



The Role of Disappointment Aversion and Expectation Proclivity in Describing Financial Risk Aversion among Financial Decision Makers

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Running head: Disappointment and Expectations

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Abstract. Using data obtained from 525 consumers, this study addressed three aims: (a) ascertain the degree to which disappointment aversion and expectation proclivity are related, (b) identify who is most likely to exhibit patterns of disappointment aversion, and (c) determine to what extent the combination of disappointment aversion and expectation proclivity is associated with financial risk aversion. Findings from this study add to the existing body of banking and financial services literature showing that aversion to disappointment and the establishment of expectations, while distinct concepts, are interrelated. Counter to conventional thinking, a negative relationship between disappointment aversion and expectation proclivity was noted. It is traditionally thought that those who establish high expectations will experience the greatest disappointment when choice outcomes fall below expectations. In this study, those who consistently established high expectations were observed to be more disappointment tolerant than others. This paper provides evidence that categories of disappointment aversion and expectation proclivity are associated with financial risk aversion and certain demographic characteristics.

The Role of Disappointment Aversion and Expectation Proclivity in Describing Financial Risk Aversion among Financial Decision Makers

The notion that it is important for financial service professionals to manage disappointment and dissatisfaction among customers and other service stakeholders is a foundational concept embedded in much of the banking literature (O'Loughlin and Szmigin, 2005). Disappointment can arise when a consumer determines that the perceived performance of a product or service falls below the consumer's pre-established expectation about the product or service (Makanyeza and Chikazhe, 2017). In this regard, consider the findings from a study of trust conducted by Poolthong and Mandhachitara (2009). They noted that the development of trust between two parties involves some degree of outcome uncertainty, which can result in disappointment when expectations are not met. The concept of disappointment has also been discussed in relation to customer satisfaction (Kaura *et al.*, 2015). The risk of misunderstanding the importance of disappointment as a factor that shapes the use of financial services was highlighted by Humbani and Wiese (2019). They remarked that if a consumer of mobile payment app transactions "... encounters obstacles, such as cost, risk, insecurity or discomfort ... this could lead to disappointment, resulting in the rejection of the mobile payment app" (p. 650). As this discussion highlights, a need exists within the banking (and more broadly within the financial services) profession to better understand how consumers conceptualize, act upon, and manage feelings of disappointment.

One way risk-averse financial decision-makers attempt to manage feelings of disappointment related to decisions in which the outcome is both uncertain and potentially negative involves reducing expectations. The management of expectations is a key element embedded in the theory of self-regulation (Bandura, 1982). The idea behind the strategy of lowering expectations was explained by Cho and Cho (2018) this way: "Lowering expectations can indeed serve to cushion and avert disappointment when negative outcomes occur ... this is because such lowered expectations are then used as a reference standard against which an outcome is judged" (p. 1). The management of expectations can then be seen as a central strategy associated with minimizing disappointment.

Closely associated with the broad concepts of disappointment and expectations are the notions of disappointment aversion and expectation proclivity. Disappointment aversion refers to

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3 the tendency among decision-makers to exhibit consistency in avoiding disappointment across
4 decision scenarios, whereas expectation proclivity, as used in this paper, describes the propensity
5 of a decision-maker to consistently establish similar expectations related to choosing scenarios in
6 which the outcomes are uncertain. The classical hypothesis related to expectation proclivity and
7 risk-taking states that financial decision-makers who establish low expectations should
8 experience low disappointment when risky choices turn out negatively (Xie, 2014). However,
9 recent research suggests that the actual relationship might be different. Cho and Cho (2018)
10 argued that financial decision-makers who purposely set low expectations in order to avoid
11 feelings of failure often experience greater disappointment than those who establish high
12 expectations. Cho and Cho concluded their study by stating that while aversion to
13 disappointment and expectation proclivity do appear related and manipulated by financial
14 decision makers in order to avoid unhappiness, the commonly held belief that those who
15 establish high expectations will feel the greatest disappointment may simply not be accurate.
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26 This paper examines the conclusions made by Cho and Cho (2018) in the context of
27 financial risk aversion. The purpose of this paper is threefold. The first purpose is to ascertain the
28 degree to which disappointment aversion and expectation proclivity are related. The second
29 purpose is to identify who is most likely to exhibit patterns of disappointment aversion.
30 Specifically, the paper describes the demographic, the expectation proclivity, and the
31 psychosocial profile of those who exhibit disappointment aversion. The third purpose is to
32 determine to what extent the combination of disappointment aversion and expectation proclivity
33 is associated with financial risk aversion. The remainder of this paper is focused on presenting a
34 review of relevant literature, the conceptual framework used to guide the study, a description of
35 the methods used to test hypotheses derived from the framework, a report of findings, and a
36 discussion of results.
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46 **Review of Literature**

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48 Disappointment refers to a negative feeling that arises when a decision outcome does not match
49 up to expectations (Bell, 1985; Makanyeza and Chikazhe, 2017). It is generally thought that one
50 should not be disappointed unless an outcome falls below a predefined expectation level. The
51 assumed relationship between feeling disappointed and establishing an expectations standard
52 provides an insight into why financial decision-makers are often advised to revise expectations
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3 downward. The thought is that future disappointment will be less, assuming an outcome falls
4 below expectations, if one starts the decision-making process with low expectations of success.
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7 It follows then that financial decision-makers should exhibit consistency in the way they
8 make choices, with financial decision-makers exhibiting disappointment aversion.
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10 Disappointment aversion was first introduced into the finance and banking lexicon by Gul
11 (1991). Using Gul's theoretical framework, Xie (2014) noted that disappointment aversion could
12 be conceptualized as the extra dislike someone exhibits to outcomes that are worse than prior
13 expectations. Financial risk aversion, or the propensity of financial decision-makers to prefer
14 reduced uncertainty when making an investment decision, has been found to be positively
15 associated with disappointment aversion. That is, those who are averse to disappointment tend to
16 be risk avoiders.
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23 Lien and Wang (2001) reported that financial decision-makers who exhibit high
24 disappointment aversion—they avoid choices that may subject the person to experience variance
25 in outcomes—act more conservatively when making certain investment and banking decisions.
26 Lien and Wang also reported that low levels of disappointment aversion are sometimes
27 associated with futures positions that expose a financial decision-maker to more return variance.
28 This finding matches results from Xie (2014), who noted that disappointment aversion leads
29 financial decision makers to reduce exposure to risky assets in diversified portfolios. At a
30 minimum, feelings of disappointment can engender attitudinal and behavioral changes
31 (Nepomuceno and Porto, 2010). Since Gul (1991) first introduced the formal theory of
32 disappointment aversion, nearly all studies that have tested the theory or used aspects of the
33 framework in subsequent models have examined disappointment aversion as a distinct construct,
34 even though prior to Gul's paper, Bell (1985) showed that disappointment goes hand-in-hand
35 with the establishment of expectations. Much of the previous literature makes the assumption
36 that expectations are unobserved and used primarily as a financial decision-maker's internal
37 reference point when evaluating outcomes (Tzieropoulos *et al.*, 2011).
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50 One reason the previous literature has separated disappointment from expectations is that
51 the theory of disappointment aversion, while originally acknowledging the role of expectations,
52 did not explicitly account for expectations. The theory conceptualized risk-taking as being
53 dependent on aversion to disappointment, holding expectation level constant. As such, it has
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3 traditionally been thought that it is a disappointment, rather the expectations or the combination
4 of expectation proclivity and disappointment aversion, that is the primary antecedent of behavior.
5 It has generally been further assumed that financial decision-makers first determine the level of
6 disappointment they are willing to endure and that this evaluation leads to the establishment of
7 an outcome expectation. A financial decision-maker's expectation then becomes secondary to
8 their aversion to disappointment.
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13 ***Financial Risk Aversion***

