Economic Inquiry

MEASURING AND MODELING INTERGENERATIONAL LINKS IN RELATION TO LONG-TERM CARE

ANDREW CAPLIN, MI LUO and KATHLEEN McGARRY*

Long-term care has profound intergenerational implications. It can be costly for those who need it and onerous for loved ones who provide it. We pinpoint three intergenerational aspects of long-term care that require further research. One concerns the link between costs of private care and intergenerational wealth transfers. The second concerns the link between participation in care and the work and welfare of family providers. The third relates to intergenerational tensions that these and other late-in-life interactions create. We outline innovations in modeling and measurement that would improve understanding of intergenerational linkages and their implementation in appropriate panel data. (*JEL* D91, I13, J22)

I. INTRODUCTION

Long-term care (LTC) has profound intergenerational implications. It can be very costly for those who need it, as well as onerous for loved ones who participate in its provision. These are among the many intergenerational aspects of LTC decisions that have featured in recent research. Yet, many other such linkages remain to be explored, in part due to data limitations.

The goal of this study is both to outline recent progress and to shed light on data enrichments that would liberate further progress. The central thesis is that further research progress rests at least as much on the generation of suitable family-related data as it does on advances in theory. The required data relate not only to past and present patterns of behavior, but also to conditional probabilities and contingent future behavior.

It is not standard in the economic literature to write an article focused on next generation measurement and how it would liberate research progress. Yet, engineering of appropriate data requires thought to be dedicated to principles of design. In particular, we highlight the intricacy, importance, and the research potential of appropriate family-based panel data. It has traditionally been easier to find outlets for speculative theories of behavior than for speculative proposals for engineering of new data. This is a limitation that the profession imposes on itself. It is the goal of this paper and the other papers in the symposium to relax this constraint and to elevate data design as a research priority.

The article has four main sections. The first three cover important areas in which our understanding of LTC rests on improved understanding of the family setting. Section II relates to the pre-care period of spending and saving by elders. Section III relates to the period of care itself and

*Andrew Caplin's research is supported by a program project grant from the National Institute on Aging P01-AG026571. The Vanguard Group Inc. supported data collection through the VRI (Vanguard Research Initiative). Vanguard's Client Insight Group and IPSOS SA were responsible for implementing the VRI surveys and provided substantial input into its design. John Ameriks and Matthew Shapiro are coprincipal investigators of the VRI with Andrew Caplin, who gratefully acknowledges their collaboration. We also thank Joseph Briggs and Chris Tonetti for their insights. All opinions are those of the authors alone and do not represent the views of the institutions they are affiliated with.

Caplin: Professor, Department of Economics, New York University, New York, NY 10012. Phone 212-998-8950, Fax 212-995-3932, E-mail andrew.caplin@nyu.edu

Luo: Ph.D. Candidate, Department of Economics, New York University, New York, NY 10012. Phone 646-201-6109, Fax 212-995-4186, E-mail mi.luo@nyu.edu

McGarry: Professor, Department of Economics, University of California, Los Angeles, Los Angeles, CA 90095-1477. Phone 310-825-1011, Fax 310-825-9428, E-mail mcgarry@econ.ucla.edu

ABBREVIATIONS

ADL: Activities of Daily Living
HRS: Health and Retirement Study
LTC: Long-Term Care
PSID: Panel Study of Income Dynamics
SCF: Survey of Consumer Finances
SSQ: Strategic Survey Question
VRI: Vanguard Research Initiative

Economic Inquiry
(ISSN 0095-2583)
Vol. 56, No. 1, January 2018, 100–113

doi:10.1111/ecin.12385
Online Early publication August 12, 2016

to possible care provision by children. Section IV focuses on the very end of life and on possibly conflicting priorities at that time.

