How Extended Family Mental Health Issues Influence Household Portfolio Allocations

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This Version: December 2018

Abstract

Growing research links household financial decisions and health status within the nuclear family. However, the focus on the nuclear family could underestimate the health-wealth effect. Previous research finds that household wealth can decline when an extended family member experiences a physical health shock. We expand current economic modeling to investigate the connection between portfolio allocations and mental health among siblings. Mental health conditions affect nearly one fourth (23%) of the adult U.S. population. We hypothesize that mental health issues outside of the nuclear family unit are a unique contributor to household portfolio allocation decisions. We use panel data and find significant effects of having at least one sibling with a mental health issue on household financial decisions. The effects include decreased probability of risky asset ownership (stocks, mutual funds), decreased risky assets as a share of financial assets, and decreased total amount of risky asset holdings.

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"[M]an is allotted a much humbler department... the care of his own happiness, or that of his family, his friends ...."
–Adam Smith, *The Theory of Moral Sentiments*, 1759

1 Introduction

The care of family can have an influential impact on how people behave. In particular, having a sibling with a mental health issue is something that could have a dramatic effect on a household's behavior. In the field of economics, as early as Smith (1759), we can find the groundwork for issues related to modern household portfolio choice, care, and familial networks.[1] More recently, issues related to nuclear family structure and household financial decisions have come to the forefront (Bogan (2013); Love (2010)).

Further evidence indicates that the extended family can influence portfolio allocation decisions. Chiteji and Hamilton (2002, 2005) and Toney (2017) find that economic fragility in the extended family can substantially lower the probability of an investor accumulating overall wealth, and can contribute to intergroup inequality in wealth. Li (2014) reveals that kin networks can assist with stock ownership. A sibling that is a first time stock owner can share information with another sibling, aiding their decision to become a stock owner.

Household financial decisions also are shaped by the health status of family members. The literature, however, primarily highlights the link between health and financial market participation, mostly in the context of the nuclear family unit (Rosen and Wu (2004); Edwards (2008); Bogan and Fertig (2013); Bogan and Fertig (2018)). An area that has received limited attention is the relationship between household finances and the health of extended family members (Bogan (2015); Heflin and Chiteji (2014)).

We expand current economic modeling to include connections in sibling networks. It is within these networks that we analyze the relationship between financial decisions and mental health. We focus on mental health conditions as they are prevalent among the American population. In fact, mental health issues affect 55 million people, or nearly one fourth (23%) of the U.S. population over the age of 18 (National Institute of Mental Health, 2017).

Using the Panel Study of Income Dynamics (PSID), we investigate how health characteristics of sibling households affect financial behaviors. In our sample, the household head in 23% of focal (eldest) sibling households have mental health issues (psychological distress). The household head in 26% of non-focal (younger) sibling households have

[1]The key insight from *The Theory of Moral Sentiments* is fundamentally about personalized relationships and sympathy, according to Viner (1927), an economic historian. The sentence directly preceding the epigraph that we have quoted from Smith is "[t]he administration of the great system of the universe, ... the care of the universal happiness of all rational and sensible beings, is the business of God and not of man." The humbler department of man indicates that there is an invisible spectator that guides the behavior or decisions of humans toward family and friends.

mental health issues. We find significant effects of having at least one sibling with mental health issues on household financial decisions: decreased probability of risky asset ownership (stocks and mutual funds), decreased risky assets as a share of financial assets, and decreased total value of risky assets. Since having risky assets in a household's portfolio represents an important route to wealth building, extended family health issues may impose a constraint on that accumulation. These results have important implications for understanding portfolio allocation and wealth building.

2 Related Literature

2.1 Nuclear Family and Household Finances

Previous scholars emphasize the aspects of physical health of the nuclear family on portfolio allocation. Rosen and Wu (2004) use the Health and Retirement Study (HRS) to examine how changes in self-reported health status are linked to changes in financial wealth portfolio composition. The main finding of the paper is that there is a lower tendency among households that report their health as being poor or fair to carry risky assets in their portfolio. In fact, experiencing poor physical health is associated with a lower proportion of wealth in risky investments and a higher proportion in safe instruments.

Edwards (2008) explores the link between the amount of risk exposure to investment portfolios and the risk to an individual's health, using data from the study of Assets and Health Dynamics Among the Oldest Old (AHEAD).[2] This paper finds that, overall, the proportion of a household's portfolio invested in risky assets decreases by 14 percentage points when there is the prospect of health risk for the elderly.

Bogan and Fertig (2013) broaden the alliance between health and portfolio choice by focusing on mental health. Mental health is becoming an increasingly important issue as the proportion of Americans affected by mental illness is close to one fourth (23%) of the US population (National Institute of Mental Health, 2017). Overall, Bogan and Fertig (2013, p. 13) find that households that struggle with mental health issues are less likely to invest in risky assets.[3] Moreover, they find that single women who struggle with psychological distress show a tendency to increase the proportion of their portfolio in safe assets.[4] Finally, men with cognitive limitations place a greater proportion of their wealth in retirement and pension assets.

[2]Health risk is a self-reported measure, capturing the projection that expenditure on medical needs will completely absorb, within five years, what the household has saved.

[3]Risky assets take the form of "shares of stock in publicly held corporations, mutual funds, or investment trusts, not including assets in individual retirement accounts (IRAs), Keogh accounts, 401Ks, or similar defined contribution pension plans."

[4]Safe assets are defined in the paper as "savings and checking accounts, money market funds, CDs, government bonds, T-bills, cash in a life insurance policy, a valuable collection, bond funds, or rights in a trust or estate."

Bogan and Fernandez (2017) investigate the importance of childhood health on household asset market participation.[5] They find that the likelihood of holding risky assets in a household's portfolio declines by 3.26 percentage points when a parent has a child that is impaired by a mental disability. Meanwhile, safe asset ownership is curtailed by 1.33 percentage points when a household has a child with a mental disability. Bogan and Fernandez (2017) also find that conditional on investing in the stock market, a household with a special needs child has an increased probability of risky asset ownership. For households with children living with a mental disability, the hurdle model predicts a decrease in the log-odds of possessing safe assets. Finally, households that contain children with a mental disability are likely to have a greater proportion of their total assets devoted to risky instruments.

2.2 Extended Family and Household Finances

The extended family could have both positive and negative influences on portfolio allocation decisions of a household. Chiteji and Hamilton (2002, 2005) find that economic fragility in the extended family (e.g siblings and parents) can substantially lower the probability of an investor accumulating overall wealth, and risky asset (i.e. stocks) holding and safe asset (i.e. checking and saving accounts) holding. Toney (2017) reveals that for intermediate income earners, grandparental poverty need pressures can absorb the ability for the current generation to accumulate wealth. Hence, socioeconomic status in the family tree is a unique contributor to an individual's financial status.

Conversely, kin networks can assist with an individual's equity investments and portfolio choices. Chiteji and Stafford (1999) reveal that adult children are more likely to become a stock owner if their parents were a stock owner. Similarly, Li (2014) finds that for an adult child with a parent who acquires stock, the odds of an adult child making an equity purchase is 34% higher than the odds for an investor without a parent making such a purchase. The paper also considers other familial cases. The odds of a parent becoming a stock owner is 23% larger than the odds for a parent that does not have offspring that buy stock. The odds are 2.7% higher for an investor to purchase stock, provided that their brother or sister recently bought stock. Understanding inter-household family connections, and how they relate to personal household finance decisions, can help to shed light on contemporary forces driving wealth accumulation and disparities.

Heflin and Chiteji (2014) explore how a sibling in poor health or poor economic standing may influence a household's financial wealth.[6] They find that the net wealth

[5] A dimension of childhood health that is recognized is mental disabilities, defined by "autism, lead poisoning [exposure], mental retardation, pervasive developmental delay, or speech language delay/disorders" on financial decisions.

[6] Data used in the analysis are from the PSID and date from 1999 to 2005. The sample is restricted to household heads that are between the ages of 25 and 54 in 2005. These households are then matched with their full biological brothers or sisters, yielding 4,059 sibling pairs. Those pairs are part of 1,352

prospects for an individual falls by as much as $14,000 when a sibling with low income faces poor heath. In other words, not only are there poverty need pressures, but also there are health need pressures of a kin relative, that affect households. A household from the middle class (income that is within the 33rd and 66th percentile) will face a $42,000 reduction in net wealth when a middle class sibling develops poor health.

Similar to Heflin and Chiteji (2014), we expand current economic modeling to include connections in sibling networks. However, we hypothesize that mental health issues outside of the nuclear family unit are a unique contributor to household portfolio allocation decisions. We attempt to offer additional insights into the effect of health on household economic status through financial decision-making. Moreover, we capitalize on a substantial panel study to highlight a slightly longer time series and process of asset generation (1999 to 2015).

3 Data

3.1 PSID

We use the PSID for our analysis since it is possible to link siblings of a family network to explore extended family health issues and portfolio allocations. The PSID is nationally representative and includes U.S. household economic data (e.g. employment, income, wealth, asset components); health data (e.g. physical, mental); and demographic data (e.g. family characteristics, marital status). We collect data on siblings from the original 1968 PSID. The siblings in our sample are born between the years of 1947 and 1967. During the time period from 1947 to 1967, the number of children per family unit was approximately four (3.7) (U.S. Census Bureau (2017)).[7] This means that in 1968 households it was common for the eldest siblings to have three other siblings. Thus, we use only households that have four or fewer children, which accounts for almost 90% of the 1968 households (see Table A1 of Appendix).

The data set is composed of 610 focal siblings (eldest siblings) that are repeatedly observed over 39 periods (610*39 = 23,790 person year observations), from 1968 to 2015.[8] However, for our regression analysis we restrict the observation years to 1999 to 2015 (5,697 person year observations). We do this for a number of reasons, based on data availability, and economic context.[9]

different families, implying that there are around three siblings per family.

[7]In *The Pecking Order: Which Siblings Succeed and Why*, Conley (2004, pg. 70) reports a similar average for children in the family unit (3.7) for 1950.

[8]The data is strongly balanced. Time periods include 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013, 2015.

[9]The time period selected allows us to highlight asset allocation and portfolio decisions over numerous business cycles in the US. Since 1999, levels of economic activity have been shaped by the dot-com boom;

The majority of health variables of interest are collected beginning in the 1999 wave and in subsequent waves of the PSID. They include the K-6 score that measures psychological distress and a mental health diagnosis variable. We focus on the K-6 score because of two main issues with the mental health diagnosis variable. First, PSID respondents are inconsistent in reporting whether or not they had a mental health diagnosis. Between the observation years of 1999 and 2015, the question that is posed to PSID respondents is: "Has a doctor or other health professional EVER told [you] that [you] had ... [a]ny emotional, nervous, or psychiatric problems?" Respondents do disclose that they had a mental health diagnosis, but then in subsequent years often report that they do not. While we do correct this inconsistency issue,[10] there remains an inherent wealth bias in the mental health diagnosis variable. Affluent households are more likely, compared to other socioeconomic classes, to obtain a mental health diagnosis. Given these issues, we focus our analysis on the K-6 score. Nonetheless, we do replicate our results with the mental health diagnosis variable (see robustness check section).[11]

3.2 Designating Focal Siblings

Through the original PSID sample of 1968 we compile siblings that are living with their parents and are between the ages of 1 and 21. By 1999, these siblings are between the ages of 32 and 52, a majority of whom have become either a household head or wife of a household head (see Table 2).

We designate the oldest child of the family as the focal sibling and all other siblings in a household as non-focal siblings. Evidence from economic research finds that younger siblings are likely to learn about asset classes from their older siblings (Lusardi, 2003). Further, sociological research reveals that the oldest and the youngest offspring are likely to be the most successful (Conley, 2004, p. 65). Within our sample we find that a higher level of median financial wealth is attributable to those focal siblings with fewer siblings. In 2015, focal siblings with one sibling have a median net worth of $122,500, while focal siblings with more than five siblings have a median net worth of $33,000.

the recession between March 2001 and November 2001 and subsequent recovery; the global real estate boom and the crisis between December 2007 and June 2009 and recovery period. Recession dates are from the National Bureau of Economic Research, http://www.nber.org/cycles.html.

[10] We scan the dichotomous mental health diagnosis variable for each sibling, taking note of the first year a sibling discloses that they had a mental health diagnosis (1=yes). We use such disclosure to ensure that subsequent responses are aligned with their first record of having a mental health diagnosis.

[11] These empirical results are qualitatively similar to our main results, supporting the core hypothesis of our paper.

