



INDIVIDUAL RISK PROPENSITY AND RISK BACKGROUND

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ABSTRACT

The paper considers the role that socio-psychological and socio-cultural factors play in individual decisions to take risk. The study employs four main measures of risk propensity: the mean probability of engaging in an investment, insurance or everyday gamble and the amount that would be invested in a hypothetical lottery. The study finds that gender had a significant influence on the probability of engaging in investment and everyday risk decisions, but a relatively insignificant impact on insurance decisions. The most important risk background variables were experience in making gambling decisions and confidence in making investment decisions. Similar results are obtained when the lottery-type measure of risk was employed.

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1. Introduction

Decision analysis involves the use of a rational process for selecting the best of several alternatives. Such analysis can be made under conditions of certainty, risk or uncertainty. When the consequence of a decision is not a single sure outcome, but the probability of each outcome is known, this is termed decision making under uncertainty or risk. The common stereotype is that women are more risk averse than men. This stereotype can potentially be used to explain important economic phenomena, such as the gender wage gap in labour markets. For example, if females are more risk-averse in the labour market they may choose jobs that have a lower mean salary [but with lower variance]. Moreover, even if there is no actual difference in gender attitudes toward risk, the belief in this stereotype may by itself have implications for which jobs women are offered and how much they are paid; this is especially relevant for jobs requiring risky decision-making (e.g., investment management, entrepreneurial pursuits). If employers believe that women are more risk averse than men, they may be unwilling to hire and compensate them as they would men.

Most theoretical models of gambling use the notion of expected utility. Statisticians postulate that individuals possess the so-called expected utility function and would therefore evaluate gambles based on expected utility rather than expected value (see Bernoulli, 1738; von Neumann and Morgenstern, 1944). Building on this framework, Kelsey and Quiggin (1992) argue that although an individual may know that a gamble is actuarially unfair, they may still engage in gambling since they believe that they may 'beat the odds'. Conlisk (1993), in contrast, postulates that engaging in the gamble provides some degree of utility or satisfaction to the party involved. Therefore, a risk-averse individual, who would not normally engage in actuarially unfair bets, would engage in gambling since it generates welfare gains. Theoretical models, while explaining why individuals make take risk, make no predictions regarding individual differences in risk taking.

Eckel and Grossman (2003), surveying the economics literature, compares the data across abstract gambles, contextual experiments and field studies. The authors conclude that while the results from field studies show that women are more risk averse, the findings of laboratory

experiments are less clear. For example, in a lab experiment using gambles, Holt and Laury (2002) find that all participants were much more risk averse when the size of the real incentives increased. However, women were more risk averse than men in low-payoff decisions. No gender differences were found in high-payoff decisions.

In an abstract lottery choice, Schubert, Gysler, Brown and Brachinger (1999) frame choices as either potential gains or as potential losses. They find that women were more risk averse than men in the gain-domain frame. For the loss-domain gambles this result is reversed: men are more risk averse than women (see also Schubert, Gysler, Brown and Brachinger, 2000). Moore and Eckel (2003) who studied the effect of ambiguity found events in which men were more risk averse than women. They also report mixed evidence in the gain domain, women were more risk averse than men, as well as significantly more averse to weak ambiguity. Conversely, when the gambles were framed as insurance this difference was reversed and men were more risk averse. The authors, however, did not find a gender difference for ambiguity aversion in the insurance frame.

This study seeks to assess whether differences in risk attitudes can be explained by considering the economic as well as the psychological and sociological perspectives. The paper contributes to the body of literature in two main areas: (1) it examines whether differences in individuals' risk background significantly influences risk decisions, and; (2) it presents new evidence on the distribution of risk attitudes in a developing country. Risk background is a relatively ignored aspect in the investigation of individual attitudes towards risk. While there may be differences in individual risk taking behaviour, these can be explained by differences in the risk background of each individual. This study should therefore improve our understanding and measurement of individual risk attitudes. The remainder of the paper is structured as follows: section 2 provides a review of the previous literature in area, sections 3 and 4 outline the conceptual framework and methodology employed, and sections 5 and 6 give the results and conclusions.

2. Literature Review: Risk Background and the Propensity to Take Risk

2.1 The Economic Perspective

Studies on the differences between men and women are distinguished by the ways in which they define and measure risk. These distinctions have implications for the ways the findings are interpreted and used to justify and form the basis of social, economic and political policy, infrastructure, and norms that support power relationships in society.

Economic studies tend to use the expected utility (EU) framework to assess differences in risk attitudes. The EU framework is used to observe decision making under uncertainty. When the consequence of a decision is not a single sure outcome, but the probability of each outcome is known, this is termed decision making under uncertainty.

