table 5: Regression Results for Stocks/Mutual Funds/Bonds and CDs Decision

| Dependent Variable: | Percent of CSL Investments in Stocks | | Percent of CSL Investments in Mutual Funds | | Percent of CSL Investments in Bonds and CDs | |
|---|---|---|---|---|---|---|
| | OLS | Tobit | OLS | Tobit | OLS | Tobit |
| Class of 2013 (alternative: 2014) | 8.254** | 31.94** | -5.084 | -14.92 | 0.841 | -3.568 |
| | (3.194) | (13.65) | (4.022) | (10.46) | (2.585) | (10.84) |
| Female | -7.143 | -31.13 | 1.519 | 0.0846 | 1.884 | 17.54 |
| | (4.454) | (21.46) | (5.267) | (13.45) | (3.840) | (13.64) |
| SAT | -0.0120 | -0.0452 | 0.0101 | 0.0367 | -0.00909 | -0.0270 |
| | (0.0159) | (0.0606) | (0.0198) | (0.0518) | (0.0136) | (0.0542) |
| GPA | -4.966 | -15.65 | 6.989 | 16.32 | -2.739 | -9.129 |
| | (3.571) | (15.18) | (4.836) | (12.81) | (3.179) | (13.03) |
| CRT | -0.551 | -5.347 | -0.313 | 0.258 | -0.286 | -1.432 |
| | (1.657) | (6.845) | (1.942) | (5.097) | (1.279) | (5.046) |
| Major: STEM | -4.766 | -14.32 | 2.697 | 1.371 | 8.935*** | 26.83 |
| | (5.179) | (18.29) | (5.702) | (14.80) | (3.287) | (16.45) |
| Major: Other | -13.94** | -54.85** | -1.690 | -13.27 | 9.547** | 26.58 |
| | (5.879) | (22.19) | (7.051) | (18.69) | (4.312) | (19.43) |
| Major: Economics | ref. group | ref. group | ref. group | ref. group | ref. group | ref. group |
| MBTI: Extrovert (vs. introvert) | -0.836 | 6.961 | 0.0119 | 0.0590 | -1.428 | -7.330 |
| | (3.164) | (13.25) | (4.043) | (10.57) | (2.604) | (10.95) |
| MBTI: Sensing (vs. intuition) | -9.099** | -42.04*** | 4.246 | 9.970 | 4.956* | 20.47* |
| | (3.740) | (14.46) | (4.299) | (11.04) | (2.581) | (11.35) |
| MBTI: Thinking (vs. feeling) | 1.364 | 21.38 | -8.518* | -23.70* | 3.997 | 12.21 |
| | (4.184) | (19.30) | (5.063) | (13.76) | (3.369) | (14.19) |
| MBTI: Judging (vs. perceiving) | 8.304** | 36.94** | -5.904 | -13.96 | -1.016 | 6.095 |
| | (3.522) | (15.10) | (4.214) | (10.89) | (2.992) | (11.61) |
| Family Inc.: $40,000 or less | 1.777 | 25.35 | 9.863 | 25.73 | 8.923* | 45.72** |
| | (6.716) | (26.05) | (8.014) | (20.83) | (4.786) | (19.68) |
| Family Inc.: $40,001 to $60,000 | -1.051 | -4.152 | -2.854 | -7.163 | 14.56** | 62.96*** |
| | (6.530) | (30.29) | (7.276) | (19.73) | (6.006) | (22.54) |
| Family Inc.: $60,001 to $80,000 | 3.715 | 19.64 | -14.97** | -37.39* | 13.18** | 57.56*** |
| | (5.595) | (23.05) | (7.325) | (19.19) | (5.700) | (19.70) |
| Family Inc.: $80,001 to $100,000 | 2.983 | 23.86 | 0.0424 | 2.125 | 5.865 | 32.98* |
| | (5.468) | (22.56) | (6.905) | (17.76) | (4.394) | (17.46) |
| Family Inc.: $101,001 to $120,000 | -1.012 | 5.695 | 4.519 | 5.077 | 0.619 | 18.80 |
| | (4.645) | (20.57) | (6.357) | (16.05) | (3.953) | (18.03) |
| Family Inc.: $120,001 or more | ref. group | ref. group | ref. group | ref. group | ref. group | ref. group |
| Family Inc.: No response | 0.874 | 1.813 | -2.160 | -8.330 | -0.895 | 1.927 |
