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**A CROSS-CULTURAL STUDY IN RISK TOLERANCE:**

**COMPARING CHINESE AND AMERICANS**

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# A CROSS-CULTURAL STUDY IN RISK TOLERANCE: COMPARING CHINESE AND AMERICANS

## **Abstract**

In this research we compare the risk preference attitudes and behavior between a sample of 470 Chinese workers and a sample of 2,671 Americans from the Survey of Consumer Finances. Our findings show that Chinese in our sample are more risk tolerant than Americans in their financial decisions, both in attitudes and behavior. Alternative explanations such as a lack of knowledge about the relationship between risk and return among the current generation Chinese are also explored. Theoretical and practical implications of this research are discussed.

*Key Words:* Choice behavior; Consumer attitudes; Consumer behavior; Financial markets; Risk attitudes

*PsycINFO Classification code:* 3920

*JEL Classification code:* D12

Risk tolerance is an extremely complex phenomenon that is studied by disciplines such as economics, psychology, finance, and management science (Roszkowski, 1993). It is an important concept when financial counseling and planning professionals help individuals and families make long-term financial decisions. It is also a key concept of the expected utility function in economic literature. In this study, we use the definition from the finance literature. Risk is measured by the investment volatility. Risk tolerance refers to people's attitudes and behavior regarding financial risk (Roszkowski, 1993). The purpose of this study is to compare risk preference attitudes and behavior between Americans and Chinese. Such an investigation has both theoretical and practical importance. Theoretically, this research will provide additional empirical evidence for refining existing theories in cultural comparative studies of risk tolerance. This research also adds to the literature of comparative studies of risk tolerance by using data collected from non-students. Practically, the findings of this study can provide knowledge about similarities and differences in risk tolerance between Americans and Chinese. Such knowledge may be useful to American entrepreneurs doing business in China in an era of increasing economic globalization, and to American businesses and professionals working with clients who have a Chinese heritage.

## **Literature Review**

### *Cultural Differences in Risk Tolerance*

Douglas and Wildavsky (1982, P.10) distinguished between societies whose cultural values, perceptions, and attitudes are shaped by either a market environment or a hierarchical bureaucratic environment. They argued that societies in which an individualistic market orientation predominates (such as the United States) are appreciative of uncertainties as

providing opportunities and thus more risk-taking. More hierarchical and bureaucratic societies (such as China) are described as deciding more by standard operating procedures and consequently as more cautious and risk-averse.

Based on multiple psychological theories pertaining to temperaments, Doyle (1999) theorized that people's financial risk tolerances are results of their temperaments, while these temperaments are related to their surviving values that are reflected by their biological and social backgrounds. By analyzing the broad literature in history, religion, law, psychology, anthropology, and other social sciences, Doyle divided the world cultures into four groups: drivers (most Europeans), amiables (most South Americans), expressives (most Africans), and analytics (most Asians). According to Doyle's research, the temperaments of drivers are competence (acquisitiveness, determination, and appreciation of risk), while those for analytics are security (caution, restraint, and aversion of risk).

Both these theories would predict that Chinese are more risk averse than Americans in making decisions under uncertainty. Additionally, empirical studies on risk preference attitudes using U.S. data have consistently found a positive relationship between economic resources and risk tolerant level (Sung & Hanna, 1996; Grable & Lytton, 1998). If such a relationship holds cross-nationally, then Chinese are expected to be less risk tolerant than Americans, because on average, Chinese have a lower level of economic resources than Americans.

However, several empirical studies using samples of both Chinese and Americans found the opposite. In a study comparing college student attitudes toward free markets between Chinese and American students, two questions were asked about risk-taking attitudes in job markets and investments (Fan, Xiao, & Xu, 1998). American students were more likely to report being willing to take risks in job markets but Chinese students were more likely to report being

willing to take risks in financial investments. In another study on differences in saving motives between Chinese and Americans, Xiao and Fan (2002) found that Chinese workers in their sample were more likely than Americans to report a motive of saving for investment, suggesting that Chinese may be more risk tolerant than Americans.