The research in Section II focuses on the balance between precautionary savings and bequest motives. It also introduces some of the recent data enrichments. These relate in particular to links between the high costs of private care for elders, whom we refer to as parents, and bequests to heirs, whom we refer to as children. The desire on the part of many parents to meet their possible later care needs may help explain both their slow spend-down of wealth in retirement (De Nardi, French, and Jones 2010; Poterba, Venti, and Wise 2011), and their low interest in annuities (Benartzi, Previtero, and Thaler 2011; Davidoff, Brown, and Diamond 2005). Yet, this is inherently a distributional decision also. Purchase of private LTC can be so costly as to significantly dent wealth available for transfers to children and/or bequests (De Nardi, French, and Jones 2010). Nursing homes currently average over $90,000 a year, with around-the-clock care at home averaging even more. Indeed, Marshall, McGarry, and Skinner (2011) find that much out-of-pocket medical spending near the end of life is for LTC needs. The impending risk of such future expenditures may lead parents to save/hold on to assets and self-insure, resulting in large bequests should they not need care (Lockwood 2014), or the use of bequests and/or inter vivos transfers to compensate children who provided needed care (Fahle 2015b; Groneck 2016).

While limitations on family-related data do constrain our understanding of LTC, recent research has already started to loosen these constraints. In particular, data enrichments are being developed to more accurately quantify the impact of different savings motives related to LTC and the family. Specifically, improved separation of precautionary savings and bequest motives involves appending survey-based data on beliefs and on preferences to classical choice data, as in Ameriks et al. (2011, 2015b, 2015c) and Brown, Goda, and McGarry (2016). Even with this, there is very little evidence on the patterns of inter vivos transfers and bequests, let alone the underlying motivations and comparative statics.[1]

1. See McGarry (2012) for an analysis of patterns of inter vivos transfers over time, and McGarry (1999) for a comparison of inter vivos transfers and intended bequests. Altonji, Hayashi, and Kotlikoff (1997) provide some of the most rigorous testing of the comparative statics with regard to parental giving.

The research in Section III on the impact of care provision on children starts from the observation that, in practice, they shoulder much of the care burden. This responsibility can be costly in terms of time and money as well as emotional stress. Recent research addresses the links between family participation in care and labor supply, location decisions, and health outcomes of adult children caregivers. In terms of the effect of care on labor supply decisions of the caregiver, while cross-sectional studies consistently show that those providing care to an elderly parent are less likely to be employed than noncaregiving children, studies that attempt to address causality typically find an insignificant relationship (Ettner 1995, 1996; Leigh 2010; Wolf and Soldo 1994). Despite the lack of a causal relationship with respect to work, it does appear that caregivers have significantly lower wages and lower wage growth (Coe, Skira, and Van Houtven 2011; McGarry 2006). In addition to the potential financial burden, the medical and psychology literatures point to physical and emotional stress faced by family caregivers (National Alliance for Caregiving and AARP 2015; Pinquart and Sorensen 2007). Amirkhanyan and Wolf (2006) emphasize that it is not just the caregivers of disabled elderly who are under stress, but also that the stress of having a parent who needs care affects the noncaregiving siblings. These results demonstrate the importance of examining the entire family when considering the issue of LTC.

Data constraints in relation to parental care are profound. With regard to children's input of time and effort, even the best data sources typically capture only the perspective of the caregiving children, and then only for a limited window of time. Surveys of caregivers do not expand their reach to include information on siblings, yet siblings provide an alternative source of care for the parent and one might imagine important intragenerational bargaining in who cares for an aging parent (Engers and Stern 2002). Conversely, those surveys that collect data from the parental perspective typically lack any sort of depth on the situation of children or how the needs of the parent are affecting their lives. Equally little is known about how observed behaviors fit into a relationship that precedes and may outlast the period of care, and how caregiving alters these relationships.