3.3 Summary Statistics

We collect data on siblings that live with their parents in the original PSID sample of 1968. Table 1 presents the demographic composition of focal and non-focal siblings as young children. The children have birth years between 1947 and 1967, and are between the ages of 1 and 21 in 1968. As survey participants, their observations number 1,740. On average, the focal siblings are 12.86 years old, while the non-focal siblings are 8.66. We follow the children across the panel study until 2015 when a majority of them are household heads (see Table 2).[12]

Table 1: **Siblings are living with their parents in 1968**

	Focal Siblings	**Non-Focal Siblings**	**Total**
Observations	610	1,130	1,740
Race			
Black [#, %]	206 (34.97%)	470 (42.10%)	
White [#,%]	398 (64.08%)	652 (57.25%)	
Age			
Average	12.86	8.66	
	(0.22)	(0.15)	
Median	14	8	

Notes: In 1968, siblings are between the ages of 1 and 21. For example, out of 1,740 siblings, 610 are the oldest siblings in their family, while 1,130 are the youngest. Meanwhile, we do find, but do not profile in this table, an additional 23 older siblings below the age of 21 that are not living with their parents. There are no age or racial differences between the older siblings that live with their parents versus older siblings that do not live with their parents in 1968, according to a Welch's t test. For the age analysis, the p value (0.88) > significance level (0.05). With respect to race, the p value (0.84) > significance level (0.05).

[12]The methodology used is one that is described as a life course analysis. Orientation on this approach comes from previous work on sibling well-being by Mazumder (2011). Mazumder (2011) uses an age range of 1 to 17 in 1968. Further orientation comes from sociological scholarship on the transmission of socioeconomic status by Conley and Glauber (2008). They use an age range of 6 to 21 in 1984. Given this precedence, our sample restriction criteria uses 1 as the lower age bound and 21 as the upper age bound. In the PSID, an age value of 1 is defined as being a newborn or being on the verge of turning two years of age.

Table 2: **Life after living with parents, 1999-2015**

(a) **Panel A: Focal Siblings**

Year	Nonresponse	Became Head	Became Wife	Lived with Parents	Lived with Siblings	Lived with Children	Lived with other Relatives	Total
1999	42	358	191	17	0	1	1	610
2001	30	364	194	18	2	1	1	610
2003	30	374	186	14	4	2	0	610
2005	28	381	183	13	4	1	0	610
2007	24	387	182	12	4	1	0	610
2009	17	391	176	16	7	2	1	610
2011	10	401	172	16	8	2	1	610
2013	14	409	166	12	7	1	1	610
2015	0	429	163	7	7	3	1	610

(b) **Panel B: Non-Focal Siblings**

Year	Nonresponse	Became Head	Became Wife	Lived with Parents	Lived with Siblings	Lived with Children	Lived with other Relatives	Total
1999	64	669	333	51	12	0	1	1130
2001	64	679	338	43	3	1	2	1130
2003	52	704	329	33	8	3	1	1130
2005	42	707	335	33	10	3	0	1130
2007	36	713	333	30	14	2	2	1130
2009	27	731	330	26	10	4	2	1130
2011	26	744	318	26	7	6	3	1130
2013	25	758	305	23	10	7	2	1130
2015	0	779	307	21	13	8	2	1130

Notes: Out of the 610 focal siblings in 1968, 358 became head of household and 191 became wife of household head by 1999. The PSID continues to follow the individuals that were part of the original sample of 1968, regardless of their marital status or position in the family unit.

3.4 Socioeconomic Profile of Siblings

Table 3 describes the socioeconomic status of the siblings that make the household finance decisions. Decision makers that hold the distinction of being the oldest siblings – labeled focal siblings in Columns (1)-(3) – number 429. Thirty-five (35.13%) percent of focal siblings are female. Focal siblings are, in terms of median age, in their early sixties. In the sample, 41.92% of focal siblings are married. Focal household heads exhibit an educational accumulation that is above the high school level (13.84 average years of education). The median income for the focal sibling group is $56,400. Overall, focal siblings possess a median net worth, calculated with home equity, of $91,000.

Columns (4)-(6) of Table 3 present the observable social and economic characteristics of the non-focal sibling households (younger siblings). The total number of non-focal sibling household heads is 779. Thirty-nine (38.86%) percent of non-focal siblings are female. The median age for the non-focal siblings is around 55. Nearly 40% of non-focal siblings are married. Non-focal decision makers, on average, have over 13 years of education. The median income attributable to the non-focal sibling group is $71,539. The median household net worth, adjusted for home equity, is $44,000.

Table 3: **Socioeconomic Characteristics of Siblings, 2015**

	Focal Siblings	**Non-Focal Siblings**
Household Head Observations	429	779
Sex		
Female	35.13%	38.86%
Age		
Average	59.69	55.52
	(0.25)	(0.18)
Median	61	55
Household Structure		
Married	41.92%	39.51%
Never Married	14.99%	19.17%
Widowed	7.03%	5.70%
Divorced	29.04%	29.27%
Separated	7.03%	6.35%
Children in household	1.44	1.41
	(0.10)	(0.06)
Education		
Average Years	13.84	13.30
	(0.11)	(0.08)
Household Income		
Average	$84,590	$71,539
	(5159.71)	(2662.89)
Median	$56,400	$50,834
5 year Average	$93,236	$76,413
	(4912.25)	(2736.09)
Household Wealth		
Wealth with Home Equity		
Mean	$428,964	$262,788
	(44924.94)	(22073.01)
Median	$91,000	$44,000
Wealth without Home Equity		
Mean	$316,756	$187,437
	(38759.16)	(19497.06)
Median	$21,850	$12,700

Notes: Each sibling in this table is a household head (see Table 2 for details). Standard errors are in parentheses. Household income and wealth figures are in 2015 dollars, adjusted with CPI of BLS.

3.5 Financial Portfolio of Sibling Households

3.5.1 Focal Siblings

Table 4 summarizes the major asset components held by focal and non-focal sibling households. A consistent finding of this table is that average asset ownership and accumulation tends to rise with age. Nearly 66% of focal siblings are homeowners. Twenty (20%) percent of focal siblings claim ownership of stocks. Nearly 31% of focal siblings own a pension. Seventy five (75%) percent of focal siblings own a safe asset, including checking accounts, saving accounts or government saving bonds. Constituents parts of other assets include "cash value in a life insurance policy, and a valuable collection for investment purposes," according to the PSID questionnaire. The rate of ownership of this type of investment is 17% for the focal siblings.

3.5.2 Non-Focal Siblings

As shown in Table 4, nearly 63% of all non-focal siblings are property owners in residential neighborhoods. About 12% of the non-focal siblings have an ownership stake in the stock market. Nearly 22% of non-focal siblings hold part of their wealth in pension assets. A slightly lower proportion of non-focal siblings have checking and savings accounts (67%) compared to focal siblings (75%). The proportion of non-focal households that own other investments is 16%.

3.6 Health of Sibling Households

Table 5 summarizes the health profile of extended family members, including self reported health status, acute and chronic conditions, substance use, health care expenditures, and mental health issues. We utilize the PSID's K-6 score as a measure for mental health issues. The K-6 score is a continuous variable, and is a proxy measure for psychological distress (Kessler et al. (2003); Furukawa, Kessler, Slade, and Andrews (2003)). As a measure it is derived from individual responses to six diagnostic dimensions of mental health.

Those six dimensions include being nervous, restless, hopeless, feeling sadness or worthless, or feeling as if everything took effort in the past month. On each dimension a respondent must answer within a range of 0 and 4. The lowest value means that they felt distress at no time, and the highest value signifies that they felt distress all of the time. These responses comprise the K-6 score, which falls between 0 and 24.

Similar to Bogan and Fertig (2018) we construct groupings and show that moderate and severe levels of psychological distress influence household portfolio allocations. A sibling with moderate distress is captured by a K-6 score that is between 5 and 12 (Prochaska, Sung, Max, Shi, & Ong, 2012). A sibling with severe distress has a K-6 score

Table 4: **Portfolio Profile of Siblings, 2015**

	Focal Siblings	**Non-Focal Siblings**
Household Head Observations	429	779
Asset Components		
Home Equity		
Owns a Home	66%	63%
Mean Value	$180,969	$150,642
	(16323.40)	(9528.09)
Median	$125,000	$95,000
Stocks		
Owns Stock Wealth	20%	12%
Mean Value	$499,435	$654,226
	(104,922)	(366,421)
Median	$120,000	$100,000
Pension (Annuity/IRA)		
Owns an Annuity/IRA Account	31%	22%
Mean Value	$336,100	$309,884
	(43476.88)	(30729.88)
Median	$190,000	$165,000
Safe Assets		
Owns Safe Assets	75%	67%
Mean Value	$32,413	$30,620
	(4032.14)	(4209.75)
Median	$7,000	$6,000
Other Investments		
Own Other Investments	17%	16%
Mean Value	$55,496	$58,937
	(9778.78)	(8683.99)
Median	$24,500	$24,000

Notes: Each sibling in this table is a household head. Standard errors associated with means are in parentheses. Household portfolio components are in 2015 dollars, adjusted with CPI of BLS.

that is 13 or higher (Kessler et al., 2003). Both moderate and severe distress variables are cast as dummy variables in our regression analysis.

Table 5 (see mental health category) shows that a smaller proportion of focal and non-focal siblings experience severe distress, in contrast to a larger proportion of focal and non-focal siblings that experience moderate levels of distress. There are no discernable differences, however, among siblings that possess moderate or severe psychological distress. In other words, the prevalence of moderate or severe psychological distress is roughly similar between focal and non-focal siblings. Similarly, there are no discernable differences between sibling networks in the underlying dimensions of mental health and emotional problems.

More substantial differences exist in the distribution of acute physical health problems and chronic diseases. Table 5 reveals that acute and chronic burdens tend to rise with age, with a higher concentration of affliction among focal siblings. Physical health issues are part of the story when it comes to outlining the triggers of portfolio allocation decisions (Rosen and Wu (2004); Edwards (2008)). That is why we control for physical health in our empirical analysis.

Table 5: **Health Profile of Siblings, 2015**

	Focal Siblings	**Non-Focal Siblings**
Household Head Observations	429	779
Mental Health		
Moderate Distress (K-6 score is 5-12)	17.76%	19.5%
Severe Distress (K-6 score is 13+)	5.38%	6.2%
Nervous	38.1%	36.56%
Restless	41.27%	43.61%
Hopeless	15.87%	15.58%
Everything was an effort	32.73%	33.87%
Worthless	11.79%	12.76%
Sadness	21.85%	22.83%
Emotional Problems	10.56%	10.92%
Physical Health		
Healthy (Excellent or Very Good)	46.37%	42.1%
Excellent	13.38%	10.89%
Very Good	33.1%	31.26%
Good	29.58%	36.19%
Fair	18.08%	16.21%
Poor	5.87%	5.45%
Sick (Fair or Poor Health)	23.89%	21.63%
Acute Conditions		
Stroke	5.4%	4.55%
Cancer	11.5%	7.42%
Lung Disease	8.69%	6.87%
Heart Attack	8.22%	5.19%
Chronic Diseases		
Heart Disease	9.86%	6.75%
Diabetes	21.41%	16.38%
Arthritis	33.8%	25.06%
Hypertension	52.82%	45.97%
Asthma	14.55%	9.6%
Substance Use		
Smoke	17.98%	22.29%
Average Cigarettes per day	11.08	11.63
	(0.76)	(0.57)
Median Cigarettes per day	10	10
Alcohol	58.2%	69.31%
Average Alcoholic Beverages per Day	2.18	2.37
	(0.11)	(0.09)
Median Alcoholic Beverages per Day	2	2
Health Care Expenditure		
Mean	\$4,152	\$3,811
	(266.84)	(303.81)
Median	\$1,884	\$2,127

Notes: Each sibling in this table is a household head. Standard errors associated with means are in parentheses. There are statistically significant differences between focal siblings and non-focal siblings on health measures (see Table A5 in Appendix).

3.7 Mental health diagnosis

Table 6 describes the age at which a focal and non-focal sibling is first diagnosed with a mental health condition. The average age a focal sibling receives their first diagnosis is at age 50. For a non-focal sibling the average age is 47.75, 45.98 and 41.80, respectively. In other words, non-focal siblings are more likely to be diagnosed with a mental health condition at a younger age.

Table 6: **Age at First Mental Health Diagnosis.**

	(1)	(2)	(3)	(4)
	Focal Sibling	**Non-Focal Sibling #1**	**Non-Focal Sibling #2**	**Non-Focal Sibling #3**
Mean	50.75	47.75	45.98	41.80
StdError	(0.2195)	(0.2354)	(0.2820)	(0.2723)
Median	51	47	46	43
Min	35	32	31	33
Max	67	66	63	50

4 Empirical Strategy

We explore how mental health issues outside of the nuclear family unit might contribute to household portfolio decisions. To analyze the extensive margin of asset market participation we use linear probability models (LPM) and logistic regressions. To explore the intensive margin we use a hurdle model, where stock ownership is identified as the hurdle. Additionally, we look at the absolute amount of assets held using OLS and quantile regressions. To chronicle the household wealth decisions stemming from extended family members with changes in their mental health status, we also run fixed effects regression models.