Theoretical models of gambling tend to employ the notion of expected utility. Statisticians postulate that individuals possess the so-called expected utility function and would therefore evaluate gambles based on expected utility rather than expected value (Cramer, 1978; Bernoulli, 1738, von Neumann and Morgenstern, 1944). This implies, for example that a gamble with an expected payoff of \$200 is not necessarily worth twice the amount of one with an expected payoff of \$100. In the context of uncertainty such as gambling, individuals tend to act to maximise expected utility rather than expected value, yet the rate of expected utility diminishes with increases in wealth. Risk attitude can be defined as the parameter that differentiates between the expected utility functions of different individuals, (Blais et al, 2006). Risk aversion manifests in situations in which the cost of losing are perceived to be greater than the benefits of gaining.

The use of economic based experimental designs has become a popular way to measure differences in risk attitudes (Schubert et al, 1999, 2000; Holt and Laury, 2002; Moore and Eckel, 2003). Participants are provided with investment, insurance, lottery and/or gambling scenarios and asked to make decisions based upon various probabilities for potential gains or losses. This

process is called framing and refers to describing risky options in terms of a potential gain or loss.

The results of these studies tend to show that women are generally more risk averse than men in low-pay off decisions and in situations in which decisions are primarily based upon perceived gains, such as investment scenarios (Holt and Laury, 2002; Schubert et al, 1999). In scenarios based upon loss-domain decisions, such as when gambling was framed as insurance, the results reverse and men are generally more risk averse than women (Shubert et al, 2000; Moore and Eckel 2003).

The main criticism of the expected utility framework is the poor predictive ability of the model in real world experiments. The validity of the variables used to measure the construct of risk aversion (attitudes) appears to be challenged by ambiguity. Kelsey and Quiggin (1992) argue that although an individual may know that the lottery is actuarially unfair, they may still engage in gambling since they believe that they may 'beat the odds.' Similarly, Conlisk (1993) argues that for some risk averse persons the loss from gambling games such as slot machines and racetrack betting may be outweighed by the sheer excitement of engaging in the gamble. The reliability of the measures used to assess risk aversion (attitudes) also requires testing, as to whether repeated applications in experimental or real world contexts with the same respondents would obtain the same results. Research by Schoemaker (1990) has indicated that reliability tests have not produced consistent results in risk aversion across different domains and situations in laboratory studies.

2.2 The Social-Psychological Perspective

Some argue that risk aversion (attitudes) can be usefully conceptualised using social-psychological measures of perceptions of risk in comparison to risk likelihood (Weber, 1998). From this social-psychological perspective, risk taking behaviour is based upon an individual's willingness to trade units of perceived risk for units of perceived return; this approach has produced consistent results across groups and situations (Weber, 1998, 2001).

The Domain-Specific Risk-Taking (DOSPERT) Scale has been widely used as a method for assessing risk attitudes using this social-psychological model and has been commended for its ability to produce consistent and reliable results (Weber et al, 2002). The DOSPERT scale measures the relationship between risk taking and risk perception across health, recreation, social, investment, gambling and ethical domains. Weber et al, (2002) found that for individual participants in their study, “the level of apparent risk taking varied across risk domains, yet his (her) domain-specific levels of perceived risk and benefits together explained a significant proportion of this variability, and for the great majority of respondents, the relationship between apparent risk taking and risk perception across domains was negative or neutral, suggesting perceived risk aversion (see Blais and Weber, 2006).

2.3 *The Socio-Cultural Perspective*

The socio-cultural perspective, goes beyond the economic model, which views the individual as a rational actor weighing the costs and benefits of risky options, and the socio-psychological perspective, that measures perceptions of risk, and seeks to measure and explain the differences in the willingness of individuals to view a risk as desirable or undesirable based upon social norms. Perceptions of risk are influenced by the ways in which behavioural norms, codes of conduct, and outside influences function to sanction or enable individuals to engage in risk. Risk taking behaviour, or the lack thereof, is viewed through the lens of social constructs that impact the various degrees of voluntary self-regulation (or conformity) that may manifest as differences in male and female aversion to risk. The symbolic meaning of risk may vary for men and women within the same social and cultural context, and to some extent is determined by differences in social groups within cultural contexts.

Recent studies illustrate the importance of considering the issues of social and cultural group membership and indicate the perception of power is related to a person’s response to risk; according to Lupton (1999):

[M]embers of social groups that are less powerful tend to be more concerned about risks than members of powerful social groups. Women compared with men, and non-whites compared with whites tend in quantitative surveys to rate their concern about specific risks more highly.... [S]tudies showed that of white men, those who had higher levels of education, higher household incomes and were politically more conservative were most likely to rate risks as less serious.’²

Socio-cultural studies of risk aversion (attitudes) measure the influence of exogenous variables related to power and status such as levels of education, income, political and religious orientation, placement among siblings, and levels of confidence, experience, and desire with making risky decisions. Odean (1998) examined gender differences in overconfidence in investment decisions and found that overconfident investors held riskier portfolios than others. These results indicate that overconfident persons are more likely to take risks even when risk perceptions are held constant. Odean (1998) found that men (particularly single men) are more frequent traders than women, but earn less net returns than women. This difference in confidence levels could help explain observed differences in risk taking behaviour.

