

## How Children with Mental Disabilities Affect Household Investment Decisions<sup>†</sup>

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Child disability is a growing issue in the United States and more and more children are suffering from mental disabilities. A total of 13 percent to 20 percent of children living in the United States experience a mental disorder in a given year, and surveillance during 1994 through 2011 has shown the prevalence of these conditions to be increasing (Perou et al. 2013). While childhood disabilities related to physical health concerns have decreased relative to the early 2000s, disabilities due to neuro-developmental and mental health problems increased dramatically between 2001 and 2010. It is estimated that nearly six million children had a disability in 2010—an increase of almost 1 million from the 2001 estimates (American Academy of Pediatrics 2013).

As a result of these trends, mental disorders among children are becoming an increasingly important public health issue in the United States, with an estimated total annual cost of \$247 billion (Perou et al. 2013). In general, the severity of the child's condition is the most important predictor of economic costs, particularly in the form of foregone earnings or labor market opportunities, but also direct out-of-pocket expenditures. Powers (2001) finds the estimated impact of offspring disability on employment is similar to the effect of a woman's own failure to complete college or of adding an additional child under age five to the family. Cidav, Marcus, and Mandell (2012) find that on average, mothers of children with autism spectrum disorder (ASD) earn 35 percent less than the mothers of children with another health limitation and 56 percent less

than the mothers of children with no health limitation. Newacheck and McManus (1988) show that charges and out-of-pocket medical expenses were two to three times higher on average for disabled children compared with other children. Sharpe and Baker (2007) find that for families with an autistic child, many survey respondents forfeited future financial security and even experienced bankruptcy to provide therapy for a child with autism. With regard to caring for children with disabilities, documented efficacy of early intervention heightens the intense pressure to use whatever means possible to secure needed therapy—including placing the family's financial future at risk.

Beyond labor force participation decisions, other household financial decisions may be affected by children with mental disabilities. It may be the case that children with mental disabilities directly affect household investment decisions in a manner that curtails household wealth accumulation. Yet, little is still known about the effects of children with mental disabilities on household portfolio choice decisions.

In this paper, we attempt to add to this area of research by analyzing how children with mental disabilities influence household investment decisions. We find that households with at least one special needs child generally have a decreased probability of holding risky assets. However, those households with at least one special needs child that do hold risky assets have a larger percentage of their financial wealth in risky assets.

### I. Data

We use US data from the biennial Panel Survey of Income Dynamics (PSID). This nationally representative panel survey contains questions on income, assets, earnings, occupation, marital status, family structure, child characteristics,

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and educational attainment.<sup>1</sup> For child information, we utilize the 1997, 2002, and 2007 waves of the Child Development Supplement (CDS) of the PSID, which contains detailed information on the health status of 3,563 individual children in 2,380 distinct households. For our analysis, we define a special needs child as being diagnosed with at least one of the following mental disabilities: autism, lead poisoning, mental retardation, pervasive developmental delay, or speech language delay/disorders. We link each child to the head of household. One drawback of these data is that we only observe mental health information for children in the CDS sample. Thus, we do not observe the mental health conditions of all children in the household. For household level financial data, we use seven PSID waves from 1999 through 2011. We aggregate the data to the household level, as stock holding and other financial variables are measured at the household level.

Within our sample, there are some characteristics in which families with and without special needs children significantly differ at the 5 percent level. Families with special needs children are more likely to have other children, be married, have an unemployed household head, and have less education. We also find a smaller percentage of households with special needs children hold risky assets (and safe assets) compared to households without special needs children (risky asset holding difference of 2.2 percentage points is statistically significant at the 5 percent level). Families with special needs children also have more household wealth (wealth difference of \$18,362 is statistically significant at the 1 percent level).

## II. Econometric Analysis and Results

Households that have special needs children can have elevated health-care costs, unavailable or high-cost child care, reduced family labor supply, and adult child-care costs. These different household expense and income profiles may induce different household investment decisions. Thus, this paper posits that having special needs children may affect household portfolio

decisions with respect to participation in specific asset markets as well as the intensity of participation in these markets.