4.1 Asset Ownership

We apply the following model to consider the extensive margin of asset ownership:

$$Asset_{it} = \alpha_i + \mathbf{X}'_{it}\beta + \mathbf{S}'_{it}\theta + \gamma Year_t + \epsilon_{it} \tag{1}$$

where $Asset_{it}$ is an asset ownership variable for focal sibling i in time t. $\mathbf{X}_{it}$ is a vector of focal sibling control variables that include demographic, socioeconomic, family background, health status, health expenditures, geographic region, and preference for risk measures. In particular, the variables in $\mathbf{X}_{it}$ include age, age squared, gender, whether household head is married, number of children in household, education, race, household income, employment status, occupation labor status in professional or management positions, number of siblings, preference for risk, computer/ internet use, mental and physical health. $\mathbf{S}_{it}$ is a vector of non-focal sibling control variables, including physical and mental health status. $Year_t$ is a vector with time dummies. The ϵ_{it} is an error term. Focal sibling and non-focal sibling control variables are summarized in Table A4, and variables are described, in the Appendix. The extensive margin refers to financial market participation. The dependent variable is dichotomous, thus we apply linear probability models (LPM) and logit regression models to the panel data. A logit model is virtuous because it calculates the probability that a dichotomous variable will take on the value of one (=own a certain asset class) as opposed to zero (=does not own that asset class). The LPM is a regression approach that estimates the binary dependent variable (possess asset type or not) using an OLS method. Thus, it can provide a check for consistency of our results using the logit model with our data.

4.2 Asset Share

To explore the intensive margin of asset ownership we estimate the following:

$$AssetValue/TotalFinancialAssetValue_{it} = \alpha + \mathbf{X}'_{it}\beta + \mathbf{S}'_{it}\theta + \gamma Year_t + \epsilon_{it} \quad (2)$$

where the dependent variable is an asset value as a proportion of financial assets for focal sibling households. Financial assets include the total holdings from checking and saving accounts, money market funds, certificates of deposit, governmental savings bonds, treasury bills, stocks (e.g. held directly, mutual funds, investment trusts, excluding pensions from employers or IRAs), other investments (e.g. bond funds, life insurance, collection for investment purposes, rights in a trust or estate), and private annuities or IRAs.

Recall that a mere 20% of older sibling households are risky asset owners in 2015 (Table 4). This means that there are a substantial number of households without risky assets in their financial portfolio, which translates into many zeros in the stock ownership variable. When there is such skewness in the data – few investors with risky assets and many without – the hurdle model is useful. The hurdle model is adept at dealing with a surplus number of zeros in a variable of interest through an estimation procedure that occurs in two parts (Cameron & Trivedi, 2010). For our purposes, in the first part, the hurdle model works to ensure that a household satisfies the criteria of being a risky asset owner. The second part estimates the value of stock holdings as a proportion of financial assets (intensive margin), conditional on stock market participation.

4.3 Asset Amount

Our empirical model to explore the relationship between sibling psychological distress and asset value uses a pooled OLS regression

$$LnAssetValue_{it} = \alpha + \mathbf{X}'_{it}\beta + \mathbf{S}'_{it}\theta + \gamma Year_t + \epsilon_{it} \quad (3)$$

where $AssetValue_{it}$ is a monetary measure of asset value (i.e. risky assets) for focal sibling i in survey year t. All continuous wealth and income variables in our regressions are in natural log form. Specifically, the inverse hyperbolic sine (IHS) transformation is applied, a log transformation that keeps the negative and zero values.[13] Burbridge, Magee, and Robb (1988) and Pence (2006) recommend this type of log transformation when estimating models with household portfolio information. A pooled OLS regression model is appropriate when the dependent variable is a monetary measure of household wealth. What is valuable about the dependent variable in log form is that we can interpret the correlation coefficients in percentage terms.

[13]The IHS log transformation is $sinh^{-1}(wealth) = log(wealth + (wealth^2+1)^{1/2})$. This is an alternative to the conventional log transformation that discards the observations with zero and negative wealth.

4.4 Fixed Effects Regressions

A fixed effects regression removes the variables that do not change over time and estimates the probability of risky asset ownership changes when a sibling has a change in their mental health status. We estimate fixed effects logit regressions of risky asset ownership on focal sibling and non-focal sibling control variables. In addition, we estimate fixed effects of the natural log of risky asset value on the same set of control variables. The decision to run a fixed effects regression is informed by a Hausman test. An underlying assumption of the Hausman test is that the random effects model satisfies the consistency requirement, the expectation that error terms are not correlated with regressors. For our purposes, the Hausman test estimates and compares the correlation coefficients for time varying measures (e.g. sociodemographic and health) that influence portfolio allocation. In all of the various fixed and random effects models that we test, the Hausman test rejects the consistency of the random effects regressions.[14] Such rejection implies that the fixed effects regression model is the more appropriate choice for model selection.

[14]As suggested by Cameron and Trivedi (2010, p. 259), we apply a Hausman test to various fixed effects and random effects models to inform our final model selection [FE Logit and FE OLS]. First, our regressions are run for a general model, with a vector of focal sibling controls, testing fixed versus random effects with the Hausman test. Then, a secondary regression model, considered to be a first specification, with focal sibling and second oldest sibling information used as controls, is tested. The second specification of the secondary model is also tested, a model which holds focal sibling, second and third oldest sibling data. Finally, a third specification is tested, with mental health information for the focal sibling, and the second through fourth oldest siblings. In each specification, the χ^2 statistic is affiliated with a p value that is approximately zero. For the general model, the $\chi^2(8) = 125.56$, and the p = 0.000; the first specification is affiliated with a $\chi^2(9) = 114.67$, and the p = 0.000; second specification with a $\chi^2(10) = 59.06$, and p = 0.000; third specification $\chi^2(11) = 32.64$, and the p = 0.000. What this means is that in all of the various fixed and random effects models, the Hausman test rejects the consistency of the random effects regressions.

5 Empirical Results

5.1 Extensive Margin

Table 7 reports the effects of extended family mental health issues on household stock ownership. Variables of interest include proxies for moderate and severe psychological distress. The models reveal how moderate and severe psychological distress in the extended family is associated with a decline in risky asset ownership. In Column (1) we only include sociodemographic controls of the focal sibling. We find that having at least one sibling with moderate distress, compared to having no sibling with such distress, can (significantly) lower the probability of stock market participation. Furthermore, having at least one sibling with severe psychological distress is associated with a (significant) decline in risky asset ownership. In Column (2) we include a full set of focal sibling covariates. With the addition of these controls the correlation coefficient for a sibling that experiences moderate distress becomes slightly less negative. Nonetheless, we do retain statistical significance. The measure of a sibling with a severe level of psychological distress is negatively correlated with stock ownership; a result that does not achieve statistical significance.

In Column (3) we test the same controls in the logistic regression model. Risky asset ownership is likely to decline when a focal sibling is related to one or more siblings with moderate or severe psychological distress. Finally, in Column (4) we report the results from a fixed effects logit regression. From this regression model, we find evidence that having one or more siblings (at the moderate level) with psychological distress causes a focal sibling to reduce their risky asset market participation.[15]

Surprisingly, one theme that arises from Table 7 is that once we include all the covariates, we retain significance for non-focal siblings, but not for focal siblings, with mental health issues. What could be driving this result? One hypothesis is that our estimates suffer from multicollinearity in the mental health variables. In Table A2 and Table A3 of the Appendix we present a correlation matrix of various health variables. Contrary to the hypothesis of multicollinearity, we find that there is low correlation between the sibling based health variables.

[15]Why do the fixed effects regressions on the probability of risky asset ownership have so few observations? In Table A6 and Table A7 of the Appendix we investigate with a transition probabilities matrix for stock ownership and (focal and non-focal) sibling mental health issues. We find that there are strong changes in probability for focal sibling stock ownership, and weak changes in probability for mental health issues. We find that for the 29.03% of non-focal siblings that ever experience moderate distress, 54.49% maintained their experience with moderate distress in the subsequent wave of the PSID survey. For the 7% of non-focal siblings that ever experience severe distress, 46% maintained their experience with severe distress in the subsequent wave of the PSID survey. With stock ownership, we find that for the 26.54% of focal siblings that ever own stock and mutual funds, 71.6% maintained their stock market participation in the subsequent wave of the PSID survey.

Table 7: **Extended Family Health and Household Portfolio Allocation Models (dependent variable: stock ownership).**

Variables	(1) LPM	(2) LPM	(3) Logit	(4) FE Logit
Non-Focal Sibling with Moderate Distress	**-0.040*** **	**-0.036** **	**-0.416** **	**-0.236**
	(0.012)	(0.016)	(0.207)	(0.238)
Non-Focal Sibling with Severe Distress	**-0.041** **	**-0.014**	**-0.023**	**0.307**
	(0.019)	(0.030)	(0.419)	(0.519)
Focal Sibling with Moderate Distress	**-0.025***	**-0.017**	**-0.086**	**0.052**
	(0.014)	(0.019)	(0.223)	(0.239)
Focal Sibling with Severe Distress	**-0.010**	**0.017**	**-0.246**	**0.275**
	(0.025)	(0.046)	(0.666)	(0.747)
Number of Siblings	-0.015***	-0.012*	-0.366**	
	(0.004)	(0.006)	(0.163)	
Sex (male=1)	0.020*	0.025*	0.265	
	(0.012)	(0.014)	(0.304)	
Race (black=1)	-0.149***	-0.135***	-2.083***	
	(0.012)	(0.019)	(0.423)	
Live in South		-0.006	-0.375	-0.840
		(0.016)	(0.311)	(0.686)
Education	0.031***	0.023***	0.211***	-0.214
	(0.003)	(0.004)	(0.069)	(0.140)
Age	0.002	-0.001	-0.001	-0.345
	(0.011)	(0.016)	(0.178)	(0.359)
Age Squared	0.000	0.000	0.001	-0.000
	(0.000)	(0.000)	(0.002)	(0.002)
Married	0.055***	0.029	0.343	0.334
	(0.014)	(0.018)	(0.293)	(0.421)
Log Household Income	0.042***	0.033***	0.700***	0.267
	(0.006)	(0.008)	(0.166)	(0.198)
Number of Children in Household	0.003	0.007	0.205	0.315
	(0.007)	(0.010)	(0.147)	(0.192)
Professional or Manager	0.084***	0.067***	0.460**	0.247
	(0.018)	(0.017)	(0.218)	(0.264)
Home Ownership		0.097***	1.411***	0.647
		(0.020)	(0.354)	(0.416)
Pension Ownership		0.143***	1.090***	0.270
		(0.017)	(0.244)	(0.287)
Log Health Expenditure		0.002	0.056	0.008
		(0.003)	(0.054)	(0.058)
Health Insurance		-0.037	0.442	0.635
		(0.032)	(0.565)	(0.629)
Acute Conditions		-0.001	-0.104	-0.215
		(0.018)	(0.254)	(0.312)
Employed		-0.046***	-0.469**	-0.532**
		(0.018)	(0.234)	(0.271)
Risk Avoidance		0.019	0.318	
		(0.015)	(0.308)	
Computer/Internet Use		-0.007	0.419	0.096
		(0.020)	(0.311)	(0.354)
Constant	-0.717**	-0.594	-16.922***	
	(0.303)	(0.427)	(5.141)	
Observations	4,340	3,056	3,056	1,062
Pseudo R-squared	0.243	0.212	0.265	0.008
Number of Focal Siblings	633	525	525	178

Notes: The dependent variable is dichotomous, where households that own stocks receive a one, other households receive a zero. A stock owner is defined as "holding shares of stock in publicly held corporations, mutual funds, or investment trusts, not including stocks in employer-based pensions or IRAs." Moderate distress [K-6 score is between 5 and 12] and severe distress [K-6 score is above 13] are the mental health measures of interest. Both moderate and severe distress variables are cast as dummy variables in our regression analysis. Missing dummy indicator variables and survey year dummy variables are included in each model. Cluster robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.2 Intensive Margin

Table 8 displays the results from the hurdle model. Our dependent variable in this model is risky asset value as a proportion of total financial asset value. Independent variables of interest include non-focal siblings with moderate or severe psychological distress, and focal siblings with moderate or severe psychological distress. The values that are shown in Column (1) are marginal effects estimates.

We estimate that a decrease in the risky asset share of financial assets is associated with at least one non-focal sibling that experiences moderate distress. In effect, household portfolio shares in risky assets are likely to be lowered by nearly two percentage points. This result achieves statistical significance at the five percent level. We also estimate that a focal sibling with moderate psychological distress is associated with a decrease in the risky asset proportion of financial assets. What is more, we find that a focal sibling with severe psychological distress is associated with a decrease in risky assets as a share of total financial assets. The statistical significance is not affiliated with the focal siblings, but it is affiliated with the non-focal siblings.

