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ABSTRACT

While there has been broad interest in the direct effects of major life events on older households that experience them, little attention has been paid to the intergenerational transmission of those effects— how negative shocks in parents' households affect the outcomes of their adult children—or to the role that grown children play in helping their parents recover from adverse events. We use regression and event study approaches to examine within-family changes in monetary transfers and informal care following wealth loss, involuntary job displacement, spousal death, and health shocks in retirement-aged households. We find that giving to adult children is responsive to changes in parents' wealth and earned income. We document large reductions in the likelihood of making financial transfers to children following wealth loss and job displacement, particularly in households with low accumulated wealth. We also find that parents increase their transfers following spousal death and reduce them with the onset of disability or poor health. We find that upstream transfers are also responsive to life events—children, particularly those with low-wealth parents, increase their financial transfers and in-kind assistance following adverse shocks in their parents' households.

JEL Classification Codes: D64, I10, J63, J12

Key Words: intergenerational transfers, health, job loss, divorce

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The consequences of adverse life events in households of retirement age are well documented in a literature spanning many decades and several disciplines. Researchers have studied the effects of wealth loss, employment transitions, health shocks, and household structure changes on finances, labor supply, consumption, and health trajectories in older households.[1] Because of their ubiquity, health shocks in particular have been the subject of a substantial body of research (see Prinz et al. (2018) for a recent summary). Recently, there has also been growing interest in understanding the effects of wealth loss and job displacement among older Americans, as research has shown that the wealth and employment trajectories of older households were substantially and permanently impacted by the severe downturns in the housing, financial, and labor markets that occurred during the Great Recession of 2007–2009 (Munnell and Rutledge, 2013).[2]

While there has been broad interest in the direct effects of significant life events on older households that experience them, little attention has been paid to the intergenerational transmission of those effects—how negative shocks in parents' households affect the outcomes of their adult children. In particular, adverse events may disrupt wealth transfers from parents to their children. Disruptions in the flow of inter vivos transfers from parents to children could have large welfare effects, as transfer amounts can be economically significant[3] and are typically given at times when children's marginal utility of income is high (McGarry, 2016). The intergenerational transmission of adverse shocks may also exacerbate the effects of cyclical fluctuations in economic conditions for young adults, who are already vulnerable in recessions (Hoynes, Miller and Schaller, 2012).

It is also likely that adult children play an important role in helping their parents recover from adverse events. Children are a potential source of monetary, residential, emotional, and caregiving support for their parents, and may be able to help their parents smooth consumption after negative events. Recent research has examined parents' role in helping children after negative shocks (Edwards, 2019; Kaplan, 2012; McGarry, 2016), but less attention has been paid to children's role in alleviating the impacts of negative shocks for their parents. Though upstream financial transfers from children to parents are less common, they may have significant welfare effects if they are given in response to declining income, wealth, or health

[1] See Schwandt (2018) and Pool et al. (2018) on the effects of wealth shocks, Chan and Stevens (2001) and Salm (2009) on the effects of job loss, Dobkin et al. (2018) and Wu (2003) on the effects of health shocks, and Sharma (2015) and Goda, Shoven and Slavov (2013) on the effects of divorce and widowhood.

[2] For example, see Farber (2017); Christelis, Georgarakos and Jappelli (2015).

[3] The average transfer recorded in our HRS sample is $13,601.

in parental households. Meanwhile, the responses of both in-kind and financial transfers to health shocks are particularly important to document from a policy standpoint, given older households' limited private options for insuring against increases in long term care expenditures and the potential for crowd-out from proposed public options (Brown and Finkelstein, 2011).

In this paper, we use panel data spanning more than 20 years from the Health and Retirement Study to examine the dynamics of intergenerational transfers between parents and their adult children following adverse events occurring in parent households. Using an event-study approach, we estimate within-family changes in transfers following several different life events impacting the older generation: sudden wealth loss, exit from employment, spousal death, hospitalization, disability, and poor health. We demonstrate that careful consideration of the dynamics of transfers around these discrete changes in household circumstances provides important insights into the within-household dynamics of transfers. While these events are not purely exogenous, their timing may be quasi-random conditional on having the event. By using an event study approach we can gain insight into the causal effects of changes in parental household circumstances on transfers that cannot be gained from the traditional cross-sectional and fixed-effects regression models that are common in the literature. In addition to studying financial transfers from parents to their children, we consider transfers from children to their parents and the provision of informal care. We also document differential exposure to these shocks among children from high and low wealth families.

We motivate our analysis with a discussion of different theoretical models of intergenerational transfers, emphasizing the expected effects of parental wealth, income, household structure, and health status on transfers—effects that the previous theoretical literature has rarely focused on directly—and considering both downstream and upstream transfers. We supplement predictions from standard transfer models with theoretical insights from recent structural models of savings and demand for long-term care insurance (Ameriks et al., 2018; Laitner, Silverman and Stolyarov, 2018) about uncertain health risk and life expectancy, state-dependent preferences, and wealth-based heterogeneity.

In our empirical analysis, we begin by documenting the correlates of intergenerational transfers in HRS households using descriptive statistics and cross-sectional regressions. This exercise echoes previous analyses of transfer behavior such as those in Cox and Rank (1992) and McGarry and Schoeni (1995). However, rather than focusing on the association between child characteristics and parent-to-child transfers, we conduct our analysis with a focus on parent households and examine both downstream and upstream transfers.

The results reveal three important patterns in transfer giving and receipt in older households. First, we confirm that parental income and wealth are significantly and positively associated with parental giving—a fact that has been found repeatedly throughout the literature on intergenerational transfers (see, for example, Altonji, Hayashi and Kotlikoff 1997; Mukherjee 2018). Second, we find that parents' household structure is an important predictor of both giving and receipt of transfers. Single females in particular are less likely to give financial transfers to their children and more likely to receive transfers and help from their children. Third, we find that disability and poor health are strong predictors of *receiving* money and help from one's children, but they are not significantly associated with the level of transfers from parents to their children.

Next, we shift our focus from cross-sectional patterns in the giving and receiving of transfers to identifying the effects of changes in circumstances within the same households over time, using household fixed effects models. This approach, recently used by McGarry (2016) to study the response of parental transfers to changes in children's life circumstances, eliminates the potentially confounding effects of unobservable fixed household characteristics that may be associated with transfer behaviors and with other key explanatory variables. We find that the signs from the cross-sectional results related to the effects of wealth, income, household structure, and health on transfers are robust to the inclusion of household fixed effects, though some effects become smaller and others become larger. Importantly, we again find that income, wealth, and family structure are associated with parental giving while health circumstances are not. With regard to the receipt of money and help from children, fixed effects analysis shows that upstream transfers respond to changes in current income, household structure, and health status in parents' households.

While fixed effects models help to zero in on effects that are more plausibly causal than those that are produced by cross-sectional models, the coefficients that they produce are difficult to interpret because within-household changes in the explanatory variables include both evolutionary and sudden changes in household circumstances. In order to gain further insight into the causal effects of household circumstances on transfers, we use an event study approach, looking for sharp changes in transfers and related outcomes around the time of discrete changes in wealth, employment status, household structure, and health in parents' households.[4] By focusing on measurable and sudden shocks to parent circumstances rather than gradual

[4]This approach is used by Dobkin et al. (2018) in an analysis of the effects of hospitalization on household labor supply and finances, also with HRS data.

evolution in those circumstances, we are able to examine changes that are plausibly exogenous (in their timing, if not in their occurrence) and more likely to be unexpected—the changes that are likely to have the largest effects on giving. We explore heterogeneity in the response to adverse shocks by estimating our model separately for households with low and high wealth holdings and investigate possible mechanisms behind changes in transfers after adverse shocks by examining the direct effects of adverse shocks on wealth, income, health expenditures, bequest expectations, and life expectancy in older households.

Our event study analysis reveals that financial transfers from older households to adult children are indeed sensitive to sudden changes in wealth and income. Examining changes in transfers that occur following major wealth loss and employment exit, we find that parents' likelihood of making a financial transfer to their children is reduced following those shocks. In particular, a sudden 25 percent decrease in wealth is associated with around a 6 percentage point reduction in the probability of making a transfer, and job loss is associated with around a 4 percentage point reduction (off of a baseline rate of around 33 percent). Estimating the model separately for low-wealth and high-wealth households reveals that the effects of wealth shocks and job exit are concentrated in households with low wealth holdings. We separately find that around the time of a spousal death (usually associated with a sudden increase in household wealth per capita), parents' likelihood of making large transfers to their children *increases* by as much as 12.5 percentage points, with particularly large increases for male widowers. Somewhat surprisingly, given the large literature showing the direct effects of health shocks on household financial outcomes, we find that neither the onset of disability nor the onset of poor health changes the likelihood of parental giving in the years immediately following the shock.

Another important finding that emerges from our event study is that adult children play an insurance role for their aging parents. In particular, we find that children are substantially more likely to provide in-kind assistance (informal care) for their parents following adverse shocks. Increases in informal care are especially large after the death of a spouse and after the onset of disability or poor health, but they are present and significant for every adverse shock that we consider. While the overall incidence of upstream financial transfers is low, we also find that children's likelihood of making large financial transfers *to* their parents is increased following disability and poor health. Increases in upstream financial transfers following health shocks are largest in parent households with low wealth levels—those that are less able to draw on savings to smooth their own consumption.

Taken together, our results reveal that adverse events in the households of aging parents have important intergenerational effects. In particular, the adult children of parents in low-wealth households receive fewer large financial transfers from their parents following negative shocks to parental wealth, employment, and health. As previous research has shown that large financial transfers from parents to their adult children are given in response to adverse shocks in children's own households or as an investment in children's human capital (i.e., when the marginal utility from such transfers is particularly high), these reductions in large transfers may have important welfare effects. Reductions in downstream transfers from parents to children are paired with increases in upstream transfers—children are more likely to provide transfers of money and time *to* their parents following adverse shocks. The positive response of upstream transfers to parental shocks may further exacerbate the transmission of adverse events to the younger generation. However, it also likely increases parental welfare through added consumption smoothing. Finally, we show that the effects of adverse shocks on both downstream and upstream transfers are concentrated in low-wealth households. This results suggests that differences in adult children's exposure to adverse shocks to their parents' health or wealth may be an important mechanism for the transmission of wealth between generations.