To analyze the effect of offspring mental disabilities on the probability of holding a particular type of asset (the extensive margin), we use univariate models in which the dependent variable is a binary variable for asset (risky asset or safe asset) market participation, the independent variable of interest is a dummy variable indicating if the household has a special needs child, and the other independent variables include household offspring characteristics and household demographic characteristics that have been previously identified as influencing investment behavior. We define risky assets as mutual fund ownership or stock ownership where stock ownership includes owning shares of stock in publicly held corporations or investment trusts.<sup>2</sup> We define safe assets as bonds, bond funds, cash value in a life insurance policy, a valuable collection for investment purposes, or rights in a trust or estate. Our baseline model specification is

$$(1) \quad OWN_{it} = \beta_0 + \beta_1 SpecialNeeds_{it} \\ + \beta_k \bar{X}_{it} + \beta_h Z_{it} + \eta_t + \epsilon_{it},$$

where  $OWN_{it}$  is a binary variable holding the value of 1 when household  $i$  in year  $t$  has asset (risky or safe) holdings and zero otherwise. The variable of interest,  $SpecialNeeds_{it}$ , is a dummy variable with a value of 1 if a child with special needs is present in the household and zero otherwise;  $\bar{X}_{it}$ , is a matrix containing observed child characteristics;<sup>3</sup>  $Z_{it}$ , is a matrix of household control variables previously shown to be significant in explaining the probability of holding stock in the United States (Bertaut 1998).<sup>4</sup>

<sup>2</sup>Stock ownership does not include assets in IRA accounts, Keogh accounts, 401(k)s or similar defined contribution pension plans.

<sup>3</sup>One child, two children, three children, and four or more children dummy variables; a dummy variable if household has a child under age five; a dummy variable indicating if a child with a physical disability (hearing, seeing, or orthopedic) is in the household; and a dummy variable indicating if parents expect at least one child to complete college.

<sup>4</sup>These variables include family income, home ownership, a received an inheritance dummy variable, and head of household characteristics (voluntary contribution pension holding, age, education, race, employment status,

<sup>1</sup>The PSID is produced and distributed by the Institute for Social Research, Survey Research Center, University of Michigan, Ann Arbor, Michigan.

TABLE 1—KEY MARGINAL EFFECTS: HOUSEHOLD ASSET HOLDING

	Risky asset holding		Safe asset holding	
Special needs child in household	-0.0326 (0.0112)	-0.0312 (0.0133)	-0.0133 (0.0111)	-0.0187 (0.0131)
Expected education for HH children	0.0232 (0.0073)	0.0168 (0.0085)	0.0104 (0.0084)	0.0027 (0.0101)
Year fixed effects	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes
Risk controls	Yes	Yes	Yes	Yes
Computer user control	No	Yes	No	Yes
Household-year observations	11,763	7,423	11,763	7,423

Notes: Marginal effects reported. Robust standard errors in parentheses.

Using the pooled PSID data, we apply a random effects linear probability model (LPM) to equation (1) to control for unobservable heterogeneity between households.<sup>5</sup> The standard errors in all regressions are adjusted for intra-cluster correlations at the household level. From Table 1, we see that having a child with a special need significantly decreases the probability of holding risky assets. Households with special needs children are 3 percentage points less likely to have risky asset holdings. This effect is slightly greater than the effect on risky asset holding of a one year reduction in education by the head of household, *ceteris paribus*. We also find households that have higher educational expectations of children are more likely to hold risky assets.

occupation type, marital status, and gender). We also control for the effects of information and transaction costs with a computer usage dummy (Bogan 2008); the health effects on asset holding behavior with a health proxy that consists of the number of chronic health conditions of the household head (Bogan and Fertig 2013); and health costs with a has health insurance dummy variable. We control for aspects of the respondents' occupation/training that could lead to increased financial market participation with an employed in a managerial or professional occupation dummy variable, a work in a finance related field dummy variable, and an unemployed dummy variable. A set of regional dummy variables are used to control for unobserved location differences. For each household, we also construct risk tolerance measures based on several risk tolerance questions in the 1996 Wave of the PSID (Hryshko, Luengo-Prado, and Sorensen 2011). Unobserved changes in national trends are captured by a set of year dummy variables,  $\eta_t$ .

<sup>5</sup>Using a LPM fixed effects model, we do obtain qualitative similar results. However, there is limited within household variation on the special needs variable and thus the fixed effects results are not significant.

To analyze the intensive margin of asset market participation, initially we consider random effects LPM and Tobit models where the dependent variable is the value of asset (risky asset or safe asset) holdings as a percentage of total household financial assets.<sup>6</sup> As the dependent variable is bounded between zero and unity, the Tobit model is widely used to estimate economic relationships when a large number of zeros are present (Cook, Kieschnick, and McCullough 2008). The specification is as follows:

$$(2) \quad P_{it} = \beta_0 + \beta_1 \text{SpecialNeeds}_{it} + \beta_k \bar{X}_{it} + \beta_h Z_{it} + \eta_t + \epsilon_{it},$$

where  $P_{it}$  is a variable between 0 and 1 that indicates the percent of financial assets that household  $i$  has invested in risky assets (or safe assets) in year  $t$ . The variable of interest,  $\text{SpecialNeeds}_{it}$ , is a dummy variable with a value of 1 if a child with special needs is present in the household and zero otherwise. The remaining independent variables are identical to the ones used in equation (1).

