DETERMINANTS OF RISK AVERSION: A MIDDLE-EASTERN PERSPECTIVE

Amit Das, Department of Management & Marketing, College of Business & Economics, Qatar University, P.O. Box 2713, Doha, Qatar
amit.das@qu.edu.qa, (974) 4403-5037

Ritab Al-Khoury, Qatar University, P.O. Box 2713, Doha, Qatar
r.al-khoury@qu.edu.qa, (974) 4403-5089

Shobha S. Das, Qatar University, P.O. Box 2713, Doha, Qatar
shobha.das@qu.edu.qa, (974) 4403-5038

ABSTRACT

We measure the risk aversion of finance major students in the context of investments and trace this attitude to their financial literacy, their perception of the risk-return tradeoff, and their sources of financial information. We find statistically significant relationships between risk aversion and all three of these antecedents.

Keywords: Risk Aversion, Financial Literacy, Risk-return Trade-off, Information Sources

INTRODUCTION

The Middle East includes countries that have some of the highest per-capita income levels in the world, yet securities markets in the region remain relatively under-developed. Most of the stock markets in the region are classified as “frontier markets” (rather than “developed” or “emerging”) based on size and liquidity (MSCI, 2013). A possible explanation for this may lie in the risk attitudes of potential investors in the region, specifically their aversion to financial risk as represented by modern financial instruments. In this paper, we examine the risk attitudes of undergraduates (juniors and seniors) specializing in finance in the business school of the state university of a small middle-eastern country. We measure the risk aversion of these students in a financial context and trace this attitude to antecedents such as their financial literacy, their perception of the risk-return tradeoff, and their sources of financial information. We find statistically significant relationships between risk aversion and these antecedents, providing guidance on how participation in securities markets might be enhanced in this country and the region.

THEORY

Risk aversion refers to preferences wherein a decision-maker settles for a certain payoff less than the expected value of an uncertain alternative. Different forms and levels of risk aversion can be modeled using a variety of utility functions. A common measure of risk aversion, due to Arrow and Pratt (1964), is calculated by dividing the second derivative of the utility function by the first derivative (and inverting the sign, to produce larger values for more risk-averse subjects).
Risk aversion, accentuated by behavioral biases such as mental accounting (Benartzi and Thaler, 1995) and narrow framing (Barberis et al, 2006), has often been viewed as a reason for low levels of participation in the stock market. Put simply, people are more concerned about avoiding losses than seeking gains, which causes them to stay out of the market even when net gains are more likely.

The study of financial literacy has been advanced in recent times by Lusardi (2008; Lusardi and Mitchell, 2011). Links have been established between financial literacy on one hand, and household saving behavior, stock market participation, and retirement planning on the other, raising significant policy implications. Specifically, van Rooij et al (2011) have demonstrated that those with low literacy are much less likely to invest in stocks, presumably due to lack of awareness and understanding of matters financial. It is, however, possible that financial literacy might heighten the perception of risk for risk-averse subjects, making them even more risk-averse.

The risk-return trade-off is a cornerstone of modern finance. Given the salience of losses over gains, riskier investments carry greater “danger” of losses, that investors must be compensated for. Since risk is universally avoided, if there existed an investment with high return and low risk, its price would be bid up by all those attracted to it, causing the “excess” return to vanish.

Therefore, it makes sense that risk and return should be positively correlated. Attempts to detect such correlation in securities markets have yielded mixed results, though larger samples (Lundblad, 2007) and newer estimation methods (Ghysels et al, 2005) have produced empirical support for the existence of the risk-return trade-off.

We assess the risk-return trade-offs perceived by our subjects in a new way: by having each of them rate a set of asset types in terms of perceived (expected) returns and risk. These intra-subject data allow us to measure how well perceptions of risk and return are correlated within each individual. Perfect correlation (+1.0) denotes strict conformance with the theory, while lower values signal disagreement between subjects’ preferences and the predictions of theory. The perception of the risk-return trade-off might affect risk aversion in either direction. It might increase risk aversion among those who are less risk-averse by highlighting that higher return almost always implies carrying greater risk. For the more risk-averse, the risk-return trade-off might cast light on low-risk investment opportunities, thus moderating their overall unwillingness to take on any form of risk.