Our examination of the effect of specific events on intergenerational transfers provides new insight into the causal effects of wealth, income, family structure, and health on giving and receiving of transfers that has not previously been gained from observational studies. Thus far, life events in giver households have not received much attention in the large empirical literature on intergenerational transfers, which has primarily studied the cross-sectional determinants of transfers and has focused on identifying the associations between children's characteristics and life events and their receipt of financial transfers (see, among others, Cox and Rank 1992; Rosenzweig and Wolpin 1993, 1994; McGarry and Schoeni 1995; McGarry 2016). Our event study results suggest that the strong correlations between transfers and parental wealth, income, household structure, and health that are seen in the cross-section are not merely reflective of spurious correlation but rather reflect causal effects of those factors on giving.

Our results also provide further insight into the effects of aggregate economic downturns on families. Previously, studies on families in economic downturns have focused on parents' roles in assisting their children after adverse shocks (for example, Bitler and Hoynes 2015; Dettling and Hsu 2018; Attanasio, Meghir and Mommaerts 2018). Our study highlights the simultaneous importance of adverse shocks in parents' own households, suggesting that those shocks may exacerbate the direct effects of an economic

downturn on children and underscore children's role in helping their parents smooth consumption after shocks. Our findings also have implications for the value and effectiveness of social safety net programs that might substitute for intra-family exchange, implying that public income support and medical insurance programs that aim to help households smooth their consumption following shocks to income and health may partially crowd out adjustments to transfers within families. Finally, our results have important implications for the literature on optimal long-term care insurance. In particular, the extent to which family members respond to households shocks by increasing their provision of informal care reduces demand for the private purchase of long-term care insurance and increases the potential for crowd-out from a public option (Pauly, 1990; Brown and Finkelstein, 2011). Our paper documents a direct response of family-provided informal care to adverse shocks to health and finances within aging households.

1. Theoretical framework and predictions

Citing the complexity of the dynamic processes determining intergenerational transfers, economists have recently opted not to specify and estimate structural models, choosing instead to outline key assumptions with informal theoretical discussion (see, for example, Altonji and Villanueva 2007; McGarry 2016; Haider and McGarry 2018). The canonical analytical models of inter vivos transfers (e.g., in Altonji, Hayashi and Kotlikoff 1997) are a useful starting point, but are simplified and do not generate concrete predictions about the effects of shocks to income, wealth, and health status on transfers. To have a theoretical framework to aid in interpretation of our empirical results, we build on the discussion in Altonji and Villanueva (2007), incorporating elements of recent theoretical work on long-term care insurance, late-life spending, and family risk sharing. We also extend the discussion to include upstream transfers.

1.1. Parent-to-child transfers

Altonji and Villanueva (2007) informally outline a theoretical model of the determination of parent-to-child transfers that serves as the starting point for our discussion. In their model, parents maximize an expected lifetime utility function that depends on their own consumption, their children's utility, and (optionally) their level of giving through a "warm glow" mechanism. Parents in the model start with an initial wealth endowment and have an uncertain stream of labor earnings prior to retirement. After retirement,

they receive a flow of social security income, pension income, and labor earnings, which is a deterministic function of their prior labor earnings and depends on their marital status. Life expectancy is uncertain, and the flow of post-retirement income terminates when both parents are dead. In each period of the model, parents choose how much to save from their income and wealth and how much to spend on their own consumption and on transfers to adult children. These choices, along with the flow of labor earnings, social security income, and pension income, determine parents' wealth in later periods.

A key feature of this model (and most theoretical models of transfers) is the altruism motive—parents care about their children and make transfers in order to increase their children's utility. Under altruism, other things being equal, increases in parental lifetime income and wealth should lead to increases in transfers. Altruistic motives lead parents to want to transfer money earlier, when children's own income and wealth levels are low, the value of investments in human capital is high, and children are likely to be liquidity-constrained (Cox, 1990). Another key ingredient of the model—uncertainty—has the opposite effect. In the presence of uncertainty about their own future income, future consumption needs, and life expectancy, as well as uncertainty about their children's future incomes, parents are incentivized to *delay* transfers as long as possible in order to gain more information and avoid accidentally overspending (Altonji, Hayashi and Kotlikoff, 1997). Precautionary motives, particularly those associated with own-income risk and late-in-life health risk, are emphasized in recent work on post-retirement consumption and the demand for long-term care insurance (see, e.g., Ameriks et al. 2018; Laitner, Silverman and Stolyarov 2018).

Considering the effects of adverse life events in parental households on transfers in light of this model, it is clear that the effects of a particular shock, whether it be to wealth, income, household structure, or health, on parental giving may operate through a variety of mechanisms. First, the shock may affect parents' expected lifetime wealth and income stream. The size of changes in lifetime wealth and income will depend on many factors including the nature, size, and permanence of the shock, the existing accumulation of wealth, and the availability of private and social insurance. Second, a shock may change parents' own expected future consumption needs. As highlighted in recent research, preferences may be state dependent. Health status in particular, is often assumed to cause changes in the marginal utility of consumption (Ameriks et al., 2018; Brown, Goda and McGarry, 2016; Finkelstein, Luttmer and Notowidigdo, 2013; Laitner, Silverman and Stolyarov, 2018). Changes in future consumption needs could also result from changes in time use, expected health costs, household size, or life expectancy. Third, a shock may reduce the incentive for parents

to delay inter vivos giving if it reduces the level of uncertainty about future income or health. Additionally, preferences for own consumption and for child utility, the degree of liquidity constraint, and household discounting and risk aversion likely play important roles in mediating the effects of shocks on transfers.

1.2. Child-to-parent transfers

Absent from Altonji and Villanueva's model, and from many analytical models of inter vivos transfers, is a framework for simultaneously considering upstream (child-to-parent) and downstream (parent-to-child) transfers. In a summary article, Laferrère and Wolff (2006) outline several different models that allow for bilateral transfers. One approach is to assume two-sided altruism. In this model, either the parent transfers to the child (if parent income is sufficiently high or child's income is sufficiently low), or the child transfers to the parent (if child income is sufficiently high, or parent income is sufficiently low), or neither makes a transfer. Under mutual altruism, the justification for child-to-parent transfers is similar to that for parent-to-child transfers. Parents transfer money to liquidity-constrained children who expect higher income in the future but are unable to borrow against it freely, while children transfer money to parents who may be unable to borrow against a fixed income stream or may encounter shocks so large that they are unable to insure against them. With child altruism, adverse shocks to parents' expected income and wealth should lead to increases in upstream transfers (Sloan, Zhang and Wang, 2002). The expected effects of changes in parental consumption needs and life expectancy should also mirror the effects in one-sided altruistic models.

Another approach to thinking about upstream transfers is to characterize transfers in an exchange framework (Cox, 1987). In an exchange framework, parents make transfers in exchange for services or financial transfers that their children are providing or will provide to them in the future. Thus, the receipt of transfers from children in old age might be viewed as reciprocity for transfers given in another form (e.g., services exchanged for money), for transfers given previously, or for an expected bequest. The exchange arrangement might be ongoing payment for informal care or, alternatively, an insurance arrangement in which children receive transfers and in return provide a safety net in case of catastrophic health expenses or unexpectedly long life. Exchange motives add another layer of complexity in considering the effects of life events, as events might not only alter parents' ability to pay and their marginal utility of general consumption, but might separately alter the marginal utility derived from child services. Moreover, there may be a lag be-

tween payment for services and receipt of services. Generally, in an exchange framework, the provision of downstream financial transfers should increase when parents' income and wealth increase, and upstream financial transfers should increase when parents' income and wealth falls. Meanwhile, downstream transfers and the (upstream) provision of services should both increase when the marginal utility from services increases. The response of informal care (service provision) to changes in the parents' financial situation is difficult to predict in an exchange model. On one hand, decreases in income and wealth reduce ability to pay for child services. On the other hand, if income and wealth fall enough, recipients might be unable to afford market services, which could increase the marginal utility derived from child-provided services.

A final alternative is to treat extended families as multilateral insurance networks, assuming that parents and children help each other to smooth consumption. For example, Attanasio, Meghir and Mommaerts (2018) apply a model of small group risk-sharing to extended families, arguing that the barriers to information and risk sharing are lower within families than between households more generally. This kind of model treats parents and children equally and would allow for transfers running in both directions at any frequency, with transfers adjusting as the ratio of the marginal utilities between parents and children fluctuates. Like the other models described above, this model also generates the prediction that adverse shocks to parental household circumstances should lead to increases in upstream transfers.

1.3. Predicting the effects of adverse life events in parent households

Informed by the theoretical models discussed above and existing empirical studies on the effects of adverse events on household outcomes, we briefly summarize the possible mechanisms through which specific adverse life events in parents' households—wealth shocks, job loss, widowhood, and health shocks—could affect transfers between parents and their adult children.