| | (5.305) | (21.26) | (6.527) | (17.11) | (3.968) | (19.57) |
| Self-reported fin. literacy (1-10 scale) | -1.845 | -9.661* | 1.419 | 1.802 | 0.117 | 2.378 |
| | (1.219) | (5.554) | (1.492) | (3.864) | (1.106) | (4.041) |
| Fin. Lit. questions score (0-2 scale) | -1.128 | 7.017 | 2.653 | 11.84 | -1.579 | -2.024 |
| | (3.653) | (17.34) | (4.260) | (11.58) | (3.453) | (11.26) |
| USAA loan (vs. NFCU loan) | -8.888 | -27.70 | 9.402 | 33.74 | 0.603 | 5.841 |
| | (6.729) | (27.51) | (6.901) | (20.52) | (4.152) | (16.89) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Advice: Financial advisor | -18.62*** | -65.12*** | 25.42*** | 67.39*** | -2.182 | -2.252 |
| | (3.618) | (15.24) | (4.547) | (12.44) | (3.312) | (12.84) |
| Advice: Friends/family | -8.989*** | -35.06** | 7.482* | 23.75** | 4.473* | 10.58 |
| | (3.343) | (13.96) | (4.105) | (10.85) | (2.441) | (10.61) |
| Advice: News sources | 10.62** | 48.55*** | -10.67* | -20.69 | 5.256 | 14.00 |
| | (4.726) | (16.86) | (5.967) | (15.20) | (4.057) | (14.88) |
| Advice: Personal research | 3.206 | 21.14 | -7.165 | -21.45* | 2.081 | 6.797 |
| | (3.350) | (14.28) | (4.793) | (12.47) | (2.971) | (12.41) |
| Advice: Other | -10.57 | -59.10 | -17.41* | -49.03 | 21.47* | 80.01** |
| | (12.70) | (56.39) | (10.10) | (29.91) | (12.94) | (39.08) |
| No transfer from family | -0.433 | -11.71 | 1.647 | 1.449 | -8.692*** | -33.29** |
| | (3.961) | (17.12) | (4.772) | (12.48) | (2.909) | (13.88) |
| Annual x-fer from fam. (hundreds $) | 0.0444 | 0.166 | 0.0100 | 0.0492 | -0.0211 | -0.0489 |
| | (0.103) | (0.405) | (0.137) | (0.365) | (0.0917) | (0.375) |
| No transfer to family | -0.00779 | 1.867 | 8.923 | 29.42** | 0.607 | -7.578 |
| | (4.097) | (17.25) | (5.450) | (14.50) | (3.370) | (13.05) |
| Annual x-fer to fam. (hundreds $) | 0.0519 | 0.244 | -0.184 | -0.329 | 0.152 | 0.234 |
| | (0.190) | (0.818) | (0.283) | (0.834) | (0.182) | (0.792) |
| Expected yrs. to having kids (unsure) | 4.559 | 20.31 | 19.28** | 43.87** | -10.44** | -41.08** |
| | (6.041) | (25.19) | (7.633) | (20.10) | (5.060) | (20.75) |
| Expected years to having kids | 0.796 | 3.353 | 1.562* | 3.292 | -1.113** | -4.610* |
| | (0.783) | (3.115) | (0.936) | (2.355) | (0.534) | (2.577) |
| Held debt prior to loan offer | -6.693 | -34.90 | 9.391 | 28.72 | -5.288 | -24.75 |
| | (5.236) | (23.59) | (7.935) | (20.84) | (5.297) | (20.56) |
| Held investments prior to loan offer | 10.77*** | 51.31*** | 5.370 | 10.61 | -5.970** | -30.64** |
| | (3.797) | (14.93) | (4.519) | (11.88) | (2.512) | (12.10) |
| Constant | 82.51*** | 139.9 | -33.50 | -179.1** | 27.30* | -26.05 |
| | (22.99) | (86.82) | (26.22) | (70.98) | (16.26) | (65.57) |
| Number of Observations: | 318 | 318 | 318 | 318 | 318 | 318 |

Note: * p<.10, ** p<.05, *** p<.01. Results are from the subsample of loan-takers with CSL investments greater than zero. Standard errors account for the finite, known population size.

