Measuring the Mechanisms of Informal Family Insurance:
Time and monetary transfers in response to poor health

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Abstract

This paper uses recently collected data on inter-vivos transfers exchanged between parents and their adult children to illustrate informal risk sharing and insurance within family networks. We show how negative health shocks to relatives lead to an increase in both time and monetary transfers throughout a family network. In the context of incompletely insured consumption, an individual's family members finance transfers through adjustments to expenditure, labor supply, and asset holdings. These transfers aid the recipient by mitigating consumption losses and lowering their need to draw down assets. The results stress the costs that shocks have throughout an extended family.

I. Introduction

A significant body of literature highlights the importance of noncoresident family members in decision making, risk sharing, and providing informal insurance in times of need (e.g. McGarry and Schoeni, 1995; Lundberg and Pollak, 2007). However, prior analysis is limited by an inability to disentangle the mechanisms underlying patterns of family assistance due to a lack of data identifying the source and destination of monetary and time transfers between extended family members. This study highlights the role of close family ties in providing support using detailed data on individual health status, genealogically linked noncoresident family members, and uniquely detailed transfer data. We combine longitudinal information linking extended families in the Panel Study of Income Dynamics with the recent PSID Family Rosters and Transfers supplement to understand the role played by specific family members, time transfers, and monetary transfers in attempting to insure consumption against a sudden health decline.

Our study documents that falling into poor health leads to earnings losses, increased health expenditures, and an accompanying increase in the incidence and value of support shared between noncoresident family members. We observe both down and upstream pathways of assistance between parents and children in response to health declines through monetary and time support. We also illustrate the impact of the interaction between a relatives' health and transfer response on the sending and receiving households. The results suggest assistance from noncoresident family members eases the burden of attempting to self-insure in the face of declining health by attenuating the need to draw down wealth and adjust household labor supply. We also discuss the potential for heterogeneity in these effects across extended families in different places in the wealth distribution, noting the

particularly severe burden borne by those without the ability to draw assistance from their families.

Due to prior data limitations, there is little existing work that has been able to examine the incidence and impact of intergenerational, inter-vivos transfers in such detail. Prior literature studying intergenerational support largely focuses on bequests at the end of life or the incidence and motives behind inter-vivos transfers rather than their impact (e.g. Altonji et al., 1997; Cox, 1987; Cox and Rank, 1992; McGarry, 1999, 2012). This prior work predominately uses fluctuating income as the source of variation driving family transfer patterns. We choose to focus on changes in health status, which are both plausibly more exogenous than income variation and represent one of the most significant financial risks to individuals and their families (Dalton and LaFave, 2017). Moreover, rarely, if ever in prior work are upstream and downstream transfers assessed in a unified framework. These gaps in the literature are particularly true when examining time assistance owing to lack of quality data (Arrondel and Masson, 2006). The rich PSID transfer supplement allows for substantial contributions to this literature.

2. Conceptual Framework – Consumption Smoothing and Inter-Vivos Transfers

Time and monetary transfers are one part of the larger connections within families that provide care and assistance in times of need. While past theoretical and empirical work examining private, family transfers has primarily focused on bequests and their underlying motives, here we focus on the more frequent form of short-term assistance and look to assess the impact of such transfers in the context of consumption smoothing and risk mitigation within family networks. The baseline question of whether individuals fully smooth consumption in the face of health risk serves as our starting point before focusing on how

monetary and time transfers impact the decision-making process and outcomes of both sending and receiving households.

In models of full insurance, permanent household resources determine period t consumption rather than idiosyncratic fluctuations in factors that potentially affect income and budget constraints such as health (e.g. Deaton, 1992). Households have access to state-contingent means of insurance to equate marginal utility across time despite facing a number of stochastic states with potential consumption realizations. Declining health is one potential state that may be unanticipated and lead to reductions in both income and nonhealth-related consumption. Under full insurance and with an assumption of separable utility, income fluctuations due to health shocks are smoothed away and do not effect the realized change in consumption between periods.

While a useful benchmark, full consumption smoothing is largely rejected in the data in favor of a partial insurance approach where household's respond to declining health (or income) to mitigate losses but do not fully smooth across states. Here we are particularly interested in extending beyond the household to explore how extended family members' time and monetary resources act as insurance mechanisms. This approach is a complement to recent work that examines how formal safety-net programs and informal within-household mechanisms are used as consumption insurance (e.g. Blundell et al., 2016). Due to data limitations, this literature has lacked a detailed analysis of time and monetary transfers exchanged upstream to parents and downstream to younger generations in response to negative health events.[1]

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[1] Various mechanisms underlying consumption smoothing in response to declining health have been explored in the literature. We assess the direct effect of declining health on labor supply, wealth, and public transfers elsewhere (Dalton and LaFave, 2017).