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16 Given one of the purposes of this study—to determine if the combination of disappointment
17 aversion and expectation proclivity is associated with financial risk aversion controlling for
18 pertinent decision-maker characteristics—it is important to understand what is meant by the term
19 financial risk aversion and how risk aversion is associated with certain personal characteristics.
20 To begin with, financial risk aversion refers to the amount of risk a financial decision-maker is
21 unwilling to endure when making a financial decision (Dickason and Ferreira, 2018; Gerrans *et*
22 *al.*, 2015). Financial risk aversion is generally thought to be inversely related to stock market
23 participation (Mishra, 2018; Ruiz-Menjivar *et al.*, 2018). Those who exhibit high financial risk
24 aversion own fewer risky assets (Lei, 2018).
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33 Nearly all economic models of financial risk aversion use some type of revealed
34 preference methodology to assess a person's unwillingness to take financial risk (Hanna and
35 Lindamood, 2004; Kahneman *et al.*, 1991). The majority of risk-aversion modeling techniques
36 use estimates of constant relative risk aversion (CRRA) as an indicator of risk aversion. CRRA
37 tests typically require a decision-maker to choose among options, where one choice offers
38 certainty and a counter choice offers an alternative where both gains and losses are potentialities
39 (Barsky *et al.*, 1997). Classical economic theory (Von Neumann and Morgenstern, 1953)
40 underlies the formulation of CRRA models. CRRA is defined as the rate at which a financial
41 decision-maker will give up a higher expected return in exchange for less volatility (Nguyen and
42 Noussair, 2014). CRRA can be calculated using the following constant relative risk aversion
43 utility functions:
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$$52 \quad U(W) = \begin{cases} \ln(W) & \text{if } \gamma = 1 \\ \frac{W^{1-\gamma}}{1-\gamma} & \text{if } \gamma > 0, \gamma \neq 1 \end{cases}$$

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3 where utility received (U) is based on an individual's level of wealth (W) and risk aversion (γ).
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6 Numerous studies conducted over the past several decades have focused on describing
7 the determinants of financial risk aversion. The following discussion highlights some of the most
8 important decision-maker characteristics that have been found to be associated with a person's
9 willingness to take risk. The variables discussed here were used in the models used to test the
10 hypotheses (described later in the paper) derived from the conceptual framework and relevant
11 literature evaluated in this paper.
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17 Of all the personal characteristics examined by researchers, gender has received the most
18 attention in the literature. In almost all cases, those who self-identify as a female have been
19 found to exhibit higher levels of financial risk aversion compared to self-identified males (Anbar
20 and Eker, 2010; Chavali and Mohanraj, 2016; Dickason and Ferreira, 2018; Fisher and Yao,
21 2017; Grable, 2000; Hallahan *et al.*, 2004; Hartnett *et al.*, 2019; Koekemoer, 2018; Larkin *et al.*,
22 2013; Lippi and Rossi, 2020). There is less consensus about the association between age and
23 financial risk aversion. Much of the extant literature has noted a positive relationship between
24 age and risk aversion (Cardak and Martin, 2019; Gibson *et al.*, 2013; Hallahan *et al.*, 2004;
25 Hartnett *et al.*, 2019; Koekemoer, 2018; Pinjisakikool, 2017; Wong, 2011; Yao *et al.*, 2011).
26 However, some studies have documented a negative relationship between these variables (e.g.,
27 Grable, 2000; Wang and Hanna, 1998), whereas, occasionally, a report will be published
28 showing no relationship between financial risk aversion and age (e.g., Anbar and Eker, 2010).
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38 Income, as a measure of financial risk capacity, is generally thought to be negatively
39 associated with financial aversion (Grable, 2000; Grable and Joo, 2004; Fang *et al.*, 2021;
40 Pinjisakikool, 2017; Wong, 2011). Similarly, attained education is most often reported in the
41 literature to be negatively associated with financial risk aversion (Grable, 2000; Grable and Joo,
42 2004; Hallahan *et al.*, 2004; Larkin *et al.*, 2013; Pinjisakikool, 2017; Wong, 2011).
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47 Variables with less consensus in the literature include marital status, race/ethnicity,
48 employment status, and homeownership. For example, Grable and Joo (2004) and Koekemoer
49 (2018) reported that those who are married exhibit greater financial risk aversion, whereas others
50 have shown that singles are more risk-averse (e.g., Hallahan *et al.*, 2004; Wong, 2011). In terms
51 of racial/ethnic background, Dickason and Ferreira (2018) reported that those who self-identify
52 as White exhibit more financial risk aversion than self-identified Blacks. However, the general
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consensus is that Black households are more likely to exhibit at least some degree of financial risk aversion (Coleman, 2003; Fisher, 2019). Similar to income, employment status acts as an indicator of financial capacity. As such, it is generally thought that those who are employed should exhibit less risk aversion (Schooley and Worden, 1996), although some have noted that those who are unemployed exhibit less financial risk aversion, primarily because they have less to lose in the case of a financial loss. Much of the previous literature also suggests that the relationship between homeownership and financial risk aversion is negative (Grable and Joo, 2004; Jianakoplos and Bernasek, 2006; Yang, 2004), although Larkin *et al.* (2013) and Sung and Hanna (1996) noted no relationship between these two variables.