The information search behavior that guides investment choices has been studied thoroughly by Lin and Lee (2004). We measure subjects’ exposure to a variety of media, and examine the effect of such variety on risk aversion. It is difficult to specify, ex ante, the effect on risk aversion without paying attention to the content of the media exposure, as success stories and cautionary tales would have opposite effects. Still, given the preponderance of “bad news” on the economic front from the 2008 crisis onwards (mortgage-backed securities collapse, recession in Europe, unemployment in the US, unrest in the Middle East …), we suspect increased media exposure, manifested as a greater number of information sources consulted by each subject, will lead to heightened risk aversion among our subjects.
The relations among the theoretical constructs above is shown graphically in Figure 1 below.

**Figure 1: Risk Aversion and its antecedents**

**METHOD**

The following data were collected online using an instrument containing multiple tasks for subjects.

**Risk Aversion** was measured by offering subjects choices between a certain payoff and four gambles of progressively increasing expected value AND variability. The excess of the expected value of a gamble over the certain payoff represents the premium demanded by a subject for taking the risk embodied in the gamble. A similar procedure for eliciting risk aversion has been used earlier by Eckel and Grossman (2002; 2008). As noted by Charness et al (2013) in their review of experimental methods of eliciting risk aversion, the Eckel-Grossman procedure allows for parameter estimation: the chosen gamble implies an interval for the Arrow-Pratt risk coefficient under the assumption of constant relative risk aversion (CRRA). We did not estimate such parameters, instead classifying subjects demanding larger risk premiums as increasingly risk-averse on a scale of 1 through 4.

**Financial Literacy** was assessed using Lusardi’s (2008) battery of questions, encompassing both basic and advanced financial literacy. The three basic questions deal with interest rates, inflation and diversification, while the five advanced questions deal with specific characteristics of stocks and bonds. Using the number of questions answered correctly as a measure of financial literacy, the minimum and maximum scores received by subjects ranged from 0 to 8 respectively.

The conformance of subjects to the **Risk-return Trade-off** was measured by having them assess the expected returns and risks (in separate sections of the instrument, to reduce bias) of eight asset types: bank deposits, stocks, mutual funds, bonds, insurance policies, commodities, real estate and gold. The intra-subject correlation of risk and return across the eight assets was calculated for each subject as her/his risk-return trade-off. If risk and return are perfectly correlated for a subject across the eight assets, the risk-return trade-off for the subject would take the maximum value of +1.
The number of **Information Sources** was assessed by having subjects check off relevant sources from a list containing family and relatives, co-workers or friends, investment seminars, computer software, financial planner / advisor, newspapers / magazines, Internet, and TV / radio. Subjects could choose none (0), some (1-7), or all (8) of these sources as relevant to their investment decision-making.

**Sample**

The instrument was administered to 192 finance majors (juniors and seniors) in the business school. Some subjects found the tasks eliciting risk aversion and risk-return trade-off to be cognitively demanding and quit the study without providing complete and consistent responses. Complete and consistent data were collected from 132 subjects, and analyzed using a regression model.

**RESULTS**

As far as demographics are concerned, 72% of all subjects were between 21 and 23 years of age (and 88% between 20 and 24). 74% of the subjects were women, reflecting the composition of the student body at the university. Neither age nor gender had a statistically significant effect on risk aversion, and were therefore excluded from the final regression model. **Risk Aversion** does appear to be high among our subjects. Over 70% of all subjects placed in the top two levels (3 and 4) of the 4-point risk aversion scale. The distribution of risk aversion scores is shown below in Figure 2 below.

