



A Cross Cultural Test of Financial Risk Tolerance Attitudes: Brazilian and American Similarities and Differences

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ABSTRACT

The purpose of this study was to examine the extent to which risk-tolerance attitudes differ between a sample of Brazilians and Americans (N=620). Based on the use of a variety of statistical methodologies, including regression, factor, and discriminant analysis. The results indicate that Americans were more apt to engage in a speculative gamble and they were less likely to hold bonds as a safe asset. Overall, both Brazilian and American female respondents exhibited lower risk-tolerance scores; however, no age or marital status differences were noted. The results from this analysis show that cultural differences exist between Brazilians and Americans in terms of financial risk-tolerance attitudes.

Keywords: Risk Tolerance, Cross Cultural, Financial Risk

JEL Classifications: G1, M1

1. INTRODUCTION

Financial risk tolerance, which is generally conceptualized as a person's willingness to engage in a financial behavior in which the outcomes of the decision are unknown and potentially costly, is a topic that has been widely studied in the context of investor behavior (Semenov and Kuznetsov, 2015). In the United States, Europe, Australia, and other countries that share a common market orientation, the notion that financial risk tolerance plays a key role in shaping financial behavior is universally accepted. Consider the following summary from Roszkowski and Davey (2010, p. 42): "Assessment of risk tolerance is now generally recognized as a prerequisite to the development of a sound financial plan for the client." In some regions of the world, investment firms and financial advisors are required by law to assess the risk tolerance of investors before the investor engages in any trading activity. For instance, in the United States, both the Securities and Exchange Commission and the Financial Industry Regulatory Authority require financial advisors to measure and assess each client's risk tolerance. In other parts of the world, on the other hand, a much more laissez faire approach to the measurement and evaluation of risk attitudes is the norm.

In general, investors are thought to be essentially similar throughout the world; that is, investors are assumed to prefer gains over losses, as well as to prefer certainty over chance. When faced with an equally compelling set of choices, it is assumed that investors will choose the investment alternative that provides the highest risk-adjusted return (Moreira et al., 2016). This assumption implies, of course, that investors share a common definition of risk and that these investors hold similar attitudes towards taking risks. It turns out, however, that many of these assumptions may not be true in practice. Statman (2008) documented that the propensity for taking risks varies across countries. For example, he noted that in China investors are much more willing to accept an income and investment gamble compared to those in Italy, Japan, Germany, and Switzerland. He and others have concluded that much of the difference in willingness to take risk is likely due to cultural factors (Cole, 1996).

Interestingly, there have been relatively few attempts to document similarities and differences in financial risk attitudes based on nationality (Bonin et al., 2009; Ganegoda and Evans, 2014; Weber and Hsee, 1999). Nearly all of the risk-tolerance assessment work that has been published tends to be based on cross-sectional data from single country markets. The few existing cross cultural studies of risk attitudes have tended to look at differences in risk tolerance

of Americans compared to those living in China, Korea, and other emerging countries in Asia (e.g., Fan and Xiao, 2006; Hsee and Weber, 1999b). Furthermore, a review of the literature shows very few direct comparisons of risk attitudes of those living throughout the Americas.

This paucity of documentation comparing the risk attitudes of those residing in North and South America is intriguing. Countries comprising the Americas, while not always sharing similar political goals, have a strong and robust trading history. Consider Brazil and the United States. The total value of trade-exports and imports-between these two countries was close to \$72,000 million in 2013. While this amount is less than the trade that occurs between the United States and China and the United States and Korea, it is nonetheless a significant dollar figure. As the two countries work more closely together in the world markets, it will become more important to understand how the culture of each country shapes the risk attitudes of investors living in each country. This is true because it tends to be the level of risk tolerance that helps shape investment decisions. As such, the purpose of this study was to evaluate the risk tolerance of a sample of Brazilians and Americans to determine the extent to which risk attitudes exhibited by those living in each country are similar or different. Findings offer another perspective showing how globalization may be impacting households in Brazil and the United States.