1.3.1. Wealth Shocks

In both altruistic and exchange-type models, pure wealth reductions in giver households are expected to cause reductions in transfers by reducing demand for all consumption goods, including children's consumption and child services. Descriptive analysis of inter vivos transfers has shown household wealth to be positively associated with giving (Altonji and Villanueva, 2007; Mukherjee, 2018). Research has also shown that household consumption decreases following shocks to financial and housing wealth in elderly house-

holds (Christelis, Georgarakos and Jappelli, 2015; Kishor, 2007). However, to our knowledge, changes in downstream transfers after parental wealth shocks have not been studied. For households at the margin of *receiving* money from their children, wealth reductions should lead to increases in upstream transfers. In a dynamic model, the extent to which changes in period wealth result in contemporaneous changes in transfers will depend on the degree to which the wealth shock is unanticipated, the degree to which it is permanent, and the degree to which parent households are liquidity-constrained (with each factor leading to increased responsiveness of giving to contemporaneous shocks).[5]

1.3.2. Employment Transitions

Involuntary job loss, job exit, and retirement are associated with a sudden reduction in earned income and a sudden change in time use. In the theoretical models outlined above, changes in employment could affect intergenerational transfers for several reasons. As with the wealth shocks discussed above, a reduction in income reduces demand, including for children's consumption and child services. Though a dynamic model with full information predicts that individuals who are not liquidity-constrained should be able to smooth their consumption across employment transitions, empirical evidence suggests that both job losers and retirees experience measurable drops in consumption upon exit from employment.[6] Reductions in household income should also increase the likelihood of *receiving* transfers from children in altruistic, exchange, and insurance models.

Unlike pure wealth shocks, changes in employment may also have direct effects on the marginal utility derived from services from children (for example, increasing demand for companionship) through their effects on time use. However, the expected direction of these effects is not clear. Employment transitions may also affect intergenerational transfers through their effects on access to employment benefits such as health insurance coverage and pension benefits (Chan and Stevens, 2001). Loss of health insurance coverage may be associated with increases in out-of-pocket expenditures and possible substitution of family-provided care for market-based health care, while reductions in pension benefits will likely reduce transfers through

[5] Wealth shocks have also been found to affect health and labor supply in elderly households (Schwandt, 2018), which could independently affect intergenerational exchange by altering time use, life expectancy, expected medical expenditures, and the marginal utilities of consumption and of child-provided services.

[6] Gruber (1997) and East and Kuka (2015) document reductions in food consumption at unemployment. Christelis, Georgarakos and Jappelli (2015) estimate that workers who became unemployed during the Great Recession reduced their spending by about 10 percent. Battistin et al. (2009) estimate that consumption falls by about 10 percent upon retirement.

wealth effects. Finally, it is important to also note that employment transitions may also affect transfers indirectly through their effects on health (see, e.g. Gallo et al. 2000) and family structure (see, e.g., Doiron and Mendolia 2012).

1.3.3. Household Structure

The predicted effects of changes in household structure on transfers to and from adult children depend on the nature of the change and on household wealth and income dynamics. We focus on spousal death, which is a sudden transition from a two-person household to a single-person household. In households with wealth holdings, this transition causes a sudden increase in per-capita wealth and income—the same assets are now possessed by one person rather than two—which is predicted to result in increased transfers. In households with little wealth, it is possible that spousal death might instead lead to a reduction in available resources and thus a reduction in transfers or an increase in upstream transfers. These effects could be enhanced if the death is accompanied by a period of unusually high medical expenditures or a decrease in the surviving spouse's marginal utility of consumption. A shift from a two-person household to a single-person household may also lead to increases in the marginal utility derived from consumption, companionship, or informal care, leading to increases in exchange-motivated transfers and increases in helping. Finally, the transition to singlehood might affect transfers if preferences for giving differed between household members prior to the shock.

1.3.4. Health Shocks

Health shocks might affect intergenerational transfers through a variety of mechanisms. First, health shocks are associated with increases in market-based medical expenditures and thus reduce the ability to consume other goods, including child consumption and child services (Dobkin et al., 2018). Second, health shocks negatively affect labor supply, changing time use, reducing earned income, limiting pension accumulation, and possibly reducing access to health insurance (Blundell et al., 2017; Bound et al., 1999). Third, health shocks may directly change the marginal utility of consumption. For example, a decline in health might limit enjoyment of travel or require an increase in food expenditures, and these changes in the marginal utility derived from other goods would affect transfers (Brown, Goda and McGarry, 2016). Fourth, health shocks could alter the marginal utility derived from child services by altering physical and cognitive

capacity. Finally, health shocks may reduce life expectancy, limiting the number of periods over which a household is optimizing.

In light of the many factors involved, it is particularly difficult to predict the effects of adverse health shocks on giving. For example, an increase in medical expenditures combined with a reduction in life expectancy may generate opposite incentives. Furthermore, the relative importance of changes in household finances, changes in preferences, and changes in life expectancy are likely to vary depending on accumulated wealth and the degree of liquidity constraint that a household faces. The theoretical ambiguity and likely heterogeneity of these responses underscore the importance of empirically estimating them, and of stratifying our analysis by household wealth.

2. Data

For our empirical analysis, we use 10 survey waves spanning 1993 to 2012 from the Health and Retirement Study (HRS) RAND public-use data files.[7] The HRS is a panel survey that comprises a series of national probability samples of Americans over the age of 50. To keep the panel representative of its target population, the HRS has recruited cohorts of participants every few years. To date, there are six cohorts, born between 1921 and 1959. We combine data from the core HRS survey, which focuses on the main respondents, and the family survey, which provides detailed information about respondents' children and transfers between family members. Our data set includes households with members between 50 and 85 years old with at least one child over the age of 18 (we exclude children under 18 from our analysis). In order to minimize within-household changes in reporting, we use the reports of household and individual-level variables from the longest-lived respondent. We adjust all measures that are reported in nominal dollars to 2017 dollars using the Consumer Price Index. Throughout our analysis, we weight observations using HRS household weights. In our main estimation sample, we have 19,276 unique households and 103,956 household-wave observations.

[7]The HRS (Health and Retirement Study) is sponsored by the National Institute on Aging (grant number NIA U01AG009740) and is conducted by the University of Michigan. The data files we use were produced by RAND with funding from the National Institute on Aging and the Social Security Administration.

2.1. Intergenerational Transfers

The HRS gathers detailed information on the health, employment, and finances of respondents and their children. Importantly, we observe large financial transfers that each child received from, or gave to, their parents in each wave of the survey. Specifically, the survey asks respondents whether they had provided financial assistance totaling at least $500 to any child since the last interview. Financial assistance is defined as giving money directly, helping to pay bills, or covering specific costs (e.g., nursing home care, rent) and can be considered support, a gift, or a loan.[8] We focus on the extensive margin of giving for our analysis. In particular, we create an indicator for whether the household made a large transfer to at least one child during the survey wave and another indicator for whether the household received a large transfer from at least one adult child. Transfer amounts are also reported, but they are noisy and often imputed in the data. Additionally, given the long recall period and the lack of verification, it is likely that even reported transfer amounts contain substantially more measurement error than whether any transfers were made.

Starting in Wave 3, the HRS also collects data on whether children help their parents with activities of daily living (ADLs) and instrumental activities of daily living (IADLs). ADLs are basic self-care tasks such as walking, dressing, or bathing. IADLs are more advanced self-care tasks that include house cleaning, shopping, and managing transportation. HRS respondents also report whether their children help them with any money management tasks, such as balancing a checkbook or filing taxes. For each task, the HRS asks the respondent whether they have "any difficulty with [task]." If so, the respondent is then asked, "Does anyone help you [task]." Finally, the respondent is asked, "Who most often helps you [task]" and "Who else helps you?" If a respondent reports that at least one child provides help in any of these three categories, we code the respondent as receiving help from their children in that wave.

2.2. Other Variables

We use a comprehensive household income measure that includes all income for the respondent and his or her spouse during the past calendar year. This measure includes regular earnings as well as unemployment and workers' compensation, Social Security and other retirement income, interest and dividends,

[8] In the HRS, financial assistance excludes shared housing and food as well as inheritances.

alimony/child support, capital income (e.g., businesses, gross rent), and all cash assistance from outside the household. It does not include capital gains or in-kind transfers (e.g., SNAP benefits). Information on each income component is typically elicited using the following two questions: "Do you yourself currently receive any income from [source]?" and "How much did you (yourself) receive from [source] last month?" When a component of income is missing, or the respondent reports a range, we use RAND's income imputations. To derive a per-capita income measure, total household income is divided by two if the respondent has a spouse.

Our primary measure of household wealth is the net value of all household assets asked about by the HRS. These include the reported value of the household's primary residence, nonresidential real estate, all transportation vehicles, the value of any businesses, IRA and Keough accounts, non-IRA stock holdings, checking accounts, certificates of deposit, bonds, and other reported assets.[9] We again use RAND's imputations when necessary.

In our descriptive analysis, we additionally use information on the age and race (white/nonwhite) of the HRS respondent and his/her spouse, household structure (couple, single male, single female), an indicator for respondent or spouse disabled, an indicator for either respondent or spouse in poor health, an indicator for hospitalization during the survey wave, employment status, home ownership, SSI receipt, and number and proximity of adult children.

To aid in interpretation of our main results, we use HRS data on life expectancy, expected bequests, and out-of-pocket medical expenses. For life expectancy, the HRS asks respondents to report the probability that they will live until 75, 85, or for 10 more years, depending on the age of the respondent. We combine these three variables based on data availability. To elicit these probabilities, the respondent is asked "(What is the percent chance) that you will live to be (Age XX) or more?" Respondents are asked to report probabilities as a number between 0 and 100, with 0 indicating "absolutely no chance" and 100 indicating "absolutely certain." These questions seem to elicit valid probabilities, as their averages are similar to average life expectancy at the population level and are correlated with variables that affect life expectancy, such as socioeconomic status, in the same way that actual survival probabilities do (Hurd and McGarry, 1995).

The HRS measures expected bequests in a similar way to life expectancy. Starting in Wave 2, respon-

[9]The wealth measure is net of any reported debt and does not include secondary residences.

dents and their spouses are asked to report the probability that they will leave a bequest of at least $100,000. In particular, respondents are asked, "And what are the chances that you [or your (husband/wife/partner)] will leave an inheritance totaling $100,000 or more?" Later waves make clear that this question encompasses "property and other valuables that you might own." Respondents report this probability on the same 0-to-100 scale as the life expectancy questions.