The literature devoted to uncovering the personal characteristics associated with financial risk aversion has also focused on personality and psychological constructs. Two variables of particular importance are locus of control and self-esteem. Locus of control refers to the tendency of individuals to generalize their expectancies as being primarily internal or external (Rotter, 1966). Those with an internal locus of control tend to believe that their actions determine outcomes. Those who hold an external locus of control believe that much of what happens to them is out of their control and related to factors like luck, fate, and the influence of powerful others. It is known that decision makers with an internal locus of control act differently compared to those with an external locus of control (Cobb-Clark *et al.*, 2016). Wong and Carducci (2015) summarized much of the literature by stating, "... the more one believes one has control over one's outcomes, the higher risk one can tolerate" (p. 34). The relationship between self-esteem and financial risk aversion has also been explored in the literature. Self-esteem can be conceptualized as a subjective evaluation of one's self-worth (Rosenberg, 1965). Those with higher levels of self-esteem typically exhibit lower levels of financial risk aversion (Grable and Joo, 2004; Johanson, 2000; Yang *et al.*, 2010).

Summary

As this review of the literature indicates, there have been very few attempts to link measures of disappointment directly with assessments of expectations. Much of the previous literature has focused on the relationship between feelings of disappointment and risk aversion. The consensus is that those who are risk-averse are also disinclined to contentedly accept disappointment. The degree to which disappointment aversion and expectation proclivity are associated has yet to be

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3 fully explored. Conversely, relationships between financial risk aversion and demographic and
4 psychosocial factors have been extensively studied and reported on in the literature. Personal
5 factors such as gender, income, education, locus of control, and self-esteem are generally thought
6 to be useful descriptors of a decision-maker's willingness to take risks. The following discussion
7 describes the theoretical orientation used to guide this study.
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12 ***Research Hypotheses and Conceptual Framework***

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15 Conceptually, the establishment of expectations and the experience of disappointment can be
16 modeled as:
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$$18 \quad D = P_V O < E_V O$$

$$19 \quad S = P_V O > E_V O$$

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22 where D represents a decision maker's feeling of disappointment, S signifies a decision maker's
23 feeling of satisfaction, $P_V O$ is the decision maker's perceived value resulting from the use of a
24 product or service, and $E_V O$ is the decision maker's predetermined expected value outcome for
25 the product or service. The models assume that $P_V O$ is not equal to $E_V O$ and each can be
26 quantified. Theoretically, disappointment should exist when $P_V O$ is less than $E_V O$. The degree of
27 disappointment experienced by a decision maker should increase as the gap between $P_V O$ and
28 $E_V O$ increases. Conversely, satisfaction should arise when $P_V O$ is greater than $E_V O$. Satisfaction
29 should increase in relation to the degree to which the perceived value outcome of a good or
30 service exceeds its expected value outcome.
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40 Based on this logic, two propositions were used to guide this study. First, it was thought
41 that since financial decision-makers are assumed to be generally rational, they should be
42 disappointment averse (although the degree of aversion can vary across decision-makers)
43 (Zeelenberg *et al.*, 2000). Second, in order to minimize potential disappointment, financial
44 decision makers ought to also exhibit some degree of consistency when establishing expectations
45 across decision scenarios. This level of consistency is described as expectation proclivity in this
46 paper. Financial decision-makers who are very disappointment averse should establish
47 expectations that are consistently aligned with their aversion to disappointment regardless of the
48 chosen scenario. Given these two propositions, the following hypothesis was tested in this study.
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3 H₁: Disappointment aversion and expectation proclivity are related.
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6 A third proposition underlying this study was an assumption that financial decision
7 makers who share a common aversion to disappointment also share demographic, expectation
8 proclivity, and psychosocial commonalities. In this regard, the following hypothesis was
9 evaluated in this study:
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13 H₂: Disappointment aversion is associated with the demographic, the expectation
14 proclivity, and the psychosocial profile of a financial decision maker.
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18 Finally, it was thought that those who are averse to disappointment should exhibit a
19 tendency to be more financially risk averse (i.e., they should be risk avoiders). As such, the
20 relationships among financial risk aversion, disappointment aversion, and expectation proclivity
21 can be modeled as:
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$$24 \quad FRA = f(DA, EP),$$

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26 where *FRA* is a decision maker's level financial risk aversion, *DA* is the decision maker's level
27 of disappointment aversion, and *EP* is the decision maker's expectation proclivity. This function
28 was tested in this study by evaluating the following hypothesis:
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33 H₃: Combinations of disappointment aversion and expectation proclivity are associated
34 with financial risk aversion.
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38 A conceptual framework was developed to test the third hypothesis. The report by Cho
39 and Cho (2018) that those who establish low expectations in anticipation of avoiding
40 disappointment report higher feelings of disappointment suggests that rather than being an
41 undefined function, a more accurate insight into the financial risk aversion of financial decision-
42 makers may be enhanced by viewing disappointment aversion and expectation proclivity jointly.
43 Specifically, in this study, it was hypothesized that those who present, for example, high
44 disappointment aversion and a high expectation proclivity will act differently compared to those
45 who are disappointment tolerant and exhibit a low outcome expectation proclivity. This
46 possibility forms the basis of the conceptual framework shown in Figure 1. In this study,
47 disappointment aversion and expectation proclivity were combined to create four categories.
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60 Traditional disappointment models suggest that financial risk aversion should be associated with

the upper right quadrant of Figure 1 (i.e., high disappointment aversion and the tendency to establish high expectations). However, as noted by Cho and Cho (2018), financial risk aversion may actually be most closely associated with the lower right quadrant (i.e., high disappointment aversion and low expectation proclivity). One outcome associated with this study was to determine which quadrant is most closely related to financial risk aversion.

