A Domain Specific Measure of Investment Risk Preference

Eun Jin Kwak[1] and John E. Grable[2]

Abstract

This study introduces and validates a domain-specific investment risk-preference measure that integrates elements of revealed-preference tests, using choice scenario dyads, with stated-preference approaches that leverage individual experiences and perceptions. Data from two surveys were analyzed using OLS regression and ordered logit models to evaluate the measure's efficacy. Results demonstrate that the proposed measure is positively associated with a modified version of the Survey of Consumer Finances (SCF) self-assessed risk-tolerance item and negatively associated with cash-holding behavior. Compared to existing risk-tolerance assessments, this measure offers a practical advantage by allowing financial advisors to align investment products more accurately with a test-taker's risk-taking comfort level. This direct applicability highlights the measure's unique value in enhancing portfolio personalization and advancing the precision of investment risk assessment tools.

Recommended Citation

Kwak, E-J., & Grable, J. E. (2025). A domain specific measure of investment risk tolerance. *Financial Services Review*, *33*(1), 179-204.

Introduction

The degree to which a household financial decision-maker allocates investable resources across risk-free, fixed-income, and growth assets is associated with the investment preference of the financial decision-maker. This is one reason governmental agencies, certification boards, and other regulatory bodies require financial service providers to assess, before making investment recommendations, their clients' preference for holding risky assets.[3] Essentially, regulators want to ensure that the risks taken by an investor align with the investor's preference for and willingness to take a risk. The importance of accurately gauging a financial decision-maker's preference for risk implies the need for reliable and valid measures of risk preference. While various academic traditions exist to estimate a person's risk-taking preference, two approaches dominate: revealed-preference tests and stated-preference measures. Revealed-preference tests are designed

[1] Corresponding author (kwake@uwgb.edu). University of Wisconsin-Green Bay, Green Bay, WI, USA
[2] University of Georgia, Athens, GA, USA

[3] The Securities and Exchange Commission (SEC) best interest regulations require investment advisers to evaluate the risk-taking preference of clients prior to making investment recommendations. Specifics about the regulations can be found at https://www.sec.gov/info/smallbus/secg/regulation-best-interest. Readers may also find the following SEC web link to be helpful: https://www.sec.gov/exams/adviser_compliance_questions. Similarly, the Financial Industry Regulatory Authority, Inc. (FINRA) has rules and standards related to client in-take assessments. These rules can be found at: https://www.finra.org/rules-guidance/key-topics/suitability/faq.

to describe preferences by observing choices made when someone is faced with an incentivized dilemma, whereas stated-preference measures (sometimes referred to as propensity or elicited risk-preference tests) rely on a test-taker's self-report of their subjective evaluation of the riskiness of choices. Regardless of the assessment approach, the intended outcome is to ascertain a financial decision-maker's stable preference for trading risk for return (Davies, 2016).

Today, not only is there disagreement about the optimal way to measure financial risk preference, but there is also no consensus on the preferred definition describing risk-taking preference (Harnum et al., 2010; Mata et al., 2018). Risk preference is sometimes referred to as risk appetite, risk aversion, or risk tolerance (Rabbani & Nobre, 2022). For clarification purposes, in this study, *risk preference* refers to a financial decision-maker's general feeling that one situation or choice is better than another one (Nobre & Grable, 2015), regardless of whether this feeling is accurate. Current methodologies used to evaluate investment risk preference tend to either place a large cognitive load upon test takers, thus reducing statistical reliability, or they skew towards being overly simplistic, which can reduce validity. This paper aims to describe the development and testing of a domain specific investment risk-preference measure that blends aspects from revealed-preference tests (i.e., choice scenario dyads) with aspects of stated-preference measures that allow a test-taker to take advantage of past investment experience and evolving perceptions when making choices. As discussed in the paper, this new measure offers a quick and accurate way to measure the specific domain of investment risk preference.

Literature Review and Hypothesis Development

Revealed-Preference Assessments

Samuelson (1938) is generally credited with introducing the theory of revealed preferences. The theory states that the consumption preference of a consumer can best be described through a consumer's behavior. Samuelson assumed that consumers are rational, and before making a decision, consumers weigh the costs and benefits of differing alternatives. Only after making an informed preference analysis does a consumer decide on the option that matches their preference. Revealed-preference theory allows for adding constraints, such as the introduction of budgets and supply and price limitations. The theory has been widely studied, and today, revealed-preference theory underlies many models of consumer choice.[4]

The use of revealed-preference assessments is one of two primary ways financial advisors assess the willingness (or unwillingness) of their clients to take financial risks. Revealed-preference tests, either in a clinical or survey setting, require test-takers to choose between controlled monetary lotteries (Arslan et al., 2020). The notion underlying such tests is that risk and risky choices can best be proxied by analyzing the variance in potential monetary outcomes associated with dyadic choices (Hertwig et al., 2018). An example of a dyadic choice is when a test-taker is asked to select their preference between an investment that provides a guaranteed gain of $500 or an investment with a 50% chance of generating a guaranteed $1,000 or a 50% chance of making nothing. Although the expected value is the same with both choices, someone who is risk intolerant will generally choose the first investment. In contrast, someone who prefers more investment risk will opt for the second investment. As noted by Hertwig et al. (2018), "The revealed-preference tradition holds that people's utilities and true beliefs are revealed

[4] Revealed-preference theory can be presented in one of three forms (Feng & Seasholes, 2005). The weak axiom suggests that consumers are consistent in their choices, given income and price constraints, and that purchases always reflect preferences. The strong axiom is premised on the idea that transitivity cannot be violated. For example, if X is preferred to Y, then Y cannot be revealed as preferred to X. The generalized axiom deals with situations where two or more alternatives are equally preferred (Richter, 1966).

through the (incentivized) choices they make" (p. 2). Through the combination of a series of related choice scenarios, it is possible to estimate a generalized preference for risk, which can then be converted to a measure of constant relative risk aversion.

