

Introduction

Investing vexes many individuals and frequently receives less thought than necessary. Benartzi & Thaler found that a majority of university employees spent less than an hour deciding their initial retirement investment allocation. One hour of thought spent on a decision that could make or break a retirement account. Additionally, it was found that 87% made one or less investment reallocation (Ameriks & Zeldes, 2004). This indicates that individuals do not reallocate their investments to increase risk diversity within their funds. Investing requires consideration of risk. Even if an individual takes precautions and meets with a professional to discuss investment, individuals must still confront risk. Discussion about taking investment risks can still be tricky to maneuver.

Message framing influences interactions in ways many do not realize. Investment planning does not escape this communication theory. To offer personalized, applicable, and advantageous investment advice in the future, the influence of frame on risk-involved messages should be investigated.

Different lifestyle characteristics can influence individuals' risk-aversion. This study focuses on the influence of self-identified competition on risk-aversion and investment decisions. By incorporating the presence or absence of gain or loss through prospect theory, this study can better assess the influence of competition on risk aversion and financial decision making.

Through the application of cumulative prospect theory and message framing theory, this study evaluates the impact of competition on risk aversion in financial decisions. Considering the context of a capitalistic country, competition finds high value and permeates culture. Insight into the impact of competition on message framing and risk aversion could open a new discussion in terms of research focused on influencing factors in decision-making under risk.

Literature Review

Cumulative Prospect Theory

Prospect theory delves into the idea of message and situation interpretation specifically under risk. In its intended form, prospect theory focuses on how individuals will react to a situation influenced by specified risks by organizing and reformulating the options to simplify evaluation and eventual decision. This theory looks closely at loss and gain evaluation (Kahneman & Tversky, 1979). Prospect theory takes a realistic view on how people interpret and react to risk within messages based on outcome perception.

Broken down into two different phases, editing and evaluation, prospect theory elaborates on the cognitive processing that individuals go through when presented a choice between two risk-influenced options. Editing simplifies evaluation and selection by employing the main operations: coding, combination, segregation, and cancellation (Kahneman & Tversky, 1979). Coding refers to the phenomena of perception of outcomes as gains or losses relative to a reference point, in early versions of this theory the reference point denotes monetary wealth. Combination and segregation exemplify the brain's tendency to simplify options. Cancellation eliminates redundant options in a choice so that the prospect only contains unique characteristics that make selection easier (Kahneman & Tversky, 1979). All of these editing operations assist in making the second phase of cognitively processing information less complicated. Evaluation, the second phase of the edited prospects then follows, leading to choice of the option that grants the highest perceived value according to that individual's reference point.

As an expansion on the original prospect theory, the cumulative prospect theory expands application to risky situations that could have any number of outcomes. It also accommodates source dependence (Kahneman & Tversky, 1992) which integrates well into risk tolerance based

on reference point (another extension of prospect theory), or for the purpose of this experiment original monetary wealth. For example, take a situation where a college student who earns minimum wage and lives paycheck to paycheck faces a choice between investing \$5,000 leaving it in their savings account. This student will view \$5,000 very differently than an individual who earns \$130,000 every year. For the student, investing \$5,000 (the amount used in this study) seems like a large amount to risk and would likely take the zero-risk route rather than lose the money that they struggle to earn. However, the individual who earns \$130,000 might see an investment of \$5,000 well worth the risk and hardly think about the decision at all.

Cumulative prospect theory furthers research on over-and-underweighting that takes place in risk-related scenarios. Overweighting of small probabilities demonstrates why lotteries and insurance have such high popularity. Underweighting of high probabilities legitimizes risk aversion in choices considering probable and sure gain as well as the risk seeking in choices between probable and sure losses (Kahneman & Tversky, 1992).

Message Framing

Message framing theory built off of the already established prospect theory. Prospect theory claims information offered as either gains or losses influences both behavior and decision-making (Rothman & Salovey, 1997). Message framing theory elaborates on this section of prospect theory and applies to extremely diverse fields. Message framing research appears frequently in health, financial, and risk-related persuasion. Many of these approaches however, utilize gain-framed versus loss-framed messages.