Weber and her colleagues have done several studies to explore cultural differences in terms of risk preferences (Bontempo, Bottom, & Weber, 1997; Hsee & Weber 1999; Weber & Hsee, 1998; Weber, Hsee, & Sokolowska). Using data from business students and security analysts in Hong Kong, Taiwan, the Netherlands, and the US to test the conjoint expected risk model, they found that cultural differences between Chinese and Westerns in terms of risk perception (Bontempo, Bottom, & Weber, 1997). Risk preference is defined “to describe a person’s choice when faced with two options that are equal in expected value but differ on a dimension assumed to affect the riskiness of options” (Weber & Hsee, 1998, p1206). Conceptually, they decomposed risk preference to two components, attitude towards risk and risk perception, which is based on the pioneering work of Markowitz (1959). Using buying prices for risky financial options as a measurement for risk preference, Weber and Hsee (1998) found that Chinese students in their sample were significantly less risk-averse in their pricing than American students. However, these apparent differences in risk preference were associated primarily with cultural differences in the perception of risk of the financial options rather than with cultural differences in attitudes towards perceived risk. Note that the attitudes towards perceived risk was calculated using data collected for the variables of willingness to pay (WTP) and risk perception. Weber and Hsee (1998) then used a “cushion hypothesis,” which is originally proposed by Hofsted (1980), to suggest that people in a collectivist society, such as China, are more likely to receive financial help from their social networks if they are in need.

Consequently, they perceive lower risks in financial decisions than those in an individualistic society such as the U.S. This hypothesis also suggests that because social and family networking is so important in a collectivist society, Chinese are likely to be more risk averse in social decisions. Two subsequent studies supported this notion. In the first study, Weber, Hsee, and Sokolowska (1998) conducted a content analysis of American, German, and Chinese proverbs related to risk and risk-taking. They found that Chinese and German proverbs provide more risk-seeking advice than American proverbs. They also found that, regardless of national origin of proverbs, Chinese raters perceived proverbs to advocate greater risk-seeking than American raters, but only for financial risks, not social risks. In the second study, Hsee and Weber (1999) reported two experiments. In the first experiment, they asked a sample of Chinese and American students to choose sets of sure versus risky options. An example of a sure option is to “receive \$400 for sure”; and an example of a risky option is to “flip a coin; receive \$2000 if H or \$0 if T”. They found that the Chinese were significantly more risk tolerant than the Americans. In the second experiment, they extended their questions to include a medical and an academic decision, in addition to an investment decision, and found that Chinese were more risk tolerant than Americans only in the investment domain, but not in the other domains.

The empirical evidence to date in the area of cultural differences in risk tolerance between Chinese and Americans suggests that Chinese are more risk tolerant in financial decision-making than Americans. However, this evidence is far from conclusive. First, most empirical studies reviewed above used college student samples from large cities. Given the variability of knowledge, beliefs, customs, and habits within any culture, it is an oversimplification to describe the difference found in these samples as a difference between Americans and Chinese in general. In the current study, we expand upon existing research by

using a non-student sample to compare risk preference between Chinese and Americans. Second, the empirical studies reviewed above only used risk attitudes as a measure of risk preference. In this study, we use an additional measure of self-reported risk-taking behavior. Although attitudes and behavior are likely to be consistent, such relationship has not been tested in a cross-cultural context. In the current study, in addition to risk preference attitudes, we further expand upon existing research by investigating whether Chinese are more risk tolerant in their self-reported financial behavior than Americans.

#### *Factors Associated with Risk Tolerance*

Another aspect of this research is to investigate factors associated with financial risk-taking attitudes and behavior, and how such factors may work differently for the Chinese and for Americans. While there is a substantial body of literature on how socio-economic characteristics affect risk tolerance using U.S. data, we are not aware of any such analysis to date using Chinese data.

Previous studies indicated that following factors affected consumer risk-taking attitudes or behavior: gender, marital status, age, education, income, having children, professional occupation, self-employed, and home ownership (Grable & Lytton, 1998; Jianakoplos & Bernasek, 1998; Roszkowski, 1993; Schooley & Worden, 1996; Sung & Hanna, 1996; Xiao, 1996; Xiao, Alhabeeb, Haynes, & Hong, 2001; Zhong & Xiao, 1995; a detailed summary table is available from the authors). All the empirical results reported in previous studies are based on data from the Surveys of Consumer Finances (SCF). For the measurement of risk-taking attitudes, the question available in the SCF asks respondents about their choice regarding the expected financial returns and risks they are willing to take for such returns. For the measurement of risk-taking behavior, household holdings of stock and other risky assets are

commonly used. While it is important to note that risk tolerance is a complex construct and has been conceptualized and measured in many different ways in the literature (see Hanna, Gutter, & Fan, 2002 for a thorough discussion on this subject), for our study, the SCF measure serves our purpose the best among available alternatives.