While revealed-preference assessment techniques are mathematically eloquent, the assessment process is not without its critics. Guiso and Sodini (2013) and Mudzingiri and Koumba (2021) noted that revealed-preference tests place a cognitive burden on test-takers, often taxing a person's numeracy skills.[5] The result can lead to cognitive biases that result in choices that vary from a person's true preference. Arshan et al. (2020) pointed out that this measurement approach relies on often violated assumptions, including the notion that preferences are temporally stable (i.e., akin to a personality trait). In a landmark study, Frey et al. (2017) concluded that nearly all revealed-preference tests, along with other behavioral assessment techniques, capture transient states rather than stable preferences. As evidence of this assertion, in tests of reliability, test-retest estimates tend to be low (e.g., .20; see Mata et al., 2018).

Stated-Preference Assessments

Stated-preference assessments are the primary alternative to revealed-preference measures. Stated-preference scores are generally estimated using a propensity scale/questionnaire or a single-item question (Cardak & Martin, 2019; Rabbani & Nobre, 2022). While psychologists generally prefer self-reports, economists tend to be skeptical of what people say because they believe there is a loose (at best) association between statements of intent and actual behavior (i.e., a self-report is 'cheap talk'). The psychological case for using stated-preference measures lies in how risk is defined using a psychometric lens. Rather than focus on the variance of returns, psychologists define risk as an activity that offers rewards with a corresponding possibility of loss. When viewed this way, rather than being always quantifiable, losses are hypothesized to be less predictable or ascertainable before engagement in a risk-taking activity.

Stated-preference tests rely on a person's introspective ability to gauge future behavior rather than current observable behavior (Arslan et al., 2020). As opposed to being a weakness (i.e., introspective evaluation), Arslan et al. (2020) argued that scores derived from stated-preference tests offer a more reliable and valid insight into a decision-maker's true preference orientation. When answering a stated-preference item or items in a questionnaire, a test-taker is forced to establish a reference frame in which the person considers their possible action(s), situational constraints, and anticipated experiences (e.g., disappointment, regret, fear; Hertwig et al., 2018). As noted by Arslan et al., stated-preference questions allow test-takers to refer to memories, experiences, and perceptions in a way that increases the validity of a preference assessment.

Summary

As this review of the literature suggests, the revealed-preference and stated-preference traditions associated with risk-preference assessment provide unique advantages and disadvantages. In terms of revealed-preference assessments, tests offer a direct way to measure choices through the presentation of bivariate alternatives offering varying degrees of risk. Appraisal of these choices does provide insight into a decision-maker's preference orientation. The primary drawback to existing revealed-preference tests is that they generally rely on presenting predetermined probability outcomes. This aspect of revealed-preference testing is divorced from the realities faced by decision-makers when formulating investment decisions. Also, the inclusion of probabilities into scenarios increases test-taker cognitive load, which is known to reduce the validity of outcome assessments. Stated-preference assessment techniques provide more valid and reliable insight into a decision-maker's preferences; however, this assessment approach lacks a direct

[5] Additionally, the notion of knowing probability outcomes prior to making a risky financial decision is removed from the realities faced by most investors.

way to assess immediate choices. Additionally, scores from stated-preference tests can be difficult to evaluate. Scores are also economically unsustainable for use in models based on modern portfolio theory (Guiso & Sodini, 2013; Hanna & Lindamood, 2004).

The advantages and disadvantages associated with these two assessment approaches have led a handful of researchers to consider alternatives to or extensions of revealed-preference and stated-preference assessment methodologies to gain a more robust understanding of investment risk preferences.[6] For example, Hanna et al. (2001) developed a measure of subjective risk tolerance based on economic theory. Their specific aim was to present a more useable and valid way to derive estimates of constant relative risk aversion. A few years later, Hanna and Lindamood (2004) designed a revealed-preference test based on pension income gambles. They added a visual element to the assessment process to reduce the cognitive load on test-takers. They reported an improvement in risk-aversion score outcomes compared to a traditionally designed revealed-preference test (i.e., risk-aversion scores were greater than what has been reported using other measures). Hanna and Lindamood also noted that scores on their measure were positively associated with the Survey of Consumer Finances single-item stated-preference risk-aversion question. Grable et al. (2020) took another approach to estimating investment risk preference by combining elements from revealed-preference and propensity measurement techniques to document risk aversion. Scores from their measure were found to correlate with outcomes from other tests of risk aversion, as well as with indicators of risk-taking. The current study extends the work of Hanna and Lindamood and Grable et al. by providing an investment domain specific assessment alternative that blends the aspects of a revealed-preference test (i.e., choice scenario dyads) with elements from stated-preference measures that allow a test-taker to take advantage of experiences and perceptions when making choices.