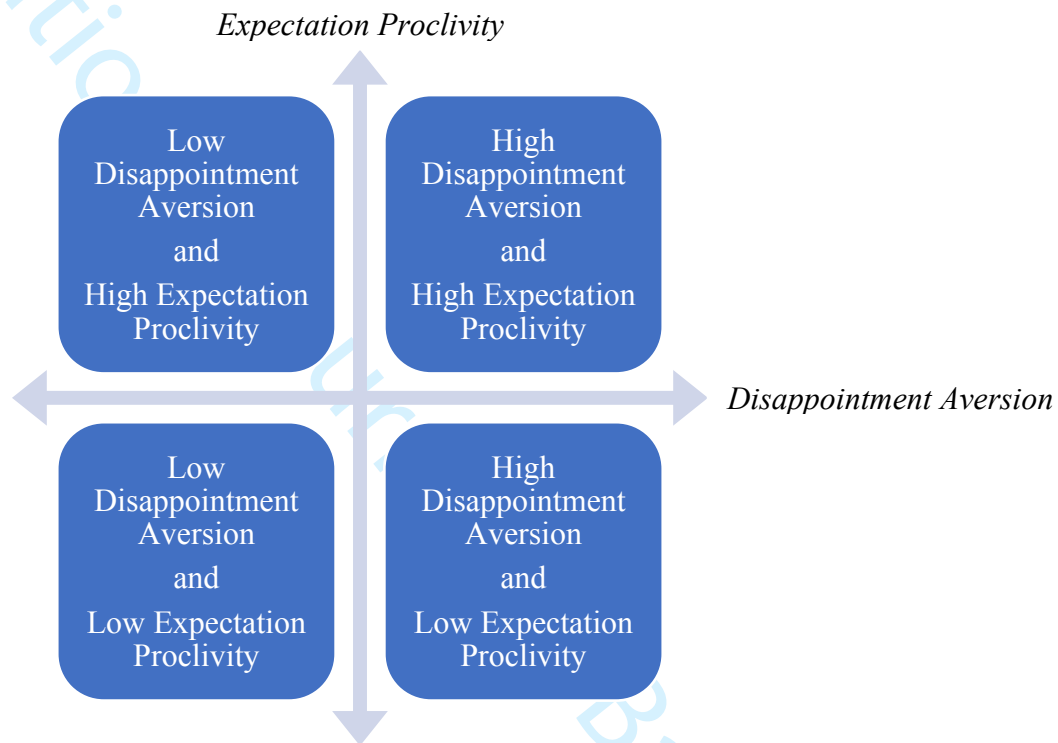


Figure 1. Disappointment Aversion and Expectation Proclivity Conceptual Framework

Methods

Sample

Data for this study were obtained from a sample of 525 individuals surveyed during early spring 2020. Those in the sample received an online survey developed using Qualtrics and distributed by Dynata. The sample, which was delimited to those who were 18 years of age or older at the time of the survey, was designed to include individuals who were likely to make an investment decision in the future. Prior to distributing the survey, the research project was approved by the research team's university institutional review board. Survey participants received a modest incentive for participating in the study.

Measures

Expectation proclivity and disappointment aversion were measured using 10 related questions.¹ Participants in the study were asked to read a short scenario in which a hypothetical outcome related to a decision was presented. Participants were then asked to indicate their expectations associated with obtaining the stated outcome. An example of an item from the expectation scale is as follows: “Recently, you learned from your financial advisor that the stock market has historically returned 9.50% on an annualized basis. After reviewing your portfolio (which is a sizable portion of your net worth), your advisor indicated that you should be earning the same return. Based on this information, what is your expectation about earning 9.50%?” Expectations were measured using a scale ranging from 0 (no expectation) to 100 (very high expectation). An overall expectation proclivity score was estimated by summing scores across the 10 scenarios. It was possible for scores on the summed scale to range from 0 to 1,000.

A skip pattern in the survey was used so that each expectation scenario was followed by a description of a hypothetically realized outcome. An example matched to the expectation proclivity item from above is: “Unfortunately, your portfolio has actually returned about 2.00%, which is close to what you could have earned in a bank account. Which of the following statements best describes your feeling after learning that you have been underperforming the market?” Survey participants were asked to specify their level of disappointment related to each outcome by selecting from one of four choices ranging from “I am not disappointed ...” (scored as 1 across scenarios) to “I am very disappointed” (scored 4 across scenarios). Disappointment aversion was estimated by summing scores across the 10 responses. Scale scores could range from 10 to 40, with higher scores representing greater disappointment aversion.

Several tests were conducted to confirm the construct validity and reliability of the expectation proclivity and disappointment aversion scales. Both scales were found to be unidimensional and comprised of one factor. Both scales were also found to be highly reliable. The Cronbach’s alpha for the expectation proclivity and disappointment aversion scales was .912 and .865, respectively.

¹ Both scales are available upon request from the authors.

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6 Financial risk aversion was assessed using the following question, which was adapted
7 from Grable *et al.* (2020):
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10 *Suppose you are considering making an investment. You have a chance to make*
11 *an investment that will return either \$50,000 or \$100,000. Your financial advisor*
12 *estimates that the probability of receiving \$50,000 is 50% and the probability of*
13 *receiving \$100,000 is also 50%. You also learn from your financial advisor that*
14 *shares in this investment are limited and difficult to obtain. Therefore, the less*
15 *you are willing to invest, the lower the chance that you will be able to participate*
16 *in the investment. Based on this information, what is the largest amount of money*
17 *you would be willing to pay to participate in this investment, assuming you had*
18 *the money?*
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26 Participants were then asked to select a dollar amount from the following choices: (1)
27 \$70,711, (2) \$66,667, (3) \$63,246, (4) \$60,571, (5) \$58,566, (6) \$57,083, (7) \$55,978, (8)
28 \$55,143, (9) \$54,499, and (10) \$53,991. These dollar figures represent certainty equivalent
29 amounts (*CE*). The γ figures correspond directly to the estimated risk premiums linked to the
30 question scenario. Someone with a γ score of 1 is considered to be risk tolerant (i.e., low risk
31 aversion), whereas a γ score of 10 is indicative of being a risk avoider (i.e., high risk
32 aversion).
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37 Eleven demographic and psychosocial variables were included in the analyses. Gender
38 was coded 1 = male and 2 = female. Age was measured in years. Household income was
39 assessed using 11 categories ranging from 1 = none to 11 = above \$100,000. Marital status was
40 included in the models as a dichotomous variable: 1 = married, otherwise 0. Racial/ethnic
41 background was measured dichotomously as 1 = White, otherwise 0 and Black = 1, otherwise 0.
42 The other category included those who self-identified as Asian, Hispanic/LatinX, or other.
43 Employment status was coded as 1 = employed full-time, otherwise 0. Attained education was
44 measured using six categories: (a) some high school or less, (b) high school graduate, (c) some
45 college/trade/vocational training, (d) Associate's degree, (e) Bachelor's degree, and (f) graduate
46 or professional degree. Home ownership was coded dichotomously with those owning a home,
47 with or without a mortgage, coded 1, otherwise 0.
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Locus of control was assessed using the following six items adapted from Ross and Broh (2000), as originally conceptualized by Rotter (1966): (1) In my life, good luck is more important than hard work for success; (2) When I make plans, I am almost certain I can make them work; (3) Every time I try to get ahead, something or somebody stops me; (4) My plans hardly ever work out, so planning makes me unhappy; (5) I do not have enough control over the direction my life is taking; and (6) Chance and luck are very important for what happens in my life. The response option per statement was a seven-point scale ranging from 1 = strongly disagree to 7 = strongly agree. The second item was reverse coded when the overall scale was estimated by summing answers across the items. Scores could range from 6 to 42, with high scores on the scale representing an external locus of control perspective. Self-esteem was assessed using the following 10 items from the Rosenberg (1965) self-esteem scale: (1) I am a person of worth; (2) I have a number of good qualities; (3) I am inclined to feel that I am a failure; (4) I am able to do things as well as most other people; (5) I feel I do not have much to be proud of; (6) I take a positive attitude toward myself; (7) I am satisfied with myself; (8) I wish I could have more respect for myself; (9) I certainly feel useless at times; and (10) at times I think I am no good at all. A seven-point scale ranging from 1 = strongly disagree to 7 = strongly agree was used to record survey participant responses to each statement. The self-esteem scale was estimated by summing answers across the items with items 3, 5, 8, 9, and 10 reverse coded. Scores ranged from 10 to 70, with high scores representing greater self-esteem.

