

Prior Perceptions, Personality Characteristics and Portfolio Preferences among Fund Managers: An Experimental Analysis

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This article examines the question of cross-domain risk-taking behavior. That is, will risky behavior in one arena translate into risky behavior in another arena? The specific area of interest concerns lifestyle risk taking and financial risk-taking behavior. We utilize several psychological tests to test the respondents for the following biases: familiarity, optimism, unique invulnerability, sensation-seeking and impulsivity. The methodology utilizes tests that have not been employed in other studies. The respondents were given these tests plus a portfolio preference survey to test for effects on investing decisions. Two cohorts of student-managed investment fund managers were surveyed. These were predominantly twenty-something males who were college seniors. These subjects were chosen for two reasons: they represented a risk-taking population in general and they were sophisticated investors. We found no discernible biases present in their survey results. We also tested the mean responses to the portfolio management survey across the two cohorts, which occurred around the subprime market crash. Interestingly, the mean responses of the portfolio choice variables were not statistically different.

Keywords: Optimism bias, Familiarity bias, Investing decisions, Sensation seeking, Financial risks

INTRODUCTION

Research studies for a number of years have been concerned with how investors make investment decisions when faced with a set of uncertain outcomes. From early expected utility studies to more contemporary analysis like prospect theory, a number of interesting behavioral propositions have been studied. Increasingly, researchers have become interested in how investors form their preferences and attitudes toward risk. There are a number of things that have been studied, including demographic variables, personality characteristics and “learning.” In other words, do people change their estimated probabilities when facing uncertainty based on more information? Another interesting line of research concerns “regret avoidance.” Does the knowledge of a past bad deci-

sion make us change our outlook with regard to a present situation? In other words, will we approach a given problem differently based on the success or failure of decisions made in the past? Many studies have also noted a “familiarity bias” in investing. This has shown that familiarity with a company or country leads one to invest in that company or country, even if better opportunities may be available elsewhere. This comfort level has been shown to lead to sub-optimal portfolio decisions, such as a lack of diversification.

Another interesting question has existed in the literature for several years. It concerns the issue of risk-taking behavior in general and whether it is a “global” phenomenon. That is, if a person is willing to engage in risky behavior in one sphere of their life (e.g., drinking and driving, skydiving, riding motorcycles too fast), will this translate into risk taking in other areas? In particular, if one is a risk taker in personal activities, will that person take financial risks? There are a number of ways in which this question can be approached and reasons why an answer is valuable. If there are some forms of standardized psychological tests that correlate well with financial risk taking, then this could be used to construct likely risk

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taking profiles for individuals. This type of information is used, for example, by financial planners to test upfront the particular risk taking propensities for their clients.

Taken together, these different attributes can give us a much richer picture of how people make financial decisions. From tests of inherent personality characteristics to assessment vehicles that test how people process information, education can be directed toward finding out people's inherent preconceptions and biases and helping them to use them constructively in their financial decisions.

This study examines how two factors have affected the investment portfolio decision making of a group of student fund managers: their underlying psychological attitudes and their level of education and experience. The group in question is primarily seniors at a small southern university who are the managers of a \$2.5 million portfolio consisting of equities and fixed income instruments. They were chosen because of their high level of financial education and sophistication and also because they represent, in general terms, a societal group that is usually associated with risk taking in their lives. We are interested in how these two factors may affect the described portfolio management style indicated by the student managers. We will be utilizing a different set of psychological tests than have been used in prior studies to look for correlation among optimism, sensation seeking and unique invulnerability and the students' portfolio management decisions. The objective is to see if they have any predictive capability and whether they may be used to construct better risk evaluation metrics.

BACKGROUND

There are a myriad of studies that have examined risk taking and financial markets in a variety of contexts. We will concentrate on two specific areas and look at some representative studies, but recognize this is by no means exhaustive. We will also list other studies that can be examined if interested.

Personality Factors

Closely related to the issue of risk taking in general is a person's inherent psychological "wiring." Some people, by virtue of their genetic predisposition, are what the literature terms "sensation seekers." Horvath and Zuckerman [1993] discuss this at length: "High sensation seekers value the rewards of the activities more than the low sensation seekers. The sensation of a free-fall for a parachutist, the 'rush' of heroin or the 'high' of cocaine, the wind in the face and the blur of accelerating scenery for the accelerating motorcyclist, the fast beating of the heart for the gambler waiting for the outcome of the bet, the excitement of sex, all seem to provide forms of arousal that are more valued by high sensation seekers than lows. The intense reward effects of such activities may outweigh the risks for the high sensation

seekers" (p. 41). The high sensation seeker tends to engage in risky behavior because the rewards overcome the inherent risks associated with the activity. Like other things, this is a matter of individual preference, so it is a function of one's inherent makeup as well as environmental conditioning.

