

## An Estimate of the Reliability of the Survey of Consumer Finances Risk-Tolerance Question

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### Abstract

The reliability of the Survey of Consumer Finances risk-tolerance question has not been reported in the literature. However, given the importance of reliability as a necessary condition for validity there is a need to know and report the question's reliability estimate. The purpose of this paper is to provide such an estimate. Several approaches were used to estimate the reliability of the question. Estimates of reliability ranged from a low of .07 to a high of .78. Although no precise reliability figure emerged from the analyses, results suggest that the reliability of the item most likely falls in the range of .52 to .59, with .59 being the most likely estimate of reliability.

Among family and consumer economists and personal finance researchers one question continues to be widely used to assess the willingness of individuals to take financial risks. That one item is generally known as the Survey of Consumer Finances (SCF) risk-tolerance question. The question is shown below:

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

1. Take substantial financial risk expecting to earn substantial returns.
2. Take above average financial risks expecting to earn above average returns.
3. Take average financial risks expecting to earn average returns.
4. Not willing to take any financial risks.

The popularity of this item among researchers is based on several factors. First, the item is one of the only risk-tolerance questions asked in national surveys of consumers. As such, responses can be used to gauge the general risk-taking preferences of Americans, whereas many other surveys that ask risk questions are limited in generalizability to the U.S. population. Second, the wide use of the item has generally been recognized as a measure offering a high degree of face validity. The majority of researchers using the item continue to do so assuming the question is a reliable substitute for longer more valid risk scales. Finally, the item continues to be used because there are few other choices available for those who want to assess risk tolerance with a national finance database.

Data were obtained from a convenience sample of faculty and staff at a large southeastern state university using a survey methodology. The survey response rate was 54%. The sample (N = 1,075) was over-weighted with women (55%), non-Hispanic Whites (90%), and those that were married (72%). Household incomes ranged from a low of \$20,000 to over \$90,000 per year. The mean age of respondents was 43 years.

During the survey process respondents were asked to answer a series of risk-tolerance assessment questions, including those used by Grable and Lytton (1999) in their 13-item risk-tolerance summated scale. The mean risk score for respondents in this study on the 13-item scale was 25.43, with a standard deviation of 5.31. Scores ranged from a low of 13 to a high of 44. Low scores were interpreted to mean a low level of risk tolerance, and vice-a-versa. The scale is generally considered to offer researchers a reasonable level of validity and reliability. Based on responses from those in the sample, the Cronbach's alpha (i.e., a measure of reliability) was determined to be .75. This corresponds to reported alphas ranging from .70 to .85 in other studies.

As part of the survey process respondents were also asked to answer the SCF risk-tolerance question. The range of responses was as follows:

- a. 4% "willing to take substantial financial risk expecting to earn substantial returns." [Coded 4]
- b. 22% "willing to take above average financial risks expecting to earn above average returns." [Coded 3]
- c. 56% "willing to take average financial risks expecting to earn average returns." [Coded 2]
- d. 18% "not willing to take any financial risks." [Coded 1]

The mean score was 2.11, with a standard deviation of .73. The distribution of answers was different from what is typically noted in the Survey of Consumer Finances, but similar to what others have found when assessing professional audiences. Overall, fewer respondents answered that they were not willing to take any financial risks compared to what has been reported in the literature when the item is used nationally. Responses to the SCF risk-tolerance question were correlated with the 13-item risk scale. A correlation of .54 ( $p < .001$ ) was noted.

Several approaches were used to estimate the reliability of the SCF risk-tolerance question. Estimates of reliability ranged from a low of .07 to a high of .78. The initial estimate, based on the correlation between the SCF risk-tolerance question and a 13-item risk-tolerance scale with a known reliability of .75 was .39. Although no precise reliability figure emerged from the analyses, Test Five provided the most useful insight into the likely maximum reliability for the SCF risk-tolerance question. Results suggest that the reliability of the item most likely falls in the range of .52 to .59, with .59 being the theoretical ceiling of the question's reliability.

Using the standard deviation score (.73) and maximum estimated reliability of the SCF risk-tolerance question (.59) from the sample used in this study results in a standard error of measurement of .47. This figure was used to estimate a true score for respondents, assuming the item were to be administered multiple times to the same people. Using *z* values associated with a 90% (1.65), 95% (1.96), and 99% (2.58) confidence interval results in possible scores falling within the ranges shown in Table 8 (assumes a mean SCF risk-tolerance question score of 2.11). For example, it is possible that, at the 95% interval level, respondents' true score on the SCF risk-tolerance question actually fell between 1.19 and 3.03.

**Table 8**  
**Confidence Intervals of SCF Risk-Tolerance Scores in the Sample**

<i>z</i> Score (a)	Standard Error of Measurement (b)	Product of (a) x (b)	SCF Mean Score	Confidence Interval (Low)	Confidence Interval (High)
1.65	.47	.78	2.11	1.33	2.89
1.96	.47	.92	2.11	1.19	3.03
2.58	.47	1.21	2.11	.90	3.32

Interpreting scores from the sample used in this study is relatively straightforward. It is possible to say, with a 95% confidence level, that the average respondent had a real risk-tolerance score, as measured with the SCF risk-tolerance question, that fell between 1 and 3 (rounded). Similarly, scores fell between 1 and 3 (rounded) at the 99% confidence level as well. Had the reliability of the item been higher, the range of scores between high and low estimates would have been smaller. In other words, the confidence generated by answers to the question would have been stronger.

The results of this study are potentially controversial. The low initial level of reliability estimated for the SCF risk-tolerance question (i.e., .39) and the wide range of subsequent reliability estimates may cause some to question the sample from which the estimates were generated. In many respects, the estimation procedure was heavily influenced by the sample used in this study. Respondent characteristics differed substantially from those sampled in the SCF. In this study, respondents were better educated than SCF respondents. Respondents also differed in terms of other demographic characteristics. More non-Hispanic Whites and women were present in the sample than what would normally be found in the weighted SCF data. These are all factors that might account for a relatively higher reported willingness to take risks than is generally reported in studies that use SCF data. On the other hand, although the sample differs from the national SCF demographic profile, this should not dramatically invalidate the results of this study. If the reliability of the SCF risk-tolerance question is high at the national level then it should also remain robust when used with sub-samples of U.S. households. If it turns out that the question's reliability varies considerably from one sample to another, this may mean that more significant validity issues may perhaps be being violated.

In summary, researchers who use the SCF risk-tolerance question ought to consider the possibility that the item's reliability is relatively low, and probably no higher than .59, and take steps to account for this possibility when interpreting findings.

#### References

- Grable, J. E., & Lytton, R. H. (1999). Financial risk tolerance revisited: The development of a risk assessment instrument. *Financial Services Review*, 8, 163-181.

#### Endnotes

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