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Article

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Crypto household behavior and experience during COVID-19

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ABSTRACT

Many households struggled both physically and financially during the COVID-19 crisis. In a time of such uncertainty, one might expect households to respond differently to financial instruments considered risker than others. Given the nature and general feelings around cryptocurrency, we expected there might be differences in how households that owned cryptocurrencies fared during the COVID-19 crisis as compared to those that did not own cryptocurrency. Our research found that cryptocurrency-owning households reported fewer financial challenges during the pandemic than households that did not own cryptocurrency. Specifically, they were less likely to experience food insecurity or miss payments on a variety of bills, including medical expenses and utilities. Crypto households experienced less unemployment, as both the head of the household and the partner more readily adapted to working from home. Crypto households were also less likely to experience death from COVID-19 than their counterparts were. Data from the Federal Reserve's 2022 Survey of Consumer Finances (SCF) reveal that cryptocurrency-owning households in fact fared better than those who did not. The linear probability model results hold after correction for data imputation and controlling for financial literacy, willingness to take risks in the short- and long-term, income, wealth, gender, age, education level, work status, and race. These findings suggest a counternarrative to the mainstream opinion of cryptocurrency owners as risk-loving, irrational, retail day traders. This research contributes to the overall literature by showing households working with cryptocurrency make financially savvy decisions and are better off generally than their counterparts.

IMPACT STATEMENT

As cryptocurrency continues to gain traction and assuming it grows at current rates, society will be greatly affected. First, more households may consider expanding their portfolios with cryptocurrency. Assuming this occurs, more individuals and companies will need to become more familiar with this risky asset and other mechanisms through which one can invest in crypto assets, such as exchange-traded funds. Second, cryptocurrency usage is not only increasing among households but businesses too, including public companies. Investors may want to review their other investments, particularly stocks, to see how they may be indirectly invested in cryptocurrency. This consideration may affect other investment motivation considerations in the impact investing space. Last, we demonstrated households had different experiences with the COVID-19 shock event. Individuals may consider cryptocurrency as another asset to diversify in moving forward depending on other potential shock events besides pandemics, such as global or regional recessions or country currency changes in international markets due to political risk.

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With COVID-19 affecting much of the world in 2020, cryptocurrency creation has accelerated. The emergence of new cryptocurrencies in addition to Bitcoin has resulted in more trading not only among individuals and governments but also corporations, as well as legalization in the marketplace through the

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Securities and Exchange Commission (Gensler, 2024). We focus on how individual retail traders used and viewed cryptocurrency during the recent pandemic.

Retail investors strongly affect trading in cryptocurrency markets (Jain et al., 2019); thus, understanding their characteristics is crucial to understanding larger market movements, as they exert more power than ever before in this new, emerging marketplace. The recent 2022 Survey of Consumer Finances (SCF) provides another revelation into the identity and preferences of these retail investors, building upon the cryptocurrency questions of its predecessor. In this study, we seek to fill the literature gap concerning cryptocurrency in the presence of an exogenous shock to the global system through lockdowns and the resulting consequences of the worldwide pandemic in 2020.

Literature review

Cryptocurrency has been a factor for more than a decade. Bitcoin was the first asset in this context in 2008 and currently has the largest market capitalization. Most of the currency was mined before 2021 in China, before it banned the practice (Mathis, 2021). Although the common public belief is that this is used for illegal activities, only approximately 3% of transactions are considered criminal (Makarov and Schoar, 2021). Despite this low rate, tight regulation and taxation have been called for to increase the transparency of this new financial tool. Ownership is currently concentrated among the rich and those who mine it, which is a cause for concern moving forward (Vereckey, 2021). A recent survey among Generation Z suggests that increasing widespread crypto adoption could be conducted by making it more useful, easier to use, technologically less risky, and better supported and regulated by the government (Sagheer et al., 2022). A meta-analysis of current crypto users revealed that those who have a positive attitude toward investing in cryptocurrency expect crypto to perform well and invest because they believe crypto is an excellent value relative to its price (Bommer et al., 2023). Crypto was also viewed as an alternative investment to use to help increase diversification in portfolios, especially in bear markets outside the United States during the pandemic (Huang et al., 2021). In fact, the Bitcoin market became more efficient and experienced less risk than the U.S. stock market during COVID-19 (Wu et al., 2021). COVID-19 spurred a contagion effect that increased market prices and helped investors diversify their investments, especially with the new crypto Ether (Katsiampa et al., 2022). When crypto prices rise, there are many more first-time transactions as well as an increase in the volume of overall transactions; also, men tend to engage in crypto transactions more than women (The Dynamics and Demographics of U.S. Household Crypto-Asset Use. (n.d.)).