Finally, starting in Wave 3, the HRS collects detailed information on medical expenditures in the last two years or since the last interview. Medical expenditures cover a broad range of payments: 1) hospital and nursing home costs; 2) doctor, dentist and outpatient surgery costs; 3) average monthly prescription drug costs; and 4) home health care and special facilities or services costs. Beginning in Wave 6, the components of [out-of-pocket spending] are 1) hospital costs; 2) nursing home costs; 3) doctor visits costs; 4) dentist costs; 5) outpatient surgery costs; 6) average monthly prescription drug costs; 7) home health care costs and 8) special facilities costs. In Wave 10, the HRS adds an "other" category. Before Wave 3, respondents were asked only about medical utilization in the last 12 months or total medical expenditures (both out-of-pocket and payments from insurance companies. In these waves, we rely on RAND imputations based on reported utilization.

2.3. Adverse Household Events

We define life events by identifying changes between waves, which is similar to the approach used in Dobkin et al. (2018) and McGarry (2016). We define a negative wealth shock as the loss of at least 25 percent of household net wealth from the previous wave. In order to avoid including changes that represent very small dollar values, we construct this shock only for households with at least $20,000 of total reported wealth.[10] We code a respondent as experiencing a job exit if they report working for pay last wave and report not working for pay in the current wave. This definition excludes any unemployment spells that are shorter than the time between waves and includes transitions out of the labor force due to retirement or a shift to volunteer work. We examine changes in household structure by looking at spousal death. A respondent experiences spousal death if they are married in the prior wave and report that their partner is no longer alive

[10]The wealth measure is somewhat noisy, bouncing around from wave to wave within households. In order to avoid picking up wealth shocks that resulted from measurement error (unusual positive values), we ignore negative wealth shocks for which there was a *positive* wealth shock of at least 50 percent in either of the two previous waves.

in the current wave.

Finally, we define three types of negative health shocks. First, we use an indicator for whether the respondent or spouse was hospitalized during the survey wave. Hospitalization has previously been found to be associated with substantial increases in health expenditures, reductions in labor supply, and increases in household debt (Dobkin et al., 2018). This is the most common health shock in our data, occurring at some point in 67 percent of HRS households. Second, we looked at the onset of disability, given its importance to future earning potential and expected future medical costs. We define disability onset to be the first wave in which the respondent or spouse reports difficulty with any ADL or IADL. By separating out disability onset, we can pick up changes in patient health that influence future income and medical expenses but may not be perceived as a large decline in general self-reported health. Finally, we use self-reported health to capture a broad range of severe and sudden health shocks. In each wave, both the respondent and spouse are asked to report their general health status on a scale from 1 (Excellent) to 5 (Poor). We define a health shock as a wave in which respondents who previously reported being in good health (a 3 or lower) report poor health (a 5).

3. Empirical Analysis

We begin our empirical analysis with a series of a descriptive exercises. These exercises serve three purposes in our paper. First, they establish the baseline propensities to give and receive in HRS households and the frequencies of upstream and downstream transfers, providing important insight into the nature of intergenerational transfers in older households. Second, they reveal cross-sectional heterogeneity across households in the propensities to give and receive along dimensions that are associated with the shocks that we consider—wealth, income, household structure, and health. Finally, results from panel regressions provide preliminary suggestive evidence that those variables are causally associated with the giving and receipt of transfers.

3.1. Intergenerational Transfers in the Pooled Cross Section

Columns 1 and 2 of Table 1 show summary statistics for our full HRS sample and for household waves in which parents make a transfer. We observe large financial transfers to adult children in 33 percent of

household-wave observations. Households that transfer money to their children are younger and more educated than the average HRS household, less likely to have a minority head or spouse. Giving households have higher per-capita income and assets and report higher probabilities of leaving bequests for their children. Giving households are more likely to be employed and to be homeowners and have fewer children than the average household. Giving is also associated with household structure and health—giving households are less likely to be single females and to report disability or poor health.

Upstream transfers are far less common than parent-to-child transfers and are also smaller on average. We observe large financial transfers from children to parents in only 6 percent of household-wave observations. Compared with the full sample, households receiving financial transfers from their children are older and much more likely to have a nonwhite head or spouse, and they have substantially lower income and wealth. Notably, almost 60 percent of transfer recipients are single females, and almost half report poor health. The rate of receipt of help from children is also relatively low in our sample, and we find that recipients of help are even more disadvantaged than the recipients of financial transfers. In fact, per-capita income in that sample is less than half of the full sample average. A full 70 percent of households receiving help are single females and almost 90 percent report disability.[11]

As the focus of this paper is on estimating and interpreting the intergenerational effects of adverse life events occurring in our sample households, we are particularly interested in understanding the associations between transfers and 1) the resources available to older households, 2) their household structure, and 3) their health status. In Table 2, we examine rates of giving and receiving, along with reported transfer amounts, for the full sample and separately by age, wealth percentile, employment status, household structure, reported health, and disability status. We find substantial variation in the rates of giving and receipt of transfers. We find that giving is very common among the youngest households in the sample—47 percent of households between the ages of 50 and 60 made large transfers to their children. This could be driven by parental resources being higher at younger ages and also by adult children's need being higher at younger ages. Not surprisingly, we find that giving is common in wealthy families, with almost half of all households in the top wealth quintile reporting large transfers. Meanwhile, rates of giving are much lower in low-wealth

[11]The high incidence of reported disability is mechanical, in some sense, because respondents must report that they "need assistance" with an activity in order to report receiving assistance. However, respondents who need assistance do not necessarily receive assistance, and assistance does not necessarily need to come from children.

households (19 percent in the bottom quintile), households with at least one member in poor health (21 percent) and single female households (27 percent).

Rates of receipt of transfers from children also vary across groups. The rate of receipt of financial transfers is relatively high in the lowest wealth quintile (8 percent), households with poor health or disability (8 and 7 percent, respectively) and single female households (9 percent). Meanwhile, only 2 percent of households in the top wealth quintile report receiving a financial transfer. The rate of receipt of ADL/IADL help from children is even more heterogeneous across the groups we consider, ranging from 1 percent in households with excellent health to 24 percent in households with poor health. Notably, households in the bottom wealth quintile, in the 75-85 year age group, and in the single female group receive far more help from their children than the average household, at a rate of 11 or 12 percent. The statistics in Table 2 suggest that, despite their relatively low rate of overall occurrence, child-to-parent transfers may play an important safety-net role, as they appear to be targeted specifically at needy households.

In Figure 1, we examine rates of giving by income quintile and health status in detail, controlling away the effects of age. We find that, even after flexibly controlling for age, giving is increasing steadily across household income quintiles, with the biggest jump from the fourth to the fifth (the highest) quintile. Giving is also steadily decreasing across the five categories of self-reported health. Child-to-parent financial transfers show the opposite patterns, decreasing across income quintiles and increasing steadily with health. The rate of helping is very responsive to health, with rates of receipt in households in "poor" health more than 20 percentage points higher even than those in households in "good" health (Category 3). Help is also decreasing with income, with the largest jump between the first (lowest) and second income quintiles.

In order to better understand the association between parental household characteristics and the transfers that parents give and receive from their children, we stack all of our HRS waves together and estimate pooled regressions. These regressions exploit both cross-sectional variation, which has been commonly used in the literature on intergenerational transfers (for example, in Cox and Rank 1992; McGarry and Schoeni 1995), and variation within households over time. Our model includes the following variables at the household level: dummies for the top four per-capita real wealth quintiles and the top four per-capita real income quintiles, dummies for self or spouse employed, indicators for single male and single female households, an indicator for any hospitalization in the current wave, an indicator for self or spouse disabled (needs ADL assistance), an indicator for self or spouse in poor health, a quadratic in age, and indicator for self or spouse

nonwhite, highest educational attainment (high school or college graduate), number of children, and a full set of HRS cohort-by-wave fixed effects.

The coefficients from our pooled cross-sectional regressions are presented in columns 1, 3, and 5 of Table 3. For easier coefficient interpretation, we report estimates from a linear probability model; logit models generate similar results. The regression results generally show the same patterns as the descriptive statistics. Income and wealth are both significant predictors of the giving of financial transfers (with which they are positively associated) and the receipt of financial transfers and help (with which they are negatively associated). The association between parental income and parent-to-child transfers is particularly strong—controlling for other factors, households in the highest income quintile are 24 percentage points more likely to make transfers than households in the bottom quintile. The receipt of help is the highest in the lowest wealth quintile and similar across other quintiles. Interestingly, there appears to be a U-shaped relationship between help and income, with the highest levels of help in the top and bottom income quintiles. This could potentially reflect the highest need in the bottom quintiles and reciprocity for transfers received at the top.

Employment is not associated with any differences in giving in the pooled cross-section, but it is associated with higher rates of receipt of financial transfers and lower rates of help from children. Controlling for age, wealth, and income, employment may reflect unobservable financial insecurity (which could explain higher receipt of money transfers) and also increased physical capacity (which could explain decreased assistance). Compared with couples, single males are more likely to give money and more likely to receive help from their children. Single females are *less* likely to give money to their children but are also more likely to receive help. Poor health and disability remain strongly associated with the receipt of both money and help in the cross-sectional regressions but are not strongly associated with giving.[12] Perhaps surprisingly, hospitalization is positively associated with giving in the cross-section. This could reflect households' willingness to spend money on health (and other things), or it could be related to unobservable differences in life expectancy.

[12] As discussed in Section 2, the fact that the disability coefficient is so large in part reflects the linkage of the needing of help and receipt of help in the HRS survey. That respondents who report needing help with activities of daily living are far more likely to report receiving help from their children with activities of daily living is not surprising. This effect could be causal, but there clearly may be some simultaneity or reverse causality.