A newer branch of exploration into message framing theory compares factually equivalent statements that differ only in description. This section of message framing is often referred to as goal framing (Levin, Schneider, & Gaeth, 1998). Simply, goal framing structures

statements to differ in end-state (goal) but have the same valence (positive outcome or negative outcome). For the purpose of this experiment, positive valence compares the difference in reaction to messages framed as presence of gain (positive with end-state of gain) with the absence of loss (positive with end-state of loss) (Yi & Baumgartner, 2008). This framing technique logically relates to outcome related risk evaluation.

Risk Tolerance

Within both prospect and message framing theories lays some degree of assumption about risk behavior. Risk tolerance or risk aversion evaluates individuals' propensity to participate or avoid risky behavior (Holt & Laury, 2002). Additionally risk aversion influences many economic behaviors, investment or portfolio choice for example (Anderson & Mellor, 2008). Therefore it stands to reason that risk tolerance should be taken into account when considering the influence of competition in message reaction. Furthermore, considering the typical scenario for measure rests in series of lottery-related questions, financial application clearly fits.

Measurement of risk tolerance usually involves testing multiple items to get a sense of placement on a scale of risk aversion. In this experiment a questionnaire of ten questions, involving choice between two options differing in risk level, will test for risk aversion. Holt & Laury's "ten paired lottery-choice decisions with low-payoffs" will function as this experiment's tool for assessing risk aversion in participants.

Competitiveness

Within the context of a capitalistic society, competitiveness frequently appears as an individualistic quality that influences many daily decisions. Competition encompasses the idea of "social comparisons involving an unequal distribution of rewards or scarce resources deriving

from the relative performance of the participants in an activity” (Mudrack, Bloodgood, & Turnley, 2011, p. 347). Essentially, competitiveness equates to the measure of how much competition influences every day decisions. As simple as that seems, measuring competitiveness eludes many unless it faces categorization and specification.

Many would argue that different types of competition exist, therefore complicating measurement, however this study highlights two main types in order to simplify the process. First, the desire to outperform others, comes across as competing to win and ultimately demonstrate superiority at the expense of the loser. Second, the desire to perform well, translates to personal development and motivates through achievement and personal gain (Hibbard & Buhrmester, 2010). These two different types of competition align with this study’s use of outcome orientation to frame competitiveness. According to Hibbard & Buhrmester (2010) the personal development competition style “is a more socially neutral form of competitiveness that is closely aligned with achievement motivation” (p. 413). Therefore, evaluation of competition (for this study) focuses on the desire to perform well compared to the ‘competing to win’ orientation of competition as part of the 2 x 2 factorial design of the experiment.

Measurement of competition usually involves testing multiple items in a self-assessment to assign the degree of competition on a scale. In this experiment a questionnaire containing twenty questions, in which the participant will rate their level of agreement according to a standard 5-point Likert Scale, will test for competitiveness. Smither & Houston’s (1999) “competitiveness index items and factor loadings” will function as this experiment’s primary tool for assessing competition in participants.

Summary

Competition influences many decisions in everyday life and logically falls under research involving prospect theory, message framing, and risk tolerance.

H₁: People who identify as more competitive will have lower risk aversion scores and will partake in riskier financial behavior, under positive message valence, than those who identify as less competitive.

H₂: Self-identified competitiveness moderates the influence of perceived risk on investment decision-making.

RQ₁: How does message framing about risk and outcome influence investment decisions?

RQ₂: To what extent do risk acceptance and competitiveness moderate differences in investment decisions based on risk-framing?

RQ₃: To what extent do risk acceptance and competitiveness moderate differences in investment decisions based on outcome-framing?