Table 6: Regression Results for “Portfolio Risk”

| Dependent Variable: | "Portfolio Risk" | | "Portfolio Risk" | | "Portfolio Risk" | |
|---|---|---|---|---|---|---|
| | OLS | Tobit | OLS | Tobit | OLS | Tobit |
| Class of 2013 (alternative: 2014) | -2638.6** | -2565.8* | -2783.9** | -2532.0* | -1800.9 | -1376.5 |
| | (1218.6) | (1328.7) | (1254.3) | (1344.9) | (1185.4) | (1257.7) |
| Female | -1178.2 | -1423.7 | 181.8 | -7.280 | 859.5 | 728.5 |
| | (1381.7) | (1630.6) | (1471.2) | (1760.5) | (1372.6) | (1625.9) |
| SAT | 3.094 | 6.416 | 2.452 | 4.886 | 3.203 | 5.903 |
| | (6.867) | (7.344) | (6.399) | (6.981) | (5.550) | (6.092) |
| GPA | -1524.3 | -1544.2 | -1744.7 | -1836.2 | -1649.0 | -1698.2 |
| | (1133.4) | (1292.1) | (1128.6) | (1315.9) | (1038.9) | (1204.1) |
| CRT | 1987.5*** | 2044.5*** | 1835.3*** | 1794.4*** | 1594.9*** | 1532.8** |
| | (663.4) | (724.5) | (630.9) | (679.1) | (567.2) | (603.6) |
| Major: STEM | -3684.7* | -4027.7** | -2054.3 | -2094.7 | -263.5 | -101.4 |
| | (1884.2) | (2035.8) | (2054.5) | (2227.5) | (2058.1) | (2230.4) |
| Major: Other | -5077.7** | -6083.7*** | -3564.1 | -4264.9* | -1776.8 | -2194.3 |
| | (2061.1) | (2335.9) | (2300.4) | (2580.1) | (2254.1) | (2518.1) |
| Major: Economics | ref. group | ref. group | ref. group | ref. group | ref. group | ref. group |
| MBTI: Extrovert (vs. introvert) | 1523.7 | 2103.3 | 1782.7 | 2418.6* | 1182.4 | 1760.7 |
| | (1193.8) | (1364.5) | (1158.6) | (1334.5) | (1079.4) | (1230.0) |
| MBTI: Sensing (vs. intuition) | -1525.3 | -1847.7 | -1331.3 | -1617.8 | -1067.3 | -1302.7 |
| | (1242.4) | (1353.8) | (1262.4) | (1371.7) | (1204.6) | (1304.0) |
| MBTI: Thinking (vs. feeling) | -427.7 | -512.9 | -1150.0 | -1590.5 | -410.7 | -737.0 |
| | (1978.2) | (2136.8) | (1921.6) | (2080.7) | (1786.1) | (1906.3) |
| MBTI: Judging (vs. perceiving) | 1920.2 | 2057.0 | 2067.0 | 2072.4 | 1861.4 | 1880.5 |
| | (1316.3) | (1446.0) | (1305.5) | (1421.0) | (1237.2) | (1334.2) |
| Family Inc.: $40,000 or less | -3623.5 | -3045.7 | -3080.4 | -2054.6 | -4278.0** | -3242.7 |
| | (2217.4) | (2362.1) | (1957.4) | (2168.7) | (1977.2) | (2148.7) |
| Family Inc.: $40,001 to $60,000 | -6768.8*** | -7498.9*** | -6318.0*** | -7029.9*** | -4675.3*** | -5114.7** |
| | (2181.2) | (2455.8) | (2036.2) | (2320.4) | (1792.0) | (2045.7) |
| Family Inc.: $60,001 to $80,000 | -3995.0** | -4480.2** | -3408.0* | -3809.2* | -3020.2** | -3360.5* |
| | (1966.9) | (2244.8) | (1742.7) | (2099.9) | (1514.3) | (1841.6) |
| Family Inc.: $80,001 to $100,000 | -2277.0 | -2279.2 | -2503.8 | -2291.8 | -2199.3 | -1972.3 |
| | (2261.0) | (2438.2) | (2101.6) | (2301.0) | (2005.8) | (2200.1) |
| Family Inc.: $101,001 to $120,000 | -4308.2** | -4099.8** | -3185.4** | -2990.8* | -2870.9** | -2675.5* |
| | (1682.4) | (1842.1) | (1451.4) | (1621.8) | (1416.9) | (1566.0) |