3.2. Responses to Changes in Family Circumstances

While descriptive statistics and pooled regressions provide information about the factors that are associated with intergenerational transfers and the types of families that give and receive them, results based on cross-sectional variation are potentially biased by fixed unobservable family characteristics and do not provide insight into the dynamics of transfers—in other words, how transfers evolve within families in response to changes in the circumstances of giving and receiving households. A recent study by McGarry (2016) explores the dynamics of household transfers with an emphasis on how parent-to-child transfers respond to child circumstances. McGarry's study reveals considerable variation in downstream transfers within households over time, showing that parental transfers are responsive to within-child changes in income, employment, and other variables, and thus highlighting the importance of studying dynamic aspects of transfers empirically.

Here, instead of focusing on children's individual and household characteristics, we focus on circumstances in parental households. Because we are interested in identifying the effects of adverse life events on transfers, we consider four categories of variables that are closely linked with the events we consider: 1) wealth, 2) employment (income), 3) household structure, and 4) health. We also consider upstream transfers, including the provision of informal care. From an identification standpoint, shifting the focus from comparison across households to comparison over time within households addresses concerns about fixed unobservable differences in the propensity to give across families that might be correlated with the key explanatory variables in the model. At the same time, it is important to note that a switch to "within" variation also changes the underlying parameter being estimated. In particular, from a theoretical standpoint, the predicted effects of differences in lifetime income, wealth, or health across households are different from the predicted effects of anticipated evolutionary changes or sudden discrete shocks to those same variables within households. Adding household fixed effects to the regression in Table 3 changes the source of identifying variation to include both types of within-household changes, and our event-study approach zeroes in more closely on the latter type.

We begin by examining the frequencies of transfers within households over the course of the panel to learn how often parents in our sample are giving transfers to and receiving transfers from their children. In order to get a sense of transfer frequencies, we look at the conditional distribution of the total number of

survey years in which each type of transfer was reported in a sample of 3,324 households that were present in all ten waves of our HRS sample. Figure 2 shows the results. Panel A shows that among ever-givers there is a wide range of giving frequencies, with 18 percent giving in only one wave and 40 percent of households giving in five or more waves.[13] Examining the frequency of older households' receipt of transfers from their adult children, we find that even among the parents who do receive transfers, the receipt of money and time from children is almost universally transitory. Among households who ever receive a financial transfer from their children, 73 percent received them in only 1 or 2 waves out of the 10 waves of the survey, and among households receiving help, 67 percent received help in only 1 or 2 waves.

Results from estimation of regression models with household fixed effects are presented in columns 2, 4, and 6 of Table 3. Focusing first on giving, we again find that giving is increasing across wealth and income quintiles. However, the effects are muted compared with those from the cross-sectional regressions. This could indicate that fixed unobservable household characteristics are positively associated both with wealth and income and with the propensity to give. However, it also could reflect that responses to transitory fluctuations in wealth and income are smaller than responses to differences in permanent lifetime wealth and income, or that movements of individual households across the quintiles are more likely to be small movements right around the cutoff. As in the cross-sectional regressions, we again do not find that employment status is correlated with giving in the fixed effects model. Strikingly, a within-household transition from being in a couple to being a single male is associated with a large (7 percentage point) increase in the likelihood of a transfer, while a transition to being a single female does not affect giving. Finally, we find that within-household changes in health status, including hospitalization, are not associated with any changes in downstream giving.

With respect to the receipt of transfers from children, results from the fixed effects models suggest that changes in wealth do not lead to changes in the receipt of financial transfers, but that they are significantly associated with help—households receive more assistance as their wealth falls. Meanwhile, income falling, particularly between the 5th (top) and 3rd (middle) quintiles, leads to increases in upstream financial transfers, but there is not a strong association between income and the receipt of help. The employment coefficient

[13] Figure 1 of McGarry (2016) provides a similar breakdown of the frequency of *receipt* of transfers at the child level. Comparing this to our Figure 2, it is clear that while the receipt of transfers is more transitory at the child level, transfers are more persistent at the parent level when transfers to all children are taken into account.

is no longer significant in either the upstream financial transfer regression or the help regression, suggesting that omitted variables bias may have influenced those coefficients in the cross-sectional results. Household structure remains an important predictor of upstream transfers, with single females receiving more money and single males and females receiving more assistance than couples in the fixed effects models. Finally, we continue to find that parents receive more money and more help in waves when they are hospitalized, report any disability, or report poor health.

3.3. Event Studies

In order to gain further insight into the dynamics of intergenerational transfers within households and how transfers respond to changes in household circumstances, we conduct a series of event studies for a set of adverse household events affecting wealth, income, household structure, and health. Thus far, event study analysis has not been used to study intergenerational transfers. One reason for this is that household events such as job loss and health shocks cannot be considered purely exogenous, and thus are unlikely to satisfy a "no pretrends" assumption. Here, we show that careful examination of changes in intergenerational transfers surrounding household events can reveal important information about the dynamics of transfers within households that cannot be obtained from fixed effects models, which confound slow evolutionary changes in outcomes with discrete changes.

To generate our main graphical-event study results, we estimate the following model:

$$T_{ht} = \alpha_h + \gamma_t + \sum_{s=-2}^{3+} 1(t = t_h^* + s)\beta_s + \epsilon_{ht} \tag{1}$$

where T_{ht} is a dummy for whether household h made (or received) a transfer at time (wave) t, α_h is a household fixed effect, γ_t is a wave fixed effect, t_h^* is the event time for household h, and s is the number of waves since the event. Recall that HRS waves are generally two years apart, which means that the event in question occurs sometime in the two years prior to the period-zero interview, the period-one interview occurs 2–4 years later, the period-two interview occurs 4–6 years later, and so on. We omit indicators for three or more waves prior to treatment so that β represents average outcomes in each wave relative to the average for the period more than six years prior to treatment. We assume that any dynamic effects of treatment are no longer relevant after six years and combine three or more waves after the event into a single indicator.

To conduct heterogeneity analysis and to look at potential mechanisms, we also estimate a simplified event study in which we restrict pre-event effects to follow a linear trend and flexibly estimate post-treatment deviations from that trend, as in Dobkin et al. (2018):

$$T_{ht} = \alpha_h + \gamma_t + (t - t_h^*)\phi + \sum_{s=0}^{3+} 1(t = t_h^* + s)\beta_s + \epsilon_{ht} \tag{2}$$

It is likely the case that families which experience a given event are different in important and unobservable ways from families that do not. We restrict our analysis only to households who experienced a given event to avoid confounding the effect of an event with the effects of these differences. In this approach, the effects of an adverse event are identified if their timing is quasi-random. In particular, households that experience the event must be on similar trends before the event occurs, and the event must be unanticipated. The specification in Equations 1 and 2 provides a natural test of this assumption. If any of the coefficients on the pre-waves are different from 0, then the event timing is likely to be endogneous or families can anticipate the event and adjust. We find no evidence of anticipation or differential pre-trends in the event study graphs presented in 3 and 4.

For our results tables, we focus on the Period 1 effect, which reflects deviations-from-trend in the outcome variable during the period 2–4 years after the event occurs.

3.3.1. Event Study Results

The results from our estimation of Equation 1 are shown in a series of panels in Figures 3 and 4. Each panel displays changes in transfers around a particular event. In each panel, the graph on the left shows the effects of the event on parent-to-child transfers (giving), the graph in the middle shows effects of the event on child-to-parent financial transfers, and the graph on the right shows effects of the event on the likelihood that children provide their parents with ADL assistance. We additionally summarize the effects of the events by reporting the coefficients on β_1 from estimating Equation 2 in Table 4.

Figure 3 shows event study estimates of the effects of shocks to parental wealth, employment, and household structure on financial transfers and children's assistance with ADLs. Recall that in sections 1.3.1 and 1.3.2 we predicted that the loss of wealth and earned income would lead to decreases in downstream transfers and increases in upstream transfers. In fact, we do find that both wealth loss (in Panel A) and

job exit (in Panel B) significantly reduce the likelihood that parents make large financial transfers to their children. In Table 4, we find that two waves after wealth loss, the likelihood of giving a transfer is reduced by more than 5 percentage points. This represents a 12 percent reduction in the likelihood of transfer following wealth loss relative to the preevent mean for that estimation sample. The estimated treatment effect from Equation 2 is -0.036, a 9 percent reduction. For job exit, we find a slightly smaller, 3.1 percentage point (7.1 percent) reduction in the likelihood of giving. Following spousal death, we observe a substantial (14 percent) increase in the likelihood of giving a large transfer to adult children for the surviving parent.

Looking at upstream financial transfers, we see possible evidence in Figure 3 of increases in the likelihood of receiving a large financial transfer from a child following wealth loss, job exit, and (possibly) spousal death. However, the regression coeffients in Table 4, which account for pre-shock trends, are not statistically significant, and given the size of the standard errors we cannot rule out large effects in either direction. Turning to in-kind transfers, we observe striking and significant increases in the likelihood that children assist their parents with ADLs after all three shocks, with an especially large increase after spousal death. Together, the results in Figure 3 suggest that events that alter the finances and household structure in aging households directly impact the adult children of those households, reducing the likelihood that they receive large financial transfers from their parents and causing them to increase their transfers to their parents.

Figure 4 shows event-study estimates of the effects on intergenerational transfers of three specific health shocks— 1) hospitalization, 2) disability onset, and 3) the transition to "poor" self reported health. The results are strikingly different from those in Figure 3. Across the three panels, we do *not* see clear evidence that health shocks cause reductions in parent-to-child transfers. While there appear to be some changes in giving in each postevent period, because the pretrends are not flat, it is difficult to discern the magnitude of the drop that can be attributed to the event visually. The estimation results in Table 4 indicate that there is a statistically significant trend deviation of -0.048 percentage points (13 percent of the preevent mean for that estimation sample) in Period One following the onset of poor health.

Importantly, we find that both disability onset and a change to poor health lead to statistically significant increases in child-to-parent financial transfers and to very large increases in the likelihood that children provide assistance with ADLs. In fact, the onset of poor health is associated with a 64 percent increase in the probability of receiving financial assistance from a child (2.9 percentage points and a full 142 percent in-

crease in the likelihood of receiving in-kind assistance (5.2 percentage points). This suggests that children's aid to their parents is closely tied with their parents' health status, and is consistent with the reciprocity and insurance models discussed in Section 1.2.