Studies indicate that gender differences persist cross-culturally (Zinkahan and Karande, 1991; Kogan and Wallach, 1964). The significance of these findings can be further explained using a social constructionist approach to defining risk. Rather than a fourth category of perspectives on risk, social constructionism stems from the socio-cultural perspective and postulates that our belief systems and moral positions, which are intricately tied to our social and cultural contexts, help to shape our perceptions of risk.

Social constructionism rejects the notion that a rational or objective perception of risk exists, since all of our belief systems and moral positions are subjective realities rendered absolute. From this perspective, risk can be defined only by understanding the dynamic ways in which meaning is constantly constructed and negotiated through social interaction within a particular

² Deborah Lupton, 1992, pp. 23 - 24.

context. The measurement of risk requires an assessment of “pre-existing realities”³ or shared definitions of the magnitude and severity of risk based upon a history of social interaction and socialisation.

The social constructionist approach helps to measure and explain variation in risk aversion by assessing individual and collective historical differences in social interaction and socialisation. From this perspective, one would expect to observe differences in perceptions of risk based upon the dissimilar social interaction and socialisation of males and females. Perhaps women have been mislabelled as risk averse, since the possibility exists that due to dissimilarities in socialisation women are prone to take different types of risk than men, yet these risk taking tendencies may not be as valued by society and therefore may tend to be measured less frequently.

Due to the variation in socialisation, women and men may share predispositions for both risk taking and aversion but in different ways. The possibility also exists that men, if faced with a similar history of social interaction and socialisation as women, may be less dissimilar in their risk taking tendencies. The approach to measuring risk aversion (attitudes) requires a qualitative component, such as focus groups, in tandem with survey methods to assess the influence of others on perceptions of risk and risk seeking behaviour.

3. Conceptual Framework

This study combines aspects of all three models (the economic, the social-psychological and social-cultural) of defining and measuring risk, and introduces the concepts of intrinsic and extrinsic risk perception. The authors hypothesise that risk aversion (attitudes) can be indicated by assessing the variance in the perceptions of whether a risk is viewed as having intrinsic or extrinsic worth. Perceived risks with intrinsic worth hold value regardless of stated quantifiable pay-off considerations.

³ Ibid, p. 29

Risk is only considered desirable when the perceived benefit outweighs the perceived loss; considered risk with extrinsic worth. The concept of extrinsic worth of a potential risk is similar to the notion of expected utility that is used to describe the ways in which risk aversion manifests as an indication of situations in which the cost of losing are perceived to be greater than the benefits of gaining. The intrinsic worth of a potential risk is based upon social, psychological and cultural factors that shape the individual and collective meaning placed on perceived risks. Ajzen's Theory of Planned Behaviour (1988, 1991) provides a framework for conceptualising the intrinsic worth of risky decisions.

Underlying Ajzen's framework is the assumption that "intentions are the precursors to behaviour," (Francis, 2004, 8). When applied to measuring risk attitudes the Theory of Planned Behaviour implies that the likelihood (intention) of an individual to take a risk depends upon its intrinsic worth that can be predicted by the following factors:

- Whether the person is in favour of doing it (*'attitude'*)
- How much the person feels social pressure to do it (*'subjective norm'*)
- Whether the person feels in control of the action in question (*'perceived behavioural control'*)⁴

An individual's 'attitude' may be a result of their willingness to trade units of perceived risk for units of perceived return, which incorporates an aspect of the socio-psychological perspective. 'Subjective norms' encompass the socio-cultural factors that influence conformity and self-regulating mechanisms—which are traditionally different for males and females. The concept of 'perceived behavioural' control points to the need to assess internal and external constraints. Internal constraints being issues of perceived power, confidence, experience, and desire to engage in risk and external constraints include social, economic, or political barriers and enablers to action.

⁴ Francis et al, 2004, p. 7

The notions of intrinsic and extrinsic worth of risks, acknowledges that individuals are rational actors and yet shaped by social and cultural norms. The variance in decisions based upon intrinsic worth may help to explain gender differences in risk attitudes based upon the influences that nurture rather than factors of nature. To investigate the influence of nurture and nature factors, this study combines economic, socio-cultural and social psychological methods to assess risk attitudes of males and females.

In summary, most of the previous literature points gender-specific differences in risk attitudes. This study seeks to assess these differences and investigate whether the divergence in risk attitudes obtained in earlier studies can be explained by not only considering economic, but psychological and sociological perspectives as well. The purpose here is to go beyond simply reporting on the differences in risk attitudes to attempting to provide explanations as to why those differences exist.

4. Empirical Approach

4.1 Survey

The survey took place at the University of the West Indies, Cave Hill Campus, Barbados, in February 2007. The authors recruited 187 students of various faculties of the campus to participate through advertisements on notice boards and the university's website. Those participating in the economic experiment were told that one of their responses would be used to calculate their payment for participation.