To fix ideas, consider a pair of related family members – e.g. a parent-child pair – where the potential sender cares about their utility as well as that of the receiver, in line with models of altruistic preferences between family members. In a potential upstream case when the parent experiences a health decline, the parent's consumption is potentially at risk. Health can impact consumption through direct health care costs or productivity costs in cases where households are resource or liquidity constrained. While self-insuring against the health shock may occur within the household through drawing down assets and increasing spousal labor supply, assistance from the sending child is a viable insurance mechanism and perhaps even preferred with sufficiently different opportunity costs of time or liquidity constraints.

The existing literature has focused on why a child would give a transfer in such a situation, positing altruistic motives as well as self-interested exchange or alternatives such as reciprocity (e.g. Arrondel and Masson, 2006; Cox, 2008). Here we are primarily interested in how the decision to make a transfer impacts the sending household as well as the recipient's well-being. Given a standard budget where expenditure on consumption and the value of monetary and time transfers sent is constrained by labor income and net wealth, the child may choose to fund a monetary transfer to their parent to offset the parent's potential consumption decline through one of three ways: reducing their own consumption, drawing down wealth, or increasing labor income. In cases where a parent is liquidity constrained, a monetary transfer from a child is a potentially better smoothing mechanisms for the entire family network rather than additional high-interest debt obligations accruing to the parent. Similarly, a potential time transfer to the parent carries an implicit opportunity cost of lost wage income or leisure time for the child.

From the parent's perspective, monetary transfers ease the budget constraint and help to defray direct or productivity costs of the health decline. Such transfers may directly aid in smoothing consumption or make it unnecessary for the recipient to borrow against their wealth, accrue debt, or adjust household labor supply. A time transfer from the child may serve to offset additional care expenditures or substitute for the need to hire additional assistance.

Each of these mechanisms is explored in the unified empirical framework that follows.

3. Empirical Approach

We utilize information on genealogically linked families in the 2005-2013 waves of the Panel Study of Income Dynamics and the 2013 Family Roster and Transfer supplemental file. The five waves of data contain consistent health, expenditure, and wealth modules. Beginning in 1968 with a nationally representative set of households, the PSID has since tracked and interviewed individuals from the original households and their offspring, or adopted children, regardless of location. By connecting PSID sample members to their families of origin, we are able to construct family trees and link a sample of approximately 6,000 households into 1,700 families in the 2013 data. We briefly describe the data construction and measurement before illustrating the empirical strategy to assess the impact of deteriorating health on family transfers.

3.1 Family Roster and Transfer Supplement

The PSID has been one of the premier datasets for intergenerational and family analyses due to the extensive split-off tracking scheme (e.g. Altonji et al. 1992, 1997; Hotz et al., 2010;

Waldkirch et al., 2004). However, the genealogical structure of the tracking implies that while it is possible to link noncoresident households into extended families, the observed family members are only a subset of the larger network. A PSID family is built from a single branch of a family tree and will necessarily miss noncoresident in-laws as well as step-children when they move out from a PSID household. The 2013 Family Roster and Transfer supplement was conducted in part to fill-in these parent-child gaps and provides the most complete accounting of inter-vivos family transfers to date in a long-running, national longitudinal study.

The transfer supplement, completed by PSID heads and spouses, enumerates a complete list of adult children, stepchildren, parents, stepparents, and in-laws, and covers the incidence and amount of time and monetary transfers sent and received. The time transfers question is phrased as:

> "Families sometimes help each other with activities such as errands, rides, chores, babysitting, or hands-on care. In 2012, did you spend time helping your parent(s)/child(ren)?"

Followed by,

> "About how many hours in 2012 did you spend helping […]?"

asked for each member in the roster file. Similar questions ask about the receipt of time assistance from each family member.

Monetary transfers are recorded for both the prior year as well as transfers of money sent specifically for school, housing, and large expenses since the denoted recipient was 18 years old. We focus here on the former, short-term transfers that are elicited through a question asking:

> "In 2012, did you give any money, loans or gifts of $100 or more to your parent(s)/child(ren)?,"

With a similar question again following on the receipt of monetary assistance from each specific relative. Important in this design for our research program here is the ability to observe a full accounting of time and monetary support as well as identify the source, destination, and magnitude of specific transfers. See Schoeni et al. (2015) for a complete description of the supplemental transfer module.

3.2 Identifying the Impact of Poor Health

We define poor health status for receiving and sending households in two complementary ways based on the cross-sectional nature of the transfer supplement.

3.2.1 Self-reported limitations of potential transfer recipients

Following Dalton and LaFave (2017), our primary health marker relies on longitudinal reports of eleven specific acute, chronic, and psychosocial conditions that were added to the PSID main interview in 1999.[3] For each of the conditions, the respondent is asked if they have ever been diagnosed and whether the condition limits their daily activities a lot, somewhat, a little, or not at all. Our primary focus is on the onset of severely limiting, or "a lot," conditions. The health data collected from these questions accurately reflect patterns in the National Health Interview Survey (Andreski et al., 2009), and are commonly used as valid measurements of health status (e.g. Johnson and Schoeni, 2011; Laditka and Laditka, 2014; Zajacova et al., 2015).