The issues addressed in Section IV involve even deeper measurement challenges in relation to the very final stages of aging, and the shadow

they cast on the earlier period. The work of Bernheim, Shleifer, and Summers (1986) on the "strategic bequest motive" introduced the idea that such tensions may impact the pattern of caregiving and financial transfers. These tensions may become ever more significant as parents' well-being, health, and cognitive abilities deteriorate. It is not unknown in life or literature for children to have somewhat different views of high late-in-life health expenses than do their parents. If parents and children sense differences in their priorities, the looming presence of such disagreement may itself cast a long shadow on the earlier period. There is very little applied research that focuses on these issues. Furthermore, while anecdotal evidence abounds about disagreements among siblings, here too there is little formal understanding of how behaviors play out over time. To clarify how disagreements are resolved requires us to design methods to assess their existence and extent, which of course requires corresponding data to be gathered.

Each of these research areas that we discuss in Sections II–IV introduce appropriate research frameworks, review relevant literature, and identify profound data constraints in relation to the end-of-life issues. Section V outlines proposals for enriched measurement of behavior, preferences, beliefs, decision-making control, as well as possible conflicts and how they get resolved. Section VI concludes by outlining possibilities for implementing the proposed measurements in the United States and elsewhere.

II. PREPARING FOR CARE: PRECAUTIONARY SAVING AND BEQUEST MOTIVES

A. *Why Is Wealth Not Spent Down?*

Retirees do not run down their wealth as the classical life-cycle consumption-saving model predicts. Current explanations for this divergence from theory involve either bequest motives, precautionary motives associated with high late-in-life health and LTC expenses (see Kotlikoff 1988), or both. Kopecky and Koreshkova (2014) and Lockwood (2014) find LTC expenses to be significant drivers of savings, and De Nardi, French, and Jones (2010) find medical expenses to be important in replicating the slow spend-down of wealth. While most studies broadly agree that the bequest motive is present and active primarily for wealthier individuals (and even found by Kopczuk and Lupton 2007 to be present for individuals without children), its quantitative importance is debated. Lockwood (2014) estimates a near linear bequest utility function which can by itself largely explain the high savings rates of the elderly, but others such as De Nardi, French, and Jones (2010) estimate the motive to be weaker.

These previous papers typically rely heavily on behavioral data, such as wealth accumulation profiles along the life cycle. As Hubbard, Skinner, and Zeldes (1995) stress, precautionary and bequest motives are notoriously hard to identify using behavioral data alone, since wealth is fungible. Some less standard measurement is now being undertaken to improve identification.

B. *Health-Dependent Utility and SSQs*

Ameriks et al. (2015c) (following Ameriks et al. 2011) introduce survey instruments of value in identification in the form of "strategic survey questions" (SSQs). The survey instruments were developed for participants in the Vanguard Research Initiative (VRI) panel of wealth-holders (see Ameriks et al. 2015a for details on the panel and the surveys). The underlying sample comprises several thousand clients drawn both from the individual and institutional client bases. Survey development requires one to specify the model precisely up front. Ameriks et al. (2015c) propose a health-dependent utility function to capture the possibility that people might value expenditure differently in the LTC state. Specifically, utility when in need of LTC associated with expenditure level e_{LTC} is

$$\theta_{LTC}\left\{\left[\left(e_{LTC}+k_{LTC}\right)^{1-\sigma}\right]/(1-\sigma)\right\}.$$

This mirrors the warm-glow utility from bequests proposed by Andreoni (1990) and De Nardi (2004). Here increases in θ increase the marginal utility of a unit of expenditure, while increases in k indicate the expenditure is valued as more of a luxury good. Negative k can be interpreted as the expenditure being a necessity.

The model provides for the possibility that individuals value resources differently when they are healthy versus sick. Work by Finkelstein, Luttmer, and Notowidigdo (2013) finds that the marginal utility of consumption declines when health declines. However, more recent work, focusing on the type of disability, finds that the marginal utility of consumption varies not just with healthy versus unhealthy states, but with age and with the type of infirmity. In particular, individuals value resources more when faced with

physical than mental disabilities (Brown, Goda, and McGarry 2016). Thus, those who are more concerned about cognitive decline may be more reluctant to transfer resources to an unhealthy state than those who fear physical decline.