The authors employed a paper-based survey approach to examine the risk propensity of participants. The instrument confronts individuals with risky choices in the form of investment, insurance and as everyday scenarios. The investment situations provide the participant with an asset that allows the individual to purchase a share in Company A or Company B. Company B provides a certain return, while Company A gives the possibility of greater returns with a certain probability. The insurance decision, on the other hand, assumes that the individual already has the asset, but its value is in danger of falling with a certain probability. The participant is then

asked whether or not they would purchase insurance, set at the expected value of the loss. The final group of questions provides the participant with a particular real world event that is likely to occur with a certain probability (for example, there is 1 in 6 chance that it is likely to rain) and ask what that individual would do (for example, would you carry an umbrella).

The investment, insurance and real world risk situations allow the authors to investigate whether or not individuals' risk propensity changes depending on the context. The investment, insurance and real world decisions are framed so as to provide identical choices, but assess participants' risk propensity towards anticipated gains or losses. There were a total of 36 decisions: 16 investment decisions, 8 real world decisions, and 12 insurance decisions. Probabilities of $1/6$, $1/2$, and $5/6$ are employed. The expected outcomes range from \$10 to \$60 million dollars. An additional 4 investment decisions are included that only provide payoffs from the gamble two years into the future to identify whether risk propensities change significantly once time is taken into account.

The survey also asked participants to answer a lottery type measure of risk preferences similar to those employed in previous studies. The question presents individuals with a scenario where they have won \$250,000 in the lottery. The opportunity arises to invest some or all of the winnings in a risky asset that offers the possibility of doubling the amount invested in two years or a loss of 50 percent of the amount invested. Individuals are then asked to indicate what fraction of the \$250,000 they would choose to invest from eight possible choices: \$0, \$10,000, \$20,000, \$50,000, \$100,000, \$150,000, \$200,000 or \$250,000.

The survey instrument also asked participants to provide information on their risk background, as well as a number of other socioeconomic variables. On average each survey session lasted about one hour in total.

4.2 *Methodology and Data*

Each question provided the participant a choice between a sure payoff and a gamble that provides the opportunity to obtain a greater payoff. If the individual chooses the gamble, the decision is allocated a 1 and zero otherwise. The average propensity to choose the gamble is then calculated for each individual. A comparison of the differences in the average propensity of males and females to choose the gamble therefore provides a measure of gender differences in risk propensity.

Risk propensity, however, can be influenced by a number of other factors. Previous studies have controlled for personal characteristics such as gender, age, height, income, parental background (education level of mother and father) and family background (number of sisters, number of brothers and placement among siblings). This study also takes into account the risk background of each individual. Three general background categories are considered: employment, investment and gambling. For each of these categories, individuals were asked to rate on a 5-point scale (1=none, 2=moderately low, 3=moderate, 4=moderately high, 5=a great deal) their experience, confidence and desire to become knowledgeable about making employment, investment and gambling decisions.

These personal characteristics and risk background variables are included as independent variables in a regression on the propensity to choose gambles. The regression approach allows one to abstract from the effects of personal characteristics and risk background to identify whether or not this changes the results in relation to the risk propensity of males and females. To evaluate the robustness of this result, the authors also use the lottery measure as the dependent variable. The lottery measure provides an assessment of how much an individual will be willing to risk in an asset that can either double their investment or halve their investment.

The demographic characteristics of the sample of individuals are provided in Table 1. The table shows that most of the individuals responding to the invitations to be part of the experiment were female (76 percent), between 18 and 21 years old (56.1 percent), not employed (70.2 percent), registered in the faculty of social sciences (96.4 percent), and in the second year of undergraduate studies (55.6 percent).

5. Results

5.1 Preliminary Results

Preliminary analyses of the male-female differences in risk propensity are shown for investment, insurance and everyday decisions as well as for all three lotteries in Table 2. Looking first at investment decisions, the table shows that on average, men are more likely to choose the gamble relative to women. In situations where the possibility of winning the gamble was relatively low (i.e. risk of loss relatively high, $p = 1/6$) a significantly larger proportion of the men chose the gamble, especially when the expected payoff was particularly high (i.e. \$43,200 and \$7.3 million). In moderately risky scenarios (i.e. $p = 1/2$), men were far more likely to accept the gamble. In five out of the six moderately risky scenarios a significantly larger proportion (difference > 10 percentage points) of men chose to accept the gamble rather than the sure payoff. This result was consistent at the upper and lower ends of the expected payoff range. In general, therefore, male participants were more likely to accept the gamble, particularly in high risk scenarios (i.e. $p = 1/6$), relative to women. Indeed, in 7 out of the 12 investment decisions, significantly larger proportions of men stated that they would accept the gamble.