Table 8: **Hurdle Model (dependent variable: stocks as a proportion of financial assets).**

Variables	(1) OLS	(2) Hurdle	(3) lnsigma
Non-Focal Sibling with Moderate Distress	**-0.0166***		
	(0.0086)		
Non-Focal Sibling with Severe Distress	**-0.0032**		
	(0.0152)		
Focal Sibling with Moderate Distress	**-0.0085**		
	(0.0099)		
Focal Sibling with Severe Distress	**0.0045**		
	(0.0213)		
Number of Siblings	-0.0062**		
	(0.0030)		
Sex (male=1)	0.0095		
	(0.0084)		
Race (black=1)	-0.0510***		
	(0.0090)		
Education	0.0088***		
	(0.0025)		
Age	-0.0005		
	(0.0090)		
Age Squared	0.0000		
	(0.0001)		
Married	0.0086		
	(0.0096)		
Log Household Income	0.0180***		
	(0.0044)		
Home Ownership	0.0448***		
	(0.0083)		
Pension Ownership	0.0243**		
	(0.0102)		
Number of Children in Household	-0.0033		
	(0.0054)		
Live in South	0.0113		
	(0.0134)		
Log Health Expenditure	0.0009		
	(0.0016)		
Health Insurance	-0.0024		
	(0.0120)		
Acute Conditions	-0.0131		
	(0.0103)		
Employed	-0.0298***		
	(0.0104)		
Risk Avoidance	0.0028		
	(0.0086)		
Professional or Manager	0.0386***		
	(0.0113)		
Computer/Internet Use	0.0116		
	(0.0088)		
Stock Ownership		3.8486***	
		(0.1327)	
Constant	-0.2739	-5.1581***	-1.4978***
	(0.2489)	(0.0000)	(0.0230)
Observations	3,056	3,056	3,056

Notes: The hurdle model is an estimation procedure that occurs in two parts. For our purposes, in the first part, the hurdle model works to ensure that a focal household satisfies the criteria of being a stock owner. The second part estimates the value of stock holdings as a proportion of financial assets (intensive margin), conditional on stock market participation. Coefficients in this table are marginal effects. Delta method standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.3 Asset Amount

Table 9 reports the influence of psychological distress on the log value of risky assets held by the focal siblings. In our baseline model (see Column (1)) we estimate that focal siblings have a lower value of risky assets when they have at least one sibling that experiences moderate or severe psychological distress. In Column (2) we add all of the covariates and reveal that the log value of risky assets is negatively (and significantly) related to extended family members with moderate psychological distress. Our fixed effects regression results are in Columns (3)-(4). Together, they provide weak evidence that changes in mental health are likely to be correlated with a decrease in household risky asset holding values.

Table 9: **Extended Family Health and Household Portfolio Allocation Models (dependent variable: log value of stocks).**

Variables	(1) OLS	(2) OLS	(3) FE	(4) FE UQR
Non-Focal Sibling with Moderate Distress	**-0.435*** **	**-0.397** **	**-0.182**	**-0.075**
	(0.142)	(0.178)	(0.173)	(0.264)
Non-Focal Sibling with Severe Distress	**-0.571*** **	**-0.317**	**0.113**	**-0.286**
	(0.205)	(0.271)	(0.324)	(0.412)
Focal Sibling with Moderate Distress	**-0.320***	**-0.180**	**0.113**	**0.395**
	(0.164)	(0.206)	(0.193)	(0.306)
Focal Sibling with Severe Distress	**-0.145**	**0.238**	**0.128**	**0.672**
	(0.281)	(0.413)	(0.480)	(0.627)
Education	0.372***	0.275***	-0.121	0.004
	(0.036)	(0.049)	(0.102)	(0.183)
Age	0.073	-0.001	-0.229	-0.965**
	(0.128)	(0.181)	(0.275)	(0.414)
Age Squared	0.000	0.001	-0.000	0.002
	(0.001)	(0.002)	(0.001)	(0.002)
Married	0.557***	0.213	0.094	-0.402
	(0.161)	(0.203)	(0.296)	(0.573)
Log Household Income	0.557***	0.431***	0.045	0.109
	(0.083)	(0.097)	(0.079)	(0.094)
Race (black=1)	-1.733***	-1.609***		
	(0.137)	(0.179)		
Number of Children in Household	-0.000	-0.003	0.190	0.062
	(0.073)	(0.104)	(0.131)	(0.192)
Professional or Manager	1.096***	0.923***	0.098	-0.042
	(0.211)	(0.230)	(0.232)	(0.484)
Number of Siblings	-0.149***	-0.111*		
	(0.045)	(0.063)		
Sex (male=1)	0.302**	0.376**		
	(0.140)	(0.171)		
Live in South		-0.017	-0.599	0.430
		(0.183)	(0.538)	(1.262)
Home Ownership		0.062	-0.214	0.267
		(0.282)	(0.456)	(0.262)
Pension Ownership		1.675***	0.339	-0.454
		(0.182)	(0.261)	(0.465)
Log Health Expenditure		0.024	-0.017	0.043
		(0.032)	(0.037)	(0.035)
Health Insurance		-0.517**	0.238	0.431
		(0.253)	(0.321)	(0.322)
Acute Conditions		-0.083	-0.138	-0.268
		(0.209)	(0.223)	(0.390)
Employed		-0.733***	-0.593***	-0.452
		(0.238)	(0.212)	(0.373)
Risk Avoidance		0.194		
		(0.174)		
Computer/Internet Use		-0.137	-0.115	0.064
		(0.184)	(0.220)	(0.275)
Constant	-10.924***	-8.018	17.509	59.449***
	(3.397)	(5.057)	(13.559)	(20.001)
Observations	4,340	3,056	3,056	3,056
R-squared	0.246	0.220	0.023	0.014
Number of Focal Siblings	633	525	525	525

Notes: The inverse hyperbolic sine transformation is applied to stock value, a log transformation that keeps the negative values and zeros. A stock owner is defined as "holding shares of stock in publicly held corporations, mutual funds, or investment trusts, not including stocks in employer-based pensions or IRAs." Moderate distress [K-6 score is between 5 and 12] and severe distress [K-6 score is above 13] are the mental health measures of interest. Both moderate and severe distress variables are cast as dummy variables in our regression analysis. Missing dummy indicator variables and survey year dummy variables are included in each model. Cluster robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

6 Robustness Checks

Extended family members may differ in observable (e.g. socioeconomic characteristics, financial portfolio and health profile) and in unobservable ways. Given this, we assess the robustness of our central finding, the negative association between extended family mental health and household risky asset holding behavior. We conduct this assessment by considering an alternative measure of mental health, an alternative data sample, the role of geographic proximity, and by exploring the effect of having a mental health diagnosis.

6.1 Alternative measure of mental health

Other than the K-6 score, an alternative measure of mental health is the PSID's mental health diagnosis dummy variable. Table 10 presents household allocation models that proxy for mental health issues with a mental health diagnosis variable. That is, their mental health problems have been diagnosed by a credentialed mental health care worker.

In Columns (1)-(3) of Table 10 we find that risky asset ownership falls when a focal sibling has one or more siblings that are diagnosed with a mental health condition. The coefficients associated with at least one non-focal sibling with a mental health diagnosis are negative and statistically significant across the LPM and logit models. Further, we test the hypothesis that mental health issues outside of the nuclear family can influence household portfolio allocations with a fixed effects logit regression. In Column (4) of Table 10 we reveal that stock market participation may be hindered when there is a change in a non-focal sibling's mental health status. However, this result is not significant at the conventional levels.

In Table 11 we report our analysis with the alternative measure of mental health issues when the dependent variable is the log value of risky assets. Empirical evidence in Columns (1)-(2) support the core hypothesis of our paper. Focal siblings may be experiencing the burden of care, deciding to lower their stock market participation when a non-focal sibling is diagnosed with a mental health condition. However, the fixed effects regression and fixed effects unconditional quantile regression models (recommended by Borgen (2016)) in Columns (3)-(4) provide modest support for our main hypothesis. After controlling for time varying regressors, the measure of a non-focal sibling with a mental health diagnosis is negatively associated with a household portfolio's risky asset value. The associations are negative in sign but they are not statistically significant.

Table 10: **Extended Family Health and Household Portfolio Allocation Models (dependent variable: stock ownership).**

Variables	(1) LPM	(2) LPM	(3) Logit	(4) FE Logit
Non-Focal Sibling with Mental Health Diagnosis	**-0.049*** **	**-0.071*** **	**-0.629** **	**-0.391**
	(0.012)	(0.015)	(0.272)	(0.363)
Focal Sibling with Mental Health Diagnosis	**-0.030** **	**-0.007**	**0.041**	**0.697**
	(0.014)	(0.018)	(0.350)	(0.470)
Number of Siblings	-0.016***	-0.008*	-0.263	
	(0.003)	(0.005)	(0.161)	
Age	-0.005	0.007	-0.059	-0.117
	(0.009)	(0.014)	(0.156)	(0.175)
Age Squared	0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.001)	(0.002)
Sex (male=1)	0.022**	0.034**	0.365	
	(0.010)	(0.013)	(0.309)	
Race (black=1)	-0.160***	-0.138***	-2.032***	
	(0.011)	(0.015)	(0.420)	
Education	0.032***	0.023***	0.213***	-0.180
	(0.003)	(0.004)	(0.067)	(0.122)
Married	0.053***	0.035**	0.368	0.295
	(0.012)	(0.016)	(0.279)	(0.378)
Log Household Income	0.047***	0.037***	0.841***	0.487***
	(0.006)	(0.007)	(0.154)	(0.174)
Number of Children in Household	0.002	0.010	0.179	0.214
	(0.006)	(0.009)	(0.134)	(0.163)
Professional or Manager	0.082***	0.069***	0.381*	0.099
	(0.016)	(0.018)	(0.201)	(0.233)
Live in South		-0.005	-0.544*	-1.227*
		(0.014)	(0.308)	(0.647)
Home Ownership		0.094***	1.169***	0.565
		(0.014)	(0.313)	(0.357)
Pension Ownership		0.146***	0.934***	0.169
		(0.014)	(0.224)	(0.253)
Log Health Expenditure		0.001	-0.004	-0.027
		(0.003)	(0.049)	(0.053)
Health Insurance		-0.036*	0.346	0.341
		(0.022)	(0.503)	(0.565)
Acute Conditions		0.013	-0.031	-0.179
		(0.017)	(0.237)	(0.283)
Employed		-0.046***	-0.540**	-0.599**
		(0.016)	(0.219)	(0.244)
Risk Avoidance		0.019	0.245	
		(0.014)	(0.313)	
Computer/Internet Use		-0.002	0.381	0.090
		(0.014)	(0.280)	(0.320)
Constant	-0.613**	-0.807**	-13.817***	
	(0.240)	(0.366)	(4.477)	
Observations	5,697	3,568	3,568	1,307
Pseudo R-squared	0.287	0.209	0.331	0.032
Number of Focal Siblings	633	525	525	188

Notes: The dependent variable is dichotomous, where households that own stocks receive a one, other households receive a zero. A stock owner is defined as "holding shares of stock in publicly held corporations, mutual funds, or investment trusts, not including stocks in employer-based pensions or IRAs." Mental health diagnosis is the health measure of interest, cast as a dummy variable in our regression analysis.. Missing dummy indicator variables and survey year dummy variables are included in each model. Cluster robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 11: **Extended Family Health and Household Portfolio Allocation Models (dependent variable: log value of stocks).**

Variables	(1) OLS	(2) OLS	(3) FE OLS	(4) FE UQR
Non-Focal Sibling with Mental Health Diagnosis	**-0.721*** **	**-0.789*** **	**-0.230**	**-0.132**
	(0.146)	(0.182)	(0.250)	(0.381)
Focal Sibling with Mental Health Diagnosis	**-0.412** **	**-0.042**	**0.224**	**-0.129**
	(0.174)	(0.222)	(0.455)	(0.641)
Education	0.371***	0.260***	-0.131	-0.012
	(0.034)	(0.045)	(0.099)	(0.149)
Age	0.073	0.031	-0.189	-0.709*
	(0.121)	(0.163)	(0.291)	(0.388)
Age Squared	-0.000	0.000	-0.000	0.001
	(0.001)	(0.002)	(0.002)	(0.002)
Married	0.565***	0.209	0.077	-0.136
	(0.151)	(0.189)	(0.321)	(0.475)
Log Household Income	0.578***	0.463***	0.091*	0.087
	(0.077)	(0.090)	(0.052)	(0.082)
Race (black=1)	-1.805***	-1.688***		
	(0.132)	(0.171)		
Number of Children in Household	0.024	0.050	0.170	0.127
	(0.069)	(0.096)	(0.134)	(0.162)
Professional or Manager	1.135***	0.942***	-0.033	-0.244
	(0.193)	(0.209)	(0.268)	(0.361)
Number of Siblings	-0.151***	-0.118**		
	(0.041)	(0.056)		
Sex (male=1)	0.311**	0.475***		
	(0.128)	(0.159)		
Live in South		0.027	-0.961*	0.305
		(0.169)	(0.572)	(1.125)
Home Ownership		-0.352	-0.420	0.256
		(0.255)	(0.292)	(0.187)
Pension Ownership		1.769***	0.206	-0.684
		(0.167)	(0.311)	(0.421)
Log Health Expenditure		0.016	-0.028	0.031
		(0.030)	(0.029)	(0.034)
Health Insurance		-0.523**	0.160	0.268
		(0.246)	(0.205)	(0.255)
Acute Conditions		0.042	-0.096	-0.290
		(0.197)	(0.186)	(0.346)
Employed		-0.701***	-0.615***	-0.323
		(0.222)	(0.202)	(0.295)
Risk Avoidance		0.183		
		(0.161)		
Computer/Internet Use		-0.083	-0.124	0.034
		(0.171)	(0.148)	(0.218)
Constant	-11.274***	-8.999**	16.435	43.978**
	(3.187)	(4.472)	(14.261)	(17.510)
Observations	5,064	3,568	3,568	3,568
R-squared	0.283	0.226	0.024	0.013
Number of Focal Siblings	633	525	525	525

Notes: The inverse hyperbolic sine transformation is applied to stock value, a log transformation that keeps the negative values and zeros. A stock owner is defined as "holding shares of stock in publicly held corporations, mutual funds, or investment trusts, not including stocks in employer-based pensions or IRAs." Mental health diagnosis is the health measure of interest, cast as a dummy variable in our regression analysis. Missing dummy indicator variables and survey year dummy variables are included in each model. Cluster robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

6.2 Alternative data set samples

6.2.1 Replicate analysis with one non-focal sibling

A theme that arises from Columns (1) – (2) of Table 7 is that once we include all the covariates, we retain significance for non-focal siblings, but not for focal siblings with mental health issues. Could it be that non-focal sibling psychological distress is correlated with the other non-focal sibling characteristics that are important to consider? The full data set we use to generate our main analysis includes focal siblings and up to three non-focal siblings. However, this specification does not enable us to control for key non-focal sibling demographic characteristics.