We first illustrate the association between the level of severe limitations and consumption but focus on individuals who report transitioning into the severe limitations

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[3] The 11 conditions asked about in the survey are stroke, high blood pressure, diabetes, arthritis, asthma, lung disease, cancer/malignant tumor (excluding skin cancer), heart attack, heart disease, emotional distress, and memory loss. Once a respondent answers that they have ever been diagnosed they are asked about limitations due to the condition in the current interview as well as in each subsequent wave.

category between their previous interview and the 2013 wave as the primary indicator of interest. This is done to explicitly analyze changes in health status that mitigate concerns surrounding the potential endogeneity of the level of an individual's health status in the 2013 wave.

Important for this research design, the onset of a severely limiting condition is both plausibly exogenous and carries significant financial costs. While we focus on consumption below, we estimate in panel regressions with individual fixed effects that the onset of a severely limiting condition is associated with approximately $3,500 of lost labor income (p-value = 0.002) and $500 of increased health expenditure (p-value = .03). These are significant losses at a magnitude that suggest transfers may in fact plausibly respond to the health shock.

It is also essential that we're able to identify plausibly exogenous changes in health status. There are two key supporting points for our measures. First, the measured changes in severe limitations pass tests of strict exogeneity based on Chamberlain (1982, 1984).[4] Second, an individual's changes in severe limitations are unpredicted by observable characteristics in the data. Individual fixed effects regressions of the likelihood of reporting severe limitations on past consumption, earnings, or wealth show no statistically significant links and point estimates that are small in magnitude. For example, an additional one thousand dollars in labor income in 2011 leads to a 0.007 percentage point decrease in the likelihood of having severe limitations in 2013 (p-value = 0.2).

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[4] Under the null of strict exogeneity, the contemporaneous level of health should be unrelated to the change in consumption conditional on the change in health and additional controls. We fail to reject the null at any reasonable level of test (p-value = 0.501).

3.2.2 Perceptions of health in the transfer supplement

Our second measure of health is used when examining an individual's report of sending assistance to a relative. In these cases, we observe a fraction of exchanges with both ends of the transfer, those recipients who also carry the PSID "gene" and are regular members of the survey who themselves complete the transfer supplement. It's possible in those instances to link, for example, a child's report of assisting their parent with the health status reported by the parent.

However, this strategy limits the sample to those instances where both individuals are interviewed contemporaneously within the survey. The transfer supplement was thus designed to elicit the sender's perceived health of the recipient – in this case, the child's report on their parent's health. To maintain the full sample of respondents to the transfer module, we make use of these reports by the transfer sender about the perceived health of their parents and children. Family members' poor health is based on a question which asks:

"Compared to others her age, is her health excellent, very good, fair, or poor?"

This question, which is more subjective than the conditions-linked limitations we use for recipient's health, leads to estimates similar in magnitude to those based on the restricted sample of cases where we observe both the sender's report about the perceived health of their relative and the relative's diagnosis-based report.

3.2.3 Consumption, assets, and labor market outcomes

The 2005 wave of the PSID marked the beginning of an expanded consumption module as well. Whereas only food and housing spending were collected prior to 1999, and education, transportation, health and child care were collected prior to 2005, we utilize detailed consumption data to separate health expenditure from expenditures on food, housing,

education, child care, transportation, recreation, clothing, home furnishings, and vacations. Blundell et al. (2008) highlight the importance of examining nonfood expenditures when assessing models of full insurance, and Blundell et al. (2016) illustrate the close connection between PSID expenditure data and consumption aggregates in national accounts. Rich information on labor-market outcomes and asset holdings provides data on a number of the underlying mechanisms families might use to finance transfers, insure consumption, and/or spread risk that plausibly interact with deteriorating health.

3.3 Estimating the Impact of Poor Health

Our models focus on how poor health and the receipt or sending of transfers impacts outcomes in the 2013 wave of the primary PSID family survey and the supplemental transfer file. The baseline specification throughout for individual i in household h who is part of family f is the following:

$$Y_{ihf} = \beta_1 H_{ihf} + \gamma \overline{Y_{ihf}^{pre}} + \delta X_{ihf} + \mu_f + \varepsilon_{ihf} \tag{1}$$

where Y is the outcome of interest, beginning with the log of nonhealth per-capita expenditure and extending to transfers, labor supply, and wealth. H measures poor health status of either the individual transfer recipient or their relative from the transfer file.