Rather than framing the question in terms of expected gain, the scenario was changed to confront the individual with the possibility that the asset they are currently holding can lose part of its value with a particular probability. Participants were then asked whether or not they would purchase insurance to guard against the possible loss in the value of the asset and how much they would pay. The findings once the scenario is changed differed to that obtained earlier. In only 3 out of the 12 insurance decisions were there significant differences between the proportions of women and men choosing the gamble (i.e. not purchasing insurance). These differences primarily occurred when the expected loss was in the mid-range of values. In general, however, there does not seem to be any significant difference in men and women in scenarios where the gamble is framed as an expected loss.

The final type of risk scenario confronted the individual with normal day-to-day risk scenarios. In the first case individuals were presented with the decision of whether or not to take an umbrella if the weatherperson predicted rain with a particular probability, while the second case

asked an individual to state whether or not they would purchase a new manufacturer's product if it is likely to be of a higher quality of that of the preferred manufacture with a particular probability. In general, men were more likely to gamble in everyday scenarios; in 5 out of the 8 everyday decisions, a significantly larger proportion of males accepted the gamble. As was the case in the investment decision scenario, men were relatively more likely to accept the gamble even in particularly risky scenarios (i.e. $p = 1/6$). Similarly, when the probability was not stated, a significantly larger number of males accepted the gamble.

The authors also asked participants whether or not they would accept the gamble if the payoff occurred in two years, rather than instantaneously. The results are presented in Table 3. Overall, a relatively larger number of male respondents accepted the gamble, even though the pay-off occurred in two years. Indeed, only situations where the risk was relatively low (i.e. risk of loss relatively high, $p = 5/6$), did a larger number of female participants accept the gamble. A similar result is obtained for moderately risky scenarios.

5.2 *Controlling for Risk Background*

A number of other factors influence individual's propensity to accept a gamble besides gender. Indeed, it is possible that once an individual's risk background is taken into account the differences in risk propensity between genders may disappear. To control for an individual's risk background in the investigation of risk propensity, the authors regress the mean probability of accepting the gamble for each individual on gender, risk background and other personal characteristics.

Table 4 presents the regression results for risk background controls for making employment, investment and gambling decisions. The table shows that, similar to the results obtained earlier, females were significantly less likely to accept the gamble in investment and everyday scenarios. There was, however, no significant difference between the genders in the case of insurance decisions. Of the three risk background variables considered only experience in making gambling decisions was significant in any of the three regressions. This result indicates that individuals that have more experience in making gambling decisions are more likely to take risk in their everyday life.

Income was significant in 2 of the 3 mean gambling regressions (insurance and everyday). However, the results were somewhat conflicting. In general, high income individuals were more likely to take risk in insurance decisions but less likely to gamble in everyday scenarios. The significance of the placement among siblings variable also suggests that older siblings were more likely to take risks in everyday situations.

Table 5, on the other hand, includes variables that capture the individual's confidence in making employment, investment and gambling decisions. Examining the investment regressions, the inclusion of these variables reduces the difference in risk preference between males and females. Indeed, individuals that stated they were confident in making investment decisions were significantly more likely to gamble in investment scenarios. Once confidence in making investment decisions is taken into account, placement among siblings also enters with a positive and statistically significant coefficient, indicating that younger/older siblings are more likely to engage in risky investment decisions.

In the case of the insurance decisions, the inclusion of the risk background did not change the main results as it relates to gender: the coefficient on the gender variable remained statistically insignificant. Similar to the results in Table 4, a relatively higher income individuals were more likely to gamble with insurance decisions, indicating a preference for self insurance. The final column in Table 5 presents the regression for everyday gambling decisions. Unlike the case of the investment decisions, the inclusion of the risk background variables did not significantly reduce the differences between genders in risk attitudes. The placement among siblings was also a statistically significant factor in explaining the risk preferences of individuals in everyday decisions.

The final group of risk background variables included were the desire to learn about making employment, investment or gambling decisions. Unlike the previous regressions, none of the risk background variables are significant at classical levels of testing. In addition, the inferences related to the gender variables did not change significantly.

5.3 *Risk Propensity with Lotteries*

To evaluate the robustness of our results, the authors also use an alternative measure of risk based on a standard lottery. The survey presented respondents with a hypothesised scenario where they were asked to identify what proportion of \$250,000 in lottery winnings they would invest in an asset that could either halve or double their investment in two years. Note that \$250,000 is roughly ten times GDP per capita in Barbados.

Figure 1 shows the distribution of responses to the question. The histogram shows that just over 10 percent of total respondents chose not to invest in the hypothetical asset. Most of the remainder chose to invest between \$10,000 and \$100,000, with the most popular value being \$50,000. In terms of the gender breakdown of the results, there is no significant difference: a larger proportion of males stated they would invest between \$50,000 - \$100,000, but only females were willing to invest \$200,000 or more.