| Family Inc.: $120,001 or more | ref. group | ref. group | ref. group | ref. group | ref. group | ref. group |
| Family Inc.: No response | -4145.9** | -4173.7** | -3428.8** | -3590.4* | -3940.2** | -4170.3** |
| | (1845.5) | (2052.6) | (1678.4) | (1903.0) | (1529.5) | (1713.3) |
| Self-reported fin. literacy (1-10 scale) | | | 555.4 | 556.4 | 239.3 | 209.0 |
| | | | (385.0) | (443.8) | (363.8) | (415.7) |
| Fin. Lit. questions score (0-2 scale) | | | 826.1 | 1744.9 | -280.1 | 470.1 |
| | | | (900.0) | (1155.5) | (816.6) | (1048.7) |
| USAA loan (vs. NFCU loan) | | | 3572.6** | 3717.8* | 3004.3* | 2957.2 |
| | | | (1694.4) | (1936.6) | (1745.0) | (1982.8) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Advice: Financial advisor | | | -1605.9 | -888.7 | -2220.3* | -1594.9 |
| | | | (1246.2) | (1444.0) | (1173.2) | (1362.9) |
| Advice: Friends/family | | | -2430.0** | -2524.7* | -2617.7** | -2694.5** |
| | | | (1235.1) | (1359.2) | (1168.4) | (1277.2) |
| Advice: News sources | | | -1379.8 | -698.9 | -1369.1 | -673.8 |
| | | | (1401.4) | (1533.0) | (1294.9) | (1420.4) |
| Advice: Personal research | | | 31.13 | 356.5 | 516.5 | 903.8 |
| | | | (1432.9) | (1545.0) | (1431.0) | (1536.2) |
| Advice: Other | | | -3980.4 | -5216.8 | -1842.2 | -2748.6 |
| | | | (4289.5) | (5144.6) | (3401.1) | (4123.7) |
| No transfer from family | | | 1490.7 | 1453.3 | 726.2 | 456.3 |
| | | | (1388.4) | (1509.7) | (1222.1) | (1318.4) |
| Annual transfer from fam. (hundreds $) | | | 55.42 | 62.82 | 55.25 | 62.42 |
| | | | (70.92) | (72.86) | (62.28) | (63.53) |
| No transfer to family | | | -2831.0* | -2687.7 | -2819.6* | -2726.6 |
| | | | (1582.9) | (1834.8) | (1532.7) | (1750.8) |
| Annual transfer to fam. (hundreds $) | | | -165.5** | -177.5** | -147.5*** | -162.3** |
| | | | (68.44) | (86.89) | (51.62) | (65.74) |
| Expected yrs. to having kids (unsure) | | | 3704.6** | 5693.2*** | 3449.4** | 5328.8** |
| | | | (1808.8) | (2169.2) | (1690.4) | (2059.9) |
| Expected years to having kids | | | 459.4* | 673.9** | 372.7* | 568.7** |
| | | | (238.7) | (270.7) | (216.4) | (247.8) |
| Expected annual gain (%) | | | | | 692.9*** | 766.6*** |
| | | | | | (207.4) | (217.2) |
| Expects to break even | | | | | -2412.4 | -3073.5 |
| | | | | | (1875.0) | (2087.2) |
| Expected annual loss (%) | | | | | -424.3 | -568.0 |
| | | | | | (262.9) | (372.3) |
| Constant | 16439.0** | 11499.0 | 9246.4 | 1691.1 | 7873.5 | 120.6 |
| | (8214.0) | (8679.9) | (7704.8) | (8534.7) | (6800.3) | (7912.2) |
| Number of Observations: | 335 | 335 | 335 | 335 | 335 | 335 |

Note: * p<.10, ** p<.05, *** p<.01. Results are from the subsample of respondents with any investment (i.e. CSL or prior investments) greater than zero. Section 4 provides details on the calculation of "portfolio risk." Standard errors account for the finite, known population size.

