An Investigation of the Relationship between Gender and Investor Behavior During a Market Correction

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Abstract

This study used primary data collected during October 2022 from 2,119 U.S. retail investors to investigate how individuals were coping with the declining stock market and rising inflation. Using a path analysis, this study sought to explain the relationships between gender, financial stress, investment overconfidence, and trading behavior. First, a positive relationship was found between males and moving from stocks and bonds to cash. Next, the results indicated that females were more likely to have experienced financial stress and males were more likely to have displayed investment overconfidence. Both financial stress and investment overconfidence were positively related to moving from stocks and bonds to cash. The indirect effects of financial stress and investment overconfidence, however, were small and only partially mediated the relationship between gender and trading behavior.

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Introduction

The purpose of this study was to investigate the relationship between gender and moving stock and bond holdings to cash during a sudden and significant capital market decline. These findings are important because a challenge faced by many financial advisors is helping clients avoid making rash decisions during periods of extreme market volatility (Gennaioli et al., 2015). Investors who allow their emotions to dictate their actions during these periods are likely to fall into the trap of selling stocks at the worst possible time, which is immediately after they drop in value. It is perhaps not surprising therefore, that individual investors underperform the stock market by an average of 3.0% per year (DALBAR, 2023). A more complete understanding of the psychological determinants of male and female investment tendencies will help financial advisors provide the intervention needed to encourage positive, long-term behaviors that close the performance gap (Kinniry et al., 2014).

In our conceptual model, financial stress and investment overconfidence were explored as mediators to the relationship between gender and investment behavior. During periods of economic hardships such as the COVID-19 pandemic and the Great Recession, females exhibited higher

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levels of financial stress (Fox & Bartholomae, 2020; Haslet et al., 2021; Peck, 2020). Lazarus and Folkman's (1984) Transactional Theory of Stress and Coping would suggest that respondents feeling high levels of discomfort would seek to eliminate the root cause and thus, would be more likely to seek the safety of cash. Other researchers have found that males were more likely to display investment overconfidence by examining behaviors such as excessive trading (Barber & Odean, 2001) and shorter time horizons (Ferriera-Schenk et al., 2021; Paisarn et al., 2021). Kaheman's (2011) System 1 and System 2 framework would suggest that overconfident investors are more likely to falsely believe they can successfully time the market.

The market correction that occurred during 2022 offered an ideal setting to explore this study's research question. During the first nine months of the year, the S&P 500 declined by 23.9% while the Bloomberg U.S. Aggregate Bond Index fell by 14.6% (Bloomberg, 2024). To understand how individual investors were coping with the markets, an online survey was sent to clients of a large U.S. asset manager in early October, resulting in a sample of 2,119 respondents. Among this sample, 13% reported having moved stocks and bonds to cash. Considering that from October 2022 through December 2023 the S&P 500 rose by 35.8% and the Bloomberg U.S. Aggregate Bond Index increased by 7.5% (Bloomberg, 2024), investors who sold a portion of their stocks and bonds likely did not fully participate in the eventual market rebound and therefore, were prone to underperforming the broader markets as predicted by DALBAR (2023).

Literature Review

Financial Stress

Financial stress arises when individuals are unable to meet current and ongoing financial obligations (Friedline et al., 2020). Triggers of financial stress may include worrying about paying bills, losing jobs, providing for children, and saving for retirement (Malhotra & Witt, 2010). Prolonged feelings of financial stress can negatively affect financial satisfaction (Lee & Dustin, 2021), life satisfaction (Stein et al., 2013), financial well-being (Heo et al., 2018), psychological well-being (Afifi et al., 2017), physical well-being (Skinner et al., 2004), and lead to depression (Guan et al., 2022).

As aforementioned, during periods of economic hardship such as the COVID-19 pandemic and the Great Recession, females were found to have higher levels of financial stress than males. For example, during the COVID-19 pandemic, women were disproportionately impacted by financial shocks caused by layoffs, pay cuts, or both (Fox & Bartholomae, 2020). Hasler et al. (2021) found that females had higher levels of both financial stress and financial anxiety compared to men during the pandemic, after controlling for socio-economic status and other demographic characteristics. Similarly, Simha et al. (2020) found higher levels of stress among U.K. female respondents after controlling for financial vulnerability. Peck (2020) suggested that because females had fewer economic resources prior to the COVID-19 pandemic, the losses incurred during this period created even higher levels of uncertainty and anxiety.