In order to investigate the determinants of individual differences in willingness to invest, the authors regress the amount invested in the lottery on the exogenous factors employed earlier. The basic regression results are shown in Table 7. The coefficient on the gender variable remains negative, as in previous regressions, but is now statistically insignificant at classical levels of testing. The main determinants of the amount invested were experience in making employment and gambling decisions, confidence in making employment decisions and desire to learn about making investment decisions.

To identify the correlation in risk propensity measures obtained earlier and the lottery measure, the mean propensity to take investment, insurance and everyday gambles are included in the lottery regressions. The frequency of accepting an investment gamble is positive and significant in all the regressions, indicating a significant positive correlation between the two measures of risk propensity. The other two measures are both insignificant, but the risk background variables (experience and confidence in making employment decisions and experience and desire to learn about making gambling decisions) are all significant at normal levels of testing.

6. Conclusions

The use of economic based experimental designs has become a popular way to measure differences in risk attitude. Previous studies, however, undervalue the socio-cultural and socio-psychological perspectives of risk-taking while attempting to explain risky behaviour. Using Ajzen's (1988,1991) Theory of Planned Behaviour, the authors design a social experiment to investigate the impact of attitude, subjective norms and perceived behavioural controls on risk taking. The paper employs observations a survey of students at the University of the West Indies (Cave Hill Campus, Barbados) as well as focus groups from the same institution. The study employs four main measures of risk propensity: the mean probability of engaging in an investment, insurance and everyday gamble as well as the amount that would be invested in a hypothetical lottery. The study finds that males were most likely to take risk in investment and everyday decisions, while in terms of insurance decisions the differences between genders were insignificant. These results were robust to changes in the time frame.

To control for the effects of individual characteristics on the results, the authors regress the mean likelihood of engaging in a gamble on a number of socio-economic background variables. The results were quite similar to those obtained earlier. Gender had a significant influence on the probability of engaging in investment and everyday decisions, but a relatively insignificant impact on insurance decisions. Other important explanatory variables included the mother's education level, the placement among siblings and the risk background variables. The most important risk background variables were experience in making gambling decisions and confidence in making investment decisions. Indeed, once the confidence in making risky decisions is taken into account the male-female difference in risk propensity falls, although there still remains a significant difference between the two groups.

As an alternative to the frequency of making gambling decisions variable, the authors also use the standard lottery-type measure of risk. The regression results show that there is a significant correlation between the frequency of making gambling decisions variable and the lottery measure. This finding indicates that individuals that are more likely to make risky investment decisions are also more likely to invest a larger proportion of their lottery earnings in a risky

asset. In addition, the risk background variables were also significant factors in explaining the amount that individuals are likely to invest in the lottery. The results show that individuals that stated that they have experience and confidence in making employment decisions are more likely to invest a larger proportion of their lottery winnings, while experience and desire to learn about making gambling decisions has a negative impact on amount of the lottery winnings invested.

The results presented in this study to a large degree conform to previous papers regarding the gender difference in risk-taking. This paper has, however, shown that this dissimilarity in risk behaviour can to a large degree be explained by socio-psychological and socio-cultural factors: experience and confidence in making risky decisions. This suggests that males and females can be effectively socialised by developing programmes, either on the job or at school, that improves risk experience and confidence.

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Table 1: Demographic Characteristics of the Sample

	Frequency	Percentages (%)
<i>Gender</i>		
Male	41	24
Female	130	76
<i>Age</i>		
Less than 18 yrs	1	0.6
18-21 yrs	96	56.1
22-30 yrs	53	31.0
30-40 yrs	13	7.6
Over 40 yrs	8	4.7
<i>Employment Status</i>		
Not employed	120	70.2
Employed full-time	20	11.7
Employed part-time	31	18.1
<i>Faculty</i>		
Social Sciences	165	96.4
Law	2	1.2
Natural Sciences	2	1.2
Humanities	2	1.2
<i>Education Level</i>		
First year undergraduate	12	7.0
Second year undergraduate	95	55.6
Third and fourth year undergraduate	60	35.0
Graduate	3	1.8