Horvath and Zuckerman also identify other factors that can contribute to high sensation seeking and engaging in risky behavior. High sensation seekers tend to be overtly optimistic individuals. They have an "optimism bias" (p. 41) that conditions how they view the world. They see themselves less at risk from their activities than other people do, and so see a lower possibility of negative outcomes from their risky behavior. Psychologists have a term that they use for this type of unfounded optimism. Unique invulnerability is the belief that "negative events and misfortunes will not happen to you" (Bodner, Cochran and Blum [2000], p. 104). The authors developed an index known as the Generalized Unique Invulnerability (GUI) scale to measure the degree of GUI that individuals possess. The GUI scale measures the belief that the person will have feelings of unique invulnerability. They gave the test to two groups, a group of skydivers and a group of randomly selected college students. These served as the control group for the skydivers, who were the risk-taking group. The hypothesis was that a risk-taking group would display higher unfounded optimism as measured by a lower GUI. An independent sample means test showed that the skydiver sample had a lower mean GUI score than the student group. This result was statistically significant. This seemed to validate their hypothesis.

Another point made by Horvath and Zuckerman was that there was a relationship between perceived controllability and unrealistic optimism. As people do a particular activity more and more, the familiarity with the activity generates a perception that the activity is less risky. The question then becomes, what level of optimism is "unrealistic"? In Hale, Fiedler and Cochran [1992], they test optimism, the "belief that desirable outcomes are attainable" (p. 517). They developed an optimism measurement known as the Revised Generalized Expectancy of Success Scale (GESS-R). Optimism, as we have said, can lead to a propensity to undertake risky behavior, but there also are benefits. Optimism is correlated with aspects of well-being such as higher self esteem and lower depression. In the HFC study, they tested experimentally a link between gambling and optimism in the following way. Participants in the study were given a "generation anagram" task. They were asked to produce as many words as possible from the word "generation" in a five-minute time interval. This was after they were asked to a priori predict the number of words that they could produce. Another experiment was performed after this experiment, where the same group was asked whether they would bet their own money on the outcome of the same experiment. By signing the participation list for the experiment, they were classified as willing to risk their own money on the outcome. The GESS-R scale is scored such that a higher score is more

indicative of optimism. HFC tested the mean score of the risk taking group versus the non-risk takers and found statistically significant higher mean GESS-R for the risk takers.

Heath and Tversky [1991] expand on this "locus of control" argument. They argue that response to uncertainty and a willingness to bet on it is a function of "competence." This is a function not only of estimated probabilities and the quality of those estimates but also of the general knowledge or understanding of the context of the event. They state: "We assume that our feeling of competence in a given context is determined by what we know relative to what can be known. Thus, it is enhanced by general knowledge, familiarity, and experience, and is diminished, for example, by calling attention to relevant information that is not available to the decision maker, especially if it is available to others" (p. 7). Success or failure in a choice, therefore, is conditioned by a feeling of competence. Lacking competence, an outcome might be attributed to ignorance or chance. If judgment is involved, then success might not be attributed to chance, but the value of knowledge as an "expert." Thus, the acquisition of knowledge conditions the probabilities and assessments of choices under uncertainty and gives the person more of a sense of control.

Another factor identified by Horvath and Zuckerman was impulsivity. Impulsivity tends to cloud judgment in the sense that impulsive people engage in behavior without completely assessing the risks associated with it. Peer influence was also identified as a possible effect on risk-taking behavior. In their study population group, this was a statistically significant effect because their sample group was college-age students. Impulsivity would be the opposite in this sense of Heath and Tversky's competence argument.

The issue of risk taking across different tasks has provided remarkably inconsistent results. An early study by Slovic [1972] constructed two different indices of risk-taking behavior applied to different gambles. Slovic found that the responses showed significant correlation, but that slight changes in the experiment could produce inconsistency in the responses of the subjects. He concluded that "the fact that a simple change in response mode can create so much inconsistency among individuals' relative standings in the group implies that high correlations between risk-taking measures in structurally different settings or between risk taking and other behaviors is unlikely to be found" (p. 133).

