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Financial fragility and financial optimism linkage during COVID-19: Does financial literacy matter?

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ABSTRACT

COVID-19 and its consequences induced many challenges for individuals, and many of them experienced financial fragility. Financial optimism is crucial in this situation as it helps individuals and organizations recover from such situations. We argue that financial fragility has a long-term consequence on individuals and examined the adverse effect of financial fragility on financial optimism. Using a nationally representative dataset from the USA, we tested if financial literacy could minimize financial fragility’s adverse impact on financial optimism. We found a negative linkage between financial fragility and financial optimism; the linkage was stronger for women. To address potential endogeneity, we conducted robustness analyses using instrumental variable regression and propensity score matching. The findings of the study provide implications to increase financial optimism during the pandemic.

1. Introduction

The COVID-19 pandemic has shaken the global economy. Unemployment in America peaked at 15% in 2020, and there are around 14 million unemployed individuals as of August 2020 (Baker et al., 2020). The US GDP has declined by 5% during the first quarter of 2020 (Wheelock, 2020). The pandemic has caused a substantial economic crisis; there is uncertainty about when the crisis would end though vaccines are now available (Jorda et al., 2020). Further, all individuals are not equally affected by the pandemic. Low-income individuals have faced severe adverse consequences, whereas the well-to-do individuals have benefitted from this crisis. However, overall negative sentiment and the economic crisis due to the pandemic are likely to reduce people’s optimistic future expectations (Das et al., 2020; Zullow, 1991). According to the Michigan Consumer Sentiment index, a delay in expenditure occurs when at the same time individuals’ pessimistic view dominates their optimism about the economic prospects (Jacobson et al., 2014). Hence, restricting the decline in optimism has substantial implications for both individuals and society. Financial optimism is different from trait optimism (a generalized view of life) and focuses on a specific situation, which is the financial situation in the present study (Bjuggren & Elert, 2019). Optimists put higher weights on desirable outcomes and least weight on unwanted results. Financial optimism helps prepare for the desirable distant future and motivates to act favourably for one’s future financial self (Puri and Robinson, 2007). Financial optimism drives household consumption, saving, and investment decisions and helps one achieve financial well-being (Stromback et al., 2017). It signals market movements and shapes broader macro-economic trends (Brunnermeier et al., 2014). Hence, financial optimism plays an essential role in economic recovery caused due to the pandemic.

The economic fallout has severely affected the financial conditions of individuals. People are more financially vulnerable (Chhatwani & Mishra, 2021), less tolerant of financial risk (Heo et al., 2020), and unprepared to withstand financial shocks (Lusardi et al., 2020). As a result, individuals may become financially fragile and not have an ability to meet heavy future expenses (Lusardi et al., 2011). Financially fragile individuals are less resilient in the present economic crisis (Lusardi et al., 2020). During financial difficulties, financially fragile people are more likely to indulge in ruminating about the misfortune to explain bad experiences and build negative future expectations (Zullow, 1991). We argue that individuals currently facing financial difficulty or experiencing financial fragility would have lesser optimistic future expectations. In other words, financial fragility during COVID-19 would reduce financial optimism.

Prior studies are inconsistent: scholars found a negative correlation...

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(Hasler et al., 2018) or no correlation (Lusardi et al., 2011) between financial fragility and financial literacy. Hence, there may be other factors that moderate the above linkage. In the present study we considered financial literacy as an important moderating factor. To produce accurate financial forecasts, individuals need to minimize their uncertainty in an unbiased manner (Nofsinger, 2005). Therefore, in the absence of domain-specific knowledge such as literacy in financial matters, it is possible to indulge in the unwarranted extrapolation of recent (unfavorable) trends (Bruine de Bruin et al., 2010). Due to a lack of financial literacy, it is possible to exaggerate the current gloomy economic condition during COVID-19 and its continued impact leading to reduced optimistic future expectations. Financial literacy enhances the ability to quantify the broad economic factors such as inflation, growth rate, unemployment and assess their impact on future economic conditions (Bruine de Bruin et al., 2010; Kirshe & Mislin, 2020). Therefore, we argue that financial literacy would help regulate the adverse impact of negative sentiments on financial optimism during the pandemic. Moreover, financially literate people save more for retirement (Lusardi & Mitchell, 2017), have higher wealth (Van Rooij et al., 2012), better portfolio diversification and returns (Bianchi, 2018), low debt (Disney & Gathergood, 2013), and lower cost of borrowings (Huston, 2012). As a result, they are prepared to meet future uncertainty, such as the COVID-19.