Table 2: Male-Female Differences in Risk Propensity

	Probability	Expected Payoff/(Loss)	% Choosing Gamble		
			Male	Female	Difference
Investment Decisions					
1	1/6	\$30	48.8	46.9	1.9
2	1/2	\$42	43.9	33.1	10.8
3	5/6	\$54	34.1	38.5	-4.4
4	1/2	\$68	56.1	36.2	19.9
5	1/6	\$43,200	36.6	21.5	15.1
6	1/2	\$60,480	39.0	26.1	12.9
7	5/6	\$77,760	51.2	46.9	4.3
8	1/2	\$145,920	39.0	24.6	14.4
9	1/6	\$7,320,000	43.9	26.9	17.0
10	1/2	\$10,248,000	22.0	17.7	4.3
11	5/6	\$13,176,000	36.6	30.0	6.6
12	1/2	\$16,592,000	39.0	26.9	12.1
Insurance Decisions					
1	1/6	(26)	48.8	50.0	-1.2
2	1/2	(18)	24.4	35.4	-11.0
3	5/6	(10)	43.9	40.0	3.9
4	1/2	(35)	31.7	36.2	-4.5
5	1/6	(54,000)	41.5	40.8	0.7
6	1/2	(42,000)	47.5	35.4	12.1
7	5/6	(30,000)	60.0	43.1	16.9
8	1/2	(75,000)	45.0	33.8	11.2
9	1/6	(4,400,000)	43.9	37.8	6.1
10	1/2	(3,600,000)	36.6	33.1	3.5
11	5/6	(2,800,000)	46.3	46.9	-0.6
12	1/2	(60,000,000)	26.8	29.5	-2.7
Everyday Decisions					
1	1/6	Take Umbrella	80.5	59.7	20.8
2	1/2	Take Umbrella	51.2	15.4	35.8
3	5/6	Take Umbrella	19.5	10.0	9.5
4	not stated	Take Umbrella	56.1	19.2	36.9
5	1/6	Choose New Manufacturer	39.0	26.9	12.1
6	1/2	Choose New Manufacturer	56.1	56.9	-0.8
7	5/6	Choose New Manufacturer	87.8	78.5	9.3
8	not stated	Choose New Manufacturer	41.4	17.7	23.7

Table 3: Male-Female Differences in Risk Propensity (Time)

	Probability	Expected Payoff in two years	% Choosing Gamble		
			Male	Female	Difference
Investment Decisions					
1	1/6	\$43,200	12.2	10.1	2.1
2	1/2	\$60,480	22.5	10.1	12.4
3	5/6	\$77,760	19.5	23.1	-3.6
4	1/2	\$145,920	24.4	14.6	9.8

Table 4: Primary Determinants of General Risk Propensity (Dependent Variable = Mean Probability of Accepting Gamble)

Variable	Investment	Insurance	Everyday
Gender (female)	-0.234 (-2.393)**	-0.014 (-0.139)	-0.415 (-4.627)**
Age	0.103 (1.010)	0.139 (1.357)	-0.118 (-1.257)
Height	-0.022 (-0.227)	0.085 (0.863)	-0.076 (-0.852)
Income	-0.020 (-0.228)	0.143 (1.611)*	-0.150 (-1.843)*
Mother's Education Level	-0.110 (-1.121)	-0.061 (-0.618)	0.069 (0.769)
Father's Education Level	0.150 (1.519)	-0.021 (-0.207)	0.075 (0.833)
Experience making employment decisions	-0.046 (-0.482)	0.116 (1.219)	0.028 (0.321)
Experience making investment decisions	-0.016 (-0.181)	-0.068 (-0.743)	-0.107 (-1.292)
Experience making gambling decisions	0.037 (0.458)	0.048 (0.594)	0.130 (1.747)*
Placement among siblings	0.135 (1.523)	0.031 (0.353)	0.234 (2.886)**
Number of sisters	0.036 (0.398)	-0.114 (-1.249)	0.104 (1.241)
Number of brothers	0.076 (0.870)	0.077 (0.878)	0.077 (0.965)
R^2	0.109	0.111	0.256
Observations	171	171	171

Note: (1) standardised coefficients are reported.

(2) t-values are presented in parentheses beneath the coefficients.

(3) ** and * indicates significance at the 5 and 10 percent level.

Table 5: Primary Determinants of General Risk Propensity (Dependent Variable = Mean Probability of Accepting Gamble)

Variable	Investment	Insurance	Everyday
Gender (female)	-0.176 (-1.805)*	-0.022 (-0.212)	-0.438 (-4.749)**
Age	0.085 (0.888)	0.187 (1.881)*	-0.105 (-1.149)
Height	0.016 (0.170)	0.081 (0.825)	-0.070 (-0.779)
Income	-0.047 (-0.526)	0.148 (1.613)*	-0.129 (-1.537)
Mother's Education Level	-0.113 (-1.171)	-0.064 (-0.638)	0.059 (0.654)
Father's Education Level	0.113 (1.169)	-0.022 (-0.222)	0.091 (0.991)
Confidence making employment decisions	-0.097 (-1.112)	-0.018 (-0.198)	-0.015 (0.186)
Confidence making investment decisions	0.250 (2.854)**	-0.041 (-0.448)	-0.120 (-1.441)
Confidence making gambling decisions	-0.019 (-0.237)	0.071 (0.841)	0.059 (0.765)
Placement among siblings	0.155 (1.815)*	0.016 (0.178)	0.215 (2.656)**
Number of sisters	0.025 (0.288)	-0.115 (-1.266)	0.086 (1.040)
Number of brothers	0.062 (0.731)	0.074 (0.836)	0.081 (1.012)
R^2	0.155	0.104	0.246
Observations	171	171	171

Note: (1) standardised coefficients are reported.

(2) t-values are presented in parentheses beneath the coefficients.

(3) ** and * indicates significance at the 5 and 10 percent level.