Designing an SSQ to explore motivational issues in the model involves setting up hypothetical scenarios with a very restricted choice set. Questions are designed to provide the survey respondent precise details on all relevant individual states of the world, from the perspective of the structural model, and parameters are of deterministic utility functions.

In the following, we review briefly the LTC SSQ, where we are interested in understanding how individuals trade off having wealth in states of the world when they do not need LTC and when they do need LTC. At the core of the question, we are asking individuals to solve a simple portfolio allocation problem. The researchers specify that the respondent has some wealth (W), faces some chance they will need LTC ($1-\pi$) and some chance they will not need LTC (π), and that they must purchase a portfolio of Arrow securities (x_1, x_2) given a relative price of x_2 (p_2) to finance expenditure in the two possible states of the world. In the survey, we set $p_2 = 1/(1-\pi)$. The optimal allocation that they choose solves the following problem:

$$
\begin{aligned}
(1) \qquad & \max_{x_1,x_2} \quad \pi\left[\left(x_1^{1-\sigma}\right)/(1-\sigma)\right] \\
& + (1-\pi)\left\{\left[\theta_{LTC}\left(x_2 + k_{LTC}\right)^{1-\sigma}\right]/(1-\sigma)\right\} \\
& \text{s.t.} \quad x_1 + p_2 x_2 \leq W \\
& x_1, x_2 \geq 0; \;\; x_2 \geq -k_{LTC}.
\end{aligned}
$$

The key survey design challenge is that most individuals cannot understand the allocation problem in the mathematical language of optimal control. We present below the SSQ that is designed to help survey respondents provide (x_1, x_2) such that they are making a choice that corresponds to that in the optimization problem, yet in a format that is comprehensible to them.

The Scenario. The survey instrument first states the scenario precisely, but as simply as possible consistent with being precise. Specifically, the survey displays a screen with the following text, which makes reference to terms such as activities of daily living (ADLs) that have been introduced to the respondents prior to the screen and have been tested for comprehension.

> We are interested in how you trade off your desire for resources when you do and when you do not need help with ADLs. This scenario is hypothetical and does not reflect a choice you are likely ever to face.
> Suppose you are 80 years old, live alone, rent your home, and pay all your own bills. Suppose that there is a chance that you will need help with ADLs in the next year. If you need help with ADLs, you will need LTC.
>
> • There is a *25%* chance that you *will* need help with ADLs for all of next year.
> • There is a *75%* chance that you *will not* need any help at all with ADLs for all of next year.
>
> You have *$100,000* to divide between two plans for the next year. This choice will affect your finances for next year alone. At the end of next year, you will be offered the same choice with another $100,000 for the following year.
>
> • Plan C is hypothetical ADL insurance that gives you money if you *do* need help with ADLs.
>
> • For every $1 you put in Plan C, you will get *$4* to spend if you need help with ADLs.
> • From that money, you will need to pay all your expenses including LTC at home or in a nursing home and any other wants, needs, and discretionary purchases.
>
> • Plan D gives you money only if you *do not* need help with ADLs.
>
> • For every $1 you put in Plan D, you will get *$1* to spend if you *do not* need help with ADLs.
> • From that money, you will need to pay for all of your wants, needs, and discretionary purchases.

Note that the desire for comprehensibility impacts not only the linguistic framing, but also the precise allocation problem that is presented. To simplify the presentation, money that is saved for the more probable event, the 75% chance of not needing care, is treated on a pure cash basis. Each dollar that is not used for the ADL state stays as $1 when care is not needed. An alternative framing would have involved multiplying up each dollar according to probability so as to

make this insurance actuarially fair. That would mean that each $3 kept in case of not needing such help would become $4 in the corresponding state. While this would have the advantage of making both forms of insurance actuarially fair, the research team judged the additional complication as ramping up the possibility of confusion, hence as not worthwhile.

The question throughout is written to mirror the static optimization problem as closely as possible. Additional text is placed in the survey to clarify the questions, and subjects take a comprehension test before completing the responses. They generally exhibit high comprehension (see Ameriks et al. 2015b).