As noted above, while we observe longitudinal data on respondents' consumption, health, labor supply, and wealth, the in-depth transfer information at the focus of this research is only available for the 2013 wave. Equation (1) is an alternative approach to a first-differenced model designed for this context. The key modification is the inclusion of the pre-2013 average of the outcome as a control variable, $\overline{Y_{ihf}^{pre}}$. This strategy utilizes the fact that we observe a history of information on a household's outcome Y rather than only the

2011 and 2013 data that would be used in a first-differenced model.[5] This approach is similar in spirit to the ANCOVA procedure discussed in Frison and Pocock (1992) and McKenzie (2012) for analyses when one observes a history of information on an individual prior to a treatment – in this case observing a health decline. Relative to a first-difference model which would define the "pre" period as only the prior 2011 wave, model (1) improves precision of the estimates by utilizing information over the entire 2005-2011 period to gain a sense of an individual's outcome prior to falling into limited health. This is particularly useful in situations where Y is weakly correlated over time, and a single observation from 2011 would not give a representative value with which to compare the 2013 outcome.[6]

With the inclusion of the pre-2013 average as a control, the parameter of interest β_1 measures the change in the outcome linked to a decline in health relative to the individual or household's long-run average.

Additional demographic controls, in X, include age and education of the household head and spouse in flexible polynomials, marital status, household and family size and gender-age composition, and formal insurance coverage (lagged one wave to avoid simultaneity concerns).

Finally, we allow for the possibility that the likelihood of experiencing poor health, attitudes toward transfers, and preferences regarding redistribution may differ across families in unobserved ways that could lead to biased estimates of β_1. The inclusion of family fixed effects, μ_f, relies on the PSID's genealogical structure to isolate identifying variation to a comparison of individuals within an extended family network. The fixed effects capture

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[5] When variables from the 2013 transfer file are used as outcomes, this lagged average is unavailable and excluded from the models.

[6] We show below that equation (1) leads to estimates close in magnitude to fixed-effects models with multiple waves of data in analyses that omits variables from the transfer supplement.

unobserved differences in wealth, generosity, expectations, lifecycle position, and other key characteristics that are common to individuals within a family.

3.4 Descriptive Statistics

The means and standard deviations for variables of interest are included in Table 1. Panel A reports demographic and outcome variables from the main interview file. Importantly, 8.5% of respondents report severe limitations due to a health condition, while 4.3% of the sample are individuals that transitioned into severe limitations in 2013. This group and their family members are the primary focus of this study. Column 2 reports means of consumption, wealth, and household labor supply.

Panel B reports descriptive statistics from the supplemental transfer file aggregated across parents and children to the household level to match the level of variation in consumption, labor supply, and wealth outcomes. Column 3 addresses monetary and time transfers sent to parents and children. The means suggest downstream financial support to children is much more common than upstream financial transfers to parents with 45.55 percent of individuals with children over the age of 18 reporting sending financial support relative to 17.75 percent of respondents with parents. The average transfer value conditional on sending is substantial at approximately $1,400 to parents and $4,800 to children. Time transfers are sent by approximately half of child and parent households and comprise 300 and 600 hours of assistance. Column 4 summarizes transfer receipt from parents and children. Similar patterns emerge as in the sending households – it is more common to receive time assistance than money, but the magnitude of monetary assistance is sizeable.

4. Results

We begin by testing whether households experience changes in consumption due to poor health status. This preliminary analysis motivates a closer examination of the effects of deteriorating health on the likelihood of sending and receiving transfers, and the impact of financial and time assistance. All standard errors in the analysis are calculated allowing for clustering at the extended-family level.

4.1 Consumption Declines with Poor Health

Table 2 presents estimates from equation (1) with the log of nonhealth expenditures per capita as the dependent variables to illustrate three key identification concerns: the importance of considering family fixed effects, the impact of health on those who transition into versus continue in poor health, and the comparability of the identification strategy in (1) with longitudinal fixed effect models. The results throughout show that consumption is at significant risk in the face of poor health.

Poor health is first defined in columns 1 and 2 as reporting severe limitations across any one of the 11 health conditions. The sample in these columns includes data from 2005 to 2013 to establish a connection between health and consumption. Column 1 reports estimates from equation (1) excluding family fixed effects. The estimated coefficient suggests an association between reporting severe limitations and reductions in non-health expenditures of approximately 24 percent.

However, the estimates in column 1 are likely contaminated by many forms of unobserved heterogeneity including access to, and preferences for, informal smoothing mechanisms. Column 2 repeats the analysis while including family-year fixed effects based on the root 1968 PSID household. This strategy limits the comparison to those individuals

within the same extended family and controls for all common unobserved heterogeneity at the family level in each year that enters the models in a linear and additive way. As the conceptual framework here is to compare how given family networks operate in the face of members' declining health, these effects serve an important theoretical role.

Column 2 reports that severe limitations are related to an approximate 20 percent reduction in nonhealth consumption when compared to one's long-term average in the face of poor health. This notable reduction in the association between poor health and consumption highlights the importance of family-year-effects in the models, as well as potential differences in smoothing patterns between families. We discuss possible sources of such heterogeneity in terms of access to resources in section 4.5.