Thus, we create an alternative data set in which we limit the sample to focal siblings that grew up with only one sibling. Using this subsample, we can control for key non-focal sibling characteristics such as non-focal sibling physical health issues and non-focal sibling health insurance. We then create additional model specifications in which the independent variables of interest are a sibling with moderate distress and a sibling with severe psychological distress. Table 12 displays that having a sibling with a mental health issue is associated with a decreased probability of household risky asset ownership. Table 13 shows that conditional on stock market participation, having a sibling with a mental health issue is associated with a decrease in risky assets as a proportion of financial assets. Table 14 illustrates that having a sibling with a mental health issue is associated with a decrease in the total amount of risky asset holdings. In effect, we find that our results do not fundamentally change if we look at the influence of one sibling with a mental health issue and control for health related non-focal sibling characteristics.

6.2.2 Explore socioeconomic status measures of one non-focal sibling

The literature also suggests that the socioeconomic status of a sibling could matter. Chiteji and Hamilton (2002, 2005) reveal that hardship in the extended family, including poverty need pressures from siblings, can significantly hinder wealth accumulation for individuals. Related to health, research finds that individual wealth can decline when a sibling with low income experiences a physical health shock (Heflin and Chiteji (2014)). Within our sample, we actually find that there is low correlation between a non-focal sibling having low income and moderate or severe psychological distress (see correlation matrix of Table A2).

However, to further analyze this issue, we define a low income sibling household as one that has income that falls below the 33rd percentile of the income distribution (this is the definition used by Heflin and Chiteji (2014)). In addition, we define a low educated sibling as one that has a high school education or less. We then use both of these income and education measures as dichotomous variables in our regression analysis.

Table 15 displays that having a sibling with low income or low educational attainment is (significantly) associated with a decreased probability of household risky asset ownership. However, even with the inclusion of the socioeconomic measures, we retain significance for the non-focal siblings with moderate psychological distress variable.

Table 12: **Extended Family (sample with one sibling) Mental Health and Stock Ownership.**

Variables	(1) LPM	(2) LPM	(3) Logit	(4) FE Logit
One Non-Focal Sibling with Moderate Distress	**-0.0590*** **	**-0.083*** **	**-0.672** **	**-0.264**
	(0.0198)	(0.025)	(0.284)	(0.393)
One Non-Focal Sibling with Severe Distress	**-0.0621**	**-0.053**	**-0.321**	**-0.041**
	(0.0470)	(0.072)	(0.837)	(0.903)
Focal Sibling with Moderate Distress	**-0.0068**	**-0.021**	**-0.042**	**0.171**
	(0.0215)	(0.027)	(0.268)	(0.331)
Focal Sibling with Severe Distress	**-0.0986** **	**-0.073**	**-0.619**	**0.068**
	(0.0384)	(0.066)	(0.684)	(0.942)
Sex (male=1)	0.0304*	0.046**	0.409	
	(0.0181)	(0.022)	(0.428)	
Race (black=1)	-0.1916***	-0.171***	-2.870***	
	(0.0173)	(0.023)	(0.640)	
Professional or Manager	0.0775***	0.081***	0.578*	0.407
	(0.0242)	(0.028)	(0.316)	(0.371)
Live in South		-0.008	-0.607	-14.580
		(0.034)	(0.525)	(1,005.594)
Education	0.0343***	0.027***	0.250**	-0.237
	(0.0044)	(0.006)	(0.104)	(0.198)
Age	-0.0032	0.021	0.261	0.349
	(0.0146)	(0.021)	(0.255)	(0.253)
Age Squared	0.0000	-0.000	-0.002	-0.003
	(0.0001)	(0.000)	(0.002)	(0.002)
Married	0.0416**	-0.000	0.004	-0.443
	(0.0202)	(0.025)	(0.442)	(0.664)
Log Household Income	0.0428***	0.029***	0.500**	0.212
	(0.0095)	(0.011)	(0.252)	(0.232)
Home Ownership		-0.040	-1.194	-0.961
		(0.039)	(1.268)	(1.299)
Pension Ownership		0.108***	0.784**	0.296
		(0.024)	(0.366)	(0.400)
Number of Children in Household	0.0107	0.016	0.267	0.473**
	(0.0095)	(0.014)	(0.200)	(0.234)
Log Health Expenditure		-0.001	0.025	-0.044
		(0.004)	(0.090)	(0.077)
Health Insurance		-0.020	1.092	1.953
		(0.040)	(0.727)	(1.220)
Acute Conditions		-0.017	0.042	-0.066
		(0.028)	(0.324)	(0.519)
Non-Focal Sibling with Acute Conditions		0.011	0.430	0.685
		(0.033)	(0.423)	(0.498)
Non-Focal Sibling with Health Insurance		0.008	-0.053	-1.977**
		(0.014)	(0.146)	(0.861)
Employed		-0.052*	-0.943***	-1.288***
		(0.029)	(0.341)	(0.398)
Risk Avoidance		0.057**	0.727*	
		(0.023)	(0.421)	
Computer/Internet Use		-0.014	0.398	0.452
		(0.025)	(0.361)	(0.499)
Constant	-0.6542*	-1.055*	-18.961**	
	(0.3888)	(0.572)	(8.137)	
Observations	2,280	1,585	1,585	631
Pseudo R-squared	0.217	0.207	0.076	0.14
Number of Focal Siblings	333	278	278	107

Notes: The dependent variable is dichotomous, where households that own stocks receive a one, other households receive a zero. A stock owner is defined as "holding shares of stock in publicly held corporations, mutual funds, or investment trusts, not including stocks in employer-based pensions or IRAs." Moderate distress [K-6 score is between 5 and 12] and severe distress [K-6 score is above 13] are the mental health measures of interest. Both moderate and severe distress variables are cast as dummy variables in our regression analysis. Missing dummy indicator variables and survey year dummy variables are included in each model. Cluster robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 13: **Hurdle Model (dependent variable: stocks as a proportion of financial assets; sample has one sibling).**

Variables	(1) OLS	(2) Hurdle	(3) lnsigma
Non-Focal Sibling with Moderate Distress	**-0.0283****		
	(0.0143)		
Non-Focal Sibling with Severe Distress	**-0.0362**		
	(0.0430)		
Focal Sibling with Moderate Distress	**0.0077**		
	(0.0161)		
Focal Sibling with Severe Distress	**0.0001**		
	(0.0486)		
Sex (male=1)	0.0246*		
	(0.0128)		
Race (black=1)	-0.0625***		
	(0.0138)		
Education	0.0071**		
	(0.0035)		
Age	-0.0076		
	(0.0124)		
Age Squared	0.0001		
	(0.0001)		
Married	-0.0002		
	(0.0141)		
Log Household Income	0.0192***		
	(0.0067)		
Home Ownership	0.0663***		
	(0.0120)		
Pension Ownership	0.0116		
	(0.0152)		
Number of Children in Household	-0.0012		
	(0.0080)		
Live in South	0.0168		
	(0.0201)		
Non-Focal Sibling with Acute Conditions	-0.0110		
	(0.0175)		
Non-Focal Sibling with Health Insurance	0.0102		
	(0.0209)		
Log Health Expenditure	-0.0002		
	(0.0027)		
Health Insurance	0.0176		
	(0.0211)		
Acute Conditions	-0.0170		
	(0.0170)		
Employed	-0.0456***		
	(0.0156)		
Risk Avoidance	0.0118		
	(0.0135)		
Professional or Manager	0.0515***		
	(0.0152)		
Computer/Internet Use	0.0264**		
	(0.0128)		
Stock Ownership		4.3097***	
		(0.1483)	
Constant	-0.1534	-5.4859***	-1.4348***
	(0.3342)	(0.0000)	(0.0283)
Observations	1,617	1,617	1,617

Notes: The hurdle model is an estimation procedure that occurs in two parts. For our purposes, in the first part, the hurdle model works to ensure that a focal household satisfies the criteria of being a stock owner. The second part estimates the value of stock holdings as a proportion of financial assets (intensive margin), conditional on stock market participation. Coefficients in this table are marginal effects. Delta method standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 14: **Extended Family (sample with one sibling) Health and Household Portfolio Allocation Models (dependent variable: log value of stocks).**

Variables	(1) OLS	(2) OLS	(3) FE
Non-Focal Sibling with Moderate Distress	**-0.649*** **	**-0.887*** **	**-0.280**
	(0.228)	(0.287)	(0.287)
Non-Focal Sibling with Severe Distress	**-0.989***	**-0.827**	**0.156**
	(0.510)	(0.772)	(0.773)
Focal Sibling with Moderate Distress	**-0.227**	**-0.233**	**0.233**
	(0.247)	(0.312)	(0.288)
Focal Sibling with Severe Distress	**-0.980** **	**-0.624**	**-0.230**
	(0.446)	(0.748)	(0.828)
Sex (male=1)	0.452**	0.595**	
	(0.210)	(0.259)	
Race (black=1)	-2.091***	-1.835***	
	(0.206)	(0.267)	
Live in South		0.027	-1.112
		(0.399)	(1.421)
Education	0.390***	0.297***	-0.141
	(0.050)	(0.072)	(0.147)
Age	0.105	0.083	-0.258
	(0.169)	(0.245)	(0.392)
Age Squared	-0.000	0.000	-0.001
	(0.002)	(0.002)	(0.002)
Married	0.277	-0.108	-0.159
	(0.237)	(0.293)	(0.443)
Log Household Income	0.544***	0.465***	0.089
	(0.121)	(0.148)	(0.110)
Home Ownership		1.573***	0.729*
		(0.259)	(0.379)
Pension Ownership		1.366***	0.431
		(0.271)	(0.382)
Number of Children in Household	0.085	0.095	0.218
	(0.105)	(0.144)	(0.172)
Log Health Expenditure		-0.004	-0.024
		(0.052)	(0.058)
Health Insurance		-0.361	0.666
		(0.455)	(0.544)
Acute Conditions		-0.131	-0.144
		(0.332)	(0.338)
Employed		-1.048***	-0.713**
		(0.316)	(0.291)
Risk Avoidance		0.545**	
		(0.268)	
Professional or Manager	1.388***	0.988***	0.649**
	(0.288)	(0.319)	(0.324)
Non-Focal Sibling with Acute Conditions		-0.153	0.209
		(0.357)	(0.359)
Non-Focal Sibling with Health Insurance		0.015	-0.682
		(0.358)	(0.479)
Computer/Internet Use		0.150	0.344
		(0.275)	(0.333)
Constant	-12.278***	-11.409*	19.571
	(4.457)	(6.581)	(16.990)
Observations	2,280	1,617	1,617
R-squared	0.243	0.220	0.030
Number of Focal Siblings	333	278	278

Notes: The inverse hyperbolic sine transformation is applied to stock value, a log transformation that keeps the negative values and zeros. A stock owner is defined as "holding shares of stock in publicly held corporations, mutual funds, or investment trusts, not including stocks in employer-based pensions or IRAs." Moderate distress [K-6 score is between 5 and 12] and severe distress [K-6 score is above 13] are the mental health measures of interest. Both moderate and severe distress variables are cast as dummy variables in our regression analysis. Missing dummy indicator variables and survey year dummy variables are included in each model. Cluster robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 15: **Extended Family (sample with one sibling) Mental Health, Socioeconomic Status and Stock Ownership.**