C. *Precautionary Saving Motives for Family*

A robust finding based on the SSQs in the VRI is that the marginal utility of expenditures when in need of LTC is larger than that from bequests. Because of the importance of the estimated health-state dependent utility, the precautionary saving motives associated with LTC contributes significantly to late-in-life savings behavior, strongly affecting wealth accumulation patterns.

While it is certainly credible that care-related precautionary motives are important, the apparently low bequest motive challenges widespread perception. In particular, there is a long-held belief that intergenerational altruism is present and important (e.g., Becker and Barro 1988). Ongoing research places these issues in a new light. It seeks to expand the methods that current applied models leave open for expressing concern for children. The only motive that is countenanced in current models is a bequest motive. By definition, this relates to transfers that occur upon the death of a parent. In ongoing work, effort is being dedicated to making separate allowance for inter vivos transfers and for the intricacy of parent–child interactions.

One branch of this work is focused on the "exchange model," wherein parents compensate children for the care they provide. Research of this form has examined the relationship between both inter vivos transfers and LTC (Norton, Nicholas, and Huang 2013) and bequests (Fahle 2015b; Groneck 2016). In addition, there is currently ongoing work with the VRI (Ameriks et al. 2016) that develops a simple model of inter vivos transfers. It treats parental utility from inter vivos transfers in a manner analogous to the standard warm-glow modeling technique for the bequest motive. The per-period utility is aggregated through a constant elasticity of substitution aggregator between own consumption and family expenditures (i.e., inter vivos transfers). The utility from making transfers has an underlying preference shifter, which governs the curvature of this portion of the utility. The shifter has stochastic components.

To study transfers requires first and foremost that they be well measured. The primary source for information on inter vivos transfers from parents to children in the United States is the Health and Retirement Study (HRS). The key question asks about lump-sum monetary transfer to the descendants:

> *Including help with education but not shared housing or shared food or any deed to a house, did you (or your husband) give financial help or (other) gifts totaling $500 or more to any of your children (or grandchildren)?*

If the respondent asked for a definition of financial help they were instructed to include:

> *giving money, helping pay bills, or covering specific types of costs such as those for medical care or insurance, schooling, down payment for a home, rent. etc. The financial help can be considered support, a gift or a loan.*

Interestingly, while the basic question appears to be about gifts, the expanded definition, which is not provided to all, suggests that the measure is intended to be far more comprehensive. For this reason, the extent to which the HRS measure captures expenditures which are not necessarily given to the descendants, but rather to a third party, is unclear. For instance, education expenditures could be paid in the form of tuition and fees to a school, and health expenditures could be paid to a doctor, and so on. These expenditures may be important but may also be missed if respondents think in terms of transfers or gifts directly to the child (or grandchild). Moreover, because respondents are only asked about total giving, we do not know how much was targeted for specific purposes such as education or housing.[2]

In survey 3 of the VRI, a series of questions were designed to capture inter vivos transfers.

2. The HRS also asks a similar question about transfers to parents, and an additional question about transfers to friends or relatives. In doing so it captures a wide swathe of giving behavior. There are also specific questions asked about payments to those who help with long-term care needs, and whether children helped with medical bills.

TABLE 1
Comparison of Existing Surveys

Features	VRI	HRS	SCF	PSID
Targeted population	Elderly	Elderly	Representative	Representative
Unit of observations	HH	Individual/HH	HH	Individual/HH
Family inventory	Yes	Yes	No	Yes
Transfers	Yes	Yes	No	Starting in 2013
Transfer categorized	Full	Partial	N/A	Partial
Past and/or future	Both	Past only	N/A	Past only

Notes: Elderly, elderly populations, typically ages 55 and above; HH, households; Family inventory, information gathered on family members; Transfer categorization, separating transfers by category; Past and/or future, documenting past and expected future transfers; N/A, not applicable.