The literature also reveals the characteristics of Japanese crypto investors. Generally, they tend to be young males with higher incomes based on entrepreneurial roles and/or have higher education and higher levels of financial literacy, and thus greater overconfidence and lower risk tolerance to financial products (Fujiki, 2020). Based on this characterization, we hypothesize that U.S. households should show comparable results. In fact, one report estimates that 13.7% of Americans own cryptos, with the majority making six figures per year and being younger and more educated (Crypto Ownership United States 2022 – Triple-A, 2023). Considering these characteristics, we propose the following hypotheses:

H1: Crypto households were more financially resilient than non-crypto households during the pandemic.

Methodology

In 2023, the Board of Governors of the Federal Reserve System published a secondary data set and made it publicly available. The study was sponsored by the U.S. Federal Reserve Board in cooperation with the U.S. Department of Treasury and confidentially interviewed 6500 families. The resulting data set was analyzed for the present research and can be freely downloaded here: https://www.federalreserve.gov/econres/scfindex.htm.

This survey included a section concerning COVID-19 as well as how households experienced it during the pandemic in questions X19000 through X19049. This section included questions about employment changes, challenges paying bills, types of relief received, childcare, and health events related to COVID-

19 (Board, 2023). To figure out whether a household owned any cryptocurrency, we first observe whether the household had any other assets (The relevant question codes and responses are listed in the Supplementary Appendix). Once we coded the data into crypto and non-crypto households, we deployed t-tests on the COVID-19 questions and answers to reveal any statistically significant differences between the samples. All models, including z-tests, used the STATA *scfcombo* protocol, where weights were assigned according to variable x42001. The results displayed are after 200 repetitive bootstraps have occurred with data implicates of five since the data were imputed five times (according to the Fed). This protocol corrected the standard errors associated with the imputed data.

With respect to the COVID-19 questions (see the Supplementary appendix), the first 20 consider employment. Questions then turn to financial difficulties, such as trouble paying bills, debt forbearance for mortgages, and rent. More pandemic benefits were considered with respect to stimuli or other aid, including unemployment benefits. Questions were asked concerning specific challenges presented by the pandemic, including how childcare (if applicable) affected the household. The last question concerns diagnosis, hospitalization, persistence, and death due to COVID-19.

Results

The sample had 4595 unique households. Of these, 163 (3.5%) owned at least one cryptocurrency, which we note is lower by double digits in some cases than other estimates discussed earlier from the literature review. Table 1 provides summary statistics of the 22,975 observations. Note that this is the entire dataset, in which the data were imputed five times. Supplementary Appendix A provides specific data descriptions and calculations used to create the variables. Supplementary Appendix B provides the sample questions used to draw the data.

Table 2 provides the z-tests of the differences in means between households with and without cryptocurrency. Significance is shown by *, **, and *** at the 5%, 2.5%, and 1% levels, respectively. We see that there is a statistically significant difference in pandemic experiences between households with cryptocurrency and those without. Crypto households experienced fewer financial issues, fewer employment issues (with respect to the head of the household), and fewer COVID-19 issues than non-crypto households.

The next series of tables describes our models of interest and evaluates the hypotheses related to risk-taking behaviors during the pandemic. Control variables include willingness to take on financial and investment risks in the short and long term, respectively. We included the Big Three Financial Literacy

Table 1. Summary statistics.

Variable	Mean	Std. Dev	Min	Max
Crypto	0.035	0.184	0	1
Mis5	0.119	0.324	0	1
Mis4	0.069	0.253	0	1
Mis3	0.107	0.309	0	1
Par4	0.004	0.061	0	1
Par1	0.021	0.144	0	1
Hospital	0.036	0.187	0	1
Other	0.002	0.049	0	1
Auto	0.038	0.192	0	1
Part6	0.150	0.357	0	1
Unemp	0.245	0.430	0	1
Died	0.018	0.133	0	1
Finriskwilling	4.746	2.847	0	10
Investrisk	2.982	0.871	1	4
Finlit1	0.678	0.467	0	1
Finlit2	0.797	0.402	0	1
Finlit3	0.828	0.377	0	1
Logage	3.947	0.329	2.890	4.554
Logincome	11.550	2.070	0	19.865
Lognetworth	12.078	4.518	0	21.594
Variable	Mean	Std. Dev	Min	Max
Workstatus	0.756	0.351	0.115	1
Education	0.689	0.187	0	0.933
Ethnicity	0.246	0.161	0.143	1
Gender	0.761	0.426	0	1

Table 2. Z-Test differences in means.