Similar conclusions regarding gender differences and financial stress were drawn during the Great Recession. For example, older adult women, and women of color were more likely to experience mortgage trouble and asset depletion during and after the Great Recession compared to their male counterparts (Castro-Baker et al., 2017). Afifi et al. (2018) found that during the Great Recession, women had higher levels of financial stress than their partners when discussing household finances and other money matters. Heretick (2013) concluded that both males and females were equally financially stressed, however, the reasons differed. Women were more likely to report feelings of anxiety and worry, whereas men were more likely to report shame and guilt.

The connection between financial stress and poor investment decision making is abundant within the literature. For example, Bernaola et al. (2020) found that respondents who reported higher levels of anxiety displayed less patience with investments that had declined in value. Rahman and Gan (2020) also found a positive relationship between feelings of anxiety and poor investment decision-making such as demonstrating a misalignment between time horizon and security

selection. Among investors in Pakistan, Moueed and Hunja (2020) concluded that under stressful conditions, investors had less control over their thinking and were unable to make optimum use of their cognitive skills. As a result, stressed investors were likely to make rash decisions based on sudden fluctuations in the stock market or lack of diversification within their portfolios.

Stress has also been found to have an impact on other financial planning behaviors, although the conclusions were mixed. For example, Fan and Henager (2021) found that feelings of financial stress were negatively related to short-term behaviors such as having emergency funds and paying off credit cards in full. Interestingly, financial stress was positively related to long-term behaviors such as calculating retirement needs and saving for retirement. Both short- and long-term behaviors were, in turn, related to overall financial well-being. Fiksenbaum et al. (2017) found that stress was a motivating factor that increased individuals' willingness to change certain behaviors that would reduce economic hardship. In this case, stressed respondents were more likely to reduce their spending or find new avenues to increase their income. Heo et al. (2024) found that the negative effect of financial stress on financial behavior was weakened during the COVID-19 pandemic, suggesting that an appropriate level of stress may serve as a coping mechanism during challenging periods.

Investment Overconfidence

Overconfidence occurs when individuals think that they know more than they actually do (Charupat et al., 2005). A common approach used by researchers to detect and measure overconfidence was to compare an individual's self-assessed subjective knowledge to how well individuals scored on a short financial literacy quiz. For example, Mokhtari and Chawla (2023) computed the difference between subjective knowledge and the number of questions answered correctly as a proxy for the degree of overconfidence. Another approach identified overconfident individuals as those with high subjective scores but low objective scores using quartiles (Robb et al., 2015; Zahirovic-Herbert et al., 2016) or by comparing means (Aristei & Gallo, 2021; Pearson & Korankye, 2022; Yeh & Ling, 2022). A third approach regressed subjective knowledge on objective knowledge and used the residual term to capture overconfidence (Kim et al., 2022; Piehlmaier, 2022).

Researchers have theorized that males were more likely to display investment overconfidence and therefore, trade more frequently than females. Excessive trading is considered detrimental to maximizing long-term investment returns due to market friction and mistimed trades (Willows & West, 2014). Overconfidence has also been linked to holding shorter-term investment horizons (Ferriera-Schenk et al., 2021; Paisarn et al., 2021). One of the first studies regarding this topic examined the trading behaviors of 35,000 households from 1991 through 1997 (Barber & Odean, 2001). The researchers found that males traded 45% more than females, and trading costs reduced male's returns by 2.65% compared to a 1.72% reduction for females. Similarly, a study regarding the trading behavior of 19,021 South African investors found that over a five-year period from 2007 to 2011, males traded more than females and experienced a greater variance of returns (Willows & West, 2014). On a risk-adjusted basis therefore, it was concluded that females were better investors than males. Controlling for the 'big five' personality traits, Zhang et al. (2014) found that males traded more than women in both price rising and price falling scenarios in a simulated stock market experiment.

Researchers that explicitly measured overconfidence painted a much more nuanced relationship between gender and trading activity. For example, Cueva et al. (2019) reported that while males did trade more than females, differences in the measured levels of overconfidence did not explain the gender gap in trading activity. Competitiveness, risk aversion, and financial literacy were also ruled out as possible explanations. Instead, the researchers suggested that perhaps sensation-seeking and gambling attitudes might explain the differences. Glaser and Weber (2007) found that investors who believed that their investment skills were above average were found to trade more, although no differences were found between males and females. Similarly, Deaves et al.