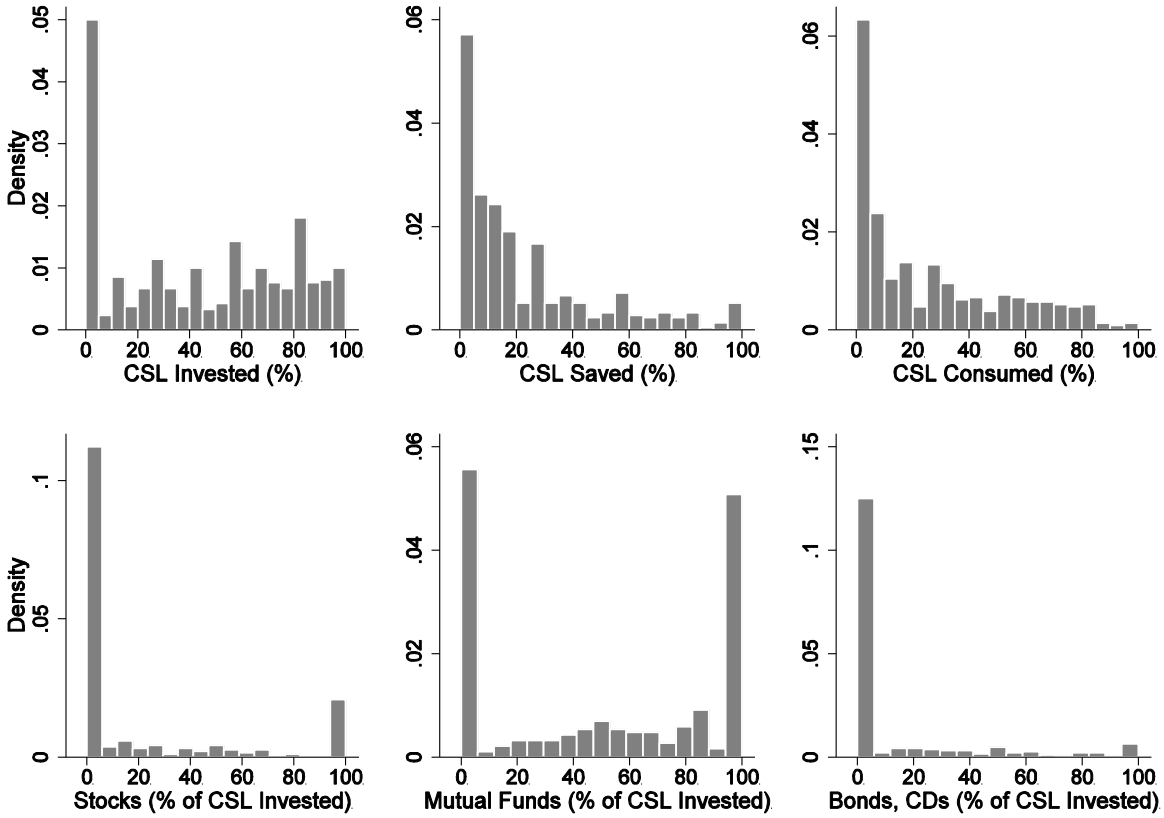
Table 7: Regression Results for Expected Annual Returns

| Dependent Variable: | Expected Annual Gain (%) | | Expected Annual Gain (%) | | Expected Annual Gain (%) | |
|---|---|---|---|---|---|---|
| | OLS | Tobit | OLS | Tobit | OLS | Tobit |
| Class of 2013 (alternative: 2014) | -0.752 | -1.515** | -0.829 | -1.598** | -0.904* | -1.683** |
| | (0.514) | (0.705) | (0.522) | (0.711) | (0.491) | (0.664) |
| Female | -1.316* | -1.938* | -0.789 | -1.269 | -0.401 | -0.725 |
| | (0.709) | (1.031) | (0.790) | (1.131) | (0.755) | (1.091) |
| SAT | -0.00119 | 0.000345 | -0.00193 | -0.00120 | -0.00188 | -0.000731 |
| | (0.00275) | (0.00360) | (0.00263) | (0.00345) | (0.00247) | (0.00322) |
| GPA | -0.268 | -0.0838 | -0.179 | -0.0253 | 0.00705 | 0.158 |
| | (0.562) | (0.761) | (0.572) | (0.784) | (0.546) | (0.750) |
| CRT | 0.371 | 0.577 | 0.281 | 0.418 | 0.229 | 0.339 |
| | (0.282) | (0.368) | (0.271) | (0.359) | (0.258) | (0.340) |
| Major: STEM | -2.473*** | -3.012*** | -2.468*** | -3.008** | -2.213** | -2.610** |
| | (0.898) | (1.141) | (0.909) | (1.171) | (0.857) | (1.097) |
| Major: Other | -2.393** | -3.141** | -2.308** | -2.987** | -1.638* | -1.970 |
| | (1.030) | (1.356) | (1.045) | (1.383) | (0.985) | (1.294) |
| Major: Economics | ref. group | ref. group | ref. group | ref. group | ref. group | ref. group |
| MBTI: Extrovert (vs. introvert) | 0.648 | 1.062 | 0.534 | 0.931 | 0.424 | 0.896 |
| | (0.523) | (0.711) | (0.525) | (0.712) | (0.501) | (0.675) |