Data Analysis Methods

Several analytic methods were used in this study. Descriptive statistics were calculated for each of the measures examined. Correlation and analysis of variance (ANOVA) tests were used to evaluate the first research hypothesis.

Regression techniques were used to estimate associations between and among the variables of interest in this study. Specifically, three regressions were estimated. The first regression was developed to identify a disappointment aversion profile of participants to address the second research hypothesis. Specification of the OLS model was as follows:

$$DA_i = \beta_0 + \sum_{k=1}^K \beta_{1,k} CTL_{i,k} + \beta_2 EP_i + \varepsilon_i$$

where DA_i is the disappointment aversion of a survey participant (i) represented as a scaled score, β_0 is a constant, $CTL_{i,k}$ are individual socio-demographic characteristics (i.e., gender, age, household income, marital status, race/ethnicity, employment status, education, home ownership, locus of control, and self-esteem), $\beta_{1,k}$ are regression coefficients for the individual characteristics, EP_i is expectation proclivity of a participant (i), and ε_i is the error term.

The second regression was estimated to determine the financial risk-aversion profile of participants. The following OLS regression model was estimated:

$$FRA_i = \beta_0 + \sum_{k=1}^K \beta_{1,k} CTL_{i,k} + \sum_{h=1}^H \beta_{2,h} DDAEP_{i,h} + \varepsilon_i$$

where FRA_i is the financial risk aversion of a participant (i), $DDAEP_{i,h}$ were four dummy variables representing the categories of disappointment aversion and expectation proclivity shown in the conceptual framework (Figure 1) that takes the value 1 if the participant falls in the category and 0 otherwise, and $\beta_{2,h}$ are regression coefficients for the categories of disappointment and expectation proclivity.

The third regression model was used to describe the profile of participants in each category of disappointment aversion and expectation proclivity. For this study, consider a random variable Y_i , that may take one of several discrete values that we index 1, 2, ..., M . Let

$$\pi_{i,m} = \Pr \{Y_i = m\}$$

denote the probability that a participant (i) falls in the (m) category among the following four categories: (a) low disappointment aversion and high expectation proclivity; (b) high disappointment aversion and high expectation proclivity; (c) low disappointment aversion and low expectation proclivity; and (d) high disappointment aversion and low expectation proclivity. Assume that the response categories are mutually exclusive and exhaustive. Also, assume that the log-odds of each response follow a linear model. Under these assumptions, the following multinomial regression was estimated:

$$\ln \frac{\pi_{i,m}}{\pi_{i,M}} = \beta_m + \sum_{k=1}^K \beta_{m,k} CTL_{i,k}$$

where M is the reference category, β_m is a constant, and $\beta_{m,k}$ are regression coefficients for the individual characteristics $CTL_{i,k}$, for $m = 1, 2, \dots, M-1$. This requires $M-1$ predicted log-odds equations, one for each category relative to the reference category.

Results

Table 1 shows the descriptive statistics for the variables of interest in this study. The sample was nearly evenly split between self-identified males and females. Overall, the sample can be described as White, middle-aged, high-income, married homeowners with an education profile skewed towards a college degree or higher level of education. Participants in the study were relatively risk-averse and prone to establish above-average expectations across the 10 scenarios. Disappointment aversion scores fell in the mid-range of the scale. Participants exhibited average locus of control scores, which suggests that those in the sample were not skewed towards either an internal or external control perspective. Self-esteem scores were above average.

Table 1. Variable Descriptives

Variable	Percentage	M (SD)
Financial Risk Aversion		6.37 (3.55)
Expectation Proclivity Scale		615.15 (189.23)
Disappointment Aversion Scale		26.33 (6.70)
Gender		
Male	51.0%	
Female	49.0%	
Age (years)		46.87 (17.19)
Household Income		
\$0	3.6%	
Less than \$20,001	15.9%	
\$20,001 to \$30,000	10.2%	
\$30,001 to \$40,000	5.4%	
\$40,001 to \$50,000	5.6%	
\$50,001 to \$60,000	7.9%	
\$60,001 to \$70,000	6.7%	
\$70,001 to \$80,000	6.5%	
\$80,001 to \$90,000	5.6%	

\$90,001 to \$100,000	5.4%	
Above \$100,000	27.4%	
Marital Status		
Married	51.0%	
Other	49.0%	
Race/Ethnicity		
White	72.0%	
Black	17.0%	
Other	11.0%	
Employment Status		
Full-Time	41.0%	
Other	59.0%	
Education		
Some High School or Less	3.1%	
High School Graduate	20.1%	
Some College/Trade/Vocation Training	22.2%	
Associate's Degree	9.2%	
Bachelor's Degree	25.5%	
Graduate or Professional Degree	19.9%	
Homeownership		
Own Home	61.0%	
Other	39.0%	
Locus of Control		20.96
		(7.66)
Self-Esteem		49.43
		(11.94)

Table 2 shows the results from the correlation test undertaken to evaluate the first hypothesis, which stated, "Disappointment aversion and expectation proclivity are related." Scale scores were found to be statistically and negatively associated. As such, support for the first hypothesis was noted.