Scholars agree that women, in general, are less optimistic as compared to men. For example, women are less optimistic about the presidential elections (Chaney et al., 1998), online shopping experience (Garbarino & Strahilevitz, 2004), marriage expectations (Lin & Raghubir, 2005), and economic conditions and personal finances (Jacobsen et al., 2014). The difference between men’s and women’s optimism lies in the different explanatory styles (Buchanan & Seligman, 1995). In general, women attribute their problems to internal, pervasive, and permanent reasons, which is a more pessimistic explanatory style (Buchanan & Seligman, 1995). Scholars agree that women are more likely to experience depression than men (Yoon & Kim, 2018). This inherent gender difference would impact the negative relationship between financial fragility during COVID-19 and financial optimism. We predict that the linkage between financial fragility and financial optimism would be stronger among women than men.

In the present study, we used nationally representative data of more than 2500 American respondents to examine the above hypotheses after controlling for predictors that may potentially explain financial optimism, such as socioeconomic status and trait optimism (Das et al., 2020; Puri and Robinson, 2007). We contribute to the literature and find that financially fragile individuals have 7% lower chances of being financially optimistic than financially non-fragile individuals during the pandemic. Further, we find that financial literacy mitigates this negative impact of fragility on optimism. In a gender-based sub-sample analysis, we found that the adverse effect of financial fragility on financial optimism is significant only among women. Our findings have practical implications because financial literacy and gender-based differences explain an individual’s future financial expectations, especially in a situation when financial fragility is high.

2. Data and methodology

We use the data collected in four different surveys by the Center for Economic and Social Research by the University of Southern California. The data used in the present study was collected under the Understanding America Study (UAS) survey, where financial optimism was collected in survey no. 250 administered during June–July 2020.

Because of the binary nature of the dependent variable, we performed logistic regression according to the following model specification:

\[ Y_i = \frac{1}{1 + e^{-\left(F_F, FL, X_i, u_i\right)}} \]

Where,
- \(Y_i\): The proxy for financial optimism index (binary dependent variable).
- \(F_F\): Financial fragility
- \(FL\): Financial literacy
- \(X_i\): The vector of control variables; \(u\): error term

We created the financial optimism proxy, which is our primary outcome variable following the approach used by Das et al. (2020). We constructed financial optimism index from six questions. A detailed explanation of this variable is given in Table 1, and the wordings of the questions are given in Appendix A.2. The proxy takes three standardized questions for personal financial condition, US business, and county-level business conditions.

Table 1 provides the details of the financial optimism proxy and the detailed wording of the survey questions for capturing financial expectations.

A fourteen-item question of financial literacy was used (Lusardi & Mitchell, 2017). Financial fragility measure was obtained based on individual confidence in meeting an unexpected expense of $2000 (Lusardi et al., 2011). In line with the existing literature, we have controlled demographics such as age, gender, education, income, marital status, and employment status (Dawson et al., 2014). We also controlled trait optimism using the life expectancy measure (Puri and Robinson, 2007). Moreover, Financial confidence may impact individuals’ expectations of the financial future (Di Girolamo et al., 2015; Hanson & Olson, 2018), so we add it as a control variable. The details of all the variables are provided in Appendix A.1.