Research Hypotheses

When the development of a risk-assessment test is contemplated, it is important to document the measure's validity. When using cross-sectional data, this is usually accomplished by correlating scores with factors associated with risk preference and risk aversion (i.e., a form of concurrent validity). For example, the proportion of one's portfolio held in less risky assets (e.g., cash) should be lower for those with a low investment risk-preference score (Kim et al., 2019). Additionally, one should expect differences in investment risk preference by gender and income (Mudzingiri & Koumba, 2021), as well as other factors (Ertac, 2020). Hartnett et al. (2019), Koekemoer (2018), and Dickason and Ferreira (2018) reported that females generally exhibit greater financial risk aversion (i.e., they prefer less risk). Income and a preference for low-risk investments are thought to be negatively associated (Grable & Joo, 2004; Pinjisakikool, 2017; Wong, 2011). Similarly, educational attainment and risk aversion are believed to be negatively associated (Hallahan et al., 2004; Larkin et al., 2013), whereas a preference for risk-taking has been reported to be positively associated with satisfaction, which is occasionally used as an indicator of financial knowledge and confidence (Atlas et al., 2019; Dare et al., 2020; Grable, 2000; Robb, 2012).

Informed by a review of the literature, this study was conceived to test the following hypotheses:

> H_1: Investment risk preference is positively associated with risk-taking investment behavior, controlling for gender, education, income, and financial satisfaction.
>
> H_2: Investment risk preference is positively associated with a person's self-evaluation of their risk tolerance, controlling for gender, education, income, and financial satisfaction.

Data, Variables, and Methodology

Data from two surveys, one conducted in 2022 and the other conducted in 2024, were used to evaluate the proposed risk-preference scale. The

[6] In addition to the studies described in this paper, readers may be interested in reviewing Barsky et al. (1997), Bowen et al. (2015), Brink and Rankin (2013), Charness et al. (2013), and Hansson and Lagerkvist (2011).

following discussion describes each survey, the variables used in this study, and the methods utilized to test the robustness of the proposed measure.

Survey One Data

Initial data for this study were obtained from a survey distributed by Precision Sample, LLC (https://www.precisionsample.com/) to a panel of adults aged 18 years or older living in the United States as of December 2022. The survey was distributed to 600 individuals who received a modest incentive upon survey completion. Useable data from 596 respondents was available and used in the analyses. Table 1 provides a descriptive overview of the sample.

Survey Two Data

Follow-up data were gathered from another survey distributed by Precision Sample, LLC to a different panel of adults aged 18 years or older who were living in the United States in November 2024. The survey was sent to 500 individuals, who, like those in the first sample, received an incentive after completing the survey. Useable data from 458 respondents was obtained. Descriptive data for the sample is provided in Table 1.

Investment Risk-Preference Test

The following six questions were presented in a skip pattern to estimate investment risk-preference scores. The test was conceptualized similarly to a revealed-preference assessment in that respondents were asked to choose between two distinct choice alternatives; however, rather than use probability estimates of return variation and/or losses/gains, the choice scenarios were written to align with the way a stated-preference item might be presented. In this way, the test blended aspects from revealed-preference and stated-preference traditions.

The series of questions was prefaced with the following statement: "Financial decision-makers face difficult choices when selecting investments. Given the following two options, which would you prefer to own?" Scores next to each choice scenario indicate how answers were coded. Whenever a respondent received a score of 0, they were skipped to the next choice scenario; otherwise, they exited the skip pattern with the assigned score. The only exception was for those faced with the final choice alternatives, in which case a respondent received a score of six or seven, depending on their choice. As such, the questioning process resulted in scores ranging from 1 to 7. The mean and standard deviation of scores was 1.53 and 1.10, respectively, in the first survey and 1.81 and 1.00, respectively, in the second survey.

Scenario 1:
Of the two investment choices shown below, which do you prefer?

(a) A 100% guaranteed short-term bank product with a low return and minimal risk, offering stable value and little to now volatility. (1)
(b) A 100% guaranteed short-term government bond with a low return and minimal risk, where the value may fluctuate slightly (i.e., go up or down). (0)

Scenario 2:
Of the two investment choices shown below, which do you prefer?

(a) A 100% guaranteed short-term government bond with a low return and almost no volatility, where the value may fluctuate slightly (i.e., go up or down). (2)
(b) A 100% guaranteed long-term bank product with a higher return and low volatility, offering stable and predictable value growth. (0)

Scenario 3:
Of the two investment choices shown below, which do you prefer?

(a) A 100% guaranteed long-term bank product with a higher return and low volatility, offering stable and predictable value growth. (3)
(b) A long-term government bond with a higher return, subject to moderate volatility, causing its value to fluctuate. (0)

Scenario 4:
Of the two investment choices shown below,

which do you prefer?

(a) A long-term government bond with a higher return, subject to moderate volatility, causing its value to fluctuate. (4)
(b) A mix of stocks and bonds with high volatility, leading to significant fluctuations in value. (0)

Scenario 5:
Of the two investment choices shown below, which do you prefer?

(a) A mix of stocks and bonds with high volatility, leading to significant fluctuations in value. (5)
(b) A mix of stocks and bonds with extremely high volatility, resulting in frequent and significant fluctuations in value. (0)

Scenario 6:
Of the two investment choices shown below, which do you prefer?

(a) A mix of stocks and bonds with extremely high volatility, resulting in frequent and significant fluctuations in value. (6)
(b) Commodities or cryptocurrencies with extremely high volatility, causing radical and unpredictable fluctuations in value. (7)

Self-Assessed Risk Tolerance

In alignment with a recommendation by Grable and Lytton (2001), and similar to the approach used by Hanna and Lindamood (2004), an adapted version of the Survey of Consumer Finances (SCF) investment choice question, which was similar to a question in the Chinese Household Financial Survey (see Hanna et al., 2018), was used to evaluate a respondent's self-assessed risk tolerance. Scores were used in a validity test of the proposed measure. The original question included the following four response categories: (a) substantial, (b) above average, (c) average, and (d) no risk. The question was revised for this study to include a below-average category. The question was asked and coded as follows:

Which of the following statements comes closest to the amount of financial risk that you are willing to take when you save or make investments?