The results (not shown) of the LPM and Tobit models indicate that educational expectations for children significantly increase the share of total financial assets devoted to risky assets. However, having a special needs child in the household significantly decreases risky assets

<sup>6</sup>Total financial assets includes stock holdings, savings/checking accounts, government bonds, T-bills, cash in a life insurance policy, a valuable collection, bond funds, rights in a trust or estate, and pension accounts (IRAs, Keogh accounts, 401(k)s, or similar defined contribution plans).

TABLE 2—HURDLE MODEL COEFFICIENTS: ASSET MARKET PARTICIPATION

	Risky assets		Safe assets	
	Participation	Share	Participation	Share
Special needs child in household	-0.2680 (0.1390)	0.0536 (0.0258)	-0.1590 (0.1060)	-0.0086 (0.0125)
Expected education for HH children	0.3100 (0.1160)	-0.0255 (0.0251)	0.1310 (0.0869)	0.0186 (0.0105)
Year fixed effects	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes
Risk controls	Yes	Yes	No	No
Computer user control	No	No	No	No
Household-year observations	11,604	11,604	11,599	11,599

Notes: Columns 1 and 3 report logit coefficients. Columns 2 and 4 report OLS estimates. Robust standard errors in parentheses.

as a share of total financial assets in the Tobit model. Also, having a special needs child significantly decreases safe assets as a share to total financial assets in both the LPM and Tobit models.

The LPM and Tobit models that we initially use to examine asset market participation do have limitations.<sup>7</sup> We therefore employ a hurdle model. The hurdle model is a two part model, which first considers participation in the asset market and then conditional on participation, estimates the level effect of household characteristics on the intensive margin of asset market participation. The hurdle model allows household characteristics to separately affect the participation decision and the amount invested. The results from our hurdle model are presented in Table 2. Consistent with our previous extensive margin risky asset results, participation in risky asset markets is significantly lower among households with special needs children. However, conditional on participating in the market, households with special needs children invest a larger portion of their total financial assets in risky assets.

One limitation of using the CDS is that, at most, two children from each household are interviewed. Therefore, our estimates may

contain measurement error, if a child with a disability is not interviewed for the survey or if children with disabilities are over-represented. As a robustness check, we perform analyses with a subsample of our data which contains only households with one or two children ( $N = 7,252$ ).<sup>8</sup> The coefficients (not shown) from the hurdle model using this subsample indicate that having a special needs child decreases the probability of holding risky assets (significant at the 5 percent level). Also similar to our other results, those special needs one or two child households that do hold risky assets, hold a larger share of their total financial assets in risky assets (significant at the 10 percent level).

### III. Concluding Remarks

The cost of caring for a child with a mental disability can be significant. For chronic conditions, these costs of care can extend into adulthood. Special needs households face a trade-off between investing in education/therapy today to increase future income potential for the child or investing in financial assets today to finance the future of the child as an adult. We examine this issue using CDS data from the PSID and find households that have children with special needs experience a significant reduction in the likelihood of holding risky assets. However, households with special needs children tend to invest

<sup>7</sup>The Tobit model accounts for the mass of zeros for households who do not participate in the market. However, it restricts the participation decision and intensity decision to be determined by a single mechanism. The single mechanism restriction has been called into question with respect to the validity of using Tobit to measure decisions for financial portfolio choice (Cook, Kieschnick, and McCullough 2008).

<sup>8</sup>When we analyze the one or two children subsample, we keep a household in the subsample only if they have one or two children. If a new child is born, then the household is dropped from the subsample.

more intensely when they do participate in the stock market.

As risky asset holding is a key component of wealth building, these findings have important implications for household wealth inequality. Our results suggest that while risky asset market participation is an important vehicle to generate the much needed funds to support a special needs child, many households with special needs children are not able to participate in these markets, despite similar average annual income levels. Hence, these results are important as the federal government and many states adopt policies which benefit special needs children. For example, some states have developed Medicaid waivers allowing households to participate in Medicaid regardless of income level, if the child has a disability. These policies can affect both the household decision to invest in education/therapy as well as the decision to invest in specific types of assets.

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