3.3.2. Heterogeneity by Wealth

The results from our event study analysis suggest that parental wealth and income are closely tied with the level of parental giving. There is also evidence that parental need (singlehood and poor health status in particular) drives parental receipt of transfers and time from children. An important open question is whether the full sample effects might be masking differing effects, depending on the level of accumulated household wealth. There are two reasons for considering wealth heterogeneity. First, recall from Section 1.2 that it is natural to think of high-wealth parent households as being givers of transfers (or at the margin of giving) to their children and lower-wealth parent households as being recipients of transfers from their children. Thus, it is possible that only some households are in a range of either giving or receiving money. Second, it is possible that wealthier households are less liquidity contrained, and thus are better able to smooth their own consumption (and giving) across periods even in the presence of shocks.

In order to examine wealth heterogeneity, we average per-capita wealth across waves for each household and stratify our sample by average real per-capita wealth, separately examining the effects of events on giving for households above and below the median wealth level. These results are presented in Table 5. Consistent with our expectations, we find that the effects of adverse household events on intergenerational financial transfers are entirely concentrated in low-wealth households, and the estimated effects are much larger, both in absolute and relative terms, than those from the full sample. In the low-wealth sample, the estimated effect of wealth loss on the probability of giving a transfer is 9 percentage points, or 27 percent of the baseline mean for that sample. The estimated reduction in the likelihood of giving after job exit is 16 percent of the baseline mean, and the increase associated with spousal death is 29 percent. Poor health is also found to dramatically reduce the likelihood of giving, by 33 percent. At the same time, *none* of the estimated effects are significant for the high wealth sample, and the coefficients are smaller in both absolute and relative terms.

Considering upstream transfers, stratifying by wealth reveals large and significant increases in child-to-parent transfers following poor health in low-wealth families. However, we still find no increase in

child-to-parent transfers following wealth loss, job exit, spousal death, hospitalization, or disability, even in low-wealth households, and we again find no evidence of any change in transfers following events in high-wealth households. In contrast with the results for upstream financial transfers, we find large adjustments in children's provision of ADL assistance to their parents in both high- and low-wealth households following adverse events, with low-wealth households showing larger absolute adjustments and high-wealth households showing larger adjustments relative to their (lower) baseline mean rates of receipt of help.

3.3.3. Mechanisms

Throughout this paper, we have focused our discussion on the association between household wealth, income, and health on intergenerational transfers, and have interpreted the effects of adverse events as reflecting the effects of changes in those underlying variables. In Table 6, we examine the "first stage" effects of adverse events on household finances and life expectancy. We generate these results by estimating the model in Equation 2 with new variables on the left-hand side: real household per-capita wealth, bequest plans, real household per-capita income, household out-of-pocket medical expenses, and a variable summarizing life expectancy based on the respondent's reported probability of surviving past the next major milestone (75, 85, or 10 years, depending on respondent age). These results provide us with important insight into the nature of the events that we consider and how they alter households' perceived financial status and planning window.

The wealth losses that we measure are associated with large wealth reductions (by construction) and also with a 3 percentage point reduction in the expected probability of leaving a bequest of more than $100,000 and a reduction in out-of-pocket medical expenditures. Perhaps surprisingly, Table 6 reveals that wealth shocks are *not* associated with reductions in household income per capita. By contrast, job exit is associated with large reductions in household income, but is not associated with changes in wealth, bequest plans, or out-of-pocket medical expenses. Importantly, we confirm that spousal death is associated with very large increases in both per capita wealth and per capita income. Spousal death is also associated with an increase in the reported likelihood of leaving a bequest and with a large reduction in household medical expenses; these two effects likely reflect high medical costs prior to death for the spouse who passed away.

Turning to health shocks, we find that only disability onset is associated with statistically significant changes in wealth, income, or reported likelihood of leaving a bequest. Interestingly, disability onset is

associated with negative changes in wealth and *positive* changes in income per capita. Hospitalization is associated with the largest increase in out-of-pocket health expenditures. Disability onset increases them as well, while poor health does not. Interestingly, none of the shocks we consider lead to changes in reported life expectancy.

The results in Table 6 support our interpretation of the three events in Figure 3— 1) wealth shocks, 2) job exit, and 3) spousal death—as largely financial shocks. These three events lead not only to changes in household per-capita wealth and income, but also changes in households' bequest plans, which suggests they have altered households' perceptions of future financial security. These changes can help to explain why we see evidence of reductions in household giving following these events. At the same time, it is perhaps surprising that we do not see children in low-wealth households increasing their financial transfers to their parents following those events. The results in Table 6 also show that health shocks do *not* have large immediate effects on households' broader financial situations (wealth and income). Instead, health shocks are associated with small (in absolute terms) increases in out-of-pocket medical expenditures.

4. Discussion and Conclusion

Intergenerational transfers are an important economic phenomenon. Gale and Scholz (1994) estimate that intended inter vivos transfers account for at least 20 percent of U.S. wealth. In the Health and Retirement Study, 62 percent of households make a large financial transfer to their adult children at some point, and 34 percent receive either financial or in-kind assistance from their children. These transfers between family members potentially play an important role in intertemporal consumption smoothing within households. However, research has only just begun to explore the dynamics of transfers and how they respond to changes in circumstances within households. In this study, we use panel data to examine the association between parental household circumstances and the likelihood that parents give money to or receive money or help from their children. In addition to standard descriptive statistics and regression analyses, we conduct an event study analysis, examining change in transfers following adverse events in parent households. Our analysis adds to the new literature on the dynamics of transfer behavior within households (McGarry, 2016; Haider and McGarry, 2018) and also reveals potentially important intergenerational effects of adverse events.

Our results reveal that in households with low total wealth holdings, the likelihood that parents make large financial transfers to their adult children is very sensitive to household wealth and income, falling substantially after wealth loss and job exit and increasing after spousal death. Parental giving in low-wealth households also falls after a transition to poor health, though it is not responsive to other health shocks, including hospitalization and disability onset. Taken together, these results suggest that the adult children of low-wealth parents are likely to experience negative effects of adverse financial and health events in their parents' households. The implication of this is that any direct effects of economic downturns that children experience may be enhanced by the negative spillover effects from events in their parents' households. Given that children are known to receive transfers during times when their marginal utility of consumption is high (McGarry, 2016), the welfare costs of the reductions in transfers that we estimate may be large. In high-wealth households, we find no significant adjustments in giving following adverse shocks, which suggests that high-wealth households are better able to self-insure.

Considering upstream transfers, we do not find that the likelihood that parents receive financial transfers from their children is significantly altered following adverse financial events, even in low-wealth households. However, given the size of our standard errors we cannot rule out the possibility of a response. We do find that low-wealth parents receive financial assistance from their children following transitions to disability and poor health.

Importantly, we find that children respond to adverse events in their parents' households by substantially increasing their in-kind assistance to their parents—we see sudden and striking increases in the likelihood that children help with activities of daily living following adverse events, particularly after spousal death and adverse health shocks. Given that the timing of adverse shocks in parental households may be unpredictable, parents' sudden increased need for help following adverse shocks also place an additional welfare burden on the children who provide them with in-kind assistance. The increase in assistance that we observe is consistent with exchange and insurance models of intergenerational transfers—these upstream in-kind transfers may be given in exchange for financial transfers that were given previously. Increases in family assistance following adverse shocks have important implications for our understanding of demand for long-term care insurance, and for potential crowdout from a publicly provided long-term-care option. To our knowledge, we are the first to document these sharp increases in helping following adverse events using an event-study framework.

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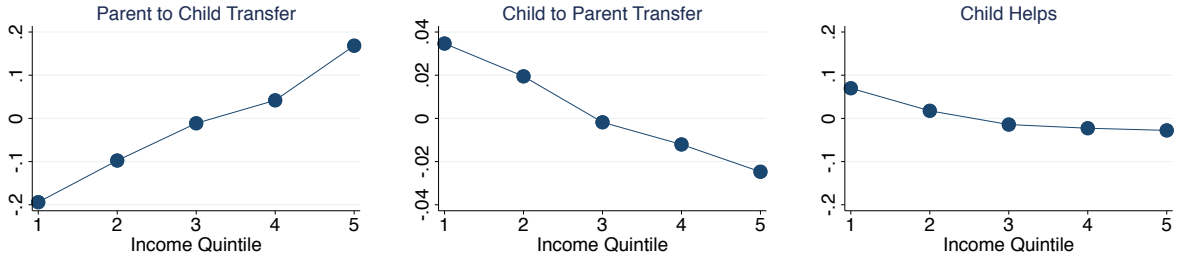
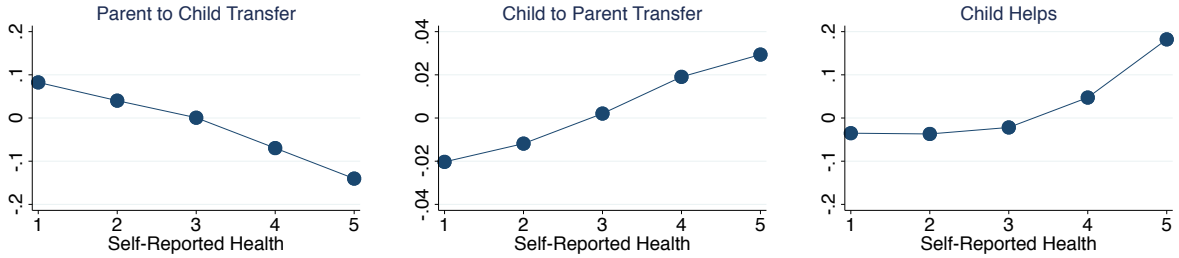
Figure 1: Patterns in Giving and Receiving by Income Quintile and Health Status

Panel A: By Income Quintile

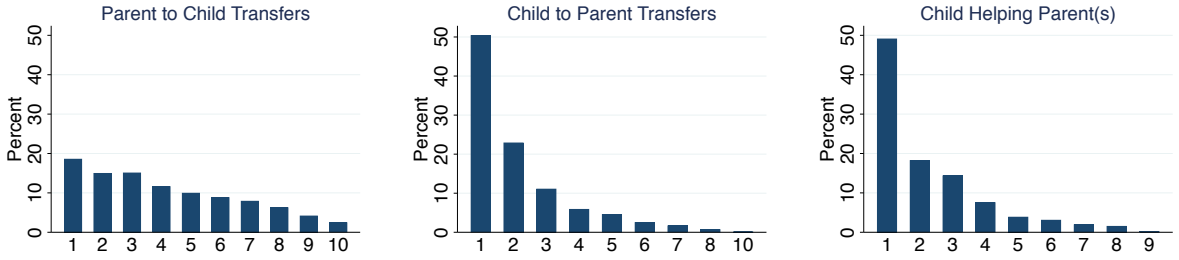


Panel B: By Self-Reported Health Status



NOTE: Markers indicate residuals from a regression of transfer status on (oldest) age dummies. Wealth is current household wealth divided by the number of household members. Health responses are "excellent," "very good," "good," "fair," and "poor." Health categories are numbered from 1 (excellent) to 5 (poor).