In the bivariate analysis, it was also determined that expectation proclivity was negatively related to being female but positively associated with higher income, being married, employed on a full-time basis, having a higher level of education, and holding an external locus of control perspective. Disappointment aversion was found to be negatively associated with identifying as Black and holding an external locus of control perspective. Disappointment aversion was positively correlated with self-identifying as female, age, being married, self-identifying as White, and having a higher level of self-esteem.

Table 2. Variable Correlations

	Disappointment Aversion	Gender	Age	HH Income	Married	White	Black	Full Time Employment	Education	Own Home	LOC	Self Esteem	Expectation Proclivity
Disappointment Aversion	1.00												
Gender	.08*	1.00											
Age	.21**	-.10*	1.00										
HH Income	-.02	-.19**	.21**	1.00									
Married	.08*	-.15**	.23**	.54**	1.00								
White	.14**	.04	.19**	.28**	.24**	1.00							
Black	-.12**	-.03	-.17**	-.34**	-.27**	-.67**	1.00						
Full Time Employment	-.05	-.15**	-.23**	.36**	.16**	.13**	-.17**	1.00					
Education	.02	-.18**	.14**	.52**	.32**	.16**	-.21**	.28**	1.00				
Own Home	.07	-.13**	.33**	.50**	.54**	.30**	-.27**	.20**	.34**	1.00			
LOC	-.17**	-.11**	-.33**	-.21**	-.09*	-.09*	.15**	.09*	-.14**	-.10**	1.00		
Self Esteem	.11**	.03	.37**	.27**	.15**	.08*	-.11**	-.01	.19**	.20**	-.71**	1.00	
Expectation Proclivity	-.17**	-.07*	-.036	.10*	.09*	.03	-.04	.08*	.11**	.05	.17**	.02	1.00

Note. * $p < .05$. ** $p < .01$.

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3 Table 3 shows the results from the regression that was estimated to describe the
4 demographic, the expectation proclivity, the locus of control, and the self-esteem profile of those
5 who exhibited disappointment aversion. The model was statistically significant, $F_{12,502} = 5.17$, p
6 $< .001$. The model's R^2 was .11.² Results provided additional support for the first hypothesis.
7
8 Partial support was noted for the second hypothesis, which stated: "Disappointment aversion is
9 associated with the demographic, the expectation proclivity, and the psychosocial profile of a
10 decision-maker." Of the demographic variables, disappointment aversion was associated with
11 age and household income. Older participants reported greater aversion to disappointment,
12 whereas those with higher levels of household income reported less disappointment aversion.
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14 Similar to the correlation analysis, a negative relationship between expectation proclivity and
15 disappointment was observed. No relationship between disappointment aversion and locus of
16 control or self-esteem was noted.
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43 ² Given the interrelated nature of disappointment aversion and expectation proclivity scores, and the possibility of
44 endogeneity in the model, a two-stage least squares regression was estimated to confirm the association between
45 expectation proclivity and disappointment aversion. The following instrumental variable was used: "How would you
46 describe your current mood?" A 10-point scale was used with 1 = bad mood and 10 = good mood. It was thought
47 that a participant's mood, as estimated at the outset of the survey, might have had a positive relationship with the
48 manner in which expectations were established later in the survey. In this regard, the correlation between
49 expectation proclivity and mood was found to be .345 ($p < .001$). Given the way disappointment aversion was
50 assessed (i.e., following the presentation of each expectation scenario) and the positioning of the mood question in
51 the survey, it was thought that disappointment aversion scores would have no causal effect on a participant's mood
52 or that mood would not be statistically associated with estimates of disappointment aversion. Although an argument
53 could be made otherwise, the correlation between the two constructs confirmed this notion ($r = .069$, $p = \text{n.s.}$). The
54 resulting two-stage least squares model estimates confirmed the associations shown in Table 3, with the relationship
55 between expectation proclivity and disappointment aversion being negative at a p -value of .045 ($F_{12,502} = 4.53$, $p <$
56 $.001$, $R^2 = .10$).
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Table 3. Disappointment Aversion Profile

Variable	<i>b</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
(Constant)	26.841	3.104		8.647	.000
Gender (female)	.953	.596	.071	1.600	.110
Age	.073	.020	.189	3.679	.000
HH Income	-.311	.115	-.166	-2.718	.007
Married	1.289	.724	.096	1.780	.076
White	1.225	.856	.082	1.432	.153
Black	-.698	1.100	-.037	-.635	.526
Full Time Employment	.610	.671	.045	.909	.364
Education	.182	.221	.042	.826	.409
Own Home	-.199	.755	-.015	-.264	.792
Locus of Control (external [luck, fate, etc.])	-.090	.056	-.103	-1.622	.105
Self-Esteem	-.011	.035	-.019	-.308	.758
Expectation Proclivity	-.005	.002	-.144	-3.280	.001

A test of the third hypothesis was undertaken to determine if categories of disappointment aversion and expectation proclivity were associated with financial risk aversion. Using the conceptual framework shown in Figure 1 as a guide, the following four categories of disappointment aversion and expectation proclivity were developed: (a) low disappointment aversion and high expectation proclivity; (b) high disappointment aversion and high expectation proclivity; (c) low disappointment aversion and low expectation proclivity; and (d) high disappointment aversion and low expectation proclivity. The categories were based on classifying participants according to median scale scores. Specifically, those whose expectation proclivity score was equal to or below 617.0 were categorized as having a lower expectation proclivity. Those whose disappointment aversion score was equal to or less than 27 were

classified as being less disappointment averse. Table 4 shows the financial risk-aversion mean score, standard deviation, and standard error associated with each category.³

Table 4. Risk Aversion Descriptive Statistics by Disappointment and Expectation

Categories

Category	<i>M</i>	<i>SD</i>	<i>SE</i>
Low Disappointment Aversion and High Expectation Proclivity	5.18	3.397	.286
High Disappointment Aversion and High Expectation Proclivity	6.61	3.530	.324
Low Disappointment Aversion and Low Expectation Proclivity	6.17	3.410	.299
High Disappointment Aversion and Low Expectation Proclivity	7.61	3.474	.304
Total	6.37	3.554	.156

An ANOVA model was estimated to determine if mean financial risk-aversion scores differed across the categories. The ANOVA model was statistically significant, $F_{3,517} = 11.54, p < .001$. The Bonferroni post-hoc test results shown in Table 5 revealed the following significant category differences: those who exhibited low disappointment aversion and high expectation proclivity reported lower risk aversion compared to (a) those with high disappointment aversion and high expectation proclivity and (b) those with high disappointment aversion and low expectation proclivity. Those who exhibited low disappointment aversion and low expectation proclivity were slightly more risk-tolerant than those with high disappointment aversion and low expectation proclivity.