Table 6: Primary Determinants of General Risk Propensity (Dependent Variable = Mean Probability of Accepting Gamble)

Variable	Investment	Insurance	Everyday
Gender (female)	-0.231 (-2.395)**	-0.017 (-0.180)	-0.411 (-4.643)**
Age	0.060 (0.604)	0.193 (1.935)*	-0.105 (-1.158)
Height	-0.018 (-0.191)	0.089 (0.920)	-0.061 (-0.689)
Income	-0.003 (-0.029)	0.135 (1.524)	-0.155 (-1.917)*
Mother's Education Level	-0.097 (-0.981)	-0.091 (-0.918)	0.028 (0.314)
Father's Education Level	0.137 (1.393)	-0.014 (-0.146)	0.085 (0.956)
Desire to learn about making employment decisions	-0.021 (-0.239)	-0.073 (-0.816)	-0.103 (1.245)
Desire to learn about making investment decisions	0.130 (1.442)	-0.097 (-1.073)	-0.071 (-0.859)
Desire to learn about making gambling decisions	0.039 (0.479)	0.069 (0.840)	0.116 (1.558)
Placement among siblings	0.133 (1.522)	0.022 (0.250)	0.229 (2.863)**
Number of sisters	0.046 (0.501)	-0.153 (-1.677)*	0.043 (0.516)
Number of brothers	0.095 (1.093)	0.059 (0.679)	0.069 (0.869)
R^2	0.122	0.121	0.266
Observations	171	171	171

Note: (1) standardised coefficients are reported.

(2) t-values are presented in parentheses beneath the coefficients.

(3) ** and * indicates significance at the 5 and 10 percent level.

Table 7: Determinants of Decision to Invest Lottery Earnings

Variable	Basic	Experience	Confidence	Desire
Gender (female)	-0.562 (0.414)	-0.569 (0.421)	-0.496 (0.429)	-0.495 (0.417)
Age	0.013 (0.211)	-0.139 (0.223)	-0.128 (0.216)	-0.129 (0.218)
Height	-0.220 (0.256)	-0.164 (0.260)	-0.165 (0.258)	-0.155 (0.258)
Income	0.083 (0.194)	0.011 (0.197)	0.001 (0.202)	0.039 (0.196)
Mother's Education Level	-0.286 (0.262)	-0.309 (0.263)	-0.326 (0.264)	-0.242 (0.265)
Father's Education Level	0.345 (0.224)	0.375 (0.225)*	0.309 (0.227)	0.322 (0.225)
Risk background – employment decisions	-	0.307 (0.159)*	0.368 (0.176)**	-0.029 (0.222)
Risk background – investment decisions	-	-0.145 (0.165)	-0.057 (0.188)	0.324 (0.186)*
Risk background – gambling decisions	-	-0.294 (0.143)**	-0.215 (0.142)	-0.178 (0.123)
Placement among siblings	0.094 (0.158)	0.105 (0.160)	0.070 (0.159)	0.090 (0.158)
Number of sisters	0.197 (0.119)	0.196 (0.121)*	0.189 (0.119)	0.249 (0.122)**
Number of brothers	-0.114 (0.115)	-0.122 (0.116)	-0.144 (0.116)	-0.114 (0.116)
Cox and Snell R^2	0.063	0.105	0.105	0.095
Observations	155	155	155	155

Note: (1) t-values are presented in parentheses beneath the coefficients.

(2) ** and * indicates significance at the 5 and 10 percent level.

Table 8: Correlation between Risk Propensities

Variable	Basic	Experience	Confidence	Desire
Frequency of investment gambling decisions	2.154 (0.701)**	2.085 (0.771)**	2.319 (0.791)**	1.957 (0.773)**
Frequency of insurance gambling decisions	-0.358 (0.530)	-0.538 (0.601)	-0.294 (0.598)	0.122 (0.756)
Frequency of everyday gambling decisions	0.105 (0.617)	0.077 (0.752)	-0.128 (0.750)	-0.290 (0.601)
Gender (female)	-	-0.385 (0.467)	-0.427 (0.477)	-0.270 (0.459)
Risk background – employment decisions	-	0.335 (0.161)**	0.420 (0.178)**	-0.053 (0.228)
Risk background – investment decisions	-	-0.147 (0.169)	-0.207 (0.198)	0.274 (0.190)
Risk background – gambling decisions	-	-0.308 (0.145)**	-0.209 (0.144)	-0.204 (0.126)*
Controls for age, height, income, mother's education level, father's education level, placement among siblings and number of sisters and brothers	No	Yes	Yes	Yes
Cox and Snell R^2	0.065	0.160	0.164	0.142
Observations	155	155	155	155

Note: (1) t-values are presented in parentheses beneath the coefficients.

(2) ** and * indicates significance at the 5 and 10 percent level.

Figure 1: Willingness to Invest in Lottery Earnings in Risky Asset