### **Hypotheses**

The purpose of this study is to (1) use a non-student sample to compare risk-taking attitudes and behavior between Americans and Chinese; and (2) to investigate country differences in factors associated with risk-taking attitudes and behavior. In doing so, we seek to further understand the concept of risk tolerance in general, and the cultural differences between Chinese and Americans in particular.

Douglas and Wildavsky (1982, P.10)'s theory on hierarchical vs. bureaucratic societies and Doyle (1999)'s theory on cultural groups (drivers, amiables, expressives, and analytics) and their temperaments suggest that Chinese should be less risk tolerant than Americans in financial decisions. The theory of risk preference developed by Weber and her colleagues suggests the opposite, which is supported by many empirical studies. It seems that the theory of risk preference is more reasonable that suggests that the observed fact that Chinese are more risk tolerance than Americans in financial decisions is because of the difference of risk perception. The differences of risk perceptions are rooted from their cultural and social systems. Because of the limitation of data used in this study, we cannot distinguish risk perception and risk taking attitude based on the theory of risk preference. For convenience, we use risk preference attitude that refers to the risk preference defined by Weber and her colleagues. We propose:

H1: Chinese are more risk tolerant than Americans in risk preference attitudes.



Based on the theory of planned behavior (Ajzen, 1991; Ajzen & Fishbein, 1977) in which attitudes, along with social norm and perceived control, should be consistent with the behavior, and assume risk preference is a component of measure of risk taking attitude, we propose:

H2: Chinese are more risk tolerant in their behavior than Americans when stock ownership is used as a measure of financial risk-taking behavior.

We propose following two null hypotheses because there is no existing literature suggesting otherwise.

H3: There is no difference between Chinese and Americans in how socio-demographic characteristics affect their financial risk preference attitudes.

H4: There is no difference between Chinese and Americans in how socio-demographic characteristics affect their financial risk-taking behavior.

## **Method**

### *Data*

The Chinese data were collected in 1998 from workers in Guangzhou, a major city and capital of Guangdong province in Southern China. A quota matrix of gender, age, and enterprise ownership was developed for this survey. Enterprises were classified into five categories: (1) state-owned, (2) collectively-owned enterprises that include various forms of publicly-traded enterprises and traditional collectively-owned enterprises, (3) foreign-owned enterprises that are invested by foreign capital, especially capital from developed countries and regions such as the U. S., Japan, Hong Kong, and Taiwan, (4) joint-ventures that are invested by both Chinese and foreign capital, and (5) privately-owned enterprises owned by one or more private Chinese citizens. Based on this quota matrix, trained research assistants collected information from

workers with specific characteristics. Five hundred questionnaires were collected for this research. Among the 500 workers who participated in the survey, 50% were from each of the two gender groups, 20% from each of the five age groups (29 years or younger, 30-39, 40-49, 50-59, 60 years or older), and 20% from each of the five types of enterprises. For this study, we excluded observations that have missing values in the variables needed in the multivariate analyses. Thus, the final sample size used in this study is 470. Compared to national representative statistics, the Guangzhou sample over-represents workers from foreign-, joint-, and private-owned companies and those with higher educational levels (China Statistical Information Network, 2001). As these characteristics may relate to risk tolerance, caution is exercised in interpreting the findings in later sections.

The American data were collected in 1998 by the National Opinion Research Center at University of Chicago and sponsored by the U. S. Federal Reserve Board. This data set is one of the triennial surveys (Kennickell, Starr-McCluer, & Surette, 2000). The original data set has 4,309 observations. To make the sample comparable with the Chinese data, we selected only full time workers who were not in the farming, forestry or fishing industries at the survey time. The final sample size used in this study is 2,671.

For the purpose of comparing Chinese and American risk tolerances, the data sets used in this study have both advantages and limitations. The two data sets include variables that are directly comparable since the Chinese questionnaire has questions regarding saving attitudes and behavior similar to those in the U.S. Survey of Consumer Finances. The two surveys also were conducted at about the same time. However, the Chinese data were obtained using a quota sampling approach in one Chinese city, while the U.S. data were collected using a random

sampling approach nationwide. Nevertheless, because of the uniqueness of this topic, these are the best data we can obtain at this time.