3. Empirical results

3.1. Descriptive analysis

The descriptive statistics and mean differences between non-fragile and fragile groups are given in Table 2. The average estimate for optimism is 0.280, which is greater than zero indicating that people believe in a better financial future. The optimism for the personal financial condition is lower than the average optimism scores for the business conditions in the US and in the county. Further, we observe that 27.8% of respondents are financially fragile. The average financial literacy score among respondents is 9.47. In our sample, the average age is 48 years, 40% of respondents are men, and 55% have a college education.

| Sr. No. | Variable | Source | Values | Reference |
|--------|----------|--------|--------|-----------|
| 1      | Financial optimism index | Mean value of standardized future expectations regarding the personal financial situation, business in the US, and business condition in the county. | 0 to 1 | Das et al. (2020) |
| 2      | Personal financial condition | Comparison between current and future expectations about the personal financial condition | Better (1) About the same or worse (0) | Michigan Consumer Sentiment Index (Personal current and future) |
| 3      | Business condition in the US | Comparison between current and future expectations about the business condition in the US | Better (1) About the same or worse (0) | Michigan Consumer Sentiment Index (MCSI) |
| 4      | Business condition in the county | Comparison between current and future expectations about the business condition in the county | Better (1) About the same or worse (0) | Adapted from MCSI for county level |
We have reported annual income in four different categories namely less than $30,000, $30,000 to $49,999, $50,000 to $99,999 and more than $100,000. 60% of our respondents are married, and the average number of children reported in the sample is about 5. Optimism (life expectancy) is a control variable for trait optimism, and its mean value is 0.2. Further, 66.8% of respondents reported being employed, and average financial confidence was 7.58.

### 3.2. Regression results

In Table 3, we present the results of logistic regression analysis (marginal effects). We run several regressions keeping the dependent variable in four different categories namely less than $30,000, $30,000 to $49,999, $50,000 to $99,999 and more than $100,000. 60% of our respondents are married, and the average number of children reported in the sample is about 5. Optimism (life expectancy) is a control variable for trait optimism, and its mean value is 0.2. Further, 66.8% of respondents reported being employed, and average financial confidence was 7.58.
variable as the index of financial optimism (Panel A), personal financial condition (Panel B), business conditions in the U.S. (Panel C), and business conditions in the county (Panel D). In column (1) of Panel A, we report the main results of the study. Our findings show that financial fragility is negatively associated with financial optimism. Being financially fragile is associated with 7% lower chances of financial optimism. Panel B, C, and D report results for respective categories of financial optimism where except for personal financial condition, we find a significantly negative impact of fragility on financial optimism. Our hypothesis of the negative relationship between fragility and optimism gets supported. We have discussed the probable reasons for the personal financial condition in the discussion.

In Table 3, the marginal effects of financial literacy in explaining financial optimism were significant. However, age (except for the personal financial condition), gender, income, and education (except for the Business condition in the country) were not significant, resulting in a departure from the literature conducted during non-pandemic times (Das et al., 2020). The possible explanation could be that once we consider financial fragility and financial literacy, which are more specific measures, socioeconomic status (income and education) may not be relevant for financial optimism.

Table 2 reports the demographic profile of the sample. A detailed explanation of the variables is given in Appendix A.1. In addition, we found the effect of optimism trait (life expectancy) on optimism was non-significant. Our findings suggest that a person’s material situation rather than his/her inherent optimism trait matters more in future forecasts during a crisis. Employment status and financial confidence are also irrelevant for financial optimism, which could be due to the high level of external uncertainty during the pandemic.

In column (2) of Panel A (Table 3), we report that the interaction effect of financial fragility and financial literacy on financial optimism was positive and significant, suggesting that financially fragile individuals having high financial literacy are more likely to have financial optimism. As reported in Panel B to Panel D, the interaction terms for the dependent variable in individual categories are also significant. Thus, financial literacy mitigates the adverse impact of financial fragility on financial optimism. We present the interaction effect (Panel A) in Fig. 1. It indicates that financially fragile respondents having high financial literacy report higher financial optimism.