Columns 3 and 4 turn toward our preferred health specification to focus on those individuals who transition into severe limitations in a given wave defined with the health history available in the PSID. These health transitions are plausibly more exogenous than the level of health that one reports, and focuses our analysis on changes in family support in relation to changing health. Column 3 uses the full 2005-13 waves to document an approximate 15% reduction in nonhealth per capita expenditure when one falls into limited health. While smaller, due in part to the impact of poor health increasing over time, we fail to reject the equality of the two effects in columns 2 and 3. We proceed with the health transition focus for its intuitive appeal but note the importance of studying the impact of long-running limitations due to health conditions in future work.

Column 4 limits the sample to only the 2013 wave that contains the Roster and Transfer data used in the remainder of the paper and illustrates that consumption is imperfectly insured against health here as well – transitioning into severe limitations is related to an approximate 14% reduction in per capita expenditure relative to the household

average. This estimate is not statistically different than the estimate including prior waves in Column 3 (the estimate excluding the 2013 wave from Column 3 is -0.14 with a standard error of 0.031). Combined with the estimates noted above regarding lost labor income and increased health expenses, there is a clear link between negative health transitions and reductions in economic resources.

4.2 Transfers Increase when Family Members are in Poor Health

Having established that poor health has a material impact on consumption, we next move to examine whether monetary and time assistance recorded in the transfers module increases as a means to aid noncoresident family members. Panel A of Table 3 examines the question from the receiving household's perspective based on the PSID head of household's reports on their own health and transfer receipt. All models exclude the lagged value of the outcome as the variables are only available in the 2013 transfer supplement.[7]

As the transfer data includes not only the incidence and amount of transfer but also the biological relationship of the sender, we examine receiving assistance first from the downstream perspective of individual's receiving help from their parents. The sample in columns 1 through 4 is restricted to those households with reports on noncoresident parents in the transfer data. Individuals who transition into poor health report an increase on the extensive margin of approximately 7 percentage points in the likelihood of receiving both monetary and time assistance from their parents. These are large increases relative to means of 23 and 32 percent.

There is potential value to thinking of the amount of transfers received as a variable censored from below at zero, where we cannot observe the full distribution of the latent

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[7] These models are done without family-level fixed effects. Given the parent-child dyad nature of the transfer module, the fixed effects would be capturing family-generation-level fixed effects. This considerably limits the sample size.

variable. As a result, we choose a Tobit specification to model the transfer amount as a censored variable. Columns 3, 4, 7, and 8 are Tobit regressions. In column 3, we observe a statistically significant 2180 dollar predicted increase in the latent parental transfer variable in response to a poor health transition. In column 4, we observe a marginally statistically significant 175-hour increase in the latent variable.

Columns 5 through 8 examine the upstream perspective with the sample of households with noncoresident children in the transfer file. Parents who fall into poor health see a marked increase in the likelihood and length of time transfers from their adult children, but no significant changes in financial assistance. The likelihood of receiving time assistance increases by 9.4 percentage points, or approximately 25% relative to the mean. Hours of time increase by 375 over the course of the past 12 months.

Panel B of Table 3 examines the question from the perspective of sending households.[8] In this analysis the sender of the support reports health status of the recipient rather than their own reduced health. Columns 1 through 4 report increases of the incidence of time and monetary support and the value of money and hours spent assisting parents in poor health. The increase in reported transfers given to parents are not statistically different than those reported by receiving parents in columns 5 through 8 of Panel A, although they are more precisely estimated. Sending parents report increasing time assistance on both the extensive and intensive margin to aid their children in poor health.

4.3 Impact of Transferring Resources on Sending Households

The question then becomes what changes do sending households make to finance the increased monetary and time support provided to their parents and children? Guided by the

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[8] As we observe transfer reports from both the sender and recipient in many cases, ongoing work looks to examine the reconciliation of the two.

components of a standard budget constraint, Table 4 reports the impact of providing transfers on the sending household's consumption, assets, and labor supply. We modify equation 1 to include not only health status on the right-hand side but the value of assistance provided, as well as the interaction between the two:

$$Y_{ihf} = \beta_1 HxT_{ihf} + \beta_2 H_{ihf} + \beta_3 T_{ihf} + \gamma \overline{Y_{ihf}^{pre}} + \delta X_{ihf} + \mu_f + \varepsilon_{ihf} \qquad (2)$$

where H again measures the health status of a relative and T measures the value of transfers from the sending household in increments of one thousand dollars or hundred hours. The primary coefficient of interest, β_1, estimates how poor health of a relative, H, impacts a sending household in the instance when they provide a transfer of value T to the individual in need. β_2, also reported in Table 4, measures the impact of the relative's poor health on potential sending households in the instances when they do not make a transfer. Lagged averages of the outcome and family fixed effects remain in the models along with demographic controls. As we treat the amount of transfer as a censored latent variable in Table 3, we include dummy variables for if the level of the transfer is censored at zero.