Methods

Sampling and Participants

Non-random convenience sampling was used to gather 80 participants (42 female and 35 male) within the Kansas State University Manhattan campus. Non-random convenience sampling provided quick access to potential participants. Three individuals did not provide demographic information and account for any total discrepancies. Sixty-four participants identified as Caucasian with the other 13 spread across the remaining categories each amounting to no more than 3.8% or 3 participants. Minimum age was 18 with an average of 21.6 and a maximum age of 32. Additionally, 70 participants were undergraduates while the remaining 7 were graduate students. Of the undergraduate students, 5 identified as freshman, 13 as sophomores, 24 as juniors, and 28 as seniors.

Design

This was a post-test only experiment using a 2 x 2 factorial design with a manipulated informational paragraph (vignette) varying risk aversion (high vs. low) as the first factor with outcome orientation (competitive vs. non-competitive) as the second factor. This design enabled testing of the two primary factors of research for this experiment and related moderators. After completing the experiment, participants finished two sets of questions to test the chosen variables directly. Lastly, demographics and questions about current investments closed the questionnaire.

Procedures

In respect of time, an in-person survey was deemed most suitable for this study. Participants were selected from various locations around the Kansas State University Manhattan campus with a standard request for action varying only in the survey version offered. Finally, as incentive for completion of the survey, all participants had the opportunity to enter a raffle for three \$10 Amazon gift cards. Each participant received one of four versions of a questionnaire, with each version having an equal share of participants.

Measures

Competitiveness

Competitiveness was measured using 20 questions (Smither & Houston, 1992) that assessed the competitiveness of participants. This evaluation of competitiveness focused on two different types of competition and enabled test comparison to the competition factor within the experiment. The measure was reliable with ($\alpha = .846$).

Risk Aversion

Risk aversion was measured with a set of 10 questions based on a paired lottery-choice decision with low payoff (Holt & Laury, 2002). These questions determined risk aversion by

comparing two options varying in risk at constant rates. To quantify this second set, a score was assigned to each item according to its risk. The participants chose either the “no risk” option (which always received a score of 0) or the “risk” option. Risk decreased as the items continued; the first question held a higher score because it was riskier. Scores of 5 were given to each “risk” answer for the 1st two items, which had the highest level of risk. Scores of 4 were given to each “risk” answer for items 3 & 4. Scores of 3 were given to each “risk” answer for items 5 & 6. Scores of 2 were given to each “risk” answer for items 7 & 8. Scores of 1 were given to each “risk” answer for items 9 & 10. The scores were then totaled, with a possible range from 0 to 30. The participants’ average score was a 10.70 (sd = 6.01), and ranged from 0-30. This method proved most useful for this experiment due to its high alpha and consistency with the structure of this experiment.

Results

Message Framing – Influence of Risk and Outcome

To test the influence of competitive message framing and risk framing, the study used a factorial ANOVA to determine whether there would be a significant difference in investment amount based on those two variables. The result of the factorial ANOVA revealed no significant difference in investment amounts based on the interaction of risk-framing and outcome-framing, $F(1, 76) = 1.31, p = .25$. However, a significant difference in investment amounts was apparent based on risk-framing, $F(1, 76) = 5.33, p = .02$. Participants were willing to invest more in the low-risk condition ($m = 2662.79, sd = 1534.21$) than in the high-risk condition ($m = 1921.62, sd = 1487.23$).

Table 1
Influence of Risk and Competition Type on Investment Allocation

Risk Type	Comp. Type	Mean	Std. Deviation	N
Low	Comfortable	3175	1616.323	20
	Beat the Market	2217.39	1338.47	23
	Total	2662.79	1534.217	43
High	Comfortable	2019.44	1436.206	18
	Beat the Market	1828.95	1567.492	19
	Total	1921.62	1487.239	37
Total	Comfortable	2627.63	1622.09	38
	Beat the Market	2041.67	1441.625	42
	Total	2320	1548.429	80

Moderation of Investment Decision – Risk-framing

A moderation analysis using Hayes' PROCESS program was used to test whether competitiveness and risk acceptance moderated the influence of risk framing on investment decisions. For competitiveness, no moderation effect was apparent, $t = .11$, $p = .92$. Likewise, for risk acceptance, there was no significant moderation effect, $t = -.29$, $p = .77$.