(a) Take substantial financial risk expecting to earn substantial returns (coded 5—substantial risk)
(b) Take above-average financial risks expecting to earn above-average returns (coded 4—above average risk)
(c) Take average financial risks expecting to earn average returns (coded 3—average risk)
(d) Take below-average financial risks expecting to earn below-average returns (coded 2—below average risk)
(e) Not willing to take any financial risks (coded 1—no risk)

Control Variables

The following control variables were measured and used as validation factors in the analyses. Gender was coded 1 = female and 0 = male. Although an "other" category was provided (e.g., non-binary), no respondents (in either survey) selected this category. Education was assessed with six ordinal categories ranging from some high school or less to graduate or professional degree. Income was measured on an ordinal scale ranging from less than $10,000 to $150,000 or more. Financial satisfaction was measured by asking respondents to indicate how satisfied they were with their present financial situation. The following response options were provided: (a) extremely negative, (b) somewhat negative, (c) neither positive nor negative, (d) somewhat positive, and (e) extremely positive. Descriptive data for the control variables are shown in Table 1.

Methodology

In addition to the descriptive statistics presented in Table 1, a correlation analysis was conducted to estimate the associations across the variables of interest in both surveys. This was followed by the estimation of regression models with the proportion of cash held by a respondent in their portfolio as the outcome variable. In the first model, investment risk-preference scores and the control variables were used as the independent factors. The model was operationalized as follows:

$$Y_{ie} = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \cdots + \beta_p X_{ip} + \varepsilon \quad (1)$$

where, Y_{ie} = represents the cash holdings for individual *i*, β_0 is the regression constant, X_{ip} denotes individual *i* values on the *p*th of predictor variables in the model, and ε is the error term. Two regressions were estimated. The first regression included the investment risk preference variable, while the second included the revised SCF risk tolerance variable that was used as proxy for self-assessed (SA) risk tolerance. This analysis was conducted to validate the findings from the first test.

This was followed by the estimation of an ordered logit regression for each survey where self-assessed risk tolerance was the dependent variable, with investment risk preference and the control variables included as predictors. The model assumes the latent variable Y^*exists corresponding to the self-assessed risk tolerance value Y_r. The model further assumed $a_1 < a_2 < a_3 < a_4 < a_5$, which represent the estimated critical values, and the relationship between $Y^*$and Y_r depends on whether it is greater than or less than the given critical values, which are defined as follows:

$$Y_r = \begin{cases} 1 & if\ Y^* \leq \alpha_1 \\ 2 & if\ \alpha_1 < Y^* \leq \alpha_2 \\ 3 & if\ \alpha_2 < Y^* \leq \alpha_3 \\ 4 & if\ \alpha_3 < Y^* \leq \alpha_4 \\ 5 & if\ \alpha_4 < Y^* \end{cases} \quad (2)$$

If Y_r is the ordinal outcome of self-assessed risk-tolerance with *J* categories, then the cumulative probability of Y_r less than or equal to a specific category *j* = 1, ..., *J*-1 is $P(Y_r \leq j)$. In the model, $P(Y_r \leq J) = 1$. The log odds of being less than or equal to a particular category can be defined as: $log\frac{P(Y_r \leq j)}{P(Y_r > j)} = logit\big(P(Y_r \leq j)\big) = \beta_0 + \beta_{j1}X_1 + \beta_{j2}X_2 + \cdots + \beta_{jp}X_p + \varepsilon$ (3)

for *p* predictors.

Results

Figure 1 shows the distribution of self-assessed risk tolerance scores derived from the modified SCF item. The distribution of scores generally matched what has generally been reported in the literature, with the majority of respondents falling into the average to above-average categories.