2. LITERATURE REVIEW

Table 1 provides a macroeconomic comparison of Brazil and the United States. For those who are less familiar with the two

Table 1: Macroeconomic comparison of Brazil and the United States

Variable	Brazil	United States
Population	202,656,788	318,892,103
World population rank	6 th	4 th
Age demographic (%)		
0-14	23.80	19.40
15-24	16.50	13.70
25-54	43.70	39.90
55-64	7.60	14.50
65 and older	7.30	13.90
Median age (years)	30.70	37.60
Population growth rate	0.80%	0.77%
Net migration rate	-0.15 migrants per 1000 population	2.45 migrants per 1,000 population
Urbanized population	87%	82%
Largest city	São Paulo (19.96 million)	New York-Newark (19.3 million)
Life expectancy at birth	73.28 years	79.56 years
Literacy rate	90.40%	99%
GDP	\$2.42 trillion	\$16.72 trillion
GDP rank	8 th	1 st
GDP growth rate	2.50%	1.60%
GDP per capita	\$12,100	\$52,800
Gross national saving	14.80% of GDP	13.50% of GDP
Labor force	107.30 million	155.40 million
Gini index	51.9	45.0
Taxes as % of GDP	38.90%	17.00%
Inflation rate	6.2%	1.5%
Number of cell phones	248,324,000	310,000,000
Internet users	75.92 million	245 million

Source: 2014 CIA World Fact Book. GDP: Gross domestic product

countries, data in Table 1 indicate that Brazil and the United States are not that divergent in economic fundamentals. Both are large, economically diverse societies. Brazilians tend to be younger than Americans, but in terms of population growth both are similar. Brazilians and Americans are well educated and connected to each other through advanced communication systems. Brazil does, however, exhibit economic patterns more closely resembling an emerging economy while Americans reflect behavior commiserate with well-established economies. Inflation and taxes as a percent of gross domestic product (GDP) are higher in an emerging economy but so is the growth rate of GDP. It is worth noting that Statman (2008) found preliminary evidence that in terms of risk tolerance, Brazilians and Americans share similar risk attitudes; specifically, Brazilians and Americans fall between China (higher risk tolerance) and Switzerland (lower risk tolerance) in terms of their willingness to engage in a risky financial behavior.

2.1. Cross Cultural Differences in Risk Tolerance

Hsee and Weber (1999b) presented a landmark cross cultural study of risk assessment. Their study tested for differences in risk preferences between Chinese and Americans. They noted that Chinese were much more likely to seek out risk compared to Americans. Rather than being a racial difference, they concluded that the difference was based, in large part, on cultural dissimilarities between Chinese and American investors. Their study helped launch what has since become known as the “cushion hypothesis.” Fan and Xiao (2006) noted that this theoretical orientation hypothesizes that those who live in collectivist societies can rely on material and financial assistance from the government, family, and friends to such an extent that the financial risks associated with investing are significantly reduced (Hsee and Weber, 1999a). Alternatively, those living in societies where individuals have less of a “cushion” to fall back on, if a financial decision turns out badly, must bear the burden of the loss to a greater extent. Hsee and Weber (1999a) noted, “Because the Chinese have a larger close social network to count on when they need such financial support, the adverse outcome of a risky financial option may - objectively and subjectively - be less severe to Chinese than Americans” (p. 172). No evidence exists to suggest that the cushion hypothesis exists outside of Asia. In the context of this paper, it may be that Brazilians are more like Americans, in which case cultural differences may not as relevant.

2.2. Factors Associated with Risk Tolerance

A best practice suggests that when risk-tolerance attitudes are evaluated, it is important to account for additional factors that may influence the way in which people frame risk choices. Grable (2008) summarized the impact numerous socioeconomic and demographic factors have in shaping risk-tolerance attitudes. Of particular importance are age, gender, and marital status. These three factors are discussed in more detail below.

Age: Two viewpoints dominate thinking about risk tolerance and age. Many financial advisors, and those in the popular press (e.g., television, radio, and newspaper reporters), believe that age is negatively associated with risk tolerance (e.g., Deaves et al., 2007; Gilliam et al., 2010; Kaczynski et al., 2014; Nairn, 2005). That is, there is an expectation that as people age, their tolerance

for risk drops. Among researchers, however, this presumed relationship is less certain. The literature is more supportive of the notion that the age-risk tolerance relationship is likely a positive one or actually not meaningful (e.g., Ardehali et al., 2005). What some people believe to be an association between age and risk tolerance may, in fact, be an indicator of a shrinking time horizon for older people. This factor may have little to do with a person's willingness to engage in a risky behavior but rather much to do with a diminished time frame in which to recoup losses. Even so, it is reasonable to hypothesize that risk-tolerance evaluation scores differ in comparison to age.