(2009) found that overconfidence was associated with greater trading volume, although gender did not play a role in the study's regression models. On the other hand, while Fellner-Röhling and Krügel (2014) found no relationship between overconfidence and trading volume, men traded more than women at higher levels of risk aversion. The gender trading gap vanished as risk aversion decreased.

Conceptual Model and Hypotheses Development

The purpose of this study was to investigate the relationships between gender and trading behavior during a market correction while exploring the mediating role of financial stress and investment overconfidence. Regarding these mediators, there are two competing points of view. First, researchers have consistently found that females were more likely to experience financial stress than males, particularly during times of economic uncertainty (Fox & Bartholomae, 2020; Hasler et al., 2021; Peck, 2020). Lazarus and Folkman's (1984) Transactional Theory of Stress and Coping suggested that individuals assess stimuli as having a positive effect, no effect, or negative effect on their well-being. In the case of the latter, stressful stimuli that is perceived as harmful or threatening generates negative emotions, and a secondary appraisal is conducted to determine what can be done to manage and potentially remove the stressor.

There are two coping strategies through which stress can be managed: problem-focused and emotional-focused (Lazarus & Folkman, 1984). Problem-focused coping strategies attempt to directly manage the stressful event, while emotional-focused coping strategies seek to regulate the negative feelings caused by the event. The process is iterative as individuals continually reappraise their environment and results of adopting coping efforts. Unsuccessful adaptation may lead to the use of additional coping strategies, and continued failure may result in psychological distress. In this case, our working hypothesis is that females are likely to feel higher levels of financial stress during a market correction and to mitigate or eliminate this perceived threat, are more likely to exit the capital markets.

The conflicting argument, however, is that males are more likely to feel overconfident in their investment abilities compared to females (Willows & West, 2014; Zhang et al., 2014). Kahneman (2011) suggested that there are two complementary modes of thinking that help individuals assess information and make decisions. System 1 operates automatically and quickly, with little or no effort. System 2 allocates attention to effortful mental activities as needed, including complex calculations. The operations of System 2 often involve choice and concentration. System 1 saves time and energy while System 2 allows for deliberate and careful decision-making. While these systems often work in harmony, misjudgments are likely to occur when difficult decisions are guided by System 1.

Investment overconfidence occurs because System 1 thinking seeks information that easily comes to mind and constructs a coherent story that makes sense (Kahneman, 2011). As a result, important information not readily recalled or known is excluded from consideration. Additionally, System 1 thinking is prone to judgment errors including the false belief that knowing the past is knowing the future, inaccurately assessing abilities and knowledge relative to others, unable to discern the differences between luck and skill, and overly relying on intuition. Kahneman (2011) stated, "subjective confidence in a judgment is not a reasoned evaluation of the probability that this judgment is correct. Confidence is a feeling that reflects the coherence of the information and cognitive ease of processing it" (p. 212). We predict a positive relationship between males and investment overconfidence, and as a result, males are more likely to attempt to successfully time a highly volatile stock market.

At this point, we posit that a relationship exists between gender and trading behavior but are uncertain about the direction given conflicting mediating factors. Additionally, we believe that these factors, financial stress and investment overconfidence, may help explain the relationship between gender and trading behavior but are uncertain which factor is more dominant.

Formally stated, therefore, this study's hypotheses are:

H1: Gender is related to moving from stocks and bonds to cash.

H2: Males are negatively related to financial stress.

H3: Financial stress is positively related to moving from stocks and bonds to cash.

H4: Males are positively related to investment overconfidence.

H5: Investment overconfidence is positively related to moving from stocks and bonds to cash.

Methodology

Data and Sample

This study was conducted in partnership with a leading global asset manager. One of the manager's lines of business is a direct channel that caters to U.S. retail investors who have established accounts without the assistance of a financial professional (although some investors may use a financial professional for other aspects of their wealth). Within this channel, only the asset manager's proprietary mutual funds are available for purchase. The direct channel was closed to new investors in 2009 but reopened in July 2020. At the end of 2021, the mean and median account balances were $104,614 and $35,782 respectively, and the mean age was approximately 56.

In October 2022, an online survey was electronically mailed in batches based on the alphabetical order of the account owner's last name. The purpose of the survey was to gain insights into how individual investors were coping with recent market volatility and high inflation. The criteria for selection were a balance greater than $0 and an email address on file. Respondents were not provided an option to skip questions but could have terminated the survey at any time. After a period of one week and collection of 2,119 responses, the survey ended.