Variable	Non-crypto	Crypto	Z-stat
Mis5	0.14	0.07	−2.97***
Mis4	0.08	0.03	−3.26***
Mis3	0.12	0.04	−5.58***
Par4	0.005	0.000	−5.00***
Par1	0.02	0.01	−3.80***
Hospital	0.0398	0.0029	−11.22***
Other	0.002	0.000	−3.84***
Auto	0.04	0.01	−3.48***
Part6	0.16	0.08	−2.68***
Unemp	0.29	0.08	−7.78***
Died	0.020	0.003	−5.45***

*, **, *** represents significance at the 10%, 5%, and 1% levels, respectively.

Table 3. Food Insecurity during the pandemic.

Variable	Coefficient (standard error)
Crypto	−0.046 (0.024)*
Finriskwilling	−0.008 (0.002)***
Investrisk	−0.007 (0.007)
Finlit1	0.008 (0.010)
Finlit2	−0.021 (0.011)
Finlit3	−0.007 (0.013)
Log(age)	−0.069 (0.018)***
Log(income)	−0.024 (0.005)***
Log (net worth)	−0.016 (0.002)***
Workstatus	0.009 (0.017)
Education	−0.185 (0.034)***
Ethnicity	0.020 (0.033)
Gender	−0.026 (0.011)**
Constant	1.054 (0.098)***
$R^2 = 11.25\%$	

*, **, *** represents significance at the 10%, 5%, and 1% levels, respectively.

Table 4. Missing medical payments during the pandemic.

Variable	Coefficient (standard error)
Crypto	−0.055 (0.017)***
Finriskwilling	0.000 (0.001)
Investrisk	−0.006 (0.007)
Finlit1	−0.002 (0.008)
Finlit2	−0.17 (0.009)
Finlit3	−0.001 (0.01)
Log(age)	−0.019 (0.013)
Log(income)	−0.022 (0.006)***
Log (net worth)	−0.008 (0.002)***
Workstatus	0.044 (0.012)***
Education	0.008 (0.022)
Ethnicity	−0.010 (0.024)
Gender	−0.002 (0.001)
Constant	0.486 (0.093)***
$R^2 =$	3.75%

*, **, *** represents significance at the 10%, 5%, and 1% levels, respectively.

Questions. The natural log of age and natural log of income are also included. Work status and education level were also included. A control for race/ethnicity, as noted by the Fed, was included (Aladangady et al., n.d.). Net worth was also determined to be important when considering pandemic experiences (Bricker et al., 2023). We computed the correlations between the controls to ensure that multicollinearity was reduced. None of the correlations was above the absolute value of 0.7. Supplementary Appendix Cprovides correlations for reference.

Table 3 provides our first linear probability model of the ability to afford food during the pandemic. The results show that crypto households were 4.6% less likely to experience food insecurity during the

Table 5. Missing utility payments during the pandemic.

Variable	Coefficient (standard error)
Crypto	−0.072 (0.015)***
Finriskwilling	−0.001 (0.002)
Investrisk	0.010 (0.008)
Finlit1	−0.030 (0.011)***
Finlit2	−0.017 (0.011)
Finlit3	−0.006 (0.013)
Log(age)	−0.063 (0.018)***
Log(income)	−0.021 (0.006)***
Log (net worth)	−0.011 (0.002)***
Workstatus	0.011 (0.018)
Education	−0.172 (0.028)***
Ethnicity	0.152 (0.031)***
Gender	−0.006 (0.010)
Constant	0.796 (0.108)***
R^2 =	9.59%

*, **, *** represents significance at the 10%, 5%, and 1% levels, respectively.

Table 6. New telework during the pandemic.

Variable	Coefficient (standard error)
Crypto	−0.008 (0.002)***
Finriskwilling	−0.000 (0.000)
Investrisk	−0.003 (0.002)
Finlit1	−0.001 (0.002)
Finlit2	−0.000 (0.002)
Finlit3	−0.002 (0.003)
Log(age)	−0.002 (0.003)
Log(income)	0.001 (0.000)**
Log (net worth)	−0.001 (0.000)
Workstatus	0.002 (0.002)
Education	−0.002 (0.006)
Ethnicity	0.013 (0.006)*
Gender	0.005 (0.002)***
Constant	0.015 (0.014)
R^2 =	0.57%

*, **, *** represents significance at the 10%, 5%, and 1% levels, respectively.

Table 7. Job loss during the pandemic.