Personality and Financial Decisions

We also are concerned with the existence of "cross-domain" risk taking. That is, can we extrapolate from lifestyle risky activities like skydiving or motorcycle riding or sports participation to financial risk taking? A substantial amount of literature has looked at personality factors, risk taking and financial decisions. The evidence here is also somewhat mixed. Wong and Carducci [1991] looked at the relationship between sensation seeking and risk taking in the financial realm. They

analyzed responses to questions in three categories: personal investment, personal money matters and gambling. Questions asked about buying stocks, bonds, certificates of deposit (CDs) or homes; keeping an adequate amount in your bank account or buying automobile insurance; or playing the lottery or participating in a game show. The gambling issue is worth noting here, as many studies use gambling as a proxy for a propensity to take financial risks. Their sample was dichotomized into high and low sensation seekers and also segregated by gender. In their sample, they found that high sensation seekers took greater risks with money matters. The results varied by gender as well, with men taking more risks as high sensation seekers than women. The gender bias was also present in general for the entire sample, as men took more risks than women in general, regardless of whether they were high sensation seekers or low.

Morse [1998] tried to replicate Wong and Carducci's analysis with a similar type of study. Morse gave his subjects two questionnaires. The first was a risk/investment questionnaire, and the second was a risk preference/investments questionnaire. Participants completed the surveys as follows. In the first, they rated themselves on a 0–10 scale, with 0 representing "not willing to take risks" and a 10 "willing to take large risks." Participants then were given a list of several investment products, such as CDs, common stock, real property, options and others. The participants then ranked them by familiarity, with 0 being "not familiar" and 4 being "very familiar." They also ranked them by perceived riskiness, with 0 being "not risky" and 10 being "risky." Finally, they rated them by preference, with 0 being "no preference" and 4 being "most preference." In their testing, they found a number of conclusions. Participants could judge risk level of investments well. This knowledge of risk was unrelated to the actual risk of the investments, though. There was no correlation between self reported risk levels and overall risk levels. Contrary to Wong and Carducci, there was no relationship between sensation seeking and actual levels of risk taking. There were also no gender differences. They summarized their findings by concluding that knowledge of the risk level of investments did not appear to be used in making investment decision. Interestingly, one significant factor in those decisions was the familiarity with the investment, which suggests something like an "inertia" effect.

Grable and Joo [2004] examined a similar question with different techniques. They were also interested in whether or not sensation seeking behavior could be used to predict asset ownership. Their proxy for sensation seeking was participation in sports and the asset class they were interested in was equity ownership. Their sample was a group of mostly white middle class professionals who were clients of financial planners. They used a multivariate approach with equity ownership as the dependent variable. They defined equity broadly as ownership of stocks, stock mutual funds, business ownership or real estate ownership apart from a principal residence. They looked at what percentage of the portfolios

was in cash, fixed income, the equity categories or other investments. To classify their respondents by risk preferences, they used the behavioral risk categories used in the Survey of Consumer Finances. These are “taking substantial financial risks expecting to earn substantial returns,” “taking above average risks expecting to earn above average returns,” “taking average risks expecting to earn average returns” and “not willing to take any financial risks.” Because the first and last categories were so small, the tested the first two as one category and the last two as another. The results of their study identified several significant predictors of equity ownership: financial risk tolerance, financial knowledge, household income, and age. The sports proxy for sensation seeking did not have a significant effect, nor did gender. This also was counter to Wong and Carducci’s claim.

Filbeck, Hatfield and Horvath [2005] also looked at personality types and investment decisions. They administered the Myers-Briggs Type Indicator to a group of college students and also administered a survey of risk tolerance. The risk tolerance survey was an attempt to discern the preferences of the subjects for expected utility-types of risk measures such as variance or skewness. The Myers-Briggs is divided into four dichotomies: Extraversion-Introversion, Sensing-Intuitive, Thinking-Feeling and Judging-Perceiving. It is one of the most widely used psychological measures in use today. The authors were concerned about risk tolerance in an expected utility sense, so that the survey questions were geared towards comfort level with variation and skewness as risk measures. In their results, the thinking dimension of the MBTI had a preference for more risk-taking in the form of both variance and skewness. Those with the judging dimension also indicated a strong preference for variance. Other studies using the MBTI have found similar results. Bringham [1994] used the MBTI typology to examine the behavior of successful currency options traders. The types most closely associated with successful traders were also those with the thinking dimension.

Mayfield, Perdue and Wooten [2008] used a different personality inventory called the Big Five to measure the investment intentions of various personality types. They used a survey to measure investment intentions (short term or long term) as well as administering the Big Five inventory. The found that more extraverted individuals displayed a preference for short-term investing, while those with more neuroticism or risk aversion avoided this. Individuals who displayed more openness to experience displayed an inclination to long-term investing, with no predisposition to short-term investing.

Information Processing and Risk Taking

Also, we are interested in how education, experience and judgment affect risk-taking propensities, particularly as they relate to portfolio decisions. There is a long history in the

psychology literature about how individuals process information and alter their outlooks as a result.