Dependent Variable

Respondents were asked "as a result of financial market performance and current inflationary environment in 2022, have you moved out of stocks and/or bonds and into cash?" A binary variable was coded as '1' for yes, '0' otherwise.

Independent Variables

Male respondents were coded as '1' and female respondents were coded as '0.' Financial stress was operationalized using the Financial Anxiety Scale (Archuleta et al., 2013). Respondents were asked on a scale of 1 to 7, where 1 means "never" and 7 means "always," how often each of the following statements apply to them. The seven statements were 'I feel anxious about my financial situation,' 'I have difficulty sleeping because of my financial situation,' 'I have difficulty concentrating on my school/or work because of my financial situation,' 'I am irritable because of my financial situation,' 'I have difficulty controlling worrying about my financial situation,' 'My muscles feel tense because of worrying about my financial situation,' and 'I feel fatigued because I worry about my financial situation.' Following the approach used by Archuleta et al (2013) and Grable et al. (2015), scores were estimated by summing each item. Factor loadings achieved 0.68 and above (Table 1), and Cronbach's alpha was 0.95.

Table 1. Factor Loadings for Financial Anxiety Scale

Item	Factor Loading
I feel anxious about my financial situation	0.6801
I have difficulty sleeping because of my financial situation	0.9086
I have difficulty concentrating on my school/work because of my financial situation	0.9269
I am irritable because of my financial situation	0.8859
I have difficulty controlling worrying about my financial situation	0.9158
My muscles feel tense because of worrying about my financial situation	0.8963
I feel fatigued because I worry about my financial situation	0.9127

Overconfidence was operationalized by utilizing the residuals from an OLS regression of respondent subjective knowledge on objective knowledge (Kim et al., 2022). A single subjective knowledge item asked respondents "How would use assess your overall financial knowledge?" on a scale of 1 to 7, where 1 means "very low" and 7 means "very high" (FINRA Investor Education Foundation, 2022). Objective knowledge was assessed as the number of correct answers to Lusardi and Mitchell's (2011) 'Big Three' financial literacy multiple-choice items regarding compounding, inflation, and diversification. 'Don't know' responses were coded as incorrect. 'Prefer not to say' was not provided as an option.

Socio-demographic characteristics were included in the analysis as categorical variables. These categorical variables included age (29 or younger, between 30 and 39, between 40 and 49, between 50 and 59, between 60 and 69, between 70 and 79, and 80 and older), ethnicity (White and non-white), education attainment (high school, some college, Bachelor's degree, and post-graduate degree), household income (less than $50,000, between $50,000 and $99,999, between $100,000 and $199,999, and $200,000 and greater), investments including retirement accounts (less than $500,000, between $500,000 and $999,999, between $1,000,000 and $1,999,999, and $2,000,000 and greater), self-assessed health status (excellent, very good, good, fair, and poor), employment status (employed, partially retired, fully retired, and out of the workforce but not retired), and marital status (married/partnered and single). Given the small number of responses, some categories were combined including age, health status, and employment status.

Empirical Strategy

To explore the relationships between gender, financial stress, investment overconfidence, and trading behavior a path analysis was specified. A path analysis is used to study complex models where variable A is related to variable B, which in turn is related to variable C (Streiner, 2005). It is important to note that a path analysis cannot be used to establish causation or whether a specified model is correct, but it can help identify the direct, indirect, and total effects of the variables under consideration. In our model, we explored the direct effects between gender and moving out of stocks and bonds to cash and the indirect effects through financial stress and investment overconfidence, while controlling for several socio-demographic characteristics.

Results

Descriptive Statistics

This study's descriptive statistics can be found in Table 2. Among the sample of 2,119 respondents, approximately 13% reported having moved from stocks and bonds into cash due to the market performance and inflationary environment in 2022. Approximately three-quarters of respondents were male (74%). The mean financial stress score was 14.43 (on a scale of 7 to 49) with a standard deviation of 8.41. Regarding the financial literacy items, the mean subjective knowledge score was 4.99 (on a scale of 1 to 7) and the standard deviation was 1.17. On average, respondents answered 2.74 of the three financial literacy questions correctly, and the standard deviation was 0.56.