Panel A focuses on the impact of financing monetary transfers to either parents or children in poor health. Recall from Panel B of Table 3 that it is more common for sending households to report monetary transfers sent to parents rather than children. Column 1 illustrates that the consumption of the sending household is reduced in instances where monetary support is sent to parents by approximately 3% for every additional $1000 transferred. Evaluated at the mean, this 3% represents approximately $976, suggesting that the transfer is financed nearly exclusively from the sender's consumption. Parental health only leads to this effect when the child's household transfers money as shown by the statistically insignificant main effect of parental health.

There are few other significant changes in the assets or labor supply of households sending monetary transfers, although there is a marked increase in debt for those households who send monetary transfers to children.

Panel B moves to the impact of providing time transfers. There is little impact on consumption or wealth of sending households in columns 1 through 5. Instead, the primary outcome of interest when sending time transfers is how the decision to assist a parent or child impacts labor supply decisions. Those parents whose children are in poor health note a large and statistically significant decrease in the amount of total time spent working by the head of the sending household. However, this change is mitigated by a small reduction when the household makes time transfers to the ill child suggesting a substitution between labor and family assistance. Further analysis suggests the intuitive pattern that the opportunity cost of an individual's time determines which parent provides the time transfer. Within sending households, the spouse that is not working in the labor market is more likely to be the one to provide the time transfer. This is true both in instances where the husband works and the wife does not, as well as when the wife works and the husband does not. When the husband and wife both work, it is more likely the wife will make the time transfer.

4.4 Impact of Transfer Assistance on Receiving Households

Table 5 approaches the question from the viewpoint of recipient households. While tables 2 and 3 established that consumption is impacted by health and that households report an increase in time and monetary assistance when ill, here we illustrate the impact of receiving financial and time assistance on expenditures, assets, and labor supply. Panel A again focuses on monetary support and Panel B on time.

Column 1 illustrates limited scope for monetary transfers to mitigate estimated consumption losses. Those households who do not receive monetary assistance when transitioning into poor health see an estimated 14% reduction in nonhealth PCE, equal to the results shown earlier in Table 2. Interactions of health with transfer receipt are positive but statistically insignificant and small in magnitude.

However, receiving financial support from parents and children appears to ease the household's burden of attempting to self-insure their health decline through their own assets and labor supply. Column 3 illustrates that those individuals who receive financial assistance from their parents and children see marked reductions in debt load relative to those individuals who fall into poor health and receive no assistance. Similarly, those without financial support see approximately $2,000 reductions in the value of home equity (though not statistically significant) that do not occur for those receiving monetary assistance from either parents or children. The results suggest financial transfers attenuate the need to draw down one's own wealth to self-insure against declining health. The large coefficients can be explained by the fact that home equity may be difficult to tap into in small amounts. This result is also interesting in contrast to previous results using the 2001-2011 waves of the PSID that find a significant decrease in home equity and increase in the likelihood of refinancing a home in response to a health decline (Dalton and LaFave, 2017). Given that this sample is only for 2013, a number of years post-Great Recession, it is not surprising to see home equity become less of a relied-upon insurance mechanism for dealing with health declines.

A somewhat similar finding is shown for labor supply in column 6. Those individuals who experience a health decline without financial assistance see the head of household's labor supply reduced by approximately 400 hours over the past year. Hours are reduced even

further in response to monetary transfers from parents, perhaps relieving part of the burden of maintaining labor income across members of the household that experiences the health decline.

Time support, analyzed in Panel B, appears most closely linked to consumption rather than financial assets or labor supply. Column 1 illustrates that time assistance from parents has a statistically significant mitigating effect on consumption losses experienced by children with declining health. This translates to a 4.2% smaller reduction in nonhealth expenditures for every 100 hours of time transfer received from a parent in response to a health decline.

We fail to reject that the estimated effects of parental and child support in each column of panels A and B are equal. This would point toward models where the source of a transfer is not relevant for family decision-making. However, the failure to detect differences is largely driven by imprecisely estimated coefficients, making it difficult to draw substantive conclusions from such tests.

4.5 Heterogeneity Across Families

The results in tables 2 through 5 illustrate that the average family in the sample is unable to smooth consumption in the face of health but engages in sharing patterns such that those transitioning into poor health are the beneficiaries of time and monetary assistance. It is certainly plausible that there is substantial heterogeneity in these effects across families based on their access to potential smoothing resources, both financial and time.

We have explored several markers of potential heterogeneity across families, and while there appears to be substantial differences in the effect of poor health on consumption and sharing patterns across the socioeconomic distribution, we lack sufficient power to

detect statistical differences. For example, the impact of transitioning into poor health is 4 percentage points larger for those in the bottom 25% of the family wealth distribution, highlighting potential differences in the access of informal smoothing mechanisms through family wealth constraints, but the effect is not statistically significant at conventional levels. Further exploring the differences in how health limitations impact family resource allocation across the socioeconomic spectrum remains important, policy-relevant work.