Hogarth [1981] surveys much of the existing psychological literature on judgment heuristics. He notes that decision processes are often represented by discrete events, rather than continuous processes. This can lead to errors or underrepresent the adaptive nature of information processing. Hogarth identifies three fundamental components of behavior: (a) the nature of the environment, (b) the nature of the organism and (c) the means the organism has developed for coping with the environment. The environment that we face is complex, characterized by uncertainty but also by redundancy. Our processing mechanisms are characterized by sequential processes, limited memory, selective perception and reliance on heuristic mechanisms. This scenario results in the development of judgment and feedback. Judgment facilitates action and commitment and feedback gives us cues about the results of those actions.

That judgment can produce biases, however. One bias is an illusion of control. By having a particular skill, individuals can perceive that they have a greater degree of control over events than they actually do. This makes them readjust their subjective probabilities and can lead to suboptimal behavioral outcomes. Individuals can also become less proactive in decisions because they consistently underestimate their own skill. Experience, therefore, becomes a conditioning factor that helps us shape our responses to our environment.

This can produce outcomes that are not always beneficial, however. This is discussed at length in Brehmer [1986]. One basic tenet of behavior seems to be that experience leads to better judgment and better decisions. Brehmer argues that this is not necessarily the case. Experience often comes without an adequate context for assessing its own value. Thus, Brehmer argues, it does not provide information for us to learn from. So “learning from experience” in the sense of improving judgment is a misnomer.

There are two experiential biases present in the finance literature that are worth mentioning: the so-called “familiarity bias” and regret avoidance. Huberman [2001] discusses the familiarity bias by looking at state-by-state comparisons in Regional Bell Operating Companies (RBOC). He shows that despite their underlying financial characteristics, people across states tended to invest much more heavily in their local RBOC. He also documents evidence of a familiarity bias in terms of domestic versus foreign equities. He states: “At the extreme, this will lead most people to shy away from foreign stocks and to concentrate their portfolios on stocks they know—for instance, their own company’s stock, stocks that are visible in the investors’ lives, and stocks that are discussed favorably in the media” (p. 678). This is counter to our usual assumptions about maximizing along some risk-return tradeoff.

In Bailey and Kinerson [2005], the authors discuss the notion of regret avoidance. That is, we tend to avoid situations where past actions have not turned out exactly as we hoped

they would. They construct measures of anticipated regret, experienced regret, and risk tolerance. They found significant effects on investment decision-making for both risk tolerance and experienced regret. Their application of this related to portfolio selection. If a client, for example, had experienced regret with a particular investment in the past, he would be hesitant to make that investment again. This might be counterproductive in the sense that an advisor might feel that that investment was most appropriate for the client's retirement planning. Given the greater control that individuals have over their own retirement planning, feelings of regret could lead to suboptimal investment outcomes.

The literature suggests that learning, judgment and experience all play crucial roles in the way in which we process financial information. This points to the value of proper education in terms of defining the environment in which we form our heuristics. We are interested in how these factors, as well as personality characteristics, affect a select group of portfolio managers. We will now describe the experimental environment created to test our hypotheses.

EXPERIMENTAL METHODOLOGY

One constant in the literature is how investors process risk. That is, that there is a tremendous amount of inconsistency in the results, depending on variables chosen and sample construction. In this study we propose an experimental analysis using a fairly homogeneous group to test the influences of education and personality preferences on portfolio decisions. We use personality instruments that are different from those used by other researchers, however. We utilize instruments that test for risk preferences indirectly through ways that have not been studied in this arena. Specifically, we look at measures of optimism, sensation seeking, delay of gratification and generalized unique invulnerability.

The sample was chosen from students that participate in a student-managed portfolio program at a small southern university. They responded voluntarily, and two separate cohorts were sampled. The nature of the program is structured as follows. Students have to complete a required sequence of prerequisite courses to be eligible to apply, and then the applicants are screened and accepted students are permitted to register. There is a minimum 3.0 grade point average for eligibility. The majority of the students are undergraduate finance majors, although that is not an explicit requirement. All students in the class, therefore, are high achievers who have completed coursework in accounting, economics, statistics, financial management and investments. In the fall semester they begin with equity fund management. This teaches them how to research companies and value them. Students are assigned current portfolio holdings and they make hold/sell recommendations to a trustee board composed of student and faculty trustees. After the hold/sell decisions are complete, they make recommendations about new acquisitions. In the

spring semester, they follow the same process for the fixed income portfolio as well as monitoring the equity portfolio for changes. They have been very successful not only in terms of returns but also are eight-time champions in international student-managed portfolio competitions. They were sampled because their educational levels are fairly consistent, and they are actively managing a multimillion dollar asset portfolio. However, they are also in the 21–25 age demographic. As experience has shown, these can be some of the most risk-taking years in a person's life. Given the literature we have discussed, this suggests a number of decision-making biases that might be present:

Familiarity Bias

Will their experience with choosing equities for the portfolio and their past education lead to a greater propensity for equity selection in their own portfolio decisions?