### *Dependent and Independent Variables*

The two dependent variables examined are risk preference attitudes and risk-taking behavior. Risk preference attitudes are measured by a categorical variable with four levels: (1) take *substantial* financial risks 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; and (4) *not willing* to take any financial risks. Risk-taking behavior is measured by stock ownership. This variable has two attributes: owning stock or not. This variable is a very crude measure of financial risk-taking behavior. It is dichotomous thus cannot capture quantitative differences in stock ownership. Also, it is a self-report measure that may or may not be consistent with actual behavior. Such limitations need to be kept in mind when the results are interpreted.

Independent variables include gender, age, marital status, education, relative income, household size, presence of children, occupation, and homeownership status. Because risk preference attitudes are likely to be an individual instead of a household behavior, we use individual level measures for the demographic variables of gender and marital status. On the other hand, stock ownership is likely to be a household instead of individual decision. While most of the variables used are those of the reference person, we use a household level measure of family type with three categories: single female headed, single male headed, and married. In addition, risk preference attitudes are included in the stock ownership model.

The descriptive statistics of these variables are presented in Table 1. Compared to Americans, the Chinese in the sample are more likely to be married, have a lower educational

level, and have a larger household size. The income variable is coded as a categorical variable indicating income percentiles because only bracket monthly income information was collected for the Chinese data. This income measure can be considered as a measure of relative income within each country.

Insert Table 1 about here

### *Analyses*

Chi-square tests are first conducted to test if there are associations between risk preference attitudes and the country variable, and between stock ownership and the country variable. Logistic regressions are then performed to test if the differences still exist when demographic variables are controlled. For the risk preference attitudes models, unordered multinomial Logistic regression is used because there are four levels of risk preference attitudes, and because the assumption of proportional odds is rejected. Binomial Logistic regression is used for the stock ownership models as there are only two attributes for this dependent variable.

We estimate two sets of Logistic regression models for each dependent variable: (1) using the Chinese sample only; (2) using the American sample only. These two models are estimated to investigate how demographic variables affect the risk preference attitudes and stock ownership differently for Chinese and for Americans. Further, in order to test if such differences are statistically significant, and if so, what the differences are in a *ceteris paribus* comparison. Log-likelihood ratio tests (Maddala, 1992) are conducted to test the overall statistical significance between the Americans and the Chinese by estimating the same model using the pooled sample without any country dummy or interaction terms (restricted model) and using the pooled sample with a country dummy and interaction terms between the country dummy and all other independent variables (full model)<sup>1</sup>. Simulations are then conducted to predict the

probabilities of having each of the four levels of risk attitudes and the probability of stock ownership for the sample, holding other things equal. In the simulations, the Chinese households in the sample are treated as if they were American households, and their probabilities of having each of these four levels of risk preference attitudes and owning stock are predicted using the Logistic regression results. These predicted probabilities are then compared with the actual probabilities for the Chinese sample. The comparison is done on the same group of people (in our case, the Chinese sample) with whom different nationalities are attached for the purpose of simulation (Fan, 1997; Xiao & Fan, 2002). Note that the simulation can also be conducted using the American sample instead.

## **Results**

Table 1 shows that for the risk preference attitudes variable, more Chinese in the sample are at the two extreme ends than Americans. While 8.9% Chinese are willing to take substantial financial risks expecting to earn substantial returns, only 6.4% Americans are willing to do so. And while 34.5% Chinese are not willing to take any financial risks, only 28.2% of Americans are in this category. Americans are more likely to be willing to take either above average or average financial risks (23.6% and 41.8%) compared to their Chinese counterpart (19.8% and 36.8%). For both countries, the mode category is “average risk”. The Chi-square test statistic shows that this country difference is statistically significant. On the other hand, country difference in stock ownership is not statistically significant at conventional levels. While 24.5% of the Chinese in the sample own stocks, 21.2% of Americans do.

Table 2 presents results from the Logistic regression analysis with risk preference attitudes as the dependent variable, for the Chinese sample and American sample, respectively.

For ease of interpretation, average marginal effects are presented in the table, together with their statistical significance levels.

Insert Table 2 about here

Table 3 presents results from the Logistic regression analysis with stock ownership as the dependent variable. Again, average marginal effects are presented, together with their statistical significance levels. As with the risk preference attitudes regression, two sets of results are reported, one with the Chinese sample only and the other with the American sample only. Finally, the Log-likelihood ratio test results and simulation results, which are based on models using both samples (not shown, but available upon request), are reported in Table 4.