5. Discussion

Past empirical research provides evidence that extended families share resources, and that monetary and time transfers are a means for facilitating these transactions. However, the vast majority of previous data sources have been restricted by only measuring the total amount of monetary transfers received or given over a period of time. This paper exploits the opportunity to observe the source and destination of monetary and time assistance occurring between generations within the same family to assess the mechanisms used to ease the burdens of declining health. While we show that the extended family does provide insurance, we also show that the patterns are nuanced, impact more than consumption, differ across time and monetary support, and different family members play potentially complementary roles. It was not possible to see these patterns with previously available data. The results provide insights into extended family behavior and emphasize how the costs of shocks reverberate throughout an entire family network.

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Table 1 - Descriptive Statistics

A. Demographics and Outcomes from Main Interview

	(1)		(2)
Age	47.49	Non-health Per Capita	10853
	(16.23)	Expenditure	(8989)
Married (%)	58	Health PCE	754
			(1354)
Household size	2.8		
	(1.57)		
Attained Years of Education	13.7	Debt	9179.9
	(2.38)		(21893)
Have Child Interviewed? (%)	33.5	Home Equity	52811
			(107376)
Have Parent Interviewed? (%)	54	Savings	15516
			(48095)
Poor Health (%)	8.50	Head's hours worked for year	1413
			(1058)
Transition into Poor Health (%)	4.25		

B. Roster and Transfer File

Sending Transfers		Receiving Transfers	
	(3)		(4)
Monetary:		Monetary:	
Send to Parents (%)	17.75	Receive from Parents (%)	23.41
Amount (conditional)	1376.16	Amount (conditional)	2971.81
	(3141.28)		(7527.4)
Send to Children (%)	45.55	Receive from Children (%)	11.78
Amount (conditional)	4826.77	Amount (conditional)	1063.55
	(13789.35)		(1930.88)
Time:		Time:	
Give to Parent (%)	45.02	From Parent (%)	31.68
Hours (conditional)	314.76	Hours (conditional)	352.789
	(796.02)		(697.16)
Give to Children (%)	46.16	From Children (%)	32.34
Hours (conditional)	594.4	Hours (conditional)	525.12
	(1175.766)		(1182.88)
N Households with parent or children in transfer file	5876		

Table 2 - Consumption Declines when Health Worsens

| | *Dependent Variable:* log(non-health PCE) | | | |
	(1)	(2)	(3)	(4)
I(Severe Limitations in Health)	-0.24***	-0.20***		
	(0.018)	(0.022)		
I(Transitioned to Severe Limitations from Previous Interview)			-0.15***	-0.14**
			(0.030)	(0.058)
Additional Ccontrols	y	y	y	y
Family Fixed Effects	n	y	y	y
Sample years	2005-13	2005-13	2005-13	2013
Observations	28,390	28,391	28,392	5,876
Number of Extended Families		1899	1899	1665

Cluster-robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3 - Incidence and Value of Transfers in Response to Poor Health

A. Receiving Transfers

Relation	From Parents				From Children			
			Value of				Value of	
	I(Receive Monetary Transfer)	I(Receive Time Assistance)	Monetary Support ($1000s)	Amount of Hours (100s)	I(Receive Monetary Transfer)	I(Receive Time Assistance)	Monetary Support ($1000s)	Amount of Hours (100s)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I(Transitioned to Severe Limitations from Previous Interview)	0.070**	0.072*	2.18**	1.75*	0.027	0.094***	0.59	3.75***
	(0.035)	(0.037)	(0.94)	(0.98)	(0.028)	(0.035)	(0.43)	(1.22)
Additional Controls	y	y	y	y	y	y	y	y
Observations	4,489	4,489	4,489	4,489	3,284	3,284	3,284	3,284

B. Sending Transfers

	To Parents				To Children			
			Value of				Value of	
	I(Send Monetary Transfer)	I(Send Time Assistance)	Monetary Support ($1000s)	Amount of Hours (100s)	I(Send Monetary Transfer)	I(Send Time Assistance)	Monetary Support ($1000s)	Amount of Hours (100s)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I(Parent Reported in Poor Health)	0.042**	0.085***	0.59**	1.76***				
	(0.016)	(0.020)	(0.27)	(0.48)				
I(Child Reported in Poor Health)					0.025	0.096***	-0.23	3.41**
					(0.035)	(0.033)	(1.07)	(1.49)
Additional Controls	y	y	y	y	y	y	y	y
Observations	4,489	4,489	4,489	4,489	3,284	3,284	3,284	3,284
R-squared	0.015	0.026	0.009	0.084	0.085	0.115	0.037	0.046

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4 - Impact of Relatives' Health and Transfers on Sending Households