Variables	(1) LPM	(2) LPM	(3) Logit	(4) FE Logit
One Non-Focal Sibling with Moderate Distress	**-0.0514*** **	**-0.075*** **	**-0.642** **	**-0.230**
	(0.0199)	(0.025)	(0.284)	(0.393)
One Non-Focal Sibling with Severe Distress	**-0.0369**	**-0.030**	**-0.186**	**0.075**
	(0.0468)	(0.072)	(0.860)	(0.930)
Focal Sibling with Moderate Distress	**-0.0072**	**-0.024**	**-0.032**	**0.169**
	(0.0215)	(0.027)	(0.267)	(0.332)
Focal Sibling with Severe Distress	**-0.1005*** **	**-0.079**	**-0.679**	**0.050**
	(0.0381)	(0.067)	(0.655)	(0.957)
Non-Focal Sibling with High School Education or Less	**-0.0286**	**-0.020**	**-0.484**	**-0.691**
	(0.0193)	(0.024)	(0.333)	(0.593)
Non-Focal Sibling with Low Income	**-0.0492*** **	**-0.054** **	**-0.391**	**0.057**
	(0.0183)	(0.024)	(0.312)	(0.446)
Sex (male=1)	0.0304*	0.045**	0.375	
	(0.0180)	(0.022)	(0.429)	
Race (black=1)	-0.1789***	-0.165***	-2.783***	
	(0.0174)	(0.023)	(0.632)	
Live in South		-0.012	-0.603	-13.555
		(0.034)	(0.530)	(608.531)
Education	0.0310***	0.025***	0.204*	-0.262
	(0.0046)	(0.007)	(0.111)	(0.198)
Age	-0.0039	0.021	0.264	0.332
	(0.0145)	(0.021)	(0.256)	(0.254)
Age Squared	0.0000	-0.000	-0.002	-0.003
	(0.0001)	(0.000)	(0.002)	(0.002)
Married	0.0409**	0.001	0.016	-0.415
	(0.0200)	(0.024)	(0.440)	(0.664)
Log Household Income	0.0398***	0.027***	0.475*	0.212
	(0.0091)	(0.010)	(0.250)	(0.233)
Home Ownership		-0.046	-1.262	-0.902
		(0.041)	(1.285)	(1.304)
Pension Ownership		0.101***	0.768**	0.270
		(0.024)	(0.362)	(0.401)
Number of Children in Household	0.0099	0.016	0.270	0.473**
	(0.0095)	(0.014)	(0.200)	(0.235)
Log Health Expenditure		-0.002	0.021	-0.042
		(0.004)	(0.090)	(0.077)
Health Insurance		-0.018	1.152	2.127*
		(0.040)	(0.752)	(1.239)
Acute Conditions		-0.011	0.080	-0.037
		(0.028)	(0.324)	(0.521)
Non-Focal Sibling with Acute Conditions		0.017	0.510	0.735
		(0.033)	(0.417)	(0.500)
Non-Focal Sibling with Health Insurance		0.006	-0.063	-1.981**
		(0.015)	(0.152)	(0.866)
Employed		-0.056*	-0.937***	-1.256***
		(0.029)	(0.344)	(0.400)
Risk Avoidance		0.062***	0.769*	
		(0.023)	(0.424)	
Professional or Manager	0.0768***	0.080***	0.598*	0.439
	(0.0241)	(0.028)	(0.315)	(0.371)
Computer/Internet Use		-0.024	0.359	0.431
		(0.025)	(0.357)	(0.500)
Constant	-0.5230	-0.941	-17.740**	
	(0.3909)	(0.577)	(8.279)	
Observations	2,280	1,585	1,585	631
Pseudo R-squared	0.215	0.205	0.075	0.137
Number of Focal Siblings	333	278	278	107

Notes: The dependent variable is dichotomous, where households that own stocks receive a one, other households receive a zero. A stock owner is defined as "holding shares of stock in publicly held corporations, mutual funds, or investment trusts, not including stocks in employer-based pensions or IRAs." Moderate distress [K-6 score is between 5 and 12] and severe distress [K-6 score is above 13] are the mental health measures of interest. Both moderate and severe distress variables are cast as dummy variables in our regression analysis. Missing dummy indicator variables and survey year dummy variables are included in each model. Cluster robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

6.3 Geographic Proximity

An alternative consideration we explore is the role of geographic proximity. To what extent does living in the same region as a sibling affect household portfolio decisions? A household's residence is made publicly available in the PSID at the regional level, such as Northeast, North Central, South, West, Alaska or Hawaii. A non-focal sibling with the same regional residence as a focal sibling household is negatively correlated (-0.14) with household risky asset ownership.[16]

In our regression analysis, geographic proximity variables are cast as dummy variables, where a non-focal sibling household receives a one if they live in the same region as a focal sibling, a zero if otherwise. Table 16 illustrates that living in the same region as a sibling is not significantly associated with a decreased probability of household risky asset ownership. Still, even with the inclusion of the geographic proximity measures, we retain significance for non-focal siblings with moderate psychological distress.[17]

[16]Meanwhile, the correlation is high (78%) between the regional residence of a focal sibling household and the regional residence of a non-focal sibling household. The raw correlation between the regional residence of a focal sibling and the regional residence of non-focal sibling #1 is 0.7784, for focal sibling and non-focal sibling #2 it is 0.7812, and for focal sibling and non-focal sibling #3 it is 0.7872.

[17]Due to data limitations with regard to the public use PSID data, we do not have state level regional controls.

Table 16: **Extended Family Mental Health, Geographic Proximity and Stock Ownership.**

Variables	(1) LPM	(2) LPM	(3) Logit	(4) FE Logit
Non-Focal Sibling with Moderate Distress	**-0.0418*** **	**-0.035** **	**-0.415** **	**-0.266**
	(0.0125)	(0.015)	(0.196)	(0.245)
Non-Focal Sibling with Severe Distress	**-0.0407** **	**-0.018**	**-0.075**	**0.221**
	(0.0193)	(0.024)	(0.421)	(0.512)
Focal Sibling with Moderate Distress	**-0.0315** **	**-0.018**	**-0.105**	**0.018**
	(0.0141)	(0.017)	(0.213)	(0.243)
Focal Sibling with Severe Distress	**-0.0216**	**0.017**	**-0.210**	**0.284**
	(0.0234)	(0.034)	(0.645)	(0.738)
Non-Focal Sibling Geographic Proximity	**-0.0700*** **	**-0.017**	**-0.269**	**-0.176**
	(0.0190)	(0.021)	(0.314)	(0.534)
Number of Siblings	-0.0051	-0.012**	-0.352**	
	(0.0038)	(0.005)	(0.176)	
Sex (male=1)	0.0156	0.024	0.248	
	(0.0122)	(0.014)	(0.318)	
Race (black=1)	-0.1248***	-0.140***	-2.550***	
	(0.0126)	(0.015)	(0.448)	
Professional or Manager	0.0465***	0.063***	0.249	-0.072
	(0.0174)	(0.019)	(0.242)	(0.278)
Education	0.0318***	0.023***	0.223***	-0.190
	(0.0031)	(0.004)	(0.074)	(0.148)
Age	-0.0481***	-0.002	-0.060	-0.313
	(0.0114)	(0.015)	(0.213)	(0.366)
Age Squared	0.0004***	0.000	0.001	0.001
	(0.0001)	(0.000)	(0.002)	(0.002)
Married	0.0904***	0.027	0.255	0.134
	(0.0137)	(0.017)	(0.343)	(0.424)
Log Household Income	0.0429***	0.030***	0.646***	0.258
	(0.0062)	(0.007)	(0.195)	(0.197)
Home Ownership		0.012	-0.425	-0.569
		(0.028)	(0.777)	(0.742)
Pension Ownership		0.143***	1.118***	0.439
		(0.015)	(0.273)	(0.294)
Number of Children in Household	-0.0200***	0.006	0.204	0.333*
	(0.0069)	(0.009)	(0.160)	(0.193)
Log Health Expenditure		0.002	0.057	0.006
		(0.003)	(0.064)	(0.059)
Health Insurance		-0.040*	0.340	0.534
		(0.023)	(0.574)	(0.650)
Acute Conditions		-0.003	-0.097	-0.131
		(0.017)	(0.228)	(0.322)
Employed		-0.049**	-0.722***	-0.846***
		(0.019)	(0.267)	(0.295)
Risk Avoidance		0.021	0.399	
		(0.015)	(0.318)	
Computer/Internet Use		-0.018	0.293	0.012
		(0.016)	(0.302)	(0.361)
Constant	0.7505**	-0.486	-13.461**	
	(0.3077)	(0.428)	(6.202)	
Observations	4,340	3,056	3,056	1,062
Pseudo R-squared	0.183	0.217	0.0866	0.1020
Number of Focal Siblings	633	525	525	178

Notes: The dependent variable is dichotomous, where households that own stocks receive a one, other households receive a zero. A stock owner is defined as "holding shares of stock in publicly held corporations, mutual funds, or investment trusts, not including stocks in employer-based pensions or IRAs." Moderate distress [K-6 score is between 5 and 12] and severe distress [K-6 score is above 13] are the mental health measures of interest. Both moderate and severe distress variables are cast as dummy variables in our regression analysis. Geographic proximity variables are cast as dummy variables, where a non-focal sibling household receives a one if they live in the same region as a focal sibling, and they receive a zero if otherwise. Missing dummy indicator variables and survey year dummy variables are included in each model. Cluster robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

7 Conclusion

There is a growing body of research that links health status and household financial decisions within the nuclear family unit. Such a focus on the nuclear family could underestimate the full extent of health related issues on household financial well-being. Previous research finds that household wealth can decline by tens of thousands of dollars when a sibling experiences a stroke, cancer, lung disease or a heart attack (Heflin and Chiteji (2014)). In this paper we expand upon current economic modeling to include a focus on the extended family. We hypothesize that mental health issues outside of the nuclear family are a unique contributor to household portfolio allocation decisions. We find that a household with at least one sibling that is diagnosed with a mental health condition or is experiencing psychological distress (at the moderate level) can compel a household to reduce their stock market participation.

Having risky assets in a household's portfolio represents an important route to wealth building. However, extended family health issues may impose a constraint on that wealth accumulation. The sympathy and care for family members may be part of the humbler department of households, but households must acknowledge the constraint of extended family health issues on stock market participation. Understanding inter-household family connections, and how they relate to personal household finance decisions, can help to shed light on contemporary forces driving wealth accumulation and disparities.

Table 17: **Extended Family (sample with one sibling) Mental Health, Geographic Proximity and Stock Ownership.**

Variables	(1) LPM	(2) LPM	(3) Logit	(4) FE Logit
Non-Focal Sibling with Moderate Distress	**-0.0468**	**-0.064**	**-0.968**	**-1.216**
	(0.0516)	(0.056)	(0.704)	(0.975)
Non-Focal Sibling with Severe Distress	**-0.0543**	**0.059**	**0.291**	**-0.210**
	(0.1078)	(0.144)	(1.084)	(1.305)
Focal Sibling with Moderate Distress	**-0.0184**	**-0.023**	**-0.027**	**0.199**
	(0.0215)	(0.027)	(0.270)	(0.328)
Focal Sibling with Severe Distress	**-0.0995*** **	**-0.056**	**-0.590**	**-0.115**
	(0.0368)	(0.064)	(0.735)	(0.939)
Non-Focal Sibling Geographic Proximity	**-0.0425**	**-0.018**	**-0.294**	**-0.026**
	(0.0281)	(0.032)	(0.466)	(0.649)
Non-Focal Sibling Moderate*Geographic Proximity	**-0.0251**	**-0.014**	**0.435**	**0.894**
	(0.0559)	(0.063)	(0.774)	(1.055)
Non-Focal Sibling Severe*Geographic Proximity	**-0.0015**	**-0.139**	**-1.009**	**-0.144**
	(0.1179)	(0.165)	(1.579)	(1.703)
Sex (male=1)	0.0289	0.044**	0.306	
	(0.0184)	(0.022)	(0.432)	
Race (black=1)	-0.1533***	-0.175***	-3.263***	
	(0.0192)	(0.022)	(0.660)	
Education	0.0336***	0.025***	0.214**	-0.290
	(0.0044)	(0.006)	(0.098)	(0.201)
Age	-0.0404***	0.012	0.170	0.007
	(0.0150)	(0.021)	(0.269)	(0.468)
Age Squared	0.0004**	-0.000	-0.001	-0.001
	(0.0001)	(0.000)	(0.003)	(0.002)
Married	0.0749***	-0.002	-0.095	-0.483
	(0.0204)	(0.024)	(0.451)	(0.639)
Log Household Income	0.0395***	0.030***	0.520**	0.263
	(0.0086)	(0.010)	(0.259)	(0.280)
Home Ownership		-0.050	-1.501	-1.246
		(0.041)	(1.454)	(1.287)
Pension Ownership		0.115***	0.826**	0.249
		(0.023)	(0.375)	(0.405)
Number of Children in Household	-0.0165*	0.016	0.322	0.455*
	(0.0097)	(0.013)	(0.201)	(0.233)
Log Health Expenditure		-0.002	0.027	-0.034
		(0.004)	(0.090)	(0.079)
Health Insurance		-0.022	1.090	2.373*
		(0.040)	(0.766)	(1.296)
Acute Conditions		-0.018	0.033	0.202
		(0.028)	(0.315)	(0.506)
Non-Focal Sibling with Health Insurance		-0.006	-0.682	-2.033**
		(0.033)	(0.599)	(0.857)
Non-Focal Sibling with Acute Conditions		-0.019	0.133	0.417
		(0.030)	(0.393)	(0.464)
Employed		-0.055*	-0.953***	-1.232***
		(0.029)	(0.345)	(0.394)
Risk Avoidance		0.061***	0.837*	
		(0.022)	(0.431)	
Professional or Manager	0.0572**	0.078***	0.555*	0.307
	(0.0240)	(0.027)	(0.319)	(0.367)
Computer/Internet Use		-0.007	0.480	0.376
		(0.025)	(0.369)	(0.506)
Constant	0.4961	-0.820	-17.889**	
	(0.4024)	(0.570)	(8.430)	
Observations	2,280	1,617	1,617	639
Pseudo R-squared	0.151	0.200	0.100	0.130
Number of Focal Siblings	333	278	278	107