Figure 1



Figure 2



Moderation of Investment Decision – Outcome-framing

A moderation analysis using Hayes' PROCESS program also was used to test whether competitiveness and risk acceptance moderated the influence of competition on investment decisions. Once again for competitiveness, no significant effect was apparent, $t = -.44, p = .66$. Likewise, for risk acceptance, there was no significant moderation effect, $t = .64, p = .53$.

Figure 3

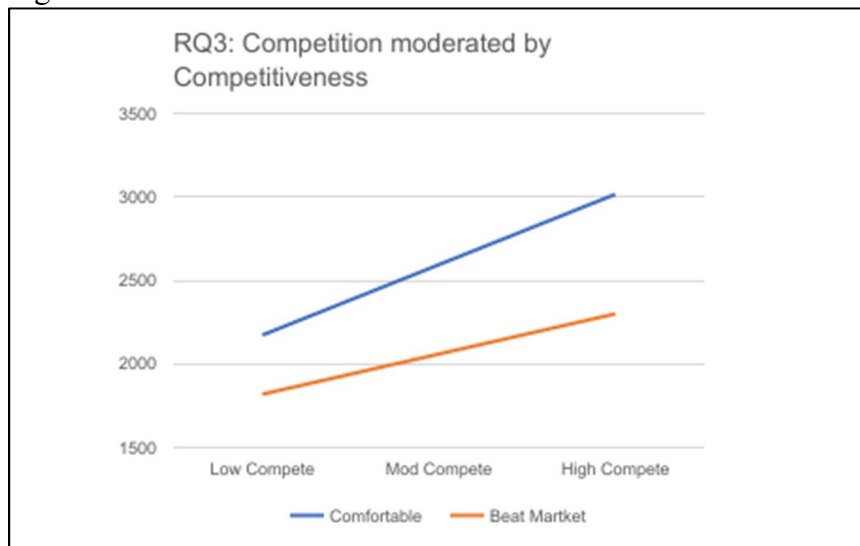
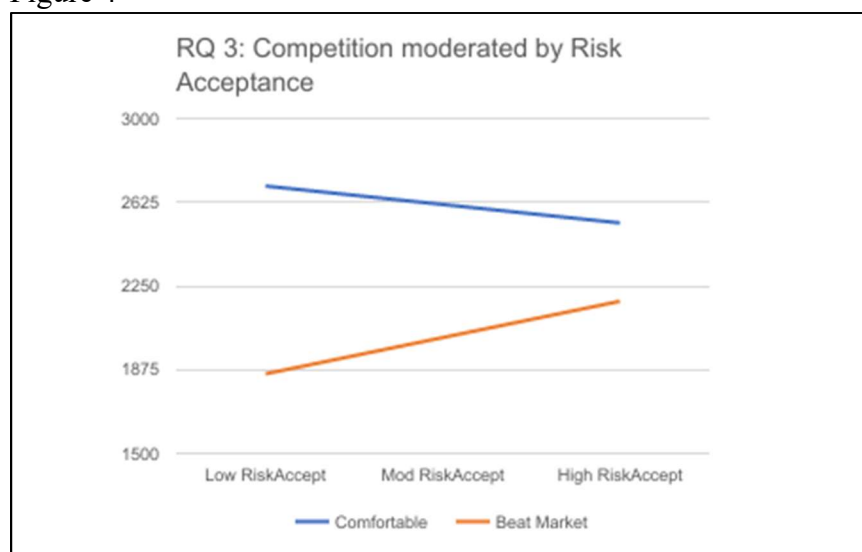


Figure 4



Discussion

The major focus of this study was the influence of competition on risk-framed financial decisions. Findings suggested that risk-framing, not competition, is the more powerful factor influencing how people invest their money. Although the data involving competition did not indicate any significant influence, the research involving the influence of risk-aversion or acceptance proved more indicative, yet still not significant in most cases.