A plurality of respondents (35%) was between ages 60 and 69. The majority were White (89%) and college educated (35% had a Bachelor's degree and 42% had a post-graduate degree). More than half of respondents reported household income above $100,000 (57%) and investment assets above $1,000,000 (51%). Most respondents were in excellent or very good health (67%), fully retired (52%), and married or partnered (67%).

A higher percentage of males (15%) moved out of stocks and bonds compared to females (10%). On average, males reported lower levels of financial stress (13.77 versus 16.28) and higher levels of subjective confidence (5.18 versus 4.54) and objective knowledge (2.80 versus 2.56). All three mean differences were statistically significant (p<0.001). Among the other demographic variables, a greater percentage of males reported household income of $100,000 and greater (60% versus 48%) and investments of at least $1,000,000 (54% versus 50%). Lastly, 73% of males were married or partnered compared to 51% of females.

Table 2. Descriptive Statistics

Variable	Full Sample % (N = 2,119)	Male % (N = 1,562)	Female % (N = 557)
Moved out of stocks and bonds to cash	13.26	14.53	9.69
Male	73.71	-	-
Financial stress (mean; 7-49)	14.43 (8.41)	13.77 (7.83)	16.28 (9.62)
Subjective confidence (mean; 1-7)	4.99 (1.17)	5.18 (1.07)	4.54 (1.28)
Objective knowledge (mean; 0-3)	2.74 (0.56)	2.80 (0.48)	2.56 (0.73)
Age			
Less than 50	6.61	5.95	8.44
Between 50 and 59	19.58	19.01	21.18
Between 60 and 69	35.06	35.08	35.01
Between 70 and 79	28.05	29.45	25.85
Age 80 and older	10.24	10.50	9.52
White	88.77	88.48	89.59
Education attainment:			
High school	4.62	4.55	4.85
Some college	18.74	18.25	20.11
Bachelor's degree	34.87	34.19	36.80
Post-graduate degree	41.76	43.02	38.24
Household income:			
Less than $50,000	11.18	8.71	18.13
Between $50,000 and $99,999	31.57	30.86	33.57
Between $100,000 and $199,999	39.69	42.00	33.21
$200,000 and greater	17.56	18.44	15.08
Investments:			
Less than $500,000	23.64	20.55	32.32
Between $500,000 and $999,999	25.06	24.46	26.75
Between $1,000,000 and $1,999,999	25.15	25.22	24.96
$2,000,000 and greater	26.14	29.77	15.98
Self-assessed health:			
Excellent	23.69	23.69	23.70
Very good	44.03	44.11	43.81
Good	24.96	25.03	24.78
Fair/poor	7.31	7.17	7.72
Fully retired	51.72	52.05	50.81
Married/partnered	67.11	72.79	51.17

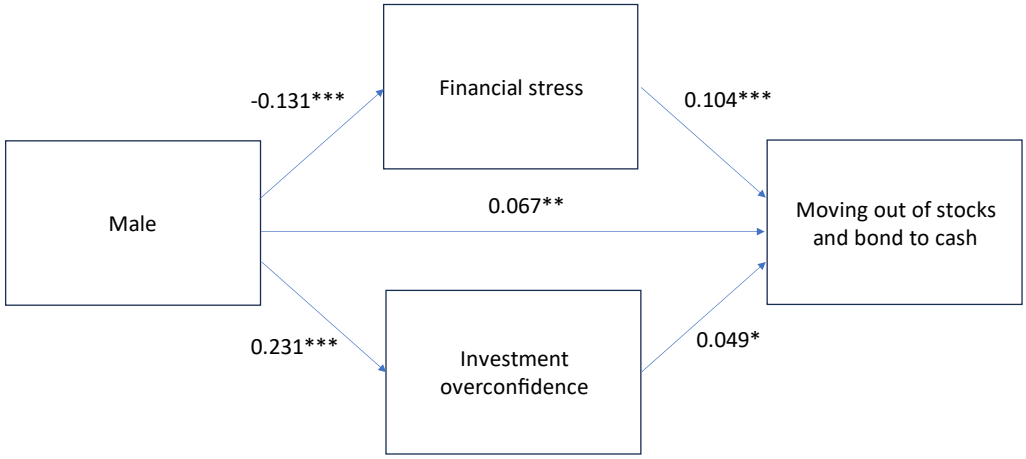
Note: Standard deviation in parentheses.