The first issue here is how to define the set of individuals who a given adult regards as potential beneficiaries of either inter vivos spending or a bequest. Identifying this group is highly nontrivial. In fact, a significant portion of the VRI survey 3 was given over to creating an inventory of such individuals. The survey defined this group as "descendants," comprising not only children (biological or nonbiological), but also all the individuals the respondents may share a profound personal, financial, and/or emotional attachment with (e.g., nephews and nieces, godchildren, friends, siblings, friend's children, amongst others). Detailed information was collected about all such descendants, including year of birth, gender, parentage (e.g., biological vs. adopted children), current marital status, highest completed academic degree, coresidence status, expected economic status, and the number of their living children.

With the family inventory completed, information was gathered on inter vivos spending on and transfers to the descendants, collectively labeled as "family expenses," in the last 3 years. The total was identified by adding up across a number of specified categories: (1) education expenditures; (2) health expenditures; (3) specific expenditures, which includes payment for vacation, wedding, home purchase/repair or rent, car purchase/repair, childcare, and so on; and (4) expenditure in the form of gifts. Table 1 provides a comparison with existing surveys that have some information on transfers: the HRS; the Survey of Consumer Finances (SCF); and the Panel Study of Income Dynamics (PSID). We compare surveys according to the population surveyed, unit of observations, whether or not there is a family inventory, whether or not inter vivos spending and transfers is broken down into detailed categories, and whether or not there is measurement both of past transfers and expected future transfers. Strong points of the VRI are that it oversamples the wealthier population, the most relevant population for studying wealth transmission, and that it documents inter vivos transfers in highest detail. The strength of the HRS, in contrast, is its population representativeness.

Ameriks et al. (2016) documents the empirical features of "family expenses" in the VRI panel. We briefly summarize these findings here, leaving a comprehensive treatment to that paper. We focus on expenditures in the last three years to illustrate the key quantitative difference. Note that the wealth levels in the VRI are far higher than in the HRS, so we must reweight the net financial wealth variable to ease the comparison. Yet, even when we reweight the HRS to make the wealth distribution largely comparable, the resulting average annual expenditures are significantly below those in the VRI (see Ameriks et al. 2016). This points to potential under-measurement of transfers in the HRS. Clearly, there is room for improvements in measurement of intergenerational resource flows, with the VRI representing only a first small step in this direction.

III. THE PERIOD OF CARE

A. *Family Supply of Care*

Families provide the vast majority of LTC (Assistant Secretary for Planning and Evaluation [ASPE] 2010). Estimates suggest that the value of this care is approximately twice as great as that of formal care (AARP 2011). While a spouse is the most common caregiver, children too comprise a significant fraction of caregivers and are the primary source of assistance for the unmarried elderly. In both cases, the caregiver is more likely to be a woman: wives in the case of spousal caregivers; and daughters (or daughters-in-law)

for children. Understanding the decision process involved in the choice of care and caregiver is crucial for assessing the impact of this care.

B. *Enriched Modeling*

Numerous studies have modeled various aspects of family care. Much recent attention has focused on the labor supply of adult daughters whose parents need care. Other work has taken a game theoretic approach to modeling the decision of siblings as to who provides care.

The relationship between caregiving and work has attracted a large amount of attention. The difficulty arises in assessing causality. Children who are not working have a lower opportunity cost of time and are therefore the most obvious choice of caregivers. Conversely, those who need to provide care for a parent may leave the labor force or reduce hours in order to provide care. Cross-sectional comparisons face challenges in terms of identifying causation. Hence, several papers have exploited panel data to examine the changes in labor market behavior and caregiving over time (Leigh 2010; McGarry 2006), attempting to eliminate the endogeneity of caregiving and work. Several recent studies have used structural models to address the issue of causation and to simulate effects of policies such as the Family Medical Leave Act and policies changing the cost of LTC (Fahle 2015a; Skira 2015). Skira focuses on the long-term consequences of a reduction in labor force participation from the provision of LTC and finds that family medical leave can lead to substantial welfare gains. Fahle similarly concludes that payments to informal caregivers can reduce the use of nursing homes and save on governmental spending for LTC.