Optimism Bias

Previous literature has indicated a relationship between high optimism and feelings of control. This can lead to a greater belief in one's own capabilities. We will test to see if higher optimism correlates with greater risk taking.

Unique Invulnerability Bias

Unique invulnerability is shown to correlate with participation in risky activities. We will examine whether the students display this behavior with regard to portfolio selection.

Sensation-seeking Bias

Does inherent gratification from sensation seeking reduce the level of caution taken when investing? Or will it lead to an increased propensity for risk-taking?

Impulsivity Bias

Once again, there is evidence in the literature that impulsivity can lead to risky behavior because decisions are not well thought out. Education should diminish this, but could it be overcome by personality makeup?

Past studies have used psychological instruments such as the Myers-Briggs Type Indicator (MBTI), Big Five personality inventory, or other proxy measures of personality characteristics. We now will discuss the measures that we will use in this study.

The Revised Generalized Expectancy of Success Scale (GESS-R)

This instrument, as we have discussed earlier, is an optimism indicator. Optimism can result in higher self esteem, but the literature also suggests that unfounded optimism can lead to risk-taking behavior. To the extent that more optimistic individuals tend to overlook financial risks, we hypothesize

that they would be more willing to invest in risky assets than less optimistic people. The GESS-R is scored such that higher scores are associated with greater optimism. Sample questions begin with the statement “In the future I expect that I will” and the respondent gives answers such as “succeed at most things I try,” “reach my financial goals,” “be able to solve my own problems,” and so forth. Each question is scored on a 1–5 basis, with 1 (*highly probable*) and 5 (*highly improbable*). There are 25 questions on the survey, with higher scores on the instrument indicating higher optimism. The mean when used with college student populations is around 99.

The Generalized Unique Invulnerability Scale (GUI)

The GUI scale measures the belief that respondents will have unique invulnerability or the belief that undesirable outcomes will not happen to them. Respondents answer a set of questions such as, “What is the probability that you will be injured in an automobile accident” or “What is the probability that you will be making a six-figure salary”. Scores are based on a 1–5 ranking, with 1 (*highly improbable*) and 5 (*highly probable*). Higher scores on the scale are indicative of a lower level of perceived unique invulnerability on the part of the respondent.

Sensation Seeking Scale (SSS)

This is a survey instrument designed to measure willingness to participate in sensation seeking activities. This, as we have discussed, can also be linked to risk taking behavior. There are 13 questions in the survey, each with two opposing responses. For example, one set of responses reads, “I would like to try parachute-jumping,” opposed with “I would never want to try jumping out of a plane, with or without a parachute.” Another reads, “People who ride motorcycles must have some kind of unconscious need to hurt themselves” versus “I would like to ride or drive a motorcycle.” The test is scored in such a way that higher scores are associated with the sensation-seeking responses.

Delay of Gratification Scale (DGS)

This is a survey designed to measure attitudes about the outcomes of a person’s actions, whether they are realized in the present or the future. Respondents respond to statements such as “I am willing to sacrifice my immediate happiness or well being to achieve future outcomes” or “I think it is important to take warnings about negative outcomes seriously even if the outcome will not occur for many years”. The instrument has 12 questions that are scored with 1 (*extremely uncharacteristic*) and 5 (*extremely characteristic*) of the respondent. Higher scores indicate a greater concern for future consequences of an action than the present. We hypothesize that this would not be characteristic of impulsive people, so

a lower score could indicate greater sensation seeking and risk-taking propensities.

Portfolio Preference Survey (PSS)

The final instrument used was a portfolio preference survey. Grable and Joo identified several significant predictors of equity ownership in their study: financial knowledge, income, and age. These are all consistent with observed behavior and represent either stricter or less strict constraints on portfolio choice. As knowledge increases, one might postulate that investors realize that stocks outperform bonds, for example on average over time. As income increases, the size and breadth of one’s portfolio we would expect to increase. Age certainly can affect risk tolerance and portfolio composition: some people “pull back the reins” as they become older and worry more about steady income rather than portfolio gains. They did not see an effect from sensation seeking, as measured by their proxy variables, though.