Path Analysis

The specified path model and standardized coefficients can be found in Figure 1. Assessing the model fit, the standardized root mean squared residual (SRMR) was 0.031, the root mean square of approximation (RMSEA) was 0.073, and the comparative fit index (CPI) was 0.957. Regarding the first hypothesis, a positive relationship was found between males and moving from stocks to bonds to cash in 2022 (β = 0.065, p = 0.003). Regarding the next two hypotheses, a negative relationship was found between males and financial stress (β = -0.131, p<0.001), and financial stress was in turn, positively related to moving from stocks and bonds to cash in 2022 (β = 0.104, p<0.001). Regarding the final two hypotheses, a positive relationship was found between males and investment overconfidence (β = 0.231, p<0.001), and investment overconfidence was in turn, positively related to moving from stocks and bonds to cash in 2022 (β = 0.049, p = 0.025).

Although support was found for hypotheses 2 through 5, the indirect effects were small. Multiplying the estimates for each path indicated an indirect effect of -0.013 for financial stress and 0.011 for investment confidence. When summed, the total indirect effect was -0.002. Combining the indirect effect of -0.002 with the direct effect between males and moving from stocks and bonds to cash (0.067) yielded a total effect of 0.065. A summary of the direct effects, indirect effects, and total effects can be found in Table 3.

Figure 1. Standardized Path Coefficients for Prediction of Moving Out of Stocks and Bonds to Cash



Note. Model fit statistics X^2 (39, N=2,119) = 479.586; p<0.001; RMSEA=0.073; SRMR=0.031; CFI=0.957

Table 3. Direct, Indirect, and Total Effects for the Hypothesized Model (N = 2,119)

	Standardized Coefficient		
	Direct effect	Indirect effect	Total effect
Path to Financial stress:			
Male	-0.131***	NA	-0.131***
Path to Investment overconfidence:			
Male	0.231***	NA	0.231***
Path to Moved out of stocks and bonds to cash:			
Male	0.067**	-0.002	0.065**
Financial stress	0.104***	NA	0.104***
Investment overconfidence	0.049*	NA	0.049*

*$p < 0.05$. **$p < .01$. ***$p < 0.001$

Discussion

This study sought to investigate the relationship between gender and moving from stocks and bonds to cash during a market correction. The steep downturn in the stock and bonds markets during the first nine months of 2022 offered an ideal time to explore this topic. First, a positive relationship was found between males and exiting the capital markets in favor of cash. Despite finding some evidence about the mediating role played by financial stress and investment overconfidence, the results of a path model indicated there is much more to the story. While strong support was found for the study's hypotheses, the indirect effects were small meaning one or more variables not identified in our model accounted for gender differences in trading behavior. Also, the direction of the indirect effects was opposite, effectively canceling each other out. The following discussion will review how our study builds upon the profession's existing understanding of the relationship between gender, financial stress, investment overconfidence, and trading behavior while also offering alternative explanations for our results that may be ripe for further investigation.

While the market downturn of 2022 was short-lived and did not compare in magnitude to the Great Recession or the COVID-19 pandemic, this event offers insights into how different investors coped with market volatility. As predicted, females in October 2022 were experiencing higher levels of stress compared to their male counterparts. This finding confirms the earlier conclusion of Hasler et al. (2021), Peak (2020), and Castro-Baker et al. (2017) regarding gender differences during periods of economic difficulties. Further, this study's conclusions regarding the connection between higher stress levels and suboptimal investment behaviors agrees with earlier findings by Bernaola et al. (2020), Rahman and Gan (2020), and Maueed and Hunja (2020).

This study also found that by comparing what investors think they know to what investors actually know (Kim et al., 2022), males were more likely to have an unfounded confidence in their financial abilities. This bias has been used to explain excessive trading as males are more likely to falsely believe they can time the market (Barber and Odean, 2001). One of the unique aspects of this study was that the administration of the survey instrument occurred during a market trough in October 2022. Unlike the Barber and Odean (2001) study which tracked investors over several years, this study investigated investor behaviors during a particularly challenging period. The connection between overconfidence and moving out of stocks and bonds in the face of a rapidly declining market offers new insights about this bias.