Variable	Coefficient (standard error)
Crypto	−0.025 (0.005)***
Finriskwilling	−0.001 (0.001)
Investrisk	−0.006 (0.003)
Finlit1	0.004 (0.004)
Finlit2	−0.006 (0.005)
Finlit3	−0.009 0.006
Log(age)	−0.020 (0.006)***
Log(income)	0.001 (0.001)
Log (net worth)	0.000 (0.001)
Workstatus	0.006 (0.007)
Education	−0.067 (0.014)***
Ethnicity	0.028 (0.011)**
Gender	0.026 (0.002)***
Constant	0.132 (0.028)***
R^2 =	2.26%

*, **, *** represents significance at the 10%, 5%, and 1% levels, respectively.

pandemic, at an alpha level of 0.05. Short-term financial risk takers, younger households, wealthier households in terms of both income and net worth, higher educated households, and female-dominated households were all less likely to have had food issues due to COVID-19.

Table 4 shows the missing medical bills. We found that 99% confident crypto households were 5.5% less likely to miss payment on a medical bill. Wealthier households in terms of both income and net

Table 8. Hospitalization during the pandemic.

Variable	Coefficient (standard error)
Crypto	−0.024 (0.005)***
Finriskwilling	−0.003 (0.001)**
Investrisk	0.002 (0.004)
Finlit1	0.002 (0.006)
Finlit2	0.008 (0.008)
Finlit3	0.010 (0.006)
Log(age)	0.020 (0.011)
Log(income)	−0.001 (0.002)
Log (net worth)	−0.000 (0.001)
Workstatus	0.001 (0.009)
Education	−0.096 (0.020)***
Ethnicity	0.064 (0.024)***
Gender	0.010 (0.006)
Constant	0.008 (0.049)
R^2 =	1.83%

*, **, *** represents significance at the 10%, 5%, and 1% levels, respectively.

Table 9. Auto loan defaults during the pandemic.

Variable	Coefficient (standard error)
Crypto	−0.043 (0.001)***
Finriskwilling	0.001 (0.002)
Investrisk	−0.010 (0.001)*
Finlit1	0.000 (0.001)
Finlit2	−0.007 (0.004)
Finlit3	0.003 (0.009)
Log(age)	−0.006 (0.009)
Log(income)	−0.007 (0.004)
Log (net worth)	−0.004 (0.001)***
Workstatus	0.040 (0.010)***
Education	−0.054 (0.019)***
Ethnicity	0.056 (0.017)***
Gender	0.002 (0.007)
Constant	0.204 (0.057)***
R^2 =	2.32%

*, **, *** represents significance at the 10%, 5%, and 1% levels, respectively.

Table 10. Head of household partner continued reporting to work during the pandemic.

Variable	Coefficient (standard error)
Crypto	−0.133 (0.024)***
Finriskwilling	0.002 (0.002)
Investrisk	0.021 (0.007)***
Finlit1	−0.014 (0.011)
Finlit2	−0.004 (0.012)
Finlit3	0.024 (0.014)
Log(age)	−0.084 (0.017)***
Log(income)	0.037 (0.004)***
Log (net worth)	0.005 (0.001)***
Workstatus	0.066 (0.015)***
Education	−0.082 (0.028)***
Ethnicity	−0.044 (0.024)
Gender	0.155 (0.008)***
Constant	−0.148 (0.089)
R^2 =	9.93%

*, **, *** represents significance at the 10%, 5%, and 1% levels, respectively.

worth were also less likely to miss payments. Interestingly, individuals who worked more were more likely to miss making payments.

Table 5 regresses the likelihood of missing a utility payment during the pandemic with our variable of interest, crypto, against the other controls. At the 1% level, we found that crypto households

Table 11. Death experienced due to COVID-19.

Variable	Coefficient (standard error)
Crypto	−0.022 (0.005)***
Finriskwilling	0.002 (0.001)
Investrisk	0.002 (0.003)
Finlit1	−0.008 (0.005)
Finlit2	0.006 (0.004)
Finlit3	−0.009 (0.006)
Log(age)	−0.018 (0.011)
Log(income)	−0.002 (0.001)
Log (net worth)	0.001 (0.001)
Workstatus	−0.004 (0.009)
Education	−0.005 (0.012)
Ethnicity	0.037 (0.016)**
Gender	−0.007 (0.006)
Constant	0.097 (0.051)
R^2 =	0.78%

*, **, *** represents significance at the 10%, 5%, and 1% levels, respectively.

experienced a 7.25% lower likelihood of missing a utility payment than non-crypto households. Individuals who knew how to diversify with mutual funds were also less likely to miss payments, along with older households, wealthier households, and more educated households. Non-white households were 15.7% more likely than average to miss utility payments during the pandemic.