Figure 1. Self-Assessed Risk-Tolerance Score Distributions

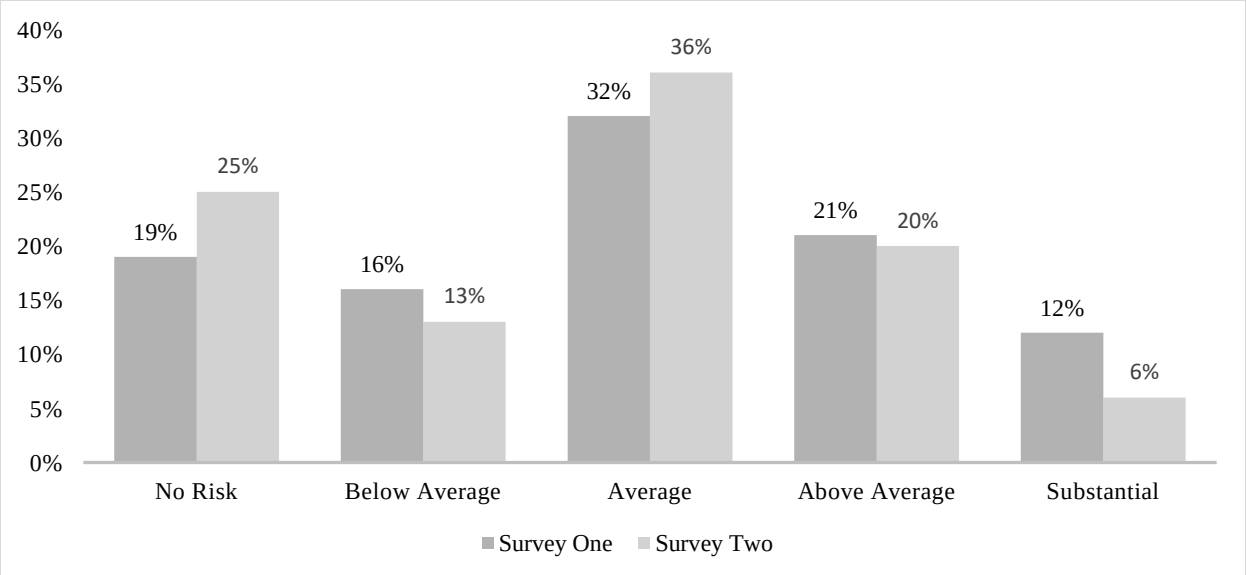

Table 1. Descriptive Sample Statistics (Sample One *N* = 596; Sample Two *N* = 458)

	Survey One			Survey Two		
Variable	**Mean**	***SD***	**%**	**Mean**	***SD***	**%**
Cash Holdings	50.48%	36.72%		51.25%	37.36%	
Gender						
Males			47%			50%
Females			53%			50%
Education						
Some High School or Less			2%			2%
High School Graduate			17%			19%
Some			22%			22%
College/Trade/Vocation Training			16%			11%
Associate's Degree			31%			34%
Bachelor's Degree			12%			12%
Graduate of Professional Degree						
Income						
Less than $10,000			4%			6%
$10,000 to $19,999			6%			8%
$20,000 to $29,999			7%			13%
$30,000 to $39,999			11%			10%
$40,000 to $49,999			10%			7%
$50,000 to $59,999			9%			11%
$60,000 to $69,999			7%			7%
$70,000 to $79,999			6%			8%
$80,000 to $89,999			5%			5%
$90,000 to $99,999			6%			3%
$100,000 to $149,999			14%			14%
$150,000 or more			15%			8%
Financial Satisfaction						
1 Extremely Negative			12%			12%
2 Somewhat Negative			16%			26%
3 Neither +/-			21%			22%
4 Somewhat Positive			32%			30%
5 Extremely Positive			195%			10%
Self-Assessed Risk Tolerance						
No Risk			19%			25%
Below Average			16%			13%
Average			32%			36%
Above Average			21%			20%
Substantial			12%			6%
Investment Risk Preference	1.53	1.10		1.81	1.00	

In the first sample, more females than males completed the questions. The gender composition of the sample was evenly split in the second survey. Most respondents had completed at least some college, trade, or vocational training in both surveys. Income in both samples was broadly distributed across the categories. Financial satisfaction was similar across the samples.

Survey One Results

Table 2 shows the correlation coefficient estimates for the variable associations in the first survey. A positive association between investment risk-preference scores and self-assessed risk tolerance was observed. Investment risk preference was not statistically significantly related to the gender, income, or the financial satisfaction of respondents. Investment risk preference was, however, negatively correlated with cash ownership.

Table 2. Correlation Estimates Across the Variables of Interest in Survey One

Variable	1	2	3	4	5	6	7
1. SA Risk Tolerance	1.00						
2. Cash	-.41**	1.00					
3. Gender	-.25**	.13*	1.00				
4. Education	.31**	-.31**	-.09*	1.00			
5. Income	.34**	-.37**	-.15**	.47**	1.00		
6. Fin. Satisfaction	.34**	-.40**	-.14**	.27**	.36**	1.00	
7. Inv. Risk Pref.	.15**	-.13**	-.01	.07	.04	.03	1.00

Note. *$p < .01$, **$p < .001$.

A regression was estimated to determine the degree to which investment risk preference was positively associated with cash ownership behavior, controlling for gender, education, income, and financial satisfaction. The model was statistically significant, $F_{5,595} = 37.408$, $p < .001$. The model explained approximately 24% of the variance in cash ownership reported by respondents. As shown in Table 3, investment risk preference was negatively associated with cash holding behavior. This finding provides support for the first research hypothesis. Education, income, and financial satisfaction were also negatively associated with cash ownership.

The last four columns of Table 3 show the model that was developed as a validity test. In this model, self-assessed risk tolerance was included as an independent variable. This model was also statistically significant ($F_{5,595} = 45.72$, $p < .001$). The amount of explained variance in cash ownership was similar to the original model (27%).

Table 3. OLS Regression: Dependent Variable Cash Holdings as Percentage of Portfolio in Survey One

	Model 1				*Validity Test Model*			
Variable	***B***	***SE***	**β**	***t***	***B***	***SE***	**β**	***t***
Constant	105.46**	5.20		20.28	105.18**	4.88		21.55
Gender	3.20	2.68	.04	1.20	-.17	2.67	-.00	-.06
Education	-3.38*	1.09	-.13	-3.09	-2.51*	1.08	-.09	-2.33
Income	-2.02**	.44	-.19	-4.56	-1.61**	.44	-.15	-3.68
Fin. Satisfaction	-3.92**	.54	-.28	-7.31	-3.21**	.54	-.23	-5.99
Inv. Risk Pref.	-3.35**	1.20	-.10	-2.79				
SA Risk Tolerance					-7.21**	1.14	-.25	-6.30

Note. *$p < .01$, **$p < .001$.