While financial stress and investment overconfidence partially explained gender differences in trading behavior during the 2022 market correction, our analysis indicates that there may be other factors behind the relationship between males and exiting the capital markets. For example, because males are likely to have a higher risk tolerance, and thus are likely to hold a greater allocation to stocks (Heo et al., 2016) males simply have more to lose than females

during a market correction. As stock prices decline, investors with greater exposure may more be tempted to "cut their losses" and seek to preserve principle in the safety of cash and cash equivalents. Additionally, market declines may be less salient to investors with smaller stock allocations, and therefore these investors may be more likely to embrace the status quo and refrain from making changes to portfolios.

A second possible explanation may be that males are less likely to use and trust a financial advisor compared to females (Collins, 2012). The guidance provided by advisors during periods of market volatility about the benefits of maintaining a long-term perspective are invaluable. Kinniry et al. (2014) estimated the economic benefits of a financial advisor's advice was an incremental 3 percent per year, half of which was attributable to 'behavioral coaching.' According to Kinniry et al. (2014) volatile markets influence investors' confidence and financial advisors can act as 'emotional circuit breakers' by helping clients overcome the natural tendency to sell high and buy low.

A final explanation may be the sensation-seeking and gambling attitudes of males suggested by Cuervo et al. (2019) who also found that overconfidence did not fully explain the gender trading gap. Perhaps males are more prone to excessive trading not only in the hopes of maximizing risk-adjusted returns but also to experience the thrill of stock investing.

Limitations

To address some of the limitations of this study, future research that incorporates asset allocation, financial advisor use, and non-financial motivations behind stock investing would potentially add to the existing body of knowledge. In addition to omitted variable bias, there were three other limitations regarding the sample and survey instrument. First, the asset manager's clientele skewed towards an older, highly educated, and wealthier cohort which may not be representative of the general population or U.S. retail investors. A more diverse sample may have yielded different results. Second, expanding the 'Big Three' objective knowledge items to the 'Big Five' that includes additional items regarding the relationship between interest rates and bond prices and mortgage amortization (Lusardi & Mitchell, 2011) may have yielded a more complete picture of respondents' financial literacy. Lastly, capturing the percentage of respondent portfolios that had shifted from stocks and bonds to cash may have improved the richness of the analysis.

Implications

Our study of gender-related trading differences offers valuable takeaways for financial practitioners. During this period, females were more likely to feel financial stress and males were more likely to feel overconfident in their financial abilities. Both the feelings of financial stress and investment overconfidence were linked to moving out of stocks and bonds, which in hindsight may have been a mistake. Consider that from October 2022 to December 2023, the S&P 500 gained 35.8% and the Bloomberg U.S. Aggregate Bond Index rose 7.5% (Bloomberg, 2024). Investors who panicked in 2022 likely fell into the trap of buying high and selling low, putting their long-term financial goals such as retirement, funding a college education for a child, or buying a new home in jeopardy. Practitioners able to identify signs of stress and overconfidence and intervene with the appropriate tools and techniques may be able to provide a differentiated client experience. At the same time, properly advised investors are positioned to reap the benefits of the incremental returns quantified by Kinniry et al. (2014).

One of the first steps a practitioner might consider with clients experiencing financial stress is a risk tolerance reassessment. Typically, an initial assessment is done by using a questionnaire and associated scoring methodology, with higher scores indicative of a higher risk tolerance leading the practitioner to recommend a greater equity allocation. Only a limited number of these commercially used risk-tolerance assessments have been peer-reviewed within the academic community, and as a result may lack reliability and validity (Kuzniak et al., 2015). Faulty assessments may lead to practitioner recommendations that are not aligned with an investor's true willingness and ability to assume risk. Panicked selling in 2022 may have been partly the result of equity allocations that far

exceeded actual financial risk tolerances. Grable and Lytton (1999) have developed one of the only peer-reviewed, publicly available risk assessment tools at no cost. The tool consists of 13 multiple-choice style questions with a very straightforward scoring methodology. Incorporating this tool into a client service model, particularly during times of market stress as a robustness check to the initial risk assessment, may be very beneficial to both the practitioner and investor.

Another technique that practitioners may use to assist financially stressed investors is to improve their financial literacy. Financial literacy consists of not only objective knowledge but also having the confidence to apply that knowledge (Huston, 2012). Higher levels of financial literacy have been linked to lower levels of financial stress (Xiao & Kim, 2021; Zhang & Chatterjee, 2023). A related concept to confidence is self-efficacy, which refers to people's beliefs in their capabilities to meet a certain goal or objective (Bandura, 1997). Letkiewicz et al. (2016) offers practitioners suggestions for improving investor financial self-efficacy through performance accomplishments, vicarious experience, verbal encouragement, and physiological states.