Gender: The literature is very clear in indicating that men tend to be more willing to take financial risks than women (e.g., Ardehali et al., 2005; Bajtelsmit et al., 1999; Ganegoda and Evans, 2014; Grable and Roszkowski, 2007; Halek and Eisenhauer, 2001; Nairn, 2005; Yao and Hanna, 2005). To illustrate, Gilliam et al. (2010) concluded that gender differences in risk tolerance are consistent across generations and when controlling for other personal and household characteristics. Statman (2008) also confirmed a gender difference exists across cultures, with women exhibiting relative risk aversion compared to men. In terms of a working hypothesis, one should expect women to exhibit lower risk-tolerance scores compared to men, regardless of nationality or cultural background.

Marital status: A person's marital status is another factor often thought to be related to risk tolerance. The general consensus is that single individuals are more likely to exhibit a higher risk tolerance than those who are married. The thought is that the effects of any negative outcomes are limited to the individual, suggesting the single person is more inclined to risk negative outcomes. On the other hand, those who are married generally must take into account the ramification of choice outcomes on their spouse or partner, which may result in relative risk aversion (Ardehali et al., 2005; Yao and Hanna, 2005). Of course, the counter argument may be true. Because married individuals tend to have greater financial capacity and stability, they may be in a better position to take on financial risk because any negative outcomes can be better absorbed by the couple. That being said, given the existing literature, a reasonable hypothesis is one that predicts singles to be more risk tolerant than those who are married.

In this study, age, gender, and marital status were evaluated in the context of examining risk-tolerance differences between Brazilians and Americans. The thought was that these three variables should be controlled as possible factors known to influence risk choices. The remainder of this paper describes the data collection and analysis procedures and results associated with this study. The models presented were designed to help determine if Brazilians and Americans are more similar or different in terms of their financial risk-tolerance attitudes.

3. METHODS

3.1. Sampling Procedure

Data for this study, conducted in 2013, were obtained from two convenience samples. The first dataset was developed in

Brazil. The convenience sample included students, professors, and employees from universities in Brazil ($N = 310$). Data were collected by sending an email with a survey link to approximately 1,000 individuals. For comparison purposes, 310 Americans were randomly selected from a larger sample of individuals who answered financial risk-tolerance questions online through the Rutgers University Cooperative Extension website (<http://www.njaes.rutgers.edu:8080/money/riskquiz/>) (Appendix A).

3.2. Data Collection Instrument

A survey was used, based on a risk scale originally developed by Grable and Lytton (1999). The questions were designed to elicit a respondent's willingness to engage in a risky financial behavior. Questions were translated into Portuguese and presented in an online format. Respondent scores from both the Brazilian and American surveys were combined. In addition to evaluating responses item-by-item, a single summated risk-tolerance scale score was developed based on criteria established by Grable and Lytton. Scores ranged from 13 to 47, with a sample average of 27.64 (standard deviation = 5.41). The reliability of the scale was estimated jointly and for Brazilians and Americans independently using Cronbach's alpha. The combined scale's alpha, with 620 responses, was 0.71. The alpha for Brazilians was also 0.71. The alpha for Americans was 0.72. These estimates match reliability scores reported in the literature (Grable and Lytton, 1999; Yang, 2004).

3.3. Control Variables

Three control variables were included in the analysis. Gender was measured as 1 = female, otherwise 0. Age was segmented into 7 categories: (1) Under age 25; (2) 25-34; (3) 35-44; (4) 45-54; (5) 55-64; (6) 65-74; and (7) 75 and older. Marital status was coded 1 as married, otherwise 0. The other category included single individuals, those living with a significant other, widows and widowers, and those who were separated or divorced at the time of the survey.

3.4. Data Analysis

Several methods were used to test for similarities and differences between Brazilians and Americans in relation to risk-tolerance attitudes. The Grable and Lytton (1999) risk-tolerance scale, and the items comprising the scale, were used to evaluate differences between the two groups. Group mean differences were evaluated using *t*, ANOVA, ordinary least squares (OLS) regression, factor analysis, and discriminant analysis tests. Results from the study are reported below.