### 3.3. Robustness tests

#### 3.3.1. Instrumental variable regression

We eliminate any possibilities of reverse causality or omitted variable bias using instrumental variable regression in Table 4. There could be several omitted variables in this model. Therefore, possibly our model may depict omitted variable bias; hence we run an instrumental variable model following the approach given by Lewbel (2012). This method uses the generated instruments from the given covariates, and it does not rely on any external instrumental variable making it a popular approach in economics studies (Churchill et al., 2019; Buch et al., 2014; Mishra & Smyth, 2015; Tas, 2020). We report results for the IV regression model in Table 4 and observe that financial fragility is negative and statistically significant for financial optimism as a dependent variable. Our results are robust to potential endogeneity and indicate a causal linkage. However, given the nature of data, one should be cautious in interpreting the causality in the relationships.

#### 3.3.2. Propensity score matching

We have also conducted propensity score matching analysis to circumvent possibilities of selection bias. However, financially fragile individuals might differ from non-fragile individuals on non-observable characteristics leading them to be less optimistic. We address this issue by conducting a propensity score matching analysis in Table 5. Using the 1:1 nearest neighbor matching method, we find that the base relationship between financial fragility and financial optimism remains significant in our matched sample, and selection bias is not a concern in our study.

### 3.4. Gender groups

We tested the combined effect of financial fragility and financial literacy on financial optimism for both the gender group separately (see Table 6). In column (1), we have reported the direct effect, and the interaction terms are given in column (2) for women and men separately. The marginal effect for financial fragility is statistically significant only for women, and this linkage is not significant for men. Our findings extend the current literature on the gender gap in optimism (Chaney et al. 1998; Jacobsen et al., 2014) by suggesting that only women report negative financial optimism when they experience financial fragility during the pandemic.

Further, the interaction term between fragility and financial literacy is significant only in the subsample of women. Based on the marginal effects, we observe that financially fragile women have high financial optimism.

### Table 4: Instrumental variable regression

| Variables          | Financial optimism index |
|--------------------|--------------------------|
| Financial fragility | -0.143***                |
| (0.058)            |                          |
| Control variables  | Yes                      |
| Constant           | 0.303***                 |
| (0.089)            |                          |
| R-squared          | 0.019                    |
| F test             | 4.250                    |
| Breusch Pagan test | 0.000                    |
| Endogeneity test   | 0.449                    |
| Hansen J test      | 0.228                    |

N = 2720. Table 4 presents the instrumental variable regression model results featuring financial optimism as a dependent variable using the generated instruments approach. Robust standard errors are denoted in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

### Table 5: Propensity score matching

| Variables          | DV = Financial optimism Unmatched sample | Matched sample |
|--------------------|-----------------------------------------|----------------|
| Financial fragility | -0.070**                                | -0.032***      |
| (0.030)            |                                         | (0.014)        |
| Controls           | Yes                                     | Yes            |
| Pseudo R squared   | 0.0499                                  | 0.2797         |

N = 2720. In Table 5, we present results for propensity score matching analysis. *** p < 0.01, ** p < 0.05, * p < 0.1.
4. Discussion and conclusion

The existing literature claims a decline in optimistic future expectations among people during the recession (Das et al., 2020). Further, the status and gender-based differences (Bjuggren & Elert, 2019; Jacobsen et al., 2014) are argued to disappear due to available macroeconomic information. We conducted this study when the pandemic was at its peak. For instance, during June and July (2020), 2,929,714 COVID-19 positive cases and 48,287 deaths were reported in the US (Worldometer, 2020). We found that financial fragility reduces financial optimism. Moreover, we found financial literacy to moderate the above linkage. These findings can have a significant impact on economy-wide activities. Our findings are based on forecasts for one year. Future studies may examine the impact of fragility on long-term financial optimism as individuals tend to be less optimistic in the short term and more in the long term (Kinari, 2016). Further, the countries where the pandemic was not as widespread as the US may report different financial optimism patterns. Our results are robust to potential endogeneity; however, the findings of the study are based on the cross-sectional survey data, and future studies may consider establishing a causal linkage based on longitudinal data and experiments. In our study, we have controlled for several factors; future studies may include more variables such as health status and time preference and also examine the impact of financial optimism on macro-economic development.