Insert Table 3 and 4 about here

### *Risk preference Attitudes*

We have mixed findings for Hypothesis 1 in that Americans are less likely than Chinese to report risk-seeking attitudes. About 8.9% of Chinese in the sample reported as willing to take substantial risk. The simulation results show that if these Chinese were Americans, only 5.1% of them would be willing to take substantial risk (Table 4). On the other hand, holding demographics and relative income equal, Chinese are less likely than Americans to be willing to take average risk expecting average returns. The probabilities of being willing to take above-average risk and to take no risk are about the same for these two samples. This country difference is statistically significant at 99% confidence level.

Rejecting Hypothesis 3, the results in Table 2 show that more demographic variables are significant in explaining the differences in risk preference attitudes among Americans than among Chinese. Out of 14 independent variables, 11 are significant at 10% or better for the

American model, but only 6 are significant at 10% or better for the Chinese model. Chi-square tests indicate that the impacts of education, relative income, occupation, and homeownership on risk preference attitudes are statistically significantly different between Chinese and Americans (test statistics not shown but available from the authors upon request).

### *Stock Ownership*

Our results support Hypothesis 2. Chinese are more likely than Americans to own stocks. Approximately 24.5% of Chinese in the sample reported as owning stocks. The simulation results show that if these Chinese were Americans, a smaller percentage, 21.6% would own stocks (Table 4). The loglikelihood test shows that this difference is statistically significant at 1% level (Note: significance level=100%-confidence level).

Rejecting Hypothesis 4, the results in Table 2 show that more demographic variables are significant in explaining the differences in stock ownership among Americans than among Chinese. Out of 17 independent variables, 10 are significant at 10% or better for the American model, but only 3 are significant at 10% or better for the Chinese model. The effects of risk preference attitudes, family type, age, education, income, and homeownership on stock ownership are statistically significantly different between Chinese and Americans (test statistics not shown but available from the authors upon request).

## **Discussion**

The discussion of this study's results must be prefaced with one important caveat. Readers should be reminded that our Guangzhou sample is not representative of the Chinese population, because Guangdong province, of which Guangzhou is the capital city, is the first Special Economic Development Area in China. As such, the economic system is more westernized and the standard of living of households is higher than most other areas of China

(Chinese Statistical Information Network, 2001, Table 10-11). In addition, our Guangzhou sample over-sampled workers from foreign-, jointly-, and privately-owned enterprises and under-sampled workers from state-owned enterprises. This sample also has higher educational levels. Also, relatively more young (age 0-14) people live in Guangdong compared to the national average. In 1998, the children dependence ratio (number of people aged 0-14 to number of people aged 15-64) in Guangdong was 45, compared to the national average of 35 (Chinese Statistical Information Network, 2001, Table 4-7).

Keeping this sampling limitation in mind, we find that on average, Chinese in our sample are more likely to take substantial financial risks expecting to earn substantial returns while Americans are more likely to take average risk expecting to earn average returns, and Chinese are more likely than Americans to own stocks, holding demographics and relative income constant. This result is contradictory to predictions from Douglas and Wildavsky (1982)'s theory that Chinese may be more cautious and risk averse than Americans because hierarchical and bureaucratic societies lead people to make decisions by standard operating procedures. This result is also contradictory to predictions from Doyle's theory that the most Asians are analytics who emphasize on security, which leads to caution, restraint, and risk-avoiding in their financial behavior (Doyle, 1999). This implies that the application of the concept "temperaments" may be overly simplified in Doyle's division of culture. The concept in this context needs to be studied further.

Our findings, however, are consistent with the theory of risk preference and empirical evidence presented by Weber and his colleagues (Hsee & Weber, 1999; Weber & Hsee, 1998; Weber, Hsee, & Sokolowska, 1998). The fact that more demographic variables are significant predictors of risk taking in the American sample than in the Chinese sample is further evidence



of the results being consistent with and predicted by the cushion hypothesis. For Chinese investors, it is the size of their social network that predicts risk taking and individual characteristics such as income are less important, because the risk is not carried entirely by the individual but partly by the network. This suggests including other (group level or network level) “demographics” in future analyses.