4. RESULTS

Table 2 provides a summary of the combined, Brazilian and American, sample characteristics. The majority were men, not married, aged 25 or younger. Tests of the equality of group means for Brazilians and Americans from Table 2 were made to determine if these two groups differed in (a) their willingness to take financial risks, (b) gender composition, (c) age, or (d) marital status. No significant differences were noted; however, Americans did exhibit a slightly higher average overall score (28.03) compared to Brazilians (27.25) ($t_{618} = 1.89$, $P = 0.06$).

An OLS regression test was then used to estimate differences between Brazilians and Americans in risk tolerance holding age, gender, and marital status constant. As shown in Table 3, the only significant difference in risk scores among the variables was related to gender. Specifically, females were shown to exhibit a lower risk tolerance.

It was thought that while average risk scores between Brazilians and Americans were similar, the way in which these two groups answered questions might be different. That is, while the average score was similar, it was possible for Brazilians to be more aggressive in relation to certain questions and Americans to be more conservative on other questions. Two factor analyses were run in order to address this possibility. A principal components analysis technique was used to explore possible factor loadings. The analysis was conducted using an Eigen >1, with 25 iterations, criteria. Data were rotated using varimax rotation with a coefficient cut point of 0.40. The Kaiser-Meyer-Okin measure of sampling adequacy was robust (0.80 and 0.79 for the Brazilian and American models, respectively) (Appendix A for a list of individual items comprising the risk scale.)

Results from the factor analysis comparison are shown in Table 4. Four factors emerged in the two comparisons. However, there

Table 2: Sample comparison (N=620)

Variable	Overall average	Brazilian average	American average
Risk score	27.64	27.25	28.03
Gender (1=female)	48%	52%	45%
Age	Under age 25	Under age 25	Under age 25
Marital status (1=married)	22%	23%	21%

Table 3: OLS regression results predicting risk scores

Variable	b	Standard error	t
Nationality (1=Brazilian)	-0.74	0.42	-1.78
Gender (1=female)	-1.82	0.42	-4.39***
Age	-0.41	0.25	-1.65
Marital status (1=married)	0.77	0.62	1.24
Constant	29.40	0.51	58.26***

***P<0.001. F_{4,608} =6.56, P<0.001; R²=0.04, OLS: Ordinary least-squares

Table 4: Principal rotated components matrixes

Risk-tolerance item	Brazilians				Risk-tolerance item	Americans			
	Factors					Factors			
	1	2	3	4		1	2	3	4
Question 8	0.70				Question 4	0.80			
Question 13	0.63				Question 5	0.68			
Question 11	0.56				Question 11	0.57			
Question 12	0.52				Question 12	0.49			
Question 1	0.40				Question 3		0.67		
Question 3		0.77			Question 8		0.54		
Question 6		0.62			Question 13		0.49		
Question 2		0.44			Question 6			0.81	
Question 5			0.66		Question 1			0.76	
Question 4			0.65		Question 10				0.69
Question 7			0.58		Question 9				0.60
Question 9				0.65	Question 7				0.53
Question 10				0.61	Question 2				0.41

was little overlap in the questions that comprised each of the factors. For example, the first factor for Brazilians was made up of questions 8, 13, 11, 12, and 1 (listed in order of coefficient size). These five items comprised nearly 57% of the cumulative variance in Brazilian risk scores. Alternatively, four factors made up the first factor for American respondents (i.e. items 4, 5, 11, and 12). Approximately 52% of the variance in risk scores was explained by these four items. Questions 11 and 12 were common components for Brazilians and Americans. These two questions asked respondents to make an asset allocation decision.

Three items made up the second factor for Brazilians (i.e., items 3, 6, and 2) and Americans (i.e., 3, 8, and 13). These items explained approximately 19% and 20% of the variance in risk scores for Brazilians and Americans, respectively. The commonality between the two groups was question 3, which entailed a lifestyle gamble.

The third factor consisted of three items for Brazilians (i.e. items 5, 4, and 7), and two items for Americans (i.e., items 6 and 1). This factor explained nearly 16% of the variance in risk scores for Brazilians and 11% for Americans. The third factor was unique in that no shared items were identified.