The second research hypothesis was addressed using an ordered logit regression. Coefficients were estimated to determine whether investment risk preference was positively associated with a respondent's self-assessment of their risk tolerance, controlling for gender, education, income, and financial satisfaction. The model (Table 4) was statistically significant, $\chi^2 = 163.616$, $p < .001$. Based on Pseudo R^2 estimates, it was determined that the model explained approximately 25% of the variance in self-evaluation scores (Cox and Snell R^2 and Nagelkerke R^2, respectively). Investment risk preference was found to be positively associated with self-assessed risk tolerance. This finding provides support for the second hypothesis. Additionally, each control variable was significant in the model, with the direction of coefficients matching what has generally been reported in the literature.

Table 4. Ordered Logit Regression: Dependent Variable Self-Assessed Risk Tolerance in Survey One

Variable	Estimate	*SE*	Wald	95% Conf. Int. Lower Bound	95% Conf. Int. Upper Bound
Gender	-.82**	.15	28.11	-1.12	-.51
Education	.24**	.06	14.93	.12	.36
Income	.09**	.03	13.43	.04	.14
Fin. Satisfaction	.17**	.03	29.08	.11	.23
Inv. Risk Pref.	.24**	.07	11.80	.10	.37

Note. *$p < .01$, **$p < .001$

Survey Two Results

The tests from the first survey were replicated using data from the second survey. Table 5 shows the correlation coefficient estimates for the variable associations in the second survey. A positive association between investment risk-preference scores and self-assessed risk tolerance was observed. Investment risk preference was not statistically significantly related to gender; however, scores were positively associated with respondent education, income, and financial satisfaction. Investment risk preference was also negatively associated with cash ownership.

Table 5. Correlation Estimates Across the Variables of Interest in Survey Two

Variable	1	2	3	4	5	6	7
1. SA Risk Tolerance	1.00						
2. Cash Holdings	-.36**	1.00					
3. Gender	-.14**	.16**	1.00				
4. Education	.23**	-.18**	.04	1.00			
5. Income	.32**	-.35**	-.03	.41**	1.00		
6. Fin. Satisfaction	.27**	-.36**	-.13*	.18**	.39**	1.00	
7. Inv. Risk Pref.	.18**	-.19**	-.08	.10*	.14**	.09*	1.00

Note. *$p < .01$, **$p < .001$.

A regression was used to assess whether investment risk preference was positively associated with cash ownership controlling for gender, education, income, and financial satisfaction. The model shown in Table 6 was statistically significant, $F_{5,453} = 25.177$, $p < .001$. The model explained approximately 22% of the variance in cash ownership reported by respondents. As shown in the table, investment risk preference was negatively associated with holding cash. This finding provides further support for the first research hypothesis. Gender, income, and financial satisfaction were also associated with cash ownership.

The last four columns of Table 6 show the model where self-assessed risk tolerance, rather than investment risk preference, was included as an independent variable. The model was statistically significant, $F_{5,453} = 29.056$, $p < .001$, explaining about 25% of the variance in cash ownership. Self-assessed risk tolerance was negatively associated with cash holdings. Gender, income, and financial satisfaction were also associated with cash ownership.

Table 6. OLS Regression: Dependent Variable Cash Holdings as Percentage of Portfolio in Survey Two

	Model 1				*Validity Test Model*			
Variable	***B***	***SE***	**β**	***t***	***B***	***SE***	**β**	***t***
Constant	87.88**	7.81		11.26	93.60**	7.79		12.01
Gender	8.49*	3.17	.11	2.68	7.31*	3.13	.10	2.33
Education	-.99	1.23	-.04	-.80	-.39	1.22	-.02	-.32
Income	-2.39**	.52	-.22	-4.60	-2.03**	.52	-.19	-3.91
Fin. Satisfaction	-7.62**	1.42	-.25	-5.38	-6.69**	1.41	-.22	-4.75
Inv. Risk Pref.	-3.92**	1.28	-.13	-3.07				
SA Risk Tolerance					-6.88**	1.38	-.22	-4.99

Note. *$p < .01$, **$p < .001$.

An ordered logit regression was used to evaluate the second research hypothesis. The model was used to establish whether investment risk preference was positively associated with a respondent's self-evaluation of their risk tolerance, controlling for gender, education, income, and financial satisfaction. The model shown in Table 7 was statistically significant, $\chi^2 = 72{,}436$, $p < .001$. The model explained between 16% and 18% of the variance in self-assessment scores. Investment risk preference was found to be positively associated with self-assessed risk tolerance. This finding adds additional support for the second hypothesis. Additionally, each control variable was significant in the model.

Table 7. Ordered Logit Regression: Dependent Variable Self-Assessed Risk Tolerance

Variable	**Estimate**	***SE***	**Wald**	**95% Conf. Int. Lower Bound**	**95% Conf. Int. Upper Bound**
Gender	-.42*	.17	5.88	-76	-.08
Education	.17*	.07	6.18	.04	.30
Income	.11**	.03	14.55	.05	.17
Fin. Satisfaction	.26**	.08	10.64	.10	.41
Inv. Risk Pref.	.20**	.07	8.11	.06	.34

Note. *$p < .01$, **$p < .001$

Discussion

This paper describes the development and testing of a domain specific investment risk-preference measure that blends aspects from revealed-preference tests with elements from stated-preference assessments. The resulting scale is one that provides insight into a financial decision maker's investment preference based on their experiences and perceptions when making asset allocation choices. This measure offers a comparatively quick and valid way to assess the specific domain of investment risk preference.