| MBTI: Sensing (vs. intuition) | -0.00866 | -0.236 | -0.0636 | -0.406 | 0.297 | 0.0525 |
| | (0.529) | (0.710) | (0.524) | (0.701) | (0.526) | (0.696) |
| MBTI: Thinking (vs. feeling) | -0.297 | -0.658 | -0.549 | -1.243 | -0.430 | -1.010 |
| | (0.714) | (0.924) | (0.717) | (0.929) | (0.666) | (0.860) |
| MBTI: Judging (vs. perceiving) | 0.272 | 0.367 | 0.367 | 0.441 | 0.204 | 0.250 |
| | (0.570) | (0.762) | (0.553) | (0.744) | (0.531) | (0.698) |
| Family Inc.: $40,000 or less | 1.279 | 1.696 | 1.360 | 1.859 | 1.374 | 1.959 |
| | (1.058) | (1.358) | (1.148) | (1.537) | (1.127) | (1.506) |
| Family Inc.: $40,001 to $60,000 | -1.858* | -2.984** | -1.769* | -3.024** | -1.248 | -2.313 |
| | (1.030) | (1.490) | (1.046) | (1.515) | (0.988) | (1.434) |
| Family Inc.: $60,001 to $80,000 | -0.705 | -0.959 | -0.520 | -0.826 | 0.0912 | 0.122 |
| | (0.896) | (1.244) | (0.857) | (1.204) | (0.810) | (1.131) |
| Family Inc.: $80,001 to $100,000 | -0.557 | -0.702 | -0.533 | -0.582 | -0.331 | -0.325 |
| | (0.864) | (1.157) | (0.873) | (1.167) | (0.824) | (1.094) |
| Family Inc.: $101,001 to $120,000 | -0.494 | -0.568 | -0.455 | -0.688 | -0.551 | -0.733 |
| | (0.708) | (0.974) | (0.688) | (0.937) | (0.652) | (0.889) |
| Family Inc.: $120,001 or more | ref. group | ref. group | ref. group | ref. group | ref. group | ref. group |
| Family Inc.: No response | 0.0766 | 0.0555 | 0.492 | 0.592 | 0.773 | 1.017 |
| | (0.924) | (1.207) | (0.932) | (1.241) | (0.906) | (1.195) |
| Self-reported fin. literacy (1-10 scale) | | | 0.377* | 0.455* | 0.410** | 0.526** |