The fourth factor was comprised of items 9 and 10 for Brazilians. These two items combined to explain approximately 8% of risk score variance. Four items were included in the fourth factor for Americans (i.e., items 10, 9, 7, and 2). Taken together, these items explained 17% of the variance in American risk scores. The commonality between Brazilians and Americans was each factor's inclusion of items 9 and 10. These questions measured aspects of risk aversion through opposite framing (i.e. positive versus negative) as described in prospect theory.

It was somewhat puzzling that the average scores on the summated scale were not significantly different for Brazilians and Americans. As described above, it was surmised that while the mean scores were similar, the pattern of responses was different. The factor analysis comparisons provide some insight into these response pattern dissimilarities.

Table 5 extends the analysis by presenting tests of equality of group means, resulting from a discriminant analysis that was designed

to classify respondents, based on risk items, as either Brazilian or American. As illustrated, Brazilians and Americans differed on 9 out of the 13 items. Findings suggest the following:

- Brazilians evaluated their risk tolerance to be higher than Americans
- Brazilians were more likely to engage in a lifestyle gamble
- Brazilians felt that they were more experienced with investments compared to Americans
- Brazilians, when faced with a sure loss, were more likely to gamble
- Brazilians were more likely to allocate investments aggressively
- Americans were more likely to engage in a speculative gamble; and
- Americans were less likely to hold bonds as a safe asset.

As noted above, the discriminant analysis method was used to classify Brazilians and Americans according to their answers on the risk items. The model was statistically significant (Wilks' Lambda=0.728; $\chi^2=193.71=0.001$). The pooled within-groups correlations between the items and the standardized canonical discriminant function are shown in Table 6. The variables shown in Table 6 are ordered by their absolute size within the function.

Results from the discriminant analysis suggest that while choices on many of the risk items between Brazilians and Americans differed, two items were of particular importance in describing

differences between the two groups (based on a 0.40 coefficient cutoff score from Table 6): Items 5 and 12. Question 5 asked: In terms of experience, how comfortable are you investing in stocks or stock mutual funds? Potential answers included: (a) Not at all comfortable, (b) somewhat comfortable, and (c) very comfortable. Brazilians were more likely to indicate more comfort. Question 12 asked: If you had to invest \$20,000, which of the following investment choices would you find most appealing? Answers included: (a) 60% in low-risk investments 30% in medium-risk investments 10% in high-risk investments; (b) 30% in low-risk investments 40% in medium-risk investments 30% in high-risk investments; and (c) 10% in low-risk investments 40% in medium-risk investments 50% in high-risk investments. Similarly, Brazilians were more likely to report accepting a higher risk allocation.

5. DISCUSSION

As discussed earlier in this paper, it is generally thought that investors tend to be similar in preferring gains over losses and certainty over chance. It has also been generally assumed as true that investors worldwide share similar risk definitions and preferences. However, recent studies have called into question both of these assertions. For example, Statman (2008) was able to show that people's propensities for taking risks varies across countries. Cole (1996) noted that dissimilarities in risk attitudes across nations are likely due to cultural differences.

Table 5: Group mean differences based on the risk items

Question	Brazilians		Americans		Significant
	Mean	SD	Mean	SD	
Q1	2.72	0.68	2.48	0.78	0.001
Q2	2.11	0.85	2.40	1.02	0.001
Q3	2.20	0.86	2.03	0.91	0.01
Q4	1.98	0.82	1.86	0.77	0.06
Q5	1.85	0.71	1.47	0.57	0.001
Q6	2.43	0.78	2.36	0.80	0.28
Q7	1.86	0.69	1.97	0.74	0.05
Q8	2.66	0.85	2.78	0.93	0.09
Q9	1.85	0.99	1.78	0.98	0.37
Q10	2.42	0.91	2.23	0.97	0.01
Q11	2.03	0.99	1.92	1.16	0.22
Q12	1.83	0.67	1.51	0.56	0.001
Q13	2.07	0.79	2.44	0.84	0.001

SD: Standard deviation

Table 6: Pooled within-groups correlation coefficients

Question	Coefficient
Q5	0.49
Q12	0.42
Q13	-0.37
Q1	0.27
Q2	-0.25
Q10	0.16
Q3	0.16
Q7	-0.13
Q4	0.13
Q8	-0.11
Q11	0.08
Q6	0.07
Q9	0.06

Interestingly, much of the evidence regarding the role of culture in shaping risk attitudes has been established on cross cultural comparisons between western investors (e.g. Australia, Europe, and North America) and those living throughout Asia, primarily China and Korea. These studies show that Asians are often more willing to accept income and investment gambles compared to others (Fan and Xiao, 2006; Weber and Hsee, 1999). The current study adds to the existing literature by first extending cross cultural comparisons to include individuals living in North and South America, and second, describing how the risk attitudes of Brazilians likely differ from that of Americans.