Notes: The dependent variable is dichotomous, where households that own stocks receive a one, other households receive a zero. A stock owner is defined as "holding shares of stock in publicly held corporations, mutual funds, or investment trusts, not including stocks in employer-based pensions or IRAs." Moderate distress [K-6 score is between 5 and 12] and severe distress [K-6 score is above 13] are the mental health measures of interest. Both moderate and severe distress variables are cast as dummy variables in our regression analysis. Geographic proximity variables are cast as dummy variables, where a non-focal sibling household receives a one if they live in the same region as a focal sibling, and they receive a zero if otherwise. Missing dummy indicator variables and survey year dummy variables are included in each model. Cluster robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

8 Appendix

8.1 Distribution of Siblings and Description of Key Variables

Table A1: **Distribution of Siblings per Family in PSID.**

Sibling Size	Freq.	Percent	Cum.
1	316	51.80	51.80
2	161	26.39	78.20
3	68	11.15	89.34
4	41	6.72	96.07
5	7	1.15	97.21
6	11	1.80	99.02
7	4	0.66	99.67
8	1	0.16	99.84
11	1	0.16	100.00
Total	**610**	100.00	

Notes: For our dataset we restrict a focal sibling to have no more than three siblings. With this method we retain nearly 90% of the sibling relationships. Family sizes are stable in our dataset. Theoretically, it is possible that an individual in 1968 may have one sibling but by 1980 they have four siblings. This is not the case for our dataset. We do not find any sibling births after 1968.

Table A2: **Correlation of Key Health Variables**

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
(1)	Log Stock Value	1.00																						
(2)	Focal Sibling with Poor Health	-0.17	1.00																					
(3)	Sibling #1 with Poor Health	-0.10	0.21	1.00																				
(4)	Sibling #2 with Poor Health	-0.10	0.15	0.14	1.00																			
(5)	Sibling #3 with Poor Health	-0.03	0.13	0.14	0.08	1.00																		
(6)	Focal Sibling K-6 Score	-0.11	0.33	0.07	0.14	0.06	1.00																	
(7)	Sibling #1 K-6 Score	-0.08	0.10	0.27	0.12	0.16	0.08	1.00																
(8)	Sibling #2 K-6 Score	-0.06	0.12	0.08	0.27	0.01	0.1	0.16	1.00															
(9)	Sibling #3 K-6 Score	-0.04	0.10	0.02	0.07	0.38	0.09	0.18	0.01	1.00														
(10)	Focal Sibling with Moderate Distress	-0.09	0.18	0.05	0.07	0.11	0.56	0.04	0.08	0.05	1.00													
(11)	Sibling #1 with Moderate Distress	-0.08	0.03	0.14	0.08	0.08	0.01	0.52	0.06	0.11	0.01	1.00												
(12)	Sibling #2 with Moderate Distress	-0.03	0.06	0.04	0.13	0.06	0.05	0.13	0.55	0.03	0.07	0.10	1.00											
(13)	Sibling #3 with Moderate Distress	-0.01	0.08	0.03	0.05	0.17	0.07	0.21	0.08	0.43	0.07	0.12	0.02	1.00										
(14)	Focal Sibling with Severe Distress	-0.07	0.21	0.05	0.11	-0.03	0.65	0.07	0.06	0.05	-0.09	0.00	0.01	0.04	1.00									
(15)	Sibling #1 with Severe Distress	-0.04	0.08	0.19	0.08	0.12	0.07	0.69	0.14	0.11	0.02	-0.1	0.07	0.14	0.07	1.00								
(16)	Sibling #2 with Severe Distress	-0.06	0.12	0.07	0.21	-0.01	0.08	0.09	0.65	0.01	0.03	-0.01	-0.12	0.07	0.06	0.13	1.00							
(17)	Sibling #3 with Severe Distress	-0.06	0.04	-0.01	0.04	0.27	0.08	0.06	-0.04	0.75	0.04	0.06	0.03	-0.12	0.05	0.01	-0.04	1.00						
(18)	Sibling #1 with Low Income	-0.17	0.19	0.28	0.11	0.12	0.07	0.23	0.10	0.05	0.05	0.14	0.07	0.11	0.02	0.17	0.08	-0.02	1.00					
(19)	Sibling #2 with Low Income	-0.11	0.17	0.14	0.12	0.09	0.08	0.08	0.19	0.10	0.03	0.03	0.14	0.07	0.08	0.06	0.12	0.06	0.24	1.00				
(20)	Sibling #3 with Low Income	-0.11	0.12	0.11	0.07	0.24	0.09	0.07	0.02	0.26	0.06	0.04	0.07	0.11	0.06	0.04	-0.02	0.21	0.18	0.35	1.00			
(21)	Sibling #1 with Low Education	-0.17	0.00	0.02	0.11	0.07	0.10	0.07	0.04	0.11	0.05	0.05	0.02	0.07	0.06	0.04	0.03	0.05	0.02	-0.07	0.02	1.00		
(22)	Sibling #2 with Low Education	-0.11	0.03	0.03	0.09	0.14	0.08	0.09	0.13	0.06	0.03	0.02	0.07	0.08	0.07	0.08	0.12	0.00	0.01	0.33	0.23	0.19	1.00	
(23)	Sibling #3 with Low Education	-0.10	0.03	0.04	0.06	0.19	0.05	0.06	0.06	0.09	0.01	0.01	0.02	0.07	0.06	0.06	0.06	0.07	0.04	0.22	0.4	0.12	0.5	1.00

Table A3: **Correlation of Key Variables**

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1)	Log Stock Value	1.00																				
(2)	Number of Siblings	-0.12	1.00																			
(3)	Sex (male=1)	0.09	0.00	1.00																		
(4)	Race (black=1)	-0.23	0.24	-0.13	1.00																	
(5)	Education	0.29	-0.11	0.11	-0.25	1.00																
(6)	Age	-0.01	0.06	0.00	-0.17	0.13	1.00															
(7)	Married	0.25	-0.05	0.12	-0.30	0.14	-0.03	1.00														
(8)	Log HH Income	0.32	-0.11	0.13	-0.33	0.35	0.04	0.41	1.00													
(9)	Home Ownership	-0.05	0.03	-0.04	0.17	-0.14	-0.44	-0.22	-0.24	1.00												
(10)	Pension Ownership	0.31	-0.16	0.02	-0.18	0.21	0.08	0.17	0.26	-0.10	1.00											
(11)	Number of Children in Household	-0.05	0.04	-0.11	0.04	-0.08	-0.35	0.18	-0.02	0.12	-0.10	1.00										
(12)	Acute Conditions	0.05	0.01	-0.01	0.03	-0.11	-0.55	0.05	-0.06	0.39	-0.16	0.27	1.00									
(13)	Focal Sibling with Poor Health	-0.17	0.05	-0.03	0.12	-0.13	0.20	-0.13	-0.21	-0.05	-0.11	-0.07	-0.11	1.00								
(14)	Sibling with Poor Health	-0.12	0.18	-0.02	0.17	-0.10	0.13	-0.10	-0.15	-0.01	-0.05	-0.03	-0.13	0.24	1.00							
(15)	Focal Sibling K-6 score	-0.11	0.04	-0.02	0.07	-0.17	-0.02	-0.15	-0.17	-0.14	-0.21	0.02	0.15	0.33	0.10	1.00						
(16)	Sibling K-6 score	-0.09	0.06	0.03	0.05	-0.10	-0.05	-0.06	-0.06	-0.06	-0.12	0.10	0.08	0.11	0.29	0.09	1.00					
(17)	Focal Sibling with Moderate Distress	-0.09	0.02	-0.01	0.02	-0.06	0.06	-0.10	-0.11	-0.07	-0.13	0.00	0.08	0.18	0.07	0.56	0.06	1.00				
(18)	Sibling with Moderate Distress	-0.09	0.22	-0.02	0.11	-0.08	0.00	-0.07	-0.08	-0.03	-0.11	0.02	0.03	0.07	0.22	0.04	0.53	0.04	1.00			
(19)	Focal Sibling with Severe Distress	-0.07	0.04	-0.02	0.06	-0.13	-0.01	-0.11	-0.11	-0.10	-0.14	0.02	0.08	0.21	0.06	0.65	0.07	-0.09	0.02	1.00		
(20)	Sibling with Severe Distress	-0.06	0.15	0.02	0.07	-0.10	-0.02	-0.04	-0.05	-0.04	-0.12	0.05	0.11	0.10	0.24	0.08	0.61	0.03	0.02	0.07	1.00	
(21)	Professional or Manager	0.14	-0.04	0.03	-0.09	0.23	0.30	0.03	0.18	-0.17	0.18	-0.16	-0.39	0.00	0.04	-0.12	-0.06	-0.07	-0.05	-0.08	-0.07	1.00

Table A4: **Summary Statistics, 1999–2015**

	Mean	Std. Dev.	Min.	Max	Observations
Stock Ownership	0.274706	0.446405	0	1	5697
Home Ownership	0.762858	0.425368	0	1	5697
Pension Ownership	0.591891	0.491527	0	1	5697
Age	51.82816	7.590636	32	69	5697
Sex (male=1)	0.461295	0.498544	0	1	5697
Race (black=1)	0.345796	0.475669	0	1	5697
Married	0.624539	0.484284	0	1	5697
Children in Household	0.513428	0.939649	0	7	5697
Education	13.6349	2.181325	2	17	5697
Employment	0.744427	0.436221	0	1	5697
Professional or Manager	0.219765	0.414124	0	1	5697
Household Income (Log)	11.75364	1.297743	-10.1198	14.96406	5697
Number of Siblings	2.875197	1.27022	2	12	5697
Health Insurance	0.936282	0.244271	0	1	5697
Health Expenditure (Log)	7.536456	2.597806	0	12.9831	5697
Poor Health	0.180095	0.3843	0	1	5697
Non-Focal Sibling with Poor Health	0.213621	0.409898	0	1	5697
Acute	0.21169	0.408542	0	1	5697
K-6 Score	2.96175	3.811197	0	24	4366
Moderate Distress	0.163705	0.370044	0	1	5064
Non-Focal Moderate Distress	0.2927	0.455053	0	1	4397
Severe Distress	0.03344	0.179804	0	1	4366
Non-Focal Severe Distress	0.077184	0.266913	0	1	4431
Mental Health Diagnosis	0.168685	0.374507	0	1	5697
Non-Focal Mental Health Diagnosis	0.192558	0.394343	0	1	5697
Region 2 (North Central)	0.253993	0.435332	0	1	5697
Region 3 (South)	0.426716	0.494644	0	1	5697
Region 4 (West)	0.168334	0.374196	0	1	5697
Region 5 (Alaska/Hawaii)	0.003511	0.059152	0	1	5697
Risk Avoidance	0.409524	0.491798	0	1	4725
Computer/Internet Use	0.764761	0.424198	0	1	4302
Non-Focal Sibling#1 Geographic Proximity	0.789714	0.407548	0	1	5697
Non-Focal Sibling#2 Geographic Proximity	0.8212617	0.3832077	0	1	2568
Non-Focal Sibling#3 Geographic Proximity	0.8691275	0.3374024	0	1	1192
Non-Focal Sibling Geographic Proximity	0.8351764	0.3710538	0	1	5697

Table A5: **Mean Comparison (t tests) Descriptive Statistics, 1999–2015**

	Focal Siblings	Non-Focal Siblings	Difference	P value
Moderate Distress (K-6 score is 5-12)	0.1637	0.2927	-0.1290	0.0000
Severe Distress (K-6 score is 13+)	0.0334	0.0772	-0.0437	0.0000
Mental Health Diagnosis	0.1687	0.1926	-0.0239	0.0009
Poor Health	0.1801	0.2136	-0.0335	0.0000
Health Expenditure (Log)	7.5365	7.4255	0.1110	0.0155
Health Insurance	0.9363	0.9967	-0.0604	0.0000
Acute Conditions	0.2117	0.2270	-0.0153	0.0489
Smoke Cigarettes	0.2368	0.3711	-0.1343	0.0000
Drink Alcohol	0.6530	0.7709	-0.1180	0.0000

Table A6: **Transition Probabilities of Mental Health Variables**

Panel A: Moderate Distress				**Panel B: Severe Distress**			
	Focal Sibling				Focal Sibling		
	0	1	Total		0	1	Total
0	3,275	438	3,713	0	2,950	71	3,021
	88.2	11.8	100		97.65	2.35	100
1	458	260	718	1	62	42	104
	63.79	**36.21**	100		59.62	**40.38**	100
Total	3,733	698	4,431	Total	3,012	113	3,125
	84.25	**15.75**	100		96.38	**3.62**	100
	Non-Focal Sibling				Non-Focal Sibling		
	0	1	Total		0	1	Total
0	1,799	396	2,195	0	2,809	115	2,924
	81.96	18.04	100		96.07	3.93	100
1	431	516	947	1	131	110	241
	45.51	**54.49**	100		54.36	**45.64**	100
Total	2,230	912	3,142	Total	2,940	225	3,165
	70.97	**29.03**	100		92.89	**7.11**	100

Notes: Moderate distress [K-6 score is between 5 and 12] and severe distress [K-6 score is above 13] are the mental health measures of interest. Both moderate and severe distress variables are cast as dummy variables. For the 912 (29.03%) non-focal siblings that ever experience moderate distress, 516 (54.49%) maintained their experience with moderate distress in the subsequent wave of the PSID survey.