We contribute to the existing literature in the following ways. One, we examine financial optimism during the current pandemic when there is enormous uncertainty. Based on the financial optimism proxy, we find that people are, in general, optimistic, and financial fragility is negatively associated with financial optimism. Two, most of the prior literature has examined future financial expectations either without considering the role of financial literacy (Jacobsen et al., 2014) or by measuring financial literacy with weak proxies such as college education (Das et al., 2020). The present study provides strong evidence using robust financial literacy measures and suggests that it mitigates the negative impact of fragility on financial optimism. Three, we find significant gender differences in the existing linkage between financial fragility and financial optimism. Our findings provide valuable insights to policymakers in understanding the heterogeneity in financial expectations across various sub-groups. A lack of optimistic future expectations may lead financially fragile individuals to refrain from investing in stock markets, increase wealth inequality, and resist economic growth during the pandemic. The government can reduce these negative impacts by devising short-term strategies like targeting financially fragile women and enhancing their long-term skills like financial literacy to ensure optimistic expectations in the economy, contributing to economic revival.

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Appendix-A.1: Variables description

| Variable                  | Description                                      | Source         |
|---------------------------|--------------------------------------------------|----------------|
| Financial optimism index  | Financial optimism proxy created as mentioned in Table 1 | UAS-250        |
| Financial fragility       | Dummy—1 if the respondent is confident about coming up with $2000 if the need arises, and zero otherwise | UAS-250        |
| Financial literacy        | Sum of the number of correct answers to the FL scale. This measure was adopted from the American Life Panel and Lunardi and Mitchell (2017). | UAS-1          |
| Control variables         |                                                  |                |
| Age                       | Ordinal variable reporting the respondent’s age in numbers | General        |
| Male                      | Dummy—1 if the respondent is male, and zero otherwise | General        |
| College education         | Dummy—1 if the respondent has a college degree, and zero otherwise | General        |
| Income                    | Income reported in four different categories     | General        |
| Marital status            | Dummy—1 if the respondent is married, and zero otherwise | General        |
| Number of children        | Continuous variable reporting number of children | General        |
| Optimism trait            | Dummy—1 if the respondent rates her chances of living beyond 75 years as 90 percent or more following Puri and Robinson (2007) | UAS-23         |
| Employed                  | Dummy—1 if the respondent is currently working, and zero otherwise | General        |
| Financial confidence      | Respondent’s answer to confidence in making financial decisions on a scale of 1 to 10 (10— highest confidence) | UAS-3B         |
Appendix A.1 reports a detailed description of all the variables used in the study and their source of respective UAS survey waves.

Appendix A.2: Financial optimism index creation

We have created financial optimism index based on six individual questions where the respondents were asked about their personal financial condition, business condition in the U.S. and business condition in the county. The Wordings of each of these six questions is as follows.

Personal financial condition:
1. I feel that my current financial situation is:
Slider: 0 (Poor) - 100 (Excellent)
2. Now we would like to know what you think your financial situation will be a year from now. If you think things won’t change, you can leave the dot in the same position and click the box below the slider.
Slider: 0 (Poor) - 100 (Excellent)
I think that my financial situation a year from now will be:
Slider: 0 (Poor) - 100 (Excellent)
3. Please use the slider below to rate current business conditions in the U.S.
I think that current business conditions in the U.S. are:
Slider: 0 (Poor) - 100 (Excellent)
4. Please use the slider below to rate current business conditions in your county of residence.
I think that current business conditions in my county are:
Slider: 0 (Poor) - 100 (Excellent)
Business condition in the county
5. Please use the slider below to rate current business conditions in your county of residence.
I think that current business conditions in my county are:
Slider: 0 (Poor) - 100 (Excellent)
6. Now use the slider below to indicate what you think business conditions in your county of residence will be a year from now. If you think things won’t change, you can leave the dot in the same position and click the box below the slider.
I think that business conditions in my County a year from now will be:
Slider: 0 (Poor) - 100 (Excellent)

Based on these two questions in each of these two categories, we compared values on a scale of 0 (poor) to 100 (excellent). If the respondent has assigned the higher value meaning better condition for the question related to future, he is identified as an optimist (1), otherwise non-optimist (0). Thus, our final dependent variable proxy is binary in nature qualifying for the logistic regression analysis used in the study.

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