![Figure 2: Risk Aversion](image_url)

**Financial Literacy** scores can go from 0 to 8, depending upon the number of questions (basic + advanced) answered correctly. The mean score of our subjects was 6.22 with a standard deviation of 1.45. The distribution of financial literacy scores in our sample is shown below in Figure 3.
Risk-return Trade-off scores are measured as intra-subject correlations, so the values for all subjects lie between -1 and +1. Zero corresponds to subjects whose risk ratings for the eight asset types were uncorrelated with their estimated returns, while +1 (or -1) indicates perfect positive (or negative) correlation between subjects’ risk and return ratings. 75% of our subjects display positive trade-off between risk and return. The mean level of the risk-return correlation among our subjects was +0.37, with a standard deviation of 0.49. The distribution of the risk-return trade-off among our subjects is shown below in Figure 4.

The number of Information Sources accessed by our subjects ranges from 0 (none) to 8 (all). The mean for this measure is 4.03 and the standard deviation 1.50. The distribution of the number of information sources is shown below in Figure 5.
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Figure 5: Information Sources

The matrix of bivariate correlations among these measures is shown below in Table 1.

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Risk Av</th>
<th>Financial Literacy (FinLit)</th>
<th>Risk-return Trade-off (RiskReturn)</th>
<th>Number of Information Sources consulted</th>
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<tr>
<td>Risk Av</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>.229</td>
<td>-1.18</td>
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<td></td>
<td>Sig. (2-tailed)</td>
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<td>.177</td>
<td>.043</td>
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<tr>
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<td>N</td>
<td>133</td>
<td>133</td>
<td>133</td>
</tr>
<tr>
<td>FinLit</td>
<td>Pearson Correlation</td>
<td>.229</td>
<td>1</td>
<td>.301</td>
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<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.008</td>
<td>.000</td>
<td>.281</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>133</td>
<td>192</td>
<td>192</td>
</tr>
<tr>
<td>RiskReturn</td>
<td>Pearson Correlation</td>
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<td>.301</td>
<td>.043</td>
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<tr>
<td></td>
<td>Sig. (2-tailed)</td>
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<td>.000</td>
<td>.557</td>
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<tr>
<td></td>
<td>N</td>
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<tr>
<td>Number of Information Sources consulted</td>
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<td>-.078</td>
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<tr>
<td></td>
<td>Sig. (2-tailed)</td>
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<td></td>
<td>N</td>
<td>133</td>
<td>192</td>
<td>192</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).**

Table 2: Bivariate Correlations

Linear regression of Risk Aversion on Financial Literacy, the Risk-return Trade-off and the number of Information Sources yields an R-square of 12% (adjusted R-square 10%). The overall model is significant in the omnibus F-test (p = 0.001), and the individual regression coefficients are all significant at the 5% level. Table 2 below summarizes the regression results. Please note that the sample size for the regression model is limited to 132 by the exclusion of cases listwise, resulting in the retention of only those cases with NO missing values.
Table 2: Regression of Risk Aversion on Financial Literacy, Risk-Return Trade-Off and Information Sources

As shown above, increasing Financial Literacy and more Information Sources consulted by subjects increased their Risk Aversion, while conformance with the Risk-return Trade-Off reduced Risk Aversion. The model passes common requirements for multi-collinearity (max VIF = 1.1) and serial autocorrelation (Durbin-Watson statistic = 1.93).

DISCUSSION

The overall level of risk aversion among subjects in the Middle-East remains high. Such risk aversion appears to increase with increasing financial literacy and the number of information sources accessed by the subject. Only conformance with the risk-return trade-off seems to reduce the level of risk aversion, perhaps by drawing attention to low-risk (hence low-return) instruments that reduce the prospect of downside loss. A wider range of information sources available to subjects also appear to heighten risk aversion, perhaps through vivid anecdotes of losses suffered by risk-takers. Some of these results (e.g. the role of financial literacy, and that of exposure to multiples sources of information) might not match those obtained in Western contexts, but cognitive differences between the west and east have already been established across multiple contexts (Nisbett, 2003).

Coming from finance major university students, our results might actually understate the degree of risk aversion in the population at large. To draw such individuals into investing their surplus in securities markets, it may be necessary to create low- or limited-risk instruments that specifically meet their needs. The developing field of Islamic Finance holds promise in the creation and popularization of securities suited to the profile of investors in the region.
REFERENCES