| | | | (0.196) | (0.263) | (0.191) | (0.257) |
| Fin. Lit. questions score (0-2 scale) | | | 1.073* | 2.099** | 1.084* | 2.148** |
| | | | (0.587) | (0.880) | (0.571) | (0.856) |
| USAA loan (vs. NFCU loan) | | | 0.363 | 1.291 | 0.354 | 1.235 |
| | | | (0.877) | (1.217) | (0.894) | (1.245) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Advice: Financial advisor | | | 0.434 | 1.146 | 0.880* | 1.764** |
| | | | (0.521) | (0.733) | (0.530) | (0.729) |
| Advice: Friends/family | | | 0.335 | 0.395 | 0.783 | 1.006 |
| | | | (0.543) | (0.733) | (0.536) | (0.720) |
| Advice: News sources | | | -0.0525 | 0.0359 | -0.0822 | 0.178 |
| | | | (0.700) | (0.948) | (0.696) | (0.941) |
| Advice: Personal research | | | -0.681 | -0.825 | -0.667 | -0.765 |
| | | | (0.539) | (0.752) | (0.521) | (0.725) |
| Advice: Other | | | -2.364 | -4.337 | -0.870 | -2.437 |
| | | | (1.542) | (2.711) | (1.109) | (2.051) |
| No transfer from family | | | 0.820 | 1.070 | 0.722 | 0.827 |
| | | | (0.659) | (0.903) | (0.612) | (0.835) |
| Annual transfer from fam. (hundreds $) | | | 0.00158 | -0.00218 | 0.00272 | -0.000750 |
| | | | (0.0186) | (0.0234) | (0.0157) | (0.0198) |
| No transfer to family | | | -0.260 | 0.00200 | -0.225 | -0.0267 |
| | | | (0.764) | (1.040) | (0.732) | (0.997) |
| Annual transfer to fam. (hundreds $) | | | -0.0207 | -0.0217 | -0.0122 | -0.00683 |
| | | | (0.0404) | (0.0581) | (0.0353) | (0.0496) |
| Expected yrs. to having kids (unsure) | | | -0.00240 | 0.658 | -0.955 | -0.626 |