Our finding that Chinese are more risk tolerant than Americans can find some anecdotal support from the gambling literature. Gambling, a behavior exhibiting high financial risk tolerance, is quite popular in China, even though the government is very much anti-gambling (Nepstad, 2000). In the U.S., casinos in Las Vegas advertise heavily in the largest U.S. based Chinese language newspaper “World Journal” to lure Asian American customers. A number of Internet sites related to gambling additions have Asian and/or Chinese specific information, with titles such as “Problem Gambling and the Asian Canadian Communities” (Addictions Foundation of Manitoba, 2001), “Prevalence of Gambling in Toronto’s Chinese Community” (The Wager, 1998), and “Chinese Community Problem Gambling Project” (NICOS, 2001). It is well documented that the first generation of Chinese immigrants to the U.S. often started their own small business such as restaurants and Laundromat (Barringer, Gardner, & Levin 1993). While one reason for such a choice could be limited opportunities and limited human capitals, it is also possible that these Chinese immigrants were quite financially risk tolerant and thus were willing to be self-employed.

Although our finding that Chinese in our sample are more risk tolerant than Americans are in line with the theory of risk preference and previous empirical studies, alternative explanations cannot be ruled out given the limitations of our study and previous studies on this topic. First, as Weber and Hsee (1998) found in their study, Chinese students in their sample

perceived lower financial risk compared to American students. While the cushion hypothesis leads to the argument that such perception of lower financial risk is justified because of family financial support network, an alternative explanation is limited knowledge about the relationship between risk and financial returns is more limited among the current generation Chinese due to a lack of financial education and limited exposure to financial markets. Compared to the U.S. stock market, the Chinese stock market is relatively new. When a market is not mature, potential large return in stock market is possible due to inside trading or government policy changes. For example, stock purchase and trading were first available only in a limited number of Chinese cities so that the demand was suppressed at the beginning. Buyers in these markets may expect stock prices to increase once the rationing period is over. Also, because the history of the stock market is relatively short, people may not have enough historical performance information to get a whole picture of the relationship between risk and return. In addition, limited choices in other investment opportunities may be another reason why Chinese are more likely to own stocks because although government bonds have been issued since the early 1980s, corporate bonds are still not common.

Additionally, it should be noted that the samples used in the studies by Weber and Hsee (from Shanghai, which is the largest city in China) and in our study are not representative of the Chinese general population. As noted earlier, Guangzhou is not a representative city of China, and our sample is not a representative sample of Guangzhou. The self selection of living in Guangzhou (migration was possible even in the earlier years of the Chinese economic reform because Guangzhou's Special Economic Development Zone status) and the self selection of working in non-state-owned enterprises, which we over-sampled, may contribute to the difference between Chinese and Americans we find in this study. To further investigate this

issue, we create weights for the Chinese sample so the sample distribution of education levels mirrors that of the population of Chinese workers. While the descriptive numbers change in that the overall risk tolerance level decreases and the percentage of stock holders decreases, the multivariate results and the simulation results still show that Chinese are more risk tolerant and more likely to hold stocks than Americans, holding demographics and relative income constant (results not shown but available from the authors upon request). While this additional analysis does not eliminate biases caused by self-selection in migration, it makes the sample more representative to some degree. Yet, in order for the findings to be conclusive, research based on representative samples is needed.

Finally, we want to note the country differences in the relationship between income and risk tolerance. For the American sample, risk tolerance level rises with income, and stock ownership rises with both income and risk tolerance level. However, for the Chinese sample, other than people in the bottom 30% of the income distribution, income does not seem to be associated with risk tolerance, both in attitudes and behavior. This might be further evidence that there is a lack of knowledge about stock market performance and the relationship between risk and return due to the novelty of stock market in China.

Using the terminology of the theory of risk preference, we do not know which factor, risk perception or risk taking attitude or both, caused the observed fact that Chinese are more financially risk tolerant than Americans in risk preference attitude. Prospect theory (Tversky & Kahneman, 1992) suggests maybe risk perception is more important. According to this theory, people use perceived decision weights to evaluate risky situations. They are more likely to make mistakes when the probability of the event is extremely high or low. The revised version of prospect theory suggests that consumer attitudes toward risks for gains are risk averse in high

probability events and risk seeking in low probability events. If considering China's short history of stock market, we could say buying stocks is a low probability event for Chinese consumers compared to their counterparts in the US.

Another theoretical explanation why Chinese are more likely than Americans to own stocks is the theory of planned behavior. Besides risk preference attitudes, stock buying behavior could be affected by social norm and perceived control. In the survey time, consumers in Guangzhou experienced the first high tide of buying stocks in China and everyone buying stocks made high profits. Then, the higher relative stock ownership among the Chinese sample might be impacted by the social norm and perceived (or misperceived) control, coupled with upward biased risk perception then.