To try and isolate the effects of risk preferences on the portfolio choice of the respondents, we designed a specific set of questions regarding the respondents’ idea of an “optimal portfolio.” Because of this, they were not constrained by income. We also wanted an initial group that was fairly homogeneous in terms of age and financial knowledge so that these would not be a factor in the outcome.

The initial sample that we are working with is the student-managed portfolio class. The students voluntarily participated in the study and the responses were collected blindly with no identifiable association with individuals. The students are either upper division undergraduates with finance majors or MBA students, so their ages are within a couple of years of one another. They answered a series of specific portfolio allocation questions in terms of their optimal portfolio preferences, not actual portfolios. Once again, this was designed to measure preferences instead of actual allocations so income would not be a constraint. They are currently managing a \$2.5 million portfolio of equities and fixed income instruments, so there is a fairly consistent level of financial knowledge present. Sample questions concerned the percentage allocations of a variety of instruments in their optimal portfolios, such as small cap equities or government bonds. Each category was divided into quintiles, such as 0–20% asset allocation. Also, there were two general portfolio management questions utilized that asked whether the respondent would use short sales or derivatives as part of their own portfolio management strategies.

The methodology is similar to that used in an earlier paper (Belcher [2005]). We will use paired means tests to examine differences between sub sample groups. We will also use correlation analysis to test whether the scores of the various instruments are correlated to the asset allocation preferences of the respondents. We will use these to identify a “higher risk taking” profile. This would include the following responses:

TABLE 1
Frequency Distributions.

Quintile	0–20	21–40	41–60	61–80	81–100	Variable
Percentages	6.5	6.5	29	45.2	12.9	Stockper
	32.3	51.6	12.9	0	3.2	Bondper
	3.2	48.4	29	19.4	0	Growthper
	19.4	19.4	48.4	12.9	0	Smallcap
	38.7	25.8	16.1	16.1	0	Treasury
	51.6	32.3	12.9	3	0	Junk
	3.2	22.6	9.7	54.8	9.7	Short
	3.2	12.9	29	41.9	12.9	Derive

- A higher allocation of equities in the overall portfolio;
- A higher allocation of small cap or growth stocks within the equity portfolio;
- A lower proportion of government securities in the fixed income portfolio;
- A greater propensity to short sell; and
- A greater propensity to use derivatives.

The hypotheses will follow those of earlier authors:

1. High sensation-seekers will tend to make riskier asset allocation decisions (higher SENSEEK).
2. Greater perceived unique invulnerability positively correlated with riskier asset allocation decisions (lower GUI).
3. More optimistic outlook positively correlated with riskier asset allocation decisions (higher GESS-R).
4. More concern with future outcomes of decisions negatively correlated with risky asset allocation decisions (higher DELAYGRAT).

RESULTS

The results are presented in Tables 1–3. The sample can be broken down as follows. There were 31 responses: 20 in the first cohort and 11 in the second. Demographically, the majority of the students were male (26/31) finance majors. If we look at Table 1, we can see frequency distributions for the responses on the portfolio survey questions.

Frequency Analysis

For each of the portfolio allocation questions, the questions begin with “In my optimal _____ portfolio, the percentage allocated to _____ would be _____. The derivative and short sale questions ask about the frequency of taking short or options/futures positions. The upper two responses are “sometimes” and “frequently.” Based on frequencies, there were a fairly sizable number of respondents who indicated they would use both short sales and derivatives as part of their portfolio management strategies. If we follow the hypotheses presented, then risk takers should desire to have higher percentages of risky assets in their portfolios or be more inclined

TABLE 2
Means Tests.

z	Variable	Sample Mean 1	Sample Mean 2
–0.08237	Stockper	3.5	3.5455
–0.28236	Bondper	1.85	2
–0.54579	Growthper	2.55	2.8182
–0.7842	Smallcap	2.4	2.8182
0.751087	Treasury	2.35	1.9091
–0.15594	Junk	1.65	1.7273
0.118974	Gessr	103	102.8182
0.405484	Delaygrat	45.6	45
0.323722	Gui	53.85	53.2727
0.840654	Senseek	6.85	6.1818
–0.00824	Short	3.45	3.4545
–0.7282	Deriv	3.35	3.7273

to use risky strategies in managing their portfolios. Based on the frequency tables, we see some interesting results:

- On the “stock percentage” question, 58% of the responses were in the upper two quintiles.
- On the “bond percentage” question, 84% of the responses were in the lower two quintiles.
- On the “growth stock” question, 81% of the responses were in the lower three quintiles, with no responses in the upper quintile.

TABLE 3
Correlation Matrix.