Table A7: **Transition Probabilities of Stock Ownership**

	Focal Sibling Stock Ownership		
	0	1	Total
0	3,311	313	3,624
	91.36	8.64	100
1	409	1,031	1,440
	28.4	**71.6**	100
Total	3,720	1,344	5,064
	73.46	**26.54**	100

Notes: The stock ownership variable is dichotomous, where households that own stocks receive a one, other households receive a zero. A stock owner is defined as "holding shares of stock in publicly held corporations, mutual funds, or investment trusts, not including stocks in employer-based pensions or IRAs." For the 1,344 (26.54%) focal siblings that ever own stock and mutual funds, 1,031 (71.6%) maintained their stock market participation in the subsequent wave of the PSID survey.

8.2 Variable Definitions

** **Household Portfolio Variables**:

- **Stock Ownership**. A PSID respondent receives a 1 if they own shares of stock in publicly held corporations, mutual funds, or investment trusts, not including stocks in employer-based pensions or Individual Retirement Accounts (IRAs), and receives a zero if otherwise.

- **Stock Value as a Proportion of Financial Asset Value.** Stock value is divided by total financial asset value. Financial asset value is a combination of total holdings from checking or savings accounts, money market funds, certificates of deposit, governmental savings bonds, treasury bills, stocks (held directly, mutual funds, investment trusts, excluding pensions from employers or Individual Retirement Accounts (IRAs)). Stock value and financial asset value are in 2015 dollars, adjusted with CPI of BLS.

- **Log Stock Value.** The inverse hyperbolic sine (IHS) transformation is applied to a PSID respondents stock value, a log transformation that keeps the negative and zero values. Stock values are in 2015 dollars, adjusted with CPI of BLS.

** **Mental Health Variables**:

- **K-6 Score of Psychological Distress.** The K-6 score is derived from individual responses to six diagnostic dimensions of mental health. Those six dimensions include being nervous, restless, hopeless, feeling sadness or worthless, or feeling as if everything took effort in the past month. On each dimension a PSID respondent must answer within a range of 0 and 4. The lowest value means that they felt distress at no time, and the highest value signifies that they felt distress all of the time. These responses comprise the K-6 score, which falls between 0 and 24. Moderate distress has a K-6 score that is between 5 and 12. Severe distress has a K-6 score of 13 or higher

- **Non-Focal Sibling with Moderate Distress Dummy Variable.** A non-focal sibling household receives a 1 if their K-6 score is between 5 and 12, and receives a 0 if otherwise.

- **Non-Focal Sibling with Severe Distress Dummy Variable.** A non-focal sibling household receives a 1 if their K-6 score is above 13, and receives a 0 if otherwise.

- **Focal Sibling with Moderate Distress Dummy Variable.** A focal sibling household receives a 1 if their K-6 score is between 5 and 12, and receives a 0 if otherwise.

- **Focal Sibling with Severe Distress Dummy Variable.** A focal sibling household receives a 1 if their K-6 score is above 13, and receives a 0 if otherwise.

- **Mental Health Diagnosis Dummy Variable.** A PSID respondent receives a 1 if they were ever told by a doctor that they had any emotional, nervous, or psychiatric problems, and receives a 0 if otherwise.

** **Independent Variables**:

- **Number of Siblings.** The number of siblings in a family's household in the original PSID sample of 1968.
- **Sex.** A PSID respondent receives a 1 if male, 0 if otherwise.
- **Race.** A PSID respondent receives a 1 if they identify as black, 0 if otherwise.
- **Geographic Region Dummy Variables.** Since there are five regions for the United States, such as Northeast, North Central, South, West and Alaska or Hawaii, four regional dummy variables are created. The Northeast region is the omitted category.
  - North Central Region Dummy Variable. A PSID respondent receives a 1 if they live in the North Central region, receives a 0 if otherwise.
  - West Region Dummy Variable. A PSID respondent receives a 1 if they live in the West region, receives a 0 if otherwise.
  - South Region Dummy Variable. A PSID respondent receives a 1 if they live in the South region, receives a 0 if otherwise.
  - Alaska/Hawaii Region Dummy Variable. A PSID respondent receives a 1 if they live in the Alaska/Hawaii region, receives a 0 if otherwise.
- **Geographic Proximity Dummy Variable.** A non-focal sibling receives a 1 if they in the same geographical region as a focal sibling, and receives a 0 if otherwise.
- **Education.** Years of education for PSID respondent.
- **Age.** Age of PSID respondent.
- **Age Squared.** Age is squared for a PSID respondent.
- **Married.** PSID respondent receives a 1 if they are married, and receives a 0 if otherwise.
- **Log Household Income.** The inverse hyperbolic sine (IHS) transformation is applied to a PSID respondents household income. Household income values are in 2015 dollars, adjusted with CPI of BLS.
- **Number of Children in Household.** Number of children below the age of eighteen in household of a PSID respondent.
- **Professional or Manager Dummy Variable.** A PSID respondent receives a 1 if they have a professional or managerial occupation code, and receives a 0 if otherwise.
  - Occupation codes are based on the 2000 Census. We define professional or managerial occupations (based upon Chiteji and Hamilton (2002)) to include above 1 and less than 43 (management occupations), above 50 and less than 73 (business operations specialists), above 80 and less than 95 (financial specialists), above 100 and less than 124 (computer and mathematical occupations), above 130 and less than

156 (architecture and engineering occupations), above 160 and less than 196 (life, physical, and social science occupations), above 200 and less than 206 (community and social services occupations), above 210 and less than 215 (legal occupations), above 220 and less than 255 (education, training and library occupations), above 260 and less than 296 (arts, design, entertainment, sports, and media occupations), above 300 and less than 354 (healthcare practitioners and technical occupations).

- **Home Ownership Dummy Variable.** A PSID respondent receives a 1 if they own an apartment or mobile home, or home, and receives a 0 if otherwise.

- **Pension Ownership Dummy Variable.** A focal sibling household receives a 1 if they have a defined contribution pension account, and receives a 0 if otherwise.

– A defined contribution pension account is defined as participation in private annuities or Individual Retirement Accounts (IRAs), or participation in a pension or retirement plan through job, or through union, or have a Keogh account, and not including Social Security or Railroad Retirement.

- **Log Health Expenditure.** The inverse hyperbolic sine (IHS) transformation is applied to a PSID respondents health expenditure. Health expenditure values are in 2015 dollars, adjusted with CPI of BLS.

- **Health Insurance Dummy Variable.** A PSID respondent receives a 1 if anyone in their family were covered by health insurance or some other kind of health care plan, and receives a 0 if otherwise.

- **Acute Conditions.** A PSID respondent receives a 1 if a doctor or health professional ever told them that they had a stroke, or cancer [or malignant tumor], or lung disease, or a heart attack, and receives a 0 if otherwise.

- **Employed Dummy Variable.** A PSID respondent receives a 1 if are employed, and receives a 0 if otherwise.

- **Risk Avoidance Dummy Variable.** A PSID respondent receives a 1 if they answered that they would take the job gamble, and receives a 0 if otherwise.

– In the 1996 PSID wave PSID asked respondents the following question: Suppose you had a job that guaranteed you income for life equal to your current, total income. And that job was [your/your family's] only source of income. Then you are given the opportunity to take a new, and equally good, job with a 50-50 chance that it will cut your income and spending power by a third. Would you take the new job? (See Kimball, Sahm, and Shapiro (2009) and Hryshko, Luengo-Prado, and Sorensen (2011))

- **Computer/Internet Use Dummy Variable.** A PSID respondent receives a 1 if they have used the internet through a computer or laptop at their home, and receives a 0 if otherwise. (See Bogan (2008))

- **High School Education or Less Dummy Variable.** A non-focal sibling household receives a 1 if they possess less than 12 years of education, and receives a 0 if otherwise.

- **Low Income Dummy Variable.** A non-focal sibling household receives a 1 if they have income that falls below the 33rd percentile of the income distribution.

8.3 Constructing the Dataset and Designating the Focal Sibling Per Family in PSID

0. The original sibling file, in the wide format, will look like this, using fam-id1968 = 84 as an example:

fam-id1968	ind-id	ind-age2015	ind-educ2015	ind-inc2015	sib-id	sib-age2015	sib-educ2015	sib-inc2015
84	84003	58	12	$67,506	84004	57	12	$107,850
84	84005	51	14	$61,000	84003	58	12	$67,506
84	84005	51	14	$61,000	84004	57	12	$107,850

1. Make three (3) copies of the original sibling file. a) keep the original untouched, call this data-a b) copy with the following variables: fam-id1968, sib-id, and sib-age variables, ..., sib-N (data-b) c) copy with the following variables: fam-id1968, ind-id, and ind-age variables, ..., ind-N (data-c)
2. On data-c: a) rename ind-id as sib-id b) rename ind-age as sib-age c) ...
3. Append (not merge) data-b and data-c
4. Sort the combined file in: a) ascending order of fam-id1968 b) descending order of sib-age2015 c) ascending order sib-id

Your data at this point, using example (fam-id1968 = 84) will look like this:

fam-id1968	sib-id	sib-age2015	sib-educ2015	sib-inc2015
84	84003	58	12	$67,506
84	84003	58	12	$67,506
84	84004	57	12	$107,850
84	84004	57	12	$107,850
84	84005	51	14	$61,000
84	84005	51	14	$61,000

5. Then remove all duplicate sib-id. Then save this as data-d
6. Then create a focal sibling dummy variable. Insert a one on the first row for each family (i.e., the oldest sibling) and insert a zero for otherwise (i.e. the nonfocal sibling). In case of twins (since they have the same age), the one value will be associated with the lower sib-id. However, there are times when the oldest sibling will not be in the first row for each family. Make sure that they are. Save this as data-e. At this point your data will look like this:

fam-id1968	sib-id	sib-age2015	sib-educ2015	sib-inc2015	focalsib
84	84003	58	12	$67,506	1
84	84004	57	12	$107,850	0
84	84005	51	14	$61,000	0

7. Reshape the data from wide to long format. The surveyyear variable will be created. The final dataset will consist of one row for each sibling family per year:

Table C8: **Long format for dataset**

(a) **Panel A: One row for each sibling, per year [select years are shown].**

individual_id	surveyyear	family_id	age	income	education	focalsibling
84003	1968	84	11	.	0	1
84003	2005	1489	48	$68,204	12	1
84003	2007	297	50	$81,565	12	1
84003	2009	1157	52	$70,818	12	1
84003	2011	2043	54	$69,120	12	1
84003	2013	478	56	$68,083	12	1
84003	2015	27	58	$67,506	12	1
84004	1968	84	10	.	0	0
84004	2005	2958	47	$152,208	12	0
84004	2007	5926	49	$100,798	12	0
84004	2009	5796	51	$97,858	12	0
84004	2011	5397	53	$97,200	12	0
84004	2013	1013	55	$97,807	12	0
84004	2015	2481	57	$107,850	12	0
84005	1968	84	4	.	0	0
84005	2005	1513	40	$66,830	12	0
84005	2007	7446	43	$57,500	12	0
84005	2009	4441	45	$62,160	14	0
84005	2011	545	46	$57,240	14	0
84005	2013	2823	49	$57,680	14	0
84005	2015	3969	51	$61,000	14	0

(b) **Panel B: One row for each sibling family, per year.**

sib1_id	surveyyear	fam1_id	sib1_age	sib1_famincome	sib1_educ	sib2_id	fam2_id	sib2_famincome	sib2_educ	sib3_id	fam3_id	sib3_age	sib3_famincome	sib3_educ
84003	1968	84	11	.	0	84004	84	.	0	84005	84	4	.	0
84003	2005	1489	48	$68,204	12	84004	2958	$152,208	12	84005	1513	40	$66,830	12
84003	2007	297	50	$81,565	12	84004	5926	$100,798	12	84005	7446	43	$57,500	12
84003	2009	1157	52	$70,818	12	84004	5796	$97,858	12	84005	4441	45	$62,160	14
84003	2011	2043	54	$69,120	12	84004	5397	$97,200	12	84005	545	46	$57,240	14
84003	2013	478	56	$68,083	12	84004	1013	$97,807	12	84005	2823	49	$57,680	14
84003	2015	27	58	$67,506	12	84004	2481	$107,850	12	84005	3969	51	$61,000	14

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