Accomplishments help build an investor's confidence and provide motivation to engage in a new task. Letkiewicz's et al. (2016) suggested structuring financial decisions that allow for small accomplishments while learning new skills. One relatively simple example is to establish an emergency fund. Moon et al. (2023) found that emergency funds were an effective way to mitigate financial stress, especially during challenging economic periods such as the COVID-19 pandemic. Cash reserves can also play an important role for retirees. Practitioners might suggest that retirees have access to enough cash to meet one to two years of living expenses (Benz, 2022). This cash buffer may give investors the peace of mind necessary to stay the course during periods of market volatility knowing no immediate lifestyle changes will be necessary.

Vicarious experiences occur when an individual sees a peer successfully reaching a goal or objective (Letkiewicz et al., 2016). Practitioners should be prepared to offer anonymous case studies or vignettes about how similarly situated investors reacted during challenging times or successfully reached certain financial milestones. Verbal encouragement also includes constructive feedback. Many investors have experienced success in other aspects of their lives and practitioners should remind these individuals the same long-term perspective that was a key element to their personal accomplishments can be applied to investing. Lastly, investors feeling nervous or anxious are likely to have low levels of self-efficacy. One way to alleviate investor stress is to establish basic ground rules for engaging during difficult economic periods. An example may be to ask for an in-person meeting to occur, that includes the spouse or partner, before any major changes are made to the portfolio's asset allocation. This pause reassures the investor that a plan is in place should the current crises worsen, while avoiding rash decisions that can easily be executed over the phone or electronically.

Overconfident investors present a slightly different challenge. While some investors may share their concerns regarding household finances, workplace uncertainty, or the broader economy thus providing clues of stressful feelings, it is less likely that an investor would admit or even recognize overconfidence in their financial abilities. As part of the new client onboarding process, practitioners might consider administering the three objective questions and one subjective question used in this study (Lewis, 2019). The larger the disparity between a client's self-assessed subjective knowledge score and the number of objective knowledge items answered correctly, the more overconfidence the investor is displaying. Regarding existing clients, practitioners might explain that as their service model evolved, a need has been recognized to build the financial literacy of not only existing investors who may be interested but also that of family members. Part of the exercise is to establish a baseline through the administration of four questions that will be revisited and tracked over time. The important point for practitioners to stress is not how the questions are answered presently, but rather, the investor's financial literacy improvements over time.

Once a financial practitioner identifies an overconfident investor, the educational process

might start by addressing objective knowledge. Adil et al. (2021) found that objective knowledge had a negative moderating effect on the relationship between overconfidence and suspect investment decision making. Since overconfident investors are more likely to engage in market timing, practitioners must be prepared to explain the futility of these actions. A tenet commonly repeated within the financial services industry is "time in the market, not market timing." As an example, according to an analysis conducted by Janus Henderson Investors (2024), $10,000 invested in the S&P 500 from 1988 through 2022 would have grown to $33,098. If the 10 best trading days, however, were missed during this period the investment would have only grown to $15,163, and if the 20 best trading days were missed the investment would have declined to $8,899. Providing investors with these simple messages through easy-to-read illustrations will help reinforce key learnings.

Managing an investor's subjective knowledge is likely to prove more challenging than simply providing facts and supporting data. In these cases, two techniques that may be helpful are Subjective Probability Interval Estimation (SPIES) (Lurtz, 2020) and premortem planning (Klein, 2007). SPIES is a graphical representation of all possible outcomes. Premortem planning starts by posing the question, "What is the worst outcome and why would that occur?" Next ask, "What is the best outcome and why would that occur?" Presenting both good and bad outcomes reminds investors of suboptimal outcomes not previously considered. In the case of the 2022 market correction, the rebound in 2023 was sudden and dramatic. This period in history can be used to remind market timers that they have to be right twice: once when they sell and again when they buy.

Evidence was found that supported this study's hypotheses regarding the relationships between gender, financial stress, investment overconfidence, and moving from stocks and bonds to cash during a market correction. Financial stress and investment overconfidence, however, only partially mediated gender differences, inviting opportunities to further explore this important topic. This study adds to the existing body of literature by providing new insights regarding trading behavior during a very challenging investment climate. Financial practitioners can use these findings to enhance their client relationships by taking proactive steps to mitigate financial stress and temper investment overconfidence.

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