Variable	Stockper	Bondper	Growthper	Smallcap	Treasury	Junk
Stockper	1	–0.576	0.567	0.176	–0.268	0.357
Bondper	–0.576	1	–0.232	0.225	0.206	–0.045
Growthper	0.567	–0.323	1	0.084	–0.288	0.26
Smallcap	0.176	0.225	0.084	1	–0.037	0.27
Treasury	–0.268	0.206	–0.288	–0.037	1	0.096
Junk	0.357	–0.045	0.26	0.27	0.096	1
Short	0.33	–0.059	0.224	0.207	–0.198	0.549
Deriv	0.236	0.056	0.252	0.062	–0.107	0.396
Gessrscore	0.063	–0.016	0.151	0.068	0.107	–0.029
Delaygrat	0.373	–0.177	0.085	–0.008	0.003	0.236
Gui	–0.189	0.14	–0.248	0.105	0.008	0.009
Senseek	0.101	–0.052	–0.21	–0.156	–0.008	0.192
Short	Deriv	Gessrscore	Delaygrat	Gui	Senseek	
0.33	0.236	0.063	0.373	–0.189	0.101	
–0.059	0.056	–0.016	–0.177	0.14	–0.052	
0.224	0.252	0.151	0.085	–0.248	–0.21	
0.207	0.062	0.068	–0.008	0.105	–0.156	
–0.198	–0.107	0.107	0.003	0.008	–0.008	
0.549	0.396	–0.029	0.236	0.009	0.192	
1	0.355	–0.106	0.463	0.151	–0.157	
0.355	1	0.043	0.213	0.141	0.098	
–0.106	0.043	1	0.093	–0.298	0.142	
0.463	0.213	0.093	1	–0.039	0.228	
0.151	0.141	–0.298	–0.039	1	–0.376	
–0.157	0.098	0.142	0.228	–0.376	1	

Note. Numbers in bold are significant at alpha = .05 level.

- On the “small cap” question, 87% of the responses were in the lower three quintiles, with no responses in the upper quintile.
- On the “junk bond” question, 84% of the responses were in the lower two quintiles, with only five responses in the third and fourth quintile.
- On the “Treasury bond” question, 81% of the respondents were in the lower three quintiles.

These questions were asset allocation questions that had to do with the percentages of each asset in a particular part of their optimal portfolio. So the majority of respondents favored equity portfolios that had less growth stocks and less small cap stocks in their allocations. On the surface, these would be less risk taking portfolios, but one might argue that a third quintile response for either would involve an equity portfolio of higher risk. The issue might be raised here as to what constitutes a risky portfolio in general. Since in theory portfolios should be constructed within the constraints imposed by a client’s risk tolerance and demographics and be well diversified, one could argue that it is hard to generalize from that point. In classes we often start with a portfolio that has a 60–40% allocation between equities and other less risky investments. The Wells Fargo Advantage Funds Web site, for example, still calls that a “moderate risk” portfolio. Their “aggressive” portfolio allocation, for example, is 80% equities in the mix. Based on that generalization, this would be a group of risk takers given that 58% of the optimal portfolio responses had an equity allocation over 60% and 84% of the optimal portfolios had a bond percentage less than 40%.

On the fixed income side, a majority of respondents indicated that they favored portfolios that had small to moderate percentages of Treasury bonds and small percentages of junk bonds in their portfolios. Once again, risk taking is a qualitative judgment here because one would have to quantify what the “risky” percentage would be. In some analyses, any junk bonds in a portfolio would be considered a high-risk strategy. For the other portfolio management questions, we saw the following responses:

- On the “short sale” question, 62% of the responses were in the upper two quintiles.
- On the “derivatives” question, 51% of the responses were in the upper two quintiles.

These responses indicate that these persons would use these “sometimes” or “frequently.” These would both be considered higher risk strategies for an investor to pursue in their own portfolios.

There were also four related questions in the personality inventories that were interesting. These were from the GESS-R and GUI indices. On the GESS-R, question 16 states: “In the future I expect that I will reach my financial goals.” The responses rank from 1 (*highly improbable*) to 5 (*highly*

probable). The responses to this question had 90% of the responses in the “probable” and “highly probable” categories. In the GUI, question 5 asks the probability of “making a six-figure salary”. 94% of the responses were in the “probable” and “highly probable” categories. Question 18 asks the probability of “marrying someone wealthy.” For this question, 24% of the responses were in the probable and highly probable categories. The last question is about “being financially secure when you retire.” The responses here were 100% in the probable and highly probable categories.