A second strand of research has attempted to formalize and model the intrafamily bargaining that likely occurs regarding who provides care, what type of care is provided, and how living arrangements factor into the decision. The literature in this realm has not only examined single child–parent pairs (Hoerger, Picone, and Sloan 1996; Sloan, Picone, and Hoerger 1997), but also has been broadened to allow for a single parent with multiple children (Engers and Stern 2002; Hiedemann and Stern 1999; Pezzin, Pollak, and Schone 2007). These studies recognize the degree of complication inherent in selecting a mode of care and the appropriate caregiver.

Absent from most of this work is a recognition of the role of preferences of the elderly parent and of the child. For example, some elderly may prefer to be cared for by a paid professional rather than rely on children, while others may prefer a family member to a stranger. Alternatively, a trained caregiver might provide assistance more efficiently than an untrained child, or a child who knows that parent's likes and dislikes may be better able to meet her needs.

In what follows, we shape our discussion on how the modeling could be enriched, first from the parental perspective, then from that of the children. As ever, children can be interpreted in a broader sense to include all close enough to either provide family care or to receive either a transfer or a bequest.

Preferences. We discuss modeling enrichment in terms of preferences first. From the perspective of parents, their preference could possibly swing from one extreme of viewing themselves as a complete burden to the family when needing care, to the other extreme of utter fear of strangers. We could augment our previous formulation for the utility when in need of LTC to capture different preferences toward family care versus professional LTC services.

From the child's perspective, there are equally many possibilities for interactive utility. Some children might desire to provide care when their parent most needs it, while some others instead crave independence and dislike coresidence. Cultural and gender differences may be important in this context. Moreover, this preference may in part be endogenous and stem from prior investment (or lack of investment) by parents. That is exactly why longer time-series could potentially be very revealing for better understanding of these forces as they play out across the lifecycle.

Impacts on Child's Labor Choice. Another particularly important issue is the child's opportunity cost of earnings when they decide to provide family care. The adverse impacts on the child's labor choice arise at several margins. On the intensive margin, provision of care is time consuming, so the child has to work fewer hours to spend more time taking care of their parent. The impact on the extensive margin is more subtle. The child might choose a different and more often an overall less satisfying job (e.g., with lower wages) to trade off for the geographical proximity or schedule flexibility. These decision-making trade-offs can readily be modeled.

To capture the intensive margin trade-off, we propose a simple time allocation framework

following the time-use literature (Aguiar and Hurst 2007; Aguiar, Hurst, and Karabarbounis 2012).[3] Let T be the total time the child has during this stage to distribute between two activities: work and family care. Denote the time spent on work as l, with $T-l$ the time spent on caring for parent (suppressing leisure). Supposing the wage is fixed at w and that the child consumes all labor earnings absent savings, the indirect utility from working l hours is $u(wl)$. However, the utility from caring for the parent is $v(T-l)$. The optimization problem is therefore:

$$\max_{0\leq l\leq T} u(wl) + v(T-l).$$

We do not discuss here the important choice of functional forms. This time allocation problem hinges upon equalizing the marginal returns to labor and family care provision.

The extensive margin is less straightforward to model. We need to introduce multidimensional jobs, and modify the usual search and matching framework to incorporate the trade-off between, for example, wages and schedule flexibility.

Note that so far we have focused on the period in which care is actually needed and provided. Yet expectations of this period would greatly influence decisions in earlier stages of life. Some diseases or disabilities are not acute, rather have a long early onset that gradually leads to the stage in which LTC is needed. Beliefs play a key role in this early phase. If the child knows for sure that their parent will need LTC soon (say, in 1 year), it might produce a desire to search for an alternative job in preparation for the care provision. If the child is informed very early of this possibility of family care, the entire career course might be altered. We can model this two-stage decision procedure as the child optimizing conditional on beliefs about the parent's future needs.