When assessing the practicality of this tool, it is worthwhile to distinguish between investment risk preference, risk tolerance, and risk aversion. Risk tolerance reflects an individual's willingness to accept financial risk, while risk aversion indicates a reluctance to take risks. In contrast, investment risk preference pertains to a decision-maker's subjective perception that one investment option is more favorable than another. As noted by Nobre and Grable (2015), someone's preference is akin to a feeling. A preference is not a characteristic trait. This means that someone's preference can change over time. For example, it is reasonable to anticipate that a financial decision-maker's preference for investments that provide higher returns with corresponding more risk (i.e., variability in returns) will increase with experience, satisfaction, and expectations. When viewed this way, risk preference becomes an important input when describing someone's risk profile, which is generally defined as a composite measure that portrays a person's willingness to take risk that accounts for their perceptions, preferences, capacities, composure, and needs (Brayman et al., 2017; Hubble et al., 2020).

This distinction between investment risk preference, risk tolerance, and risk aversion highlights the unique contribution of the measure introduced in this study, which differs from the SCF self-assessed risk item and other risk-tolerance assessments. Although the models incorporating the investment risk-preference measure and the self-assessed stated-preference item produced comparable results, the investment risk-preference measure provides a notable advantage. Specifically, it enables financial advisors to align a test-taker more accurately with investment products that align with their risk-taking comfort level, offering a direct and practical application for portfolio personalization. This precise alignment underscores the significant value of the investment risk-preference measure introduced in this research.

In this study, investment risk preference was found to be negatively associated with cash holding behavior. Investment risk preference was also found to be positively correlated with self-assessed risk tolerance, attained education, income, and financial satisfaction. Findings from this study suggest that the domain specific assessment tool presented in this paper provides a way to quickly estimate a person's preference when allocating household investment resources. Those with a low investment risk-preference scale score are expected to be more likely to hold a greater proportion of their household wealth in low return/low risk assets. On the other hand, as scale scores increase, it is reasonable to expect someone to hold proportionately more risky assets in their household portfolio(s).

It is worth considering potential study limitations when evaluating the results of this research project. To begin with, the samples were not nationally representative. The samples were chosen to be descriptive of adults who are tasked with making household investment asset allocation decisions. This helps explain the relatively high degree of risk aversion exhibited by survey respondents. The average respondent's preference for low-risk investments may have also been tied to the market environment when the surveys were distributed. The year 2022 marked the worst market for bonds in over 100 years. Returns on equity investments were also negative. The markets in 2024, however, were generally positive, but overshadowed by a rigorously contested presidential election. It is possible that after incurring portfolio losses, and being uncertain about election outcomes, respondents in both surveys shifted their preference towards lower risk investments at the time of survey completion. This possibility can be checked by administering the test again during a bond and equity bull market that is unencumbered by a national election. It would also be beneficial for future studies to test scores in predicting risky asset ownership. Whereas scores in this study were found to be robust in describing cash holding behavior it is possible that preferences are stronger in describing risk avoiding behavior than risk-taking behavior. This possibility is something that ought to be explored in future studies. Nonetheless, findings from this study indicate that the domain specific investment risk-preference measure does appear to offer a unique insight into a financial decision-maker's predilection when making asset allocation choices.

References

Arslan, R. C., Brümmer, M., Dohmen, T., Drewelies, J., Hertwig, R., & Wagner, G. G. (2020). How people know their risk preference. *Scientific Reports, 10*, 15365. 10.1038/s41598-020-72077-5

Atlas, S. A., Lu, J., Micu, P. D., & Porto, N. (2019). Financial knowledge, confidence, credit use, and financial satisfaction. *Journal of Financial Counseling and Planning, 30*(2), 175-190.

Barsky, R. B., Juster, F. T., Kimball, M. S., & Shapiro, M. D. (1997). Preference parameters and behavioral heterogeneity: An experimental approach in the health and retirement study. *Quarterly Journal of Economics, 112*(2), 537-579

Bowen, D. H., Buck, S., Deck, C., Mills, J. N., & Shuls, J. V. (2015). Risky business: An analysis of teacher risk preferences. *Education Economics, 23*(4), 470-480.

Brayman, S., Grable, J. E., Griffin, P., & Finke, M. (2017). Assessing a client's risk

profile: A review of solution providers. *Journal of Financial Service Professionals, 71*(1), 71-81.

Brink, A. G., & Rankin, F. W. (2013). The effects of risk preference and loss aversion on individual behavior under bonus, penalty, and combined contract frames. *Behavioral Research in Accounting, 25*(2), 145-170.

Cardak, B. A., & Martin, V. L. (2019). Once in a lifetime? The effects of the global financial crisis on household willingness to take financial risk. *Economic Record*. doi:10.1111/1475-4932.12506

Charness, G., Gneezy, U., Imas, A. (2013). Experimental methods: Eliciting risk preferences. *Journal of Economic Behavior & Organization, 87*, 43-51.

Dare, S. E., van Dijk, W. W., van Dijk, E., van Dillen, L. F., Gallucci, M., & Simonse, O. (2020). The road to financial satisfaction: Testing the paths of knowledge, attitudes, sense of control, and positive financial behaviors. *Journal of Financial Therapy, 11*(2), 1-30.

Davies, G. (2016). *How not to measure risk tolerance*. https://www.linkedin.com/pulse/how-measure-risk-tolerance-greg-b-davies

Dickason, Z., & Ferreira, S. J. (2018). Gender and behavior: The effect of gender and ethnicity on financial risk tolerance in South Africa. *Gender and Behaviour, 16*, 10851-10862.