### **Conclusion and Implications**

In this research we use a sample of Chinese workers from the city of Guangzhou to compare their risk preference attitudes and behavior with a sample of Americans from the Survey of Consumer Finances. Our findings show that Chinese in our sample are more risk tolerant in attitudes seeking extreme high risks expecting extreme high returns and in stock buying behavior. The observed differences could be explained by the theory of risk preference, the prospect theory, and the theory of planned behavior.

Our findings have both theoretical and empirical implications. Theoretically, our results show that while the concept of risk tolerance and its determinants are applicable to our Chinese sample to a large extent, the relationships between socio-economic characteristics and risk tolerance have are different for the Chinese sample and the American sample. This finding suggests that our understanding of risk tolerance needs to be expanded if the concept is to have universal validity. Risk tolerance has been studied theoretically in a variety of ways (an

excellent survey could be found in Weber 2001a, 2001b). Also, risk perceptions in specific domains are not correlated according to a recent study (Weber, Blais, & Betz, 2002). Future theoretical research needs to develop a framework to uniform these findings, to apply the framework to other cultural contexts in addition to American, and to address their implications to predict human behavior. Specifically, the concept of “cultural temperaments” needs to be studied in more detail by incorporating recent development of the theory and empirical studies of risk preference.

Practically, our findings are useful for American entrepreneurs (including financial management businesses) conducting business in China, and for U.S. financial planners and counselors in understanding the cultural differences when helping their clients with a Chinese cultural background. The findings can also be useful to social workers who help addicted gamblers of Chinese background to understand the cultural context of their behavior and to develop special programs that take this cultural context into consideration. Finally, our findings have implications for future empirical research. For our findings and findings from previous study on this topic to be generalized to Chinese population, it is very important for future studies to use more representative Chinese samples, especially samples including Chinese living in smaller urban areas and rural areas.

## Endnotes

1. The estimates from the full model and the restricted model are not reported in tables in this paper because these two models were estimated for the sole purpose of conducting the log-likelihood tests. The test results are reported in this paper.

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Table 1.  
*Descriptive Statistics of the Samples by Country*

	Chinese (%)	American (%)	X <sup>2</sup>
Gender and marital status			56.41***
Married family	83.0	66.2	
Single male headed	10.0	14.7	
Single female headed	7.0	19.1	
Age			55.48***
35 years or younger	20.9	19.4	
36-45	32.8	46.0	
46-55	24.9	24.0	
56-65	21.5	10.6	
Education			189.63***
Grade 1-9	21.7	4.5	
Grade 10-12	21.5	34.8	
Occup. sch./some coll.	20.4	22.5	
College	36.4	38.2	
Household size			238.72***
1 person	2.6	18.6	
2 persons	6.8	28.4	
3 persons	32.3	19.9	
4 to 5 persons	48.3	28.8	
6 persons or more	10.0	4.3	
Presence of children	76.4	55.7	70.65***
Professional occupations	54.0	65.1	21.01***
Self employed	3.2	13.0	37.61***
Homeowner	46.6	66.1	65.62***
Income rank <sup>a</sup>			
Bottom 30%	<2.5k yuan	<\$32k	
Lower middle 25%	2.5k-3.5k yuan	\$32k-\$63k	
Upper middle 20%	3.5k-4.5k yuan	\$63k-\$130k	
Top 25%	>4.5k yuan	>\$130k	
Substantial risk/return	8.9	6.4	
Above average risk/return	19.8	23.6	14.21***
Below average risk/return	36.8	41.8	
No risk	34.5	28.2	
Own Stock	24.5	21.2	2.46

a. For the Chinese sample, income is measured as monthly income in Chinese yuan. For the American sample, income is measured as annually income in U.S. dollar. The exchange rate of Chinese yuan for US dollar is about 8 to 1 in 1998, the year both surveys were conducted.