| | | | (0.944) | (1.330) | (0.921) | (1.276) |
| Expected years to having kids | | | 0.0604 | 0.143 | -0.0542 | -0.0150 |
| | | | (0.109) | (0.150) | (0.102) | (0.140) |
| Penny stocks and options (% of portfolio) | | | | | 0.0267 | 0.0360 |
| | | | | | (0.0180) | (0.0263) |
| Stocks (% of porfolio) | | | | | 0.0600*** | 0.0859*** |
| | | | | | (0.0110) | (0.0156) |
| Mutual funds (% of portfolio) | | | | | 0.0338*** | 0.0540*** |
| | | | | | (0.00781) | (0.0124) |
| Bonds and CDs (% of portfolio) | | | | | -0.00607 | -0.00794 |
| | | | | | (0.00895) | (0.0164) |
| Constant | 10.08*** | 7.139 | 6.113* | 0.506 | 2.069 | -6.168 |
| | (3.454) | (4.378) | (3.646) | (4.783) | (3.447) | (4.731) |
| Number of Observations: | 335 | 335 | 335 | 335 | 335 | 335 |

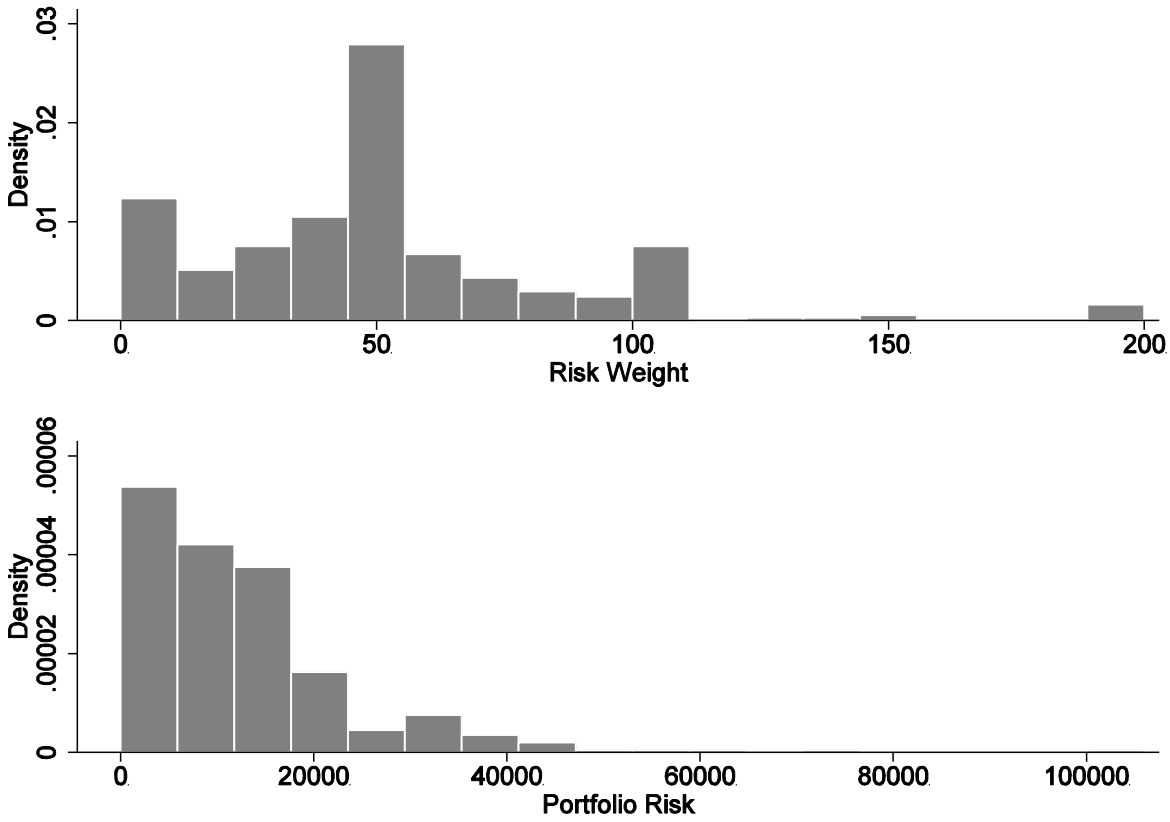
Note: * p<.10, ** p<.05, *** p<.01. Results are from the subsample of respondents with any investment (i.e. CSL or prior investments) greater than zero. Standard errors account for the finite, known population size.

Figure 1: Distributions of Dependent Variables from Table 4 and Table 5




Note: Figure presents distributions of each dependent variable from regressions in Tables 4 and 5. Section 4 describes the calculation of each variable.

Figure 2: Distributions of $RiskWeight_i$ and *Portfolio Risk*




Note: The top panel of the figure presents the distribution of the *risk weight* variable. The bottom panel displays the distribution of the *portfolio risk* variable. Section 4 describes the calculation of both variables.