Figure 2: Transfer Event Frequencies (non-zero), Households with 10 Waves of Data



NOTE: Samples sizes are 2,801, 829, and 505 households with 10 waves of data and at least one transfer.

Figure 3: Event Study Analysis: Wealth, Employment, Family Structure Shocks

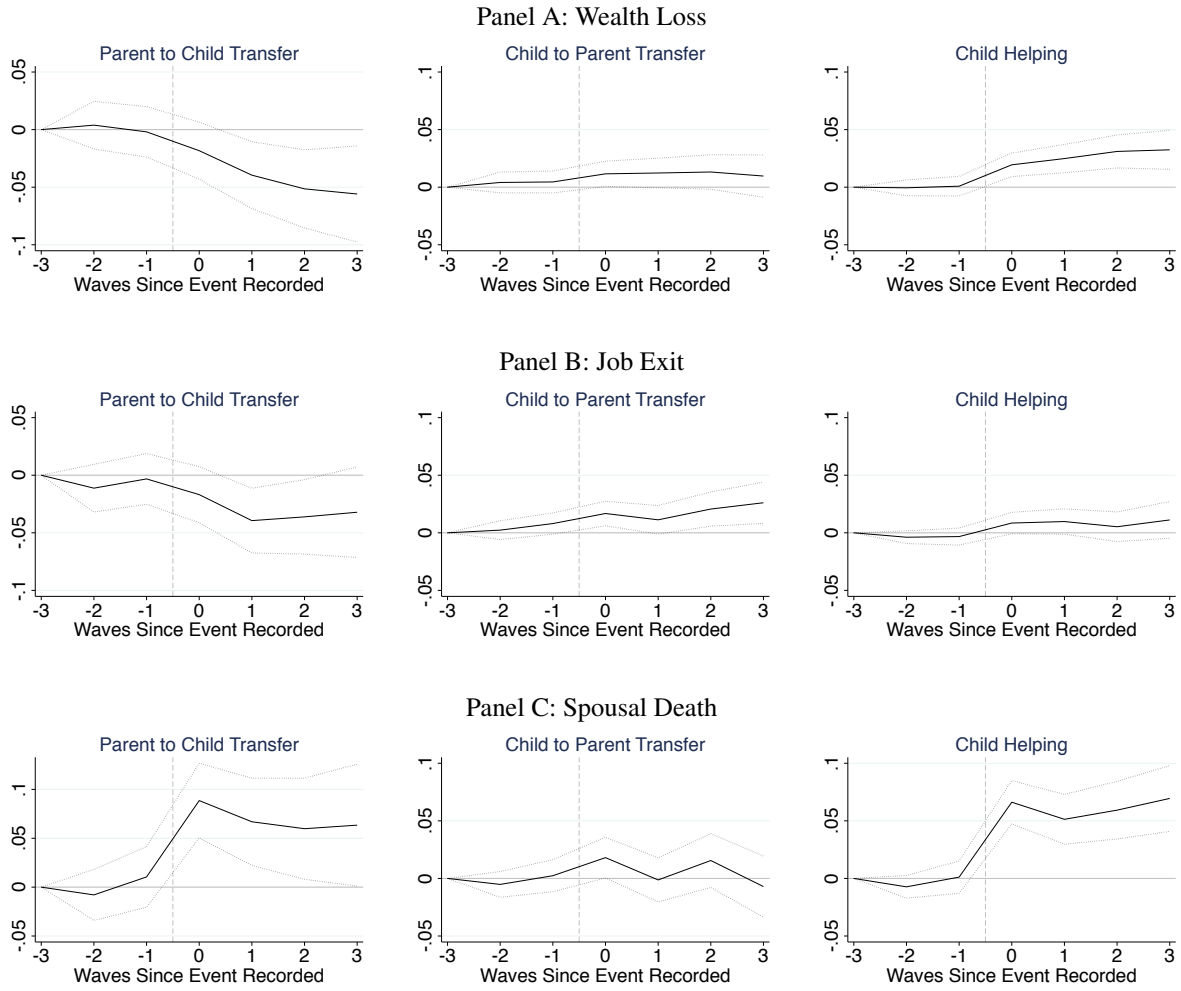


Figure 4: Event Study Analysis: Health Shocks

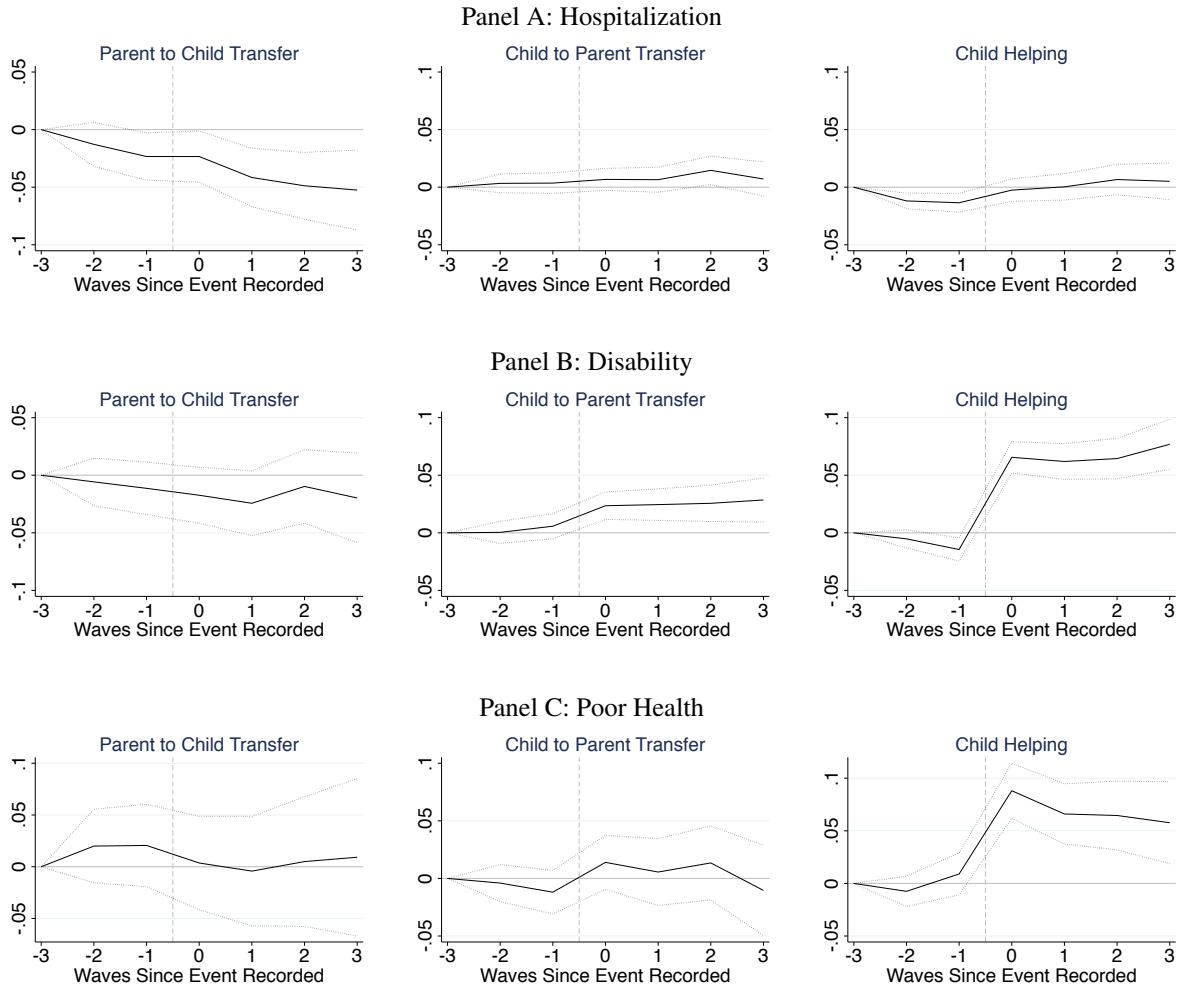


Table 1: Weighted Sample Means by Transfer Status

	Full Sample	Giving $	Receiving $
Oldest age	65.89	63.91	67.63
Any Non-white	0.17	0.13	0.30
Highest education	13.05	14.04	12.13
Real per capita income	47571.33	66114.63	27510.08
Real per capita assets	297715.43	419191.04	142822.98
Any employed	0.53	0.64	0.40
Home owner	0.78	0.86	0.65
SSI receipt	0.02	0.01	0.03
Hospitalization	0.33	0.31	0.39
Any disability	0.24	0.19	0.36
Any bad health	0.35	0.28	0.47
Out-of-pocket medical expenses	5601.68	6188.17	5636.67
Life expectancy ratio	0.86	0.90	0.78
Single male	0.10	0.11	0.06
Single female	0.31	0.23	0.58
Number of children	3.37	3.16	3.83
Any child within 10 miles	0.52	0.51	0.54
Observations	103956	33305	5894