The findings reported here provide evidence that cross cultural variation in risk-tolerance attitudes between Brazilians and Americans exists. It is important to note, however, that the variation is not necessarily seen in a summed risk score. Rather, differences are situational and based on preferences for risk in certain scenarios. In general, Brazilians appear to be more risk tolerant than Americans. Brazilians are also more likely to allocate investments more aggressively. If true, then Brazilians may hold cultural beliefs regarding risk taking that are more closely aligned with, say, Chinese than Americans. It is possible that the cushion hypothesis, which has been well documented in Asia, might also exist in Brazil.

Results may, however, also may be indicative of a low level of financial numeracy in Brazil. In spite of claiming to be more risk tolerant, studies show that Brazilians usually do not make personal investments in the same way as Americans. A culture of consumption is far more prevalent. For example, the number

of Brazilian households who reported being active investors was <700,000 in 2013 (BM&F BOVESPA, 2014), whereas in the United States the number was far larger. As such, it may be that Brazilians lack the experience to accurately answer some types of investment and allocation questions. An alternate explanation is that some Brazilians may see investing as a lottery that could result in large gains (Ferreira et al., 2009) as a way to promote household and macroeconomic economic growth (Rohrmann and Renn, 2000).

5.1. Education and Planning Implications

Two educational and planning opportunities are apparent from the results of this study. First, the persistent gender difference in risk-tolerance scores that has been noted in the literature was present in this study as well. In general, women exhibited lower risk scores than men. This was true for Brazilians and Americans. Without some type of educational intervention it is possible that risk-averse attitudes might lead to risk avoiding financial behavior among women (Neelakantan, 2010), which can cause later life dissatisfaction among women. This can occur because being too conservative with investment choices is acknowledged to be a cause of lifespan wealth discrepancies between women and men (Fonseca et al., 2012). As a mediator, education is known to significantly reduce gender differences in financial risk tolerance (Cupples et al., 2013). If true, then a unique opportunity exists to enhance the financial capabilities of women in such a way that the risk attitudes of women shift towards those of men. In doing so, future gaps in wealth between women and men may become smaller.

Second, results suggest that educators and financial planning professionals need to take care when helping others evaluate risk attitudes. As noted here, no significant differences in summated risk scores between Brazilians and Americans were noted. It is important to note, however, that there were significant differences in the way scores were answered, but not in the total summed score. This hints at an educational opportunity and challenge; namely, the need to provide appropriate information and documentation to audiences with different ethnic and cultural backgrounds. Whereas Americans were more likely, for example, to engage in speculative gambles, Brazilians were more apt to choose lifestyle gambles. Providing the same educational materials to both groups might turn out to be less effective compared to targeted interventions based on an attitudinal response assessment.

6. CONCLUSION

In conclusion, results from this analysis show that cultural differences exist between Brazilians and Americans in terms of financial risk-tolerance attitudes. It is important to note, however, that there were similarities as well. For instance, women in both Brazil and United States exhibited lower risk scores. Additionally, no age or marital status differences were noted in either cultural group. This hints at the notion that there may be universal demographic similarities that help shape risk attitudes. Finally, it is important for readers to evaluate the findings from this study in the context of the sample frames. Both the Brazilian and American samples were ones of convenience. While convenience samples

are useful in establishing baseline measures, further research is needed, using broader samples, to confirm the results from this study. In addition, it would be useful to compare Brazilians, Americans, and Asians to determine the extent to which risk attitudes differ across these cultural contexts.