Ertac, S. (2020). *The Formation and Malleability of Preferences and Noncognitive Skills*. Springer.

Feng, L., & Seasholes, M. S. (2005). Do investor sophistication and trading experience eliminate behavioral biases in financial markets? *Review of Finance*, *9*(3), 305-351.

Frey, R., Pedroni, A., Mata, R., & Hertwig, R. (2017). Risk preference shares the psychometric structure of major psychological traits. *Science Advances, 3*(10). doi: 10.1126/sciadv.1701381

Grable, J. E. (2000). Financial risk tolerance and additional factors that affect risk taking in everyday money matters. *Journal of Business and Psychology*, *14*, 625-630.

Grable, J. E., & Joo, S-H. (2004). Environmental and biopsychosocial factors associated with financial risk tolerance. *Journal of Financial Counseling and Planning, 15*(1), 73-82.

Grable, J. E., & Lytton, R. H. (2001). Assessing the concurrent validity of the SCF risk assessment item. *Financial Counseling and Planning, 12(*2), 43-52.

Grable, J. E., Kwak, E-J., Fulk, M., & Routh, A. (2020). A simplified measure of investor risk aversion. *Journal of Interdisciplinary Economics, 34*(1), 7-34. doi.org/10.1177/0260107920924518

Guiso, L., & Sodini, P. (2013). Household finance: An emerging field in G. M. Constantinides, M. Harris, & R. M. Stulz (eds.) (pp. 799-1612), *Handbook of the Economics of Finance, Volume 2 Part B*. Elsevier: Amsterdam.

Hallahan, T. A., Faff, R. W., & McKenzie, M D. (2004). An empirical investigation of personal financial risk tolerance. *Financial Services Review, 13*, 57-78.

Hanna, S. D. & Lindamood, S. (2004). An improved measure of risk aversion. *Journal of Financial Counseling and Planning, 15*(2), 27-45.

Hanna, S. D., Gutter, M. S., & Fan, J. X. (2001). A measure of risk tolerance based on economic theory. *Journal of Financial Counseling and Planning, 12*(2), 53-60.

Hanna, S. D., Kim, K. T., & Lindamood, S. (2018). Factors related to the risk tolerance of households in China and the United States: Implications for the future of financial markets in China. *Financial Services Review, 27*(3), 279-302.

Hansson, H., & Lagerkvist, C. J. (2011). Measuring farmers' preferences for risk:

A domain-specific preference scale. *Journal of Risk Research, 15*(7), 737-753.

Harnum, K., Cooper, T., & Faseruk, A. (2010). A review of the psychology of risk-taking behavior for individual investors. *Journal of Finance Issues, 8*(1), 19-28.

Hartnett, N., Gerrans, P., & Faff, R. (2019). Trusting clients' financial risk tolerance survey scores. *Financial Analysts Journal, 75*(2), 91-104.

Hertwig, R., Wulff, D. U., & Mata, R. (2018). Three gaps and what they may mean for risk preference. *Philosophical Transactions of the Royal Society B, 374*(1766). Doi.org/10.1098/rstb.2018.0140

Hubble, A., Grable, J. E., & Dannhauser, B. (2020). *Investment Risk Profiling: A Guide for Financial Advisors*. CFA Research Reports. https://www.cfainstitute.org/en/research/industry-research/investment-risk-profiling

Kim, S. D., Cotwright, M., & Chatterjee, S. (2019). Who are robo-advisor users? *Journal of Finance Issues, 18*(2), 33-50.

Koekemoer, Z. (2018). The influence of demographic factors on risk tolerance for South African investors. *Proceedings of the International Academic Conferences*, 6408640, International Institute of Social and Economic Sciences.

Larkin, C., Lucey, B. M., & Mulholland, M. (2013). Risk tolerance and demographic characteristics: Preliminary Irish evidence. *Financial Services Review, 22*, 77-91.

Mata, R., Frey, R., Richter, D., Schupp, R., & Hertwig, R. (2018). Risk preference: A view from psychology. *Journal of Economic Perspectives, 32*(2), 155-172.

Mudzingiri, C., & Koumba, U. (2021). Eliciting risk preferences experimentally versus using a general risk question: Does financial literacy bridge the gap? *Risks, 9*, 140. doi.org/10.3390/risks9080140

Nobre, L. H. N., & Grable, J. E. (2015). The role of risk profiles and risk tolerance in shaping client decisions. *Journal of Financial Service Professionals, 69*(3), 18–21.

Pinjisakikool, T. (2017). The influence of personality traits on households' financial risk tolerance and financial behavior. *Journal of Interdisciplinary Economics, 30*, 32-54.

Rabbani, A. G., & Nobre, L. H. (2022). Financial risk tolerance. In *De Gruyter handbook of personal finance*, pp. 137-156. John E. Grable and Swarn Chatterjee (Eds.). De Gruyter.

Richter, M. K. (1966). Revealed preference theory. *Econometrica, 34*(3), 635-645.

Robb, C. A., Babiarz, P., & Woodyard, A. (2012). The demand for financial professionals' advice: The role of financial knowledge, satisfaction, and confidence. *Financial Services Review, 21*(4), 291-306.

Samuelson, P. A. (1938). A note on the pure theory of consumers' behavior. *Economica. New Series, 5*(17), 61-71.

Wong, A. (2011). Financial risk tolerance and selected demographic factors: A comparative study in 3 countries. *Global Journal of Finance & Banking Issues, 5*(5), 1-12.