A. Sending Monetary Support

Dependent Variable

	log(non-health PCE)	Health PCE	Debt	Home Equity	Savings	Head of Household Labor Supply
	(1)	(2)	(3)	(4)	(5)	(6)
I(Parent in Poor Health) x Value of Monetary Transfer to Parents ($000s)	-0.032**	15.2	173	-130	-1,273	-21.6
	(0.015)	(24.9)	(312)	(1,227)	(1,120)	(20.5)
I(Child in Poor Health) x Value of Monetary Transfer to Children ($000s)	-0.00053	46.4	548**	518	-838	8.08
	(0.015)	(41.2)	(249)	(1,740)	(1,282)	(13.9)
I(Parent in Poor Health)	0.0049	-22.7	-973	2,161	164	9.10
	(0.033)	(52.5)	(2,417)	(1,591)	(828)	(35.8)
I(Child in Poor Health)	0.037	-77.5	8,732	3,807	-3,333**	89.3
	(0.072)	(111)	(5,804)	(4,739)	(1,646)	(69.0)
Additional Controls	y	y	y	y	y	y
Family Fixed Effects	y	y	y	y	y	y
Observations	5,876	5,876	5,876	5,876	5,876	5,876

B. Sending Time Assistance

	log(non-health PCE)	Health PCE	Debt	Home Equity	Savings	Head of Household Labor Supply
	(1)	(2)	(3)	(4)	(5)	(6)
I(Parent in Poor Health) x Hours of Time Assistance to Parents (per 100 hours)	-0.0032	4.55	18.1	127	-115	-0.13
	(0.0049)	(4.51)	(150)	(591)	(175)	(5.29)
I(Child in Poor Health) x Hours of Time Assistance to Children (per 100 hours)	-0.000037	-7.38*	79.9	122	-32.4	-5.58*
	(0.0039)	(3.96)	(59.7)	(141)	(102)	(3.19)
I(Parent in Poor Health)	0.0075	-29.2	183	2,157	183	0.96
	(0.034)	(53.8)	(810)	(1,590)	(810)	(37.6)
I(Child in Poor Health)	0.0078	11.4	-3,022*	2,933	-3,022*	115
	(0.069)	(112)	(1,608)	(4,866)	(1,608)	(69.9)
Additional Controls	y	y	y	y	y	y
Family Fixed Effects	y	y	y	y	y	y
Observations	5,876	5,876	5,876	5,876	5,876	5,876

Cluster-robust standard errors in parentheses. All models include the main effect of money/time transfers sent to parents/children

*** p<0.01, ** p<0.05, * p<0.1

Table 5 - Impact of Time and Monetary Transfers on Recipients

A. Receiving Monetary Support

	log(non-health PCE)	Health PCE	Debt	Home Equity	Savings	Household Labor Supply
			Dependent Variable			
	(1)	(2)	(3)	(4)	(5)	(6)
I(Transitioned to Severe Limitations) x	0.0019	-31.0**	-877**	1,136*	-285	-40.9**
Value of Monetary Transfers from Parents ($000s)	(0.027)	(13.1)	(389)	(644)	(360)	(17.7)
I(Transitioned to Severe Limitations) x	0.014	160	-2,451**	7,409*	-7,303	-111
Value of Monetary Transfers from Children ($000s)	(0.10)	(106)	(1,180)	(4,501)	(6,280)	(112)
I(Transitioned to Limited Health)	-0.14**	-97.2	-3,120	-1,855	1,497	-404***
	(0.060)	(76.1)	(3,493)	(1,474)	(1,419)	(69.1)
Additional Controls	y	y	y	y	y	y
Family Fixed Effects	y	y	y	y	y	y
Observations	5,876	5,876	5,876	5,876	5,876	5,876

B. Receiving Time Support

	log(non-health PCE)	Health PCE	Debt	Home Equity	Savings	Household Labor Supply
	(1)	(2)	(3)	(4)	(5)	(6)
I(Transitioned to Severe Limitations) x	0.042***	-5.67	-184	683	-36.1	-33.1
Amount of Time from Parents (per 100 hours)	(0.011)	(10.6)	(189)	(659)	(178)	(33.2)
I(Transitioned to Severe Limitations) x	0.0029	-5.69	-157	356	20.2	10.4
Amount of Time from Children (per 100 hours)	(0.0094)	(6.27)	(108)	(298)	(123)	(6.61)
I(Transitioned to Limited Health)	-0.17**	-88.4	-3,115	-2,686*	1,202	-450***
	(0.067)	(81.3)	(3,806)	(1,544)	(1,548)	(72.6)
Additional Controls	y	y	y	y	y	y
Family Fixed Effects	y	y	y	y	y	y
Observations	5,876	5,876	5,876	5,876	5,876	5,876

Cluster-robust standard errors in parentheses. All models include the main effect of money/time transfers received from parents/children
*** p<0.01, ** p<0.05, * p<0.1