³ Although the outcome variable was measured ordinally, an ANOVA model, rather than a Kruskal-Wallis H test, is reported at this stage of the study. Both approaches showed the same significance levels; however, the ANOVA results are reported to enhance interpretation of the data.

Table 5. ANOVA Post-hoc Test Results

Category	Comparison	Mean Difference	Std. Error	<i>p</i>
Low Disappointment Aversion and High Expectation Proclivity	High Disappointment Aversion and High Expectation Proclivity	-1.429**	.430	.006
	Low Disappointment Aversion and Low Expectation Proclivity	-.985	.420	.116
	High Disappointment Aversion and Low Expectation Proclivity	-2.426**	.419	.000
High Disappointment Aversion and High Expectation Proclivity	Low Disappointment Aversion and High Expectation Proclivity	1.429**	.430	.006
	High Disappointment Tolerance and Low Expectation Proclivity	.444	.438	1.000
	High Disappointment Aversion and Low Expectation Proclivity	-.997	.437	.137
Low Disappointment Aversion and Low Expectation Proclivity	Low Disappointment Aversion and High Expectation Proclivity	.985	.420	.116
	High Disappointment Aversion and High Expectation Proclivity	-.444	.438	1.000
	High Disappointment Aversion and Low Expectation Proclivity	-1.441**	.427	.005
High Disappointment Aversion and Low Expectation Proclivity	Low Disappointment Aversion and High Expectation Proclivity	2.426**	.419	.000

Disappointment and Expectations 22

High Disappointment Aversion and High Expectation Proclivity	.997	.437	.137
Low Disappointment Aversion and Low Expectation Proclivity	1.441**	.427	.005

Note. * $p < .05$. ** $p < .01$.

Given that the ANOVA results showed an association between categories of disappointment aversion and expectation proclivity, a regression analysis was conducted to determine how these categories were related to financial risk aversion accounting for the demographic and psychosocial characteristics of survey participants.⁴ The low disappointment aversion and low expectation proclivity classification was used as the reference category. The model was statistically significant, $F_{14,499} = 6.02$, $p < .001$. The model's R^2 was .144. Table 6 shows the results from the test.

Table 6. Profile of Financial Risk Aversion

Variable	<i>b</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
(Constant)	4.845	1.715		2.825	.005
Gender (female)	1.212	.314	.171	3.864	.000
Age	.017	.011	.085	1.641	.101
HH Income	-.016	.060	-.016	-.261	.794
Married	.507	.378	.071	1.341	.181
White	.441	.451	.056	.978	.329
Black	-.313	.576	-.031	-.543	.588
Full-time Employment	-.764	.352	-.106	-2.172	.030
Education	-.161	.116	-.069	-1.391	.165
Own Home	-.267	.394	-.037	-.677	.499
Locus of Control (external [luck, fate, etc.])	-.024	.029	-.051	-.824	.410
Self Esteem	.002	.019	.006	.098	.922
Low Dis Aversion and High Exp Proclivity	-.887	.432	-.111	-2.053	.041
High Dis Aversion and High Exp Proclivity	-.121	.441	-.015	-.274	.784
High Dis Aversion and Low Exp Proclivity	1.019	.429	.124	2.375	.018

⁴ The results in Table 6 represent OLS regression coefficients. Similar to Menon *et al.* (2015), the test was also run as an ordered latent model. Although not shown, the results were similar in terms of significance and magnitude to those shown in Table 6.

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5 Partial support was found for the third hypothesis, which stated: “Combinations of
6 disappointment aversion and expectation proclivity are associated with financial risk aversion.”
7 When compared to those with low disappointment aversion and low expectation proclivity, two
8 categories were observed to be significantly associated with financial risk aversion. Participants
9 who were classified as having low disappointment aversion and high expectation proclivity were
10 more risk-seeking. On the other hand, those categorized into the high disappointment aversion
11 and low expectation proclivity group were more risk-averse. Those who self-identified as a
12 female were also more risk-averse, whereas participants who were employed on a full-time basis
13 exhibited greater risk tolerance.
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21 **Discussion**