Table 2  
*Multinomial Logit Regression Results on Risk Attitudes for the Chinese Sample and the American Sample: Average Marginal Effects and Overall Significance Levels*

Variable	Substantial risk (%)	Above-average risk (%)	Below-average risk (%)	No risk (%)	Overall X <sup>2</sup>
<u>Chinese</u>					
Male	2.9	1.4	-1.2	-3.1	1.52
Married	5.7	-11.9	3.7	2.5	3.29
Age	-0.3	-0.4	0.1	0.6	11.84 ***
Grade 1-9	-4.3	-0.7	-11.6	16.6	6.30 *
Grade 10-12	-9.3	3.2	-6.6	12.8	7.73 *
Some college	-4.8	-1.6	1.3	5.1	2.47
Bottom 30% income	0.1	-11.6	-3.9	15.5	8.10 **
Lower middle 25% income	0.9	-5.6	2.9	1.8	1.16
Upper middle 20% income	1.3	-5.7	10.4	-6.1	2.91
Household size	-1.2	3.3	-0.6	-1.5	3.80
Presence of dependent children	-4.6	-3.9	5.1	3.4	1.54
Professional occupation	2.0	-6.5	9.4	-4.9	5.02
Self employed	9.6	22.3	-0.5	-31.4	7.54 *
Home owner	-4.2	2.0	10.4	-8.3	7.93 **
<u>Americans</u>					
Male	1.6	5.7	0.3	-7.7	10.65 **
Married	-4.5	-5.9	2.0	8.5	20.63 ***
Age	-0.1	-0.6	0.3	0.4	66.48 ***
Grade 1-9	-6.2	-7.7	-12.7	26.6	44.02 ***
Grade 10-12	-0.4	-13.6	-1.9	15.1	66.79 ***
Some college	-1.2	-7.4	-1.9	9.4	22.88 ***
Bottom 30% income	-6.9	-26.6	-24.7	58.2	42.11 ***
Lower middle 25% income	-4.6	-17.0	-23.6	45.3	21.42 ***
Upper middle 20% income	-4.6	-10.4	-18.7	33.7	11.25 ***
Household size	-0.2	-0.9	-0.8	1.8	5.07
Presence of dependent children	2.4	2.6	-3.0	-2.1	5.02
Professional occupation	2.3	2.9	-4.1	-1.1	6.79 *
Self employed	2.1	-3.3	1.7	-0.5	3.83
Home owner	0.8	10.6	-2.8	-8.6	37.19 ***

\* p<.10, \*\* p<.05, \*\*\* p<.01.

Table 3.

*Logistic Results on Stock Ownership: Coefficients and Average Marginal Effects*

Variable	Chinese Sample		American Sample	
	Marginal effects (%)	X <sup>2</sup>	Marginal effects (%)	X <sup>2</sup>
Substantial risk tolerance	8.9	1.59	25.0	49.11 ***
Above-average risk tolerance	12.7	5.12 **	21.7	60.02 ***
Below-average risk tolerance	1.6	0.11	10.3	16.12 ***
Single male headed household	-1.3	0.02	-1.5	0.26
Single female headed household	-22.6	3.66 *	0.3	0.01
Age	-0.3	2.29	0.2	5.08 **
Grade 1-9	-22.7	8.12 ***	-27.2	8.51 ***
Grade 10-12	-5.9	1.18	-8.5	13.27 ***
Some college	-2.5	0.26	-0.3	0.02
Bottom 30% income	-4.4	0.60	-28.4	56.25 ***
Lower middle 25% income	-5.8	1.02	-22.4	48.02 ***
Upper middle 20% income	-2.8	0.23	-17.1	31.06 ***
Household size	1.8	0.86	-0.3	0.11
Presence of dependent children	-1.4	0.03	-1.6	0.41
Professional occupation	0.9	6.04	3.4	2.51
Self employed	-5.7	0.27	-2.9	1.45
Home owner	-0.8	0.04	8.5	13.93 ***

Note: The following are the reference categories: married, college, and top 25% income.

\* p<.10, \*\* p<.05, \*\*\* p<.01.

Table 4  
*Simulation Results on Risk Attitudes and Stock Ownership*

	Chinese actual (%)	Simulated (%)	Loglikelihood Ratio Test
Substantial risk	8.9	5.1	
Above-average risk	19.8	20.8	93.34 ***
Average risk	36.8	39.6	
No risk	34.5	34.5	
Stock Ownership	24.5	21.6	57.10***

Note: The numbers in this table can be interpreted as follows: 24.5% of the Chinese in the sample report owning stocks. If these Chinese were Americans with the same set of characteristics, 21.6% of them would have reported owning stocks.

\* p<.10, \*\* p<.05, \*\*\* p<.01.