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APPENDIX A

Risk tolerance measure (Grable and Lytton, 1999)

1. In general, how would your best friend describe you as a risk taker?
 - a. A real gambler
 - b. Willing to take risks after completing adequate research
 - c. Cautious
 - d. A real risk avoider

2. You are on a TV game show and can choose one of the following. Which would you take?
 - a. \$1,000 in cash
 - b. A 50% chance at winning \$5,000
 - c. A 25% chance at winning \$10,000
 - d. A 5% chance at winning \$100,000

3. You have just finished saving for a “once-in-a-lifetime” vacation. 3 weeks before you plan to leave, you lose your job. You would:
 - a. Cancel the vacation
 - b. Take a much more modest vacation
 - c. Go as scheduled, reasoning that you need the time to prepare for a job search
 - d. Extend your vacation, because this might be your last chance to go first-class

4. If you unexpectedly received \$20,000 to *invest*, what would you do?
 - a. Deposit it in a bank account, money market account, or an insured CD
 - b. Invest it in safe high quality bonds or bond mutual funds
 - c. Invest it in stocks or stock mutual funds

5. In terms of experience, how comfortable are you investing in stocks or stock mutual funds?
 - a. Not at all comfortable
 - b. Somewhat comfortable
 - c. Very comfortable

6. When you think of the word “risk” which of the following words comes to mind first?
 - a. Loss
 - b. Uncertainty
 - c. Opportunity
 - d. Thrill

7. Some experts are predicting prices of assets such as gold, jewels, collectibles, and real estate (hard assets) to increase in value; bond prices may fall, however, experts tend to agree that government bonds are relatively safe. Most of your investment assets are now in high interest government bonds. What would you do?
 - a. Hold the bonds
 - b. Sell the bonds, put half the proceeds into money market accounts, and the other half into hard assets
 - c. Sell the bonds and put the total proceeds into hard assets
 - d. Sell the bonds, put all the money into hard assets, and borrow additional money to buy more

8. Given the best and worst case returns of the four investment choices below, which would you prefer?
 - a. \$200 gain best case; \$0 gain/loss worst case
 - b. \$800 gain best case; \$200 loss worst case
 - c. \$2,600 gain best case; \$800 loss worst case
 - d. \$4,800 gain best case; \$2,400 loss worst case

9. In addition to whatever you own, you have been given \$1,000. You are now asked to choose between:
 - a. A sure gain of \$500
 - b. A 50% chance to gain \$1,000 and a 50% chance to gain nothing

10. In addition to whatever you own, you have been given \$2,000. You are now asked to choose between:
 - a. A sure loss of \$500
 - b. A 50% chance to lose \$1,000 and a 50% chance to lose nothing

11. Suppose a relative left you an inheritance of \$100,000, stipulating in the will that you invest ALL the money in ONE of the following choices. Which one would you select?
 - a. A savings account or money market mutual fund
 - b. A mutual fund that owns stocks and bonds
 - c. A portfolio of 15 common stocks
 - d. Commodities like gold, silver, and oil

12. If you had to invest \$20,000, which of the following investment choices would you find most appealing?
 - a. 60% in low-risk investments 30% in medium-risk investments 10% in high-risk investments
 - b. 30% in low-risk investments 40% in medium-risk investments 30% in high-risk investments
 - c. 10% in low-risk investments 40% in medium-risk investments 50% in high-risk investments

13. Your trusted friend and neighbor, an experienced geologist, is putting together a group of investors to fund an exploratory gold mining venture. The venture could pay back 50 to 100 times the investment if successful. If the mine is a bust, the entire investment is worthless. Your friend estimates the chance of success is only 20%. If you had the money, how much would you invest?
 - a. Nothing
 - b. 1 month salary
 - c. 3 month's salary
 - d. 6 month's salary

Scoring

1. a=4; b=3; c=2; d=1
2. a=1; b=2; c=3; d=4
3. a=1; b=2; c=3; d=4
4. a=1; b=2; c=3
5. a=1; b=2; c=3
6. a=1; b=2; c=3; d=4
7. a=1; b=2; c=3; d=4
8. a=1; b=2; c=3; d=4
9. a=1; b=3
10. a=1; b=3
11. a=1; b=2; c=3; d=4
12. a=1; b=2; c=3
13. a=1; b=2; c=3; d=4

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

Key: Score Risk Tolerance Level 0-18 Low tolerance for risk 19-22 Below-average tolerance for risk 23-28 Average/moderate tolerance for risk 29-32 Above-average tolerance for risk 33-47 High tolerance for risk.

Note: Answers to questions 9 and 10 can be averaged to obtain a combined score.