22 Findings from this study add to the existing literature on disappointment aversion in the financial
23 services and banking literature by verifying that aversion to disappointment and the
24 establishment of expectations, while distinct concepts, are interrelated. In this study, a negative
25 relationship between disappointment aversion and expectation proclivity was noted. This finding
26 is in line with reports by Cho and Cho (2018) but counters popular wisdom. It is traditionally
27 thought that those who establish high expectations will experience the greatest disappointment
28 when choice outcomes fall below expectations. This is the premise that underlies many decision-
29 making heuristics that suggest financial decision-makers ought to revise expectations downward
30 in order to reduce future disappointment. In actuality, it appears that when a financial decision-
31 maker consistently establishes high outcome expectations and results fall below expectations, the
32 financial decision-maker expresses less disappointment. More precisely, those who consistently
33 establish high expectations tend to be more disappointment tolerant than others.
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45 This study also showed that categories of disappointment aversion and expectation proclivity can
46 be used to describe differences in financial risk aversion among financial decision-makers.
47 Specifically, the test results showed that financial risk aversion, among those in the sample, was
48 positively associated with high disappointment aversion and low expectation proclivity and
49 negatively related with low disappointment aversion and high expectation proclivity. It is
50 important to note that these findings do not imply causality. Future research is needed to
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3 decompose the causal relationships between disappointment aversion, expectation proclivity, and
4 financial risk aversion.
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7 These findings support the argument made by Cho and Cho (2018) that decision-makers
8 who establish low expectations experience greater disappointment when scenario outcomes turn
9 out worse than expected. The results from this study run counter to traditional hypotheses, which
10 intimate that feelings of disappointment should be most closely associated with establishing high
11 expectations. It is generally thought that those who are disappointment averse *and* are prone to
12 establish high expectations will be the most risk-averse when making financial decisions. The
13 reason is that since most financial decision-makers set out to avoid disappointment (Gul, 1991),
14 those who establish high expectations should make choices that potentially provide outcomes
15 with a low return variance. However, this was not the case across the 10 scenarios used in this
16 study. Several of the scenarios evaluated in this study involved high-stakes outcomes, uncertain
17 returns, and potentially traumatic consequences. Even so, no relationship with financial risk
18 aversion was noted for those who had established high expectations and were highly averse to
19 disappointment (using the low disappointment aversion and low expectation proclivity group as
20 the reference category).
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32 Results from this study have implications for those who provide financial advice to others
33 (e.g., financial service professionals and bankers). A common situation arises when an investor
34 or bank customer seeks help in answering a financial question. The financial professional is
35 generally required by statute and professional practice standards to assess the customer's level of
36 financial risk aversion prior to making a financial, banking, or an investment recommendation.
37 Simply relying on someone's response to a measure of risk aversion or answer to an open-ended
38 risk-assessment question may not provide sufficient insights into the future feelings and
39 behaviors of the customer. As shown in this study, a financial service professional could benefit
40 by having their client (e.g., investor or banking customer), in addition to completing a risk-
41 aversion assessment, respond to a series of scenarios that ask the client to indicate expectations
42 around potential outcomes and then to provide disappointment responses related to each
43 scenario. When viewed holistically, the financial service professional would know to be cautious
44 when a financial decision-maker indicates high disappointment aversion when establishing low
45 expectations regarding scenario outcomes. Those who fit this profile are likely to exhibit the
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3 highest levels of risk aversion. They may also be the type of financial decision-maker who reacts
4 the most negatively when faced with high return variation and losses. Consider another situation
5 where a banking customer with high-risk aversion is asked to begin using a banking app. If the
6 customer has little experience with banking apps and establishes low expectations in relation to
7 the app, it is more likely that this customer will exhibit disappointment if the app fails to live up
8 to expectations. In this type of situation, a banking professional should take extra time to provide
9 guidance, counsel, and support to the customer if customer satisfaction is a high priority. On the
10 other hand, a banking customer who exhibits disappointment tolerance when concurrently
11 establishing high expectations would be predicted to be both less risk-averse and less dissatisfied
12 if the banking app fails to meet expectations. This type of customer may be in a better
13 psychological position when dealing with uncertainty.
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23 A reasonable question follows these insights: What is the profile of a person fitting into
24 one of the disappointment aversion and expectation proclivity categories? The answer can be
25 found in Table 7. The table shows the results from a multinomial regression where the outcome
26 variable was the disappointment aversion and expectation proclivity categories (the reference
27 category was low disappointment aversion and low expectation proclivity). The model was
28 statistically significant, $\chi^2 = 103.147$, $p < .001$. The model explained approximately 19%
29 (Nagelkerke) of the variance in the outcome variable.
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36 Those predicted to be in the most risk-averse category (i.e., high disappointment aversion
37 and low expectation proclivity) include older, low-income households headed by a non-Black
38 female financial decision-maker. Knowing nothing else about someone other than these
39 characteristics, a financial service professional could reasonably assume that someone matching
40 this profile will likely be unwilling to incur much variability in outcomes. Those who exhibit
41 low-risk aversion (i.e., low disappointment aversion and high expectation proclivity) tend to be
42 well educated, non-White decision-makers with an external locus of control and high self-
43 esteem. Someone fitting this profile can reasonably be assumed to be willing to take more risk
44 when making a financial decision.
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Table 7. Profile of Risk Averse and Risk Seeking Financial Decision Makers

Category	Variable	<i>b</i>	<i>SE</i>	Wald	<i>p</i>	β
High	Intercept	-3.419	1.458	5.498	.019	
Disappointment	Gender	.630	.278	5.149	.023	1.878
Aversion and	Age	.030	.009	10.091	.001	1.030
Low Expectation	HH Income	-.136	.054	6.403	.011	.873
Proclivity	Married	.383	.330	1.347	.246	1.466
	White	-.409	.393	1.086	.297	.664
	Black	-1.068	.516	4.280	.039	.344
	Full Time Emp	.439	.311	1.985	.159	1.551
	Education	.174	.102	2.891	.089	1.189
	Own Home	.104	.346	.091	.763	1.110
	LOC	.022	.026	.669	.413	1.022
	Self Esteem	.018	.016	1.337	.247	1.018
Low	Intercept	-6.224	1.466	18.021	.000	
Disappointment	Gender	.381	.274	1.930	.165	1.464
Aversion and	Age	.000	.009	.002	.963	1.000
High Expectation	HH Income	-.050	.052	.927	.336	.951
Proclivity	Married	.239	.331	.521	.470	1.270
	White	-.773	.383	4.071	.044	.461
	Black	-.574	.463	1.533	.216	.563
	Full Time Emp	.336	.303	1.231	.267	1.399
	Education	.283	.103	7.594	.006	1.327
	Own Home	.318	.341	.872	.350	1.374
	LOC	.111	.025	19.131	.000	1.117
	Self Esteem	.057	.016	12.189	.000	1.058

Conclusion

As with all exploratory research, the findings from this study need to be evaluated in the context of certain limitations. For example, the sample used for this study was not intended to be nationally representative of the U.S. population. Future studies are needed to replicate findings using a more generalizable sample. Also, it is important to acknowledge the timing of the survey. The survey was distributed during the beginning stages of the COVID-19 pandemic in the United States. Whether distributing the survey at that time had an influence on participant responses is unknown. Issues of endogeneity also need to be acknowledged. While this study was explicitly

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3 designed to avoid tests of causation, it is still possible that dual-causality was present in the data.
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5 Future studies should endeavor to decompose the causal relationship between financial risk
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7 aversion, disappointment aversion, and expectation proclivity. It is possible that risk aversion, as
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9 a trait factor, is responsible for shaping someone's expectations and disappointment reactions. As
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11 framed in this study, it is also possible that expectation proclivity and disappointment aversion
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13 are merely associated with financial risk aversion. It is also conceivable that a causal relationship
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15 from these factors to risk aversion may be present and that the questions asked to assess
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17 disappointment may not have been relevant to each participant.

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19 In conclusion, the findings from this study add to the finance and banking literature on
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21 disappointment aversion in several ways. It does appear that disappointment aversion,
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23 expectation proclivity, and the combination of these two constructs are related to financial risk
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25 aversion. Future research is needed to validate measures of disappointment aversion and
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27 expectation proclivity. Additionally, the use of larger representative samples may provide
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29 additional insights into the role these factors play in describing risk aversion. Nonetheless,
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31 findings from this study do inform how financial risk aversion can be evaluated. Rather than rely
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33 solely on measures of risk aversion measured with revealed preference tests, it appears useful to
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35 include an evaluation of a financial decision-maker's degree of disappointment aversion and
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37 expectation proclivity prior to making an investment decision or financial recommendation.
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