Table 6 provides a model that predicts the likelihood of a new job using teleworking during the pandemic. Non-crypto households were 0.8% less likely to engage in new work. Households with higher incomes were more likely to do new telework, along with non-white heads of households and female heads of households.

Table 7 considers job losses during COVID-19. Crypto households were 2.5% less likely than average to experience job loss (at the 1% level). Older households and households with higher education levels were also less likely to experience job loss. Non-white heads of households and female heads of households experienced more job loss during the pandemic.

Table 8 attempts to predict whether a household had an individual hospitalized due to COVID-19 during the pandemic. Crypto households experienced this 2.39% less than non-crypto households ($Z = -5.20$). Households willing to take short-term financial risk also experienced hospitalization less. Higher-educated households experienced this less. Unfortunately, non-white households had more hospitalizations.

Table 9 considers the defaults on auto loans during the COVID-19 pandemic. Crypto households were 4.35% less likely to experience this ($Z = -4.48$). Individuals willing to take on long-term investment risk were more likely to experience defaults, along with non-white households. Households with fewer work hours are more likely to default. Households with more income, wealth, and higher education are less likely to default on car loans.

Table 10 attempts to predict whether the partner to the head of household continued working on-site during the pandemic. Crypto households were 13.29% less likely to have to report to work on-site (at the 1% level). Households with low tolerance to long-term investment risk were more likely to report to physical work locations, along with female heads of household. Households with younger heads of household and more education were less likely to report to work physically. Households with more income and more wealth worked more on site. Heads of household with a work status besides full employment were more likely to work on site.

Table 11 shows the deaths experienced in a household directly due to the COVID-19 pandemic. Crypto households were 2.2% less likely to have had a household death due to the coronavirus (at the 1% level). Unfortunately, non-white households experienced more deaths.

We consider other variables and test for robustness. First, we considered a zero-one indicator control for the presence of children (an indicator of one if any of the following variables were "yes" to children: x6530, x6531, and x19040-5) in the household. All results continue to hold, with little to no significance of the control in all regressions.

Second, we consider controlling for the partner's gender (x103/2, where 0 means no partner, 1/2 indicates male, and 1 indicates female). The results continue to hold, except in the first model. Partner was statistically significant in most models; however, partner was correlated with gender at 0.69. Thus, we did not report regressions with this because of collinearity concerns. Third, we considered the marital status of the interviewees and their potential partners (x7372/6). Crypto remained statistically significant and robust to inclusion of this control. Legal status was statistically significant in the partner regressions corresponding to new telework and job loss, as well as in the auto model. However, legal status and partner were correlated at 0.78; therefore, we did not include the results here, given concerns of autocorrelation.

Finally, we considered the percentage of cryptocurrencies held compared to net worth. We totaled the values of cryptocurrency and divided this by net worth. When considering all the data, most of the results were insignificant except at the 10% level for new telework and lost jobs and at the 1% level for reporting to work. We reran the models on only the subsample of crypto households and found no results. Thus, it was not the value or amount of cryptocurrency held by households that matters, but simply the presence of the asset itself, regardless of the amount, which was robust to our earlier findings.

Conclusions

We found that U.S. households that held cryptos were relatively financially resilient during the global pandemic. Specifically, households that invested in cryptocurrency were less likely to have food insecurity issues and less likely to miss paying a variety of bills because they remained employed and healthy. The evidence shows that this was not only true of the head of the household but also for others in the household, especially their partners, as they were relatively more adaptable and continued to work from home.

Further research could investigate whether there were other prior events that made individuals more likely to go ahead in the manner they later chose, or if the pandemic was the catalyst that caused the change. In addition, in a few years, new survey data can be examined to discover whether crypto adopters remained at the same percentage or continued to grow. Specifically, new adoption by the SEC can be another exogenous shock to consider when reviewing future data concerning U.S. household usage of cryptocurrency (Gensler, 2024).

Author contributions

RB: Wrote the literature review, drafted the introduction of the paper and conducted initial analysis and interpretation of the data. JG: Reviewed the analysis, critically revised the paper for intellectual content, and worked on the final approval version for submission. Both authors collectively agreed to be accountable for all aspects of the work.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Data availability statement

The study used publicly available data from the 2022 Survey of Consumer Finances from the Board of Governors of the Federal Reserve Board which is available from https://www.federalreserve.gov/econres/scfindex.htm. The authors are ready to make the data and any materials associated with the paper available to anyone upon reasonable request.

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