Table 2: Intergenerational Transfers in HRS Households

Panel A: Full Sample and by Age, Wealth, and Employment						
		Oldest Age		Wealth Percentile		
	Full Sample	75 to 85	50 to 60	Bottom 20	Top 20	Employed
Parent-to-child transfer	0.36	0.27	0.45	0.19	0.49	0.44
Parent-to-child amt, nonzero	13600.94	16364.26	12957.62	6291.73	24172.05	13275.75
Child-to-parent transfer	0.05	0.06	0.04	0.08	0.02	0.04
Child-to-parent amt, nonzero	5117.53	5688.96	4567.66	4146.51	9725.22	4808.72
Probability of bequest	43.06	39.69	44.62	8.32	79.36	48.62
ADL/IADL help	0.05	0.11	0.03	0.12	0.02	0.01
Observations	103956	28502	28528	20808	20791	47359

Panel B: By Household Structure and Health Status						
	Household Structure			Health Status		
	Female	Male	Couple	Poor	Excellent	Disabled
Parent-to-child transfer	0.27	0.37	0.40	0.21	0.46	0.28
Parent-to-child amt, nonzero	11175.88	15012.06	14237.08	11418.60	19060.18	11223.88
Child-to-parent transfer	0.09	0.03	0.03	0.08	0.03	0.07
Child-to-parent amt, nonzero	4836.18	4757.29	5639.61	4811.67	6723.31	5014.57
Probability of bequest	29.55	39.96	50.55	18.36	60.64	29.39
ADL/IADL help	0.11	0.05	0.02	0.24	0.01	0.18
Observations	36258	9797	57901	9050	12149	27706

NOTE: Sample is restricted to households with members aged 50-85. Observations are weighted using HRS sample weights.

Table 3: Regression Analysis

Event:	Giving $		Receiving $		Receiving help	
	CS	FE	CS	FE	CS	FE
Wealth Q2	0.057***	0.032***	-0.004	-0.002	-0.018***	-0.017***
	(0.006)	(0.007)	(0.004)	(0.004)	(0.004)	(0.004)
Wealth Q3	0.081***	0.032***	-0.013***	-0.005	-0.013***	-0.023***
	(0.007)	(0.008)	(0.004)	(0.005)	(0.004)	(0.004)
Wealth Q4	0.116***	0.052***	-0.023***	-0.005	-0.015***	-0.027***
	(0.008)	(0.010)	(0.004)	(0.005)	(0.004)	(0.005)
Wealth Q5	0.153***	0.065***	-0.029***	-0.002	-0.018***	-0.032***
	(0.009)	(0.011)	(0.004)	(0.005)	(0.004)	(0.005)
Income Q2	0.049***	0.009	-0.001	-0.001	-0.011***	0.003
	(0.005)	(0.006)	(0.004)	(0.004)	(0.004)	(0.004)
Income Q3	0.114***	0.043***	-0.017***	-0.008**	-0.019***	-0.003
	(0.006)	(0.007)	(0.004)	(0.004)	(0.004)	(0.003)
Income Q4	0.152***	0.048***	-0.024***	-0.011***	-0.010***	0.006
	(0.007)	(0.008)	(0.004)	(0.004)	(0.004)	(0.004)
Income Q5	0.242***	0.094***	-0.029***	-0.014***	-0.000	0.010***
	(0.008)	(0.009)	(0.004)	(0.004)	(0.003)	(0.004)
Any employed	0.005	0.004	0.010***	0.002	-0.016***	-0.002
	(0.006)	(0.006)	(0.002)	(0.003)	(0.002)	(0.002)
Single male	0.026***	0.070***	-0.001	0.002	0.023***	0.055***
	(0.010)	(0.015)	(0.003)	(0.006)	(0.003)	(0.006)
Single female	-0.023***	0.006	0.054***	0.034***	0.072***	0.068***
	(0.006)	(0.010)	(0.003)	(0.005)	(0.003)	(0.005)
Hospitalization	0.014***	0.006	0.006***	0.006***	0.016***	0.011***
	(0.004)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)
Any disability	-0.002	-0.004	0.014***	0.013***	0.147***	0.113***
	(0.005)	(0.005)	(0.002)	(0.003)	(0.003)	(0.003)
Any bad health	0.005	0.003	0.004**	0.004*	0.017***	0.010***
	(0.005)	(0.005)	(0.002)	(0.002)	(0.002)	(0.002)
Mean	0.320	0.320	0.057	0.057	0.061	0.061

NOTE: The number of household-wave observations is 103,956. All regressions include a quadratic in age, an indicator for nonwhite respondent or spouse, indicators for highest educational attainment (high school graduate, college graduate), number of children, and a full set of HRS cohort-by-wave dummies.

Table 4: Parental Household Events and Intergenerational Transfers

Event:	Wealth loss	Job exit	Spousal death	Any hosp	Disability onset	Poor health
			Panel A: Any Parent-to-Child Transfer			
2-4 year effect	-0.036**	-0.031**	0.051**	0.005	-0.002	-0.048*
	(0.014)	(0.015)	(0.021)	(0.014)	(0.016)	(0.027)
Mean	0.409	0.439	0.363	0.401	0.380	0.360
			Panel B: Any Child-to-Parent Transfer			
2-4 year effect	0.003	-0.004	-0.004	-0.001	0.014*	0.029**
	(0.006)	(0.006)	(0.010)	(0.006)	(0.007)	(0.012)
Mean	0.041	0.040	0.039	0.043	0.045	0.045
			Panel C: Any Child Helps with ADLs			
2-4 year effect	0.023***	0.017***	0.052***	0.028***	0.090***	0.052***
	(0.005)	(0.005)	(0.010)	(0.005)	(0.007)	(0.014)
Mean	0.024	0.010	0.019	0.021	0.008	0.035
Observations	60170	56217	24364	84382	62879	14394
Households	8690	7319	3262	13540	10532	1983

Table 5: Parental Household Events and Intergenerational Transfers, by Household Wealth

Event:	Wealth loss	Job exit	Spousal death	Any hosp	Disability onset	Poor health
			Panel A: Any Parent-to-Child Transfer			
Low Wealth						
2-4 year effect	-0.090***	-0.055**	0.077**	-0.016	0.001	-0.092**
	(0.020)	(0.022)	(0.030)	(0.020)	(0.022)	(0.036)
Mean	0.332	0.343	0.271	0.301	0.285	0.276
High Wealth						
2-4 year effect	0.007	-0.011	0.031	0.023	0.003	0.008
	(0.020)	(0.021)	(0.029)	(0.019)	(0.023)	(0.042)
Mean	0.467	0.514	0.429	0.473	0.460	0.452
			Panel B: Any Child-to-Parent Transfer			
Low Wealth						
2-4 year effect	0.011	-0.008	-0.012	0.004	0.018	0.041**
	(0.011)	(0.012)	(0.021)	(0.012)	(0.013)	(0.020)
Mean	0.064	0.063	0.066	0.067	0.068	0.064
High Wealth						
2-4 year effect	-0.006	-0.001	0.002	-0.006	0.008	0.013
	(0.006)	(0.006)	(0.010)	(0.006)	(0.008)	(0.013)
Mean	0.024	0.022	0.019	0.026	0.025	0.026
			Panel C: Any Child Helps with ADLs			
Low Wealth						
2-4 year effect	0.023***	0.030***	0.080***	0.032***	0.100***	0.051**
	(0.009)	(0.009)	(0.018)	(0.010)	(0.010)	(0.021)
Mean	0.038	0.016	0.033	0.037	0.011	0.048
High Wealth						
2-4 year effect	0.020***	0.007	0.033***	0.022***	0.071***	0.047**
	(0.006)	(0.005)	(0.011)	(0.005)	(0.008)	(0.019)
Mean	0.013	0.005	0.010	0.009	0.005	0.021

Table 6: Mechanisms

Event:	Wealth loss	Job exit	Spousal death	Any hosp	Disability onset	Poor health
			Panel A: Wealth per Capita ($100,000s)			
2-4 year effect	-162545.67***	-12181.95	176621.16***	-21217.61	-27832.02**	-9107.00
	(20608.68)	(15058.32)	(24938.22)	(25008.83)	(13781.37)	(30366.48)
Mean	363785.45	276922.34	268630.15	303082.78	286897.40	249684.12
			Panel B: Probability of Leaving a Bequest of at Least $100,000			
2-4 year effect	-2.96***	-0.61	4.19***	-1.22	2.06*	-0.16
	(0.96)	(1.04)	(1.55)	(0.98)	(1.12)	(2.08)
Mean	44.98	44.02	41.40	43.40	40.58	35.33
			Panel C: Income per Capita ($10,000s)			
2-4 year effect	2347.70	-17685.75***	13415.87***	-1284.66	6167.03***	3679.97
	(2633.59)	(3949.58)	(3113.13)	(2772.03)	(2083.06)	(3013.57)
Mean	52989.06	60290.71	38913.57	53295.46	46465.50	39306.60
			Panel D: Out-of-Pocket Medical Expenses ($1000s)			
2-4 year effect	-1331.47***	53.30	-8137.84***	1757.50***	1455.46*	871.17
	(460.29)	(529.89)	(1032.23)	(391.07)	(763.97)	(1233.90)
Mean	5562.21	5185.74	8003.69	3884.02	5247.04	6339.00
			Panel E: Life Expectancy (probability)			
2-4 year effect	-0.98	-0.46	0.47	-0.41	-0.36	-1.71
	(0.76)	(0.79)	(1.28)	(0.78)	(0.95)	(1.77)
Mean	62.70	65.78	58.39	63.96	59.93	58.30