The influence of risk-framing fits with cumulative prospect theory. Just by altering the way risk was presented to participants (high vs. low risk), the participants' monetary investment amount changed. According to prospect theory, variations in the framing of options leads to dissimilarity of preference (Tversky & Kahneman, 1992), demonstrated in Table 1. Additionally, gain-framed choices usually lead to greater risk aversion (Tversky & Kahneman, 1986). This study utilized positive-valence gain-framed choices to align with the testing of competition and its relationship to risk-aversion and, in doing so, inadvertently primed participants' risk aversion. The influence of risk aversion is important to note, too. Although moderation analysis did not reveal statistically significant moderation, the figures presented suggest that risk aversion is an

important factor in influencing investment decisions. For example, highly risk accepting individuals who received a highly competitive message were willing to invest more than low risk accepting individuals who received the same message. The opposite held true for people who received a low competitive message. In short, risk acceptance/aversion does seem to play a role in how people process messages regarding risk and competition.

Implications

Message framing plays an important role in financial decisions. Regardless of the intent, what is said about risk can alter the final allocation of money. This study demonstrated the influence of risk-aversion in participants' increased willingness to invest in "lower-risk" situations. Even though the greatest variance within the vignettes was in relation to how the risk was presented, it manifested in a difference of over \$740.

Also consider that the vignettes were read by participants without any opportunity for clarification, discussion, or presence of interpersonal persuasion. Simply introducing human interaction into risk-related decision-making situations complicates the results. Much and more can be said about the influence of nonverbal as well as verbal communication on any interaction. With the addition of a persuasive element, the results of this study have the opportunity to be magnified.

The results of this study suggest that anyone in the business of building investments should frame risk according to their audience's risk aversion. For example, in this study the average risk-acceptance scores were relatively low (10.70 on a scale out of 30) which correlates with the higher willingness to invest under the "lower-risk" vignettes.

Limitations

There are many areas of improvement upon this study. The first improvements focus around sampling. First of all, diversity among participants within this study was limited. Diversity of age could yield different reactions due to a higher likelihood of investment knowledge and experience. Second, only 80 individuals participated in this study which limits the significance of every item tested. Finally, developing and utilizing an electronic version of this study to increase the spectrum of utility could be beneficial. An electronic version could increase the radius of testing and greatly impact the diversity of a sample.

Another point of improvement lies within the vignettes. When evaluating the results of this study, it appeared that participants may have gotten lost in the content of the vignettes. In making decisions, especially when elements of risk and uncertainty are present, people will use heuristic shortcuts to simplify the situation and make the decision easier. “People employ various approximation methods that enable them to process the relevant information in making a decision” (Tversky 1969, p. 456). Therefore, considering the length and complexity of the vignettes utilized in this study, it is reasonable to scrutinize their versatility.

Future Research

An interesting point of future research lies in the addition of human elements. The results of this study indicate that the way risk messages are framed makes a difference. Therefore, including a verbal aspect to this study could provide further insight into how risk could best be communicated to prospective investors.

Investigating diverse baseline understandings of investment could also be useful. In order to accurately prescribe an investment solution, it would be valuable to know if there are any financial risk aversion differences between individuals with higher or lower understanding of investing. Additionally, changing the terminology to reduce the complexity of the vignettes is

worth pursuing. As mentioned above, the complexity of the vignettes influence how individuals process the information and reducing the complexity could allow for a more accurate measurement of tested variables.

Conclusion

Cumulative prospect theory and message framing theory guided this study to evaluate the impact of competition on risk aversion in financial decisions. Although competition lacked influence upon perception of risk, this study proved the importance of risk-framing. Prospect theory and message framing helped demonstrate the impact of the construction of risk-related messages. However, to develop this conclusion, the messages themselves need some work. In order to get a better idea of just how influential risk framing can be, this experiment needs to be critically evaluated. One recommended adaptation is to simplify the manipulated paragraphs so as to reduce the amount of heuristic shortcuts available and focus attention upon the information being tested. Even though the hypotheses were proven incorrect, in order to make advancements in the field of investment, one must first be willing to take risks.