In terms of interpreting these results, the effects of education and youth appear to be colliding. These are all students in their early twenties and predominantly male. They indicate a propensity to have moderate to high risk portfolios and are willing to use both short positions as well as derivative positions for portfolio enhancements. In terms of education, these are highly sophisticated investors who bear the fiduciary responsibility for managing a multimillion dollar portfolio of equities and bonds. They are all familiar with the inherent risks and rewards of equities and bonds and are aware of how to execute sophisticated portfolio enhancements. Based on their responses, it will be interesting to see how their personality characteristics interact with these findings.

Means Analysis

During the course of the study, we collected surveys from two separate cohorts of students. The surveys were collected during September in each fall semester. In between cohort one and cohort two, something interesting happened which we call the sub-prime mortgage crisis. In terms of the class investment philosophy, it went from a small cap growth focus to a large cap dividend stock focus. An interesting question is, did the collective mirror changes in the individuals’ risk tolerances? To test this, we did some independent sample means tests. The results are as follows:

Table 2 indicates the z score for a null hypotheses that the difference in the mean values is zero. For each of the portfolio survey variables as well as the psychological indicator index scores, there was no statistically significant difference in the means between cohorts at the $\alpha = 0.05$ level of significance. Thus we could not reject the null hypothesis for any of the variables tested.

Correlation Analysis

For the correlation analysis, we performed a series of bivariate Pearson correlation tests on the data. The correlation matrix is reproduced in Table 3. To test our hypotheses, we were looking for the following relationships to occur:

- Positive correlation between “higher risk” financial choice variables and the psychological risk measures that indicate higher risk and negative correlation between the higher risk financial choice variables and the lower risk psychological risk measures.

- This would imply positive correlations between stockper, growthper, smallcap junk, short and deriv variables and the GESS-R and SENSEEK scores and negative correlation between those variables and GUI and DELAYGRAT scores.
- Lower risk taking would be characterized by higher bondper and Treasury choices, so the opposite of the above would apply.

We posed a set of hypothetical portfolio preference questions to a group of well-informed college students who are, in general, in a higher personal risk-taking population than the general population. We controlled for income by asking hypothetical questions and ended up with a fairly homogeneous sample. In general, we found no significant correlation patterns among the financial choice variables and the psychological indicators. At least for this sample, the scores do not indicate a strong pattern among choices. If we examine the correlation matrix, we find support for some earlier research that indicates that there is no consistent relationship between the personality inventories employed and the reported financial choices made by investors in the sample. The only correlations that were significant between the inventory variables and the portfolio choice variables were the delay of gratification scale and the stock percentage and short selling variables. These correlations both had a positive sign. Our hypothesis was that a higher delay of gratification scale would imply less impulsivity and so possibly less risk taking. Given a positive correlation between the index and the two portfolio variables, it could also indicate a knowledge that one has more time to make up for risky decisions made today with a portfolio choice.

CONCLUSION

A consistent question that numerous authors have investigated involves whether risk taking is an inherent personality trait that crosses over to multiple domains or whether it is confined to certain activities. Slovic [1972] argued that risk taking was specific and did not necessarily cross over. Of particular interest to us is whether personal risk taking and financial risk taking overlap. This question has been modeled by other authors using a variety of psychological surveys and proxy variables such as sports participation to address the personal risk taking domain. In this study, we used several well-tested psychological instruments to measure personal risk taking and tested to see whether cross-domain risk taking appeared. The evidence surveyed was mixed: use of the Myers-Briggs Type Indicator showed that certain types were more risk tolerant: Bringham [1994] and Filbeck, Hatfield and Horvath [2005]. Wong and Carducci [1991] used a survey of sensation seeking and found positive relationship with financial risk taking. Morse [1998] tried to replicate this but did not get the same results

This study used explicit measures of risk taking, sensation seeking, optimism, and intertemporal orientation to test for similar patterns. While our sample indicated through the portfolio preference survey that they had a propensity to choose moderately risky portfolios and portfolio management strategies, we found no discernible pattern with the psychological instruments and the portfolio preferences shown. This would tend to validate Slovic's claim.

We also tested for differences in preferences between two separate cohorts of students in the student fund program. Despite the second group making decisions about investment policy following the onset of the subprime mortgage crisis, the mean responses of all of the variables tested showed no significant differences with the earlier cohort. This could be a result of youthful optimism, however, as their mean GESS-R score was above the typical mean for college student populations. It could also be the result of their separating the goals of the portfolio they manage from their own personal portfolio goals. One could infer a familiarity bias in the sense that students based their portfolio selections on things they were intimately familiar with. The optimism bias did not show up statistically, but certainly the students know the risk-return tradeoff quite well. Another implied optimism bias could be shown by the fact that the mean portfolio selection and psychological test values did not change after the subprime mortgage crisis was processed by the students.

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