For simplicity, we consider a two-stage problem (with T_i denoting the amount of time available in period $i=1,2$), where the child believes in the first stage that the parent will need LTC in the second stage with probability p_2. The child needs to make a career job decision during the first stage, and cannot change careers during the second stage. A career has two dimensions, wage w and flexibility λ (time or space). If the job is flexible enough ($\lambda \geq \lambda^*$), the child can take some time off to provide family care in case parent needs it during the second stage; otherwise ($\lambda < \lambda^*$) the child cannot take time off.

3. This is the simplest framework to start with, and many details could be easily modified.

Following the time-allocation problem above, the indirect utility from the second stage when the child has a flexible career job is

$$V_2^F(w,l) = \max_l u(wl) + v\left(T_2 - l\right),$$

while that for an inflexible career job is simply based on working full time,

$$V_2^{IF}(w) = u\left(wT_2\right) + v(0).$$

Note that we are assuming that flexibility of a job provides utility only indirectly through the option of providing family care, but not directly through the job itself (i.e., people feel good when they have a more flexible job). Assuming the child works full time in the first stage, we can write the first stage problem as

$$V_1(w,\lambda) = \max_{(w,\lambda)\in W\times\Lambda} u\left(wT_1\right) + \mathbf{1}\left(\lambda \geq \lambda^*\right) p_2 V_2^F(w,l) + \ldots \left[\mathbf{1}\left(\lambda \geq \lambda^*\right)\left(1-p_2\right) + \mathbf{1}\left(\lambda < \lambda^*\right)\right] V_2^{IF}(w)$$

where $W\times\Lambda$ is the career job set available to the child.

Note that we assume away several important issues in the above layout, notably around the exogenous belief p_2. For instance, the gap in time between the two stages will impact the relevant degree of uncertainty concerning the second stage.

Two major issues emerge from the analysis of this section. First, all the modeling enrichment outlined above point to the need for enriched measurement, as outlined in Section V. Second, we implicitly assume so far the child agrees with the parent in terms of preferences. In practice, they may disagree. The next section discusses some potential disagreements and control of decision-making.

IV. DISAGREEMENT AND CONTROL

In introducing a strategic bequest motive, Bernheim, Shleifer, and Summers (1986) suggested that intergenerational tension may impact the period of caregiving. In this section we focus on just such parent–child tensions. In practice, these tensions may range from minor disagreements concerning the value of higher quality care to altogether more profound issues associated with potentially expensive end-of-life care. In this section we deliberately focus on possibly the most profound decision of all, right at the very end of life. We do so not because

the situation that we model arises every day, but rather because it represents a feared final stage that may cast a shadow on the final years.

A. *Life or Death?*

Health costs spike toward the end of life so that choice of health treatment in the final years may produce particularly sharp intergenerational tensions. We model this possibility using a variant of the health model of Grossman (1972). Following Murphy and Topel (2006), Yogo (2009), and Hall and Jones (2007), we consider a choice that determines length of life. A healthy retired wealthholder endowed with wealth $w_1 > 0$ at point of retirement contemplates in future facing a simple life or death decision. A strictly concave and differentiable single period expected utility function, $u(c)$, applies to regular spending $c > 0$. For simplicity, there is no income, no interest on savings, and no discounting.

While health in the first period is good, $h_1 = 1$, and survival to the start of the second period certain, this is not true for the second period. At the start of this period the health state is random with distribution $Q(h_2)$ that has full support, $h_2 \in (0, 1]$. If health is not good, $h_2 < 1$, death ensues unless a costly countermeasure is taken. By assumption, death zeroes out second period health state utility and nullifies consumption utility.

The only way for the agent to survive is to pay the survival cost $\sigma(h_2) \geq 0$, which payment allows the agent to survive the second period in that health state. Costs satisfy $\sigma(1) = 0$, are strictly decreasing in h_2, and rise without bound as the health state falls to 0, $\sigma'(h_2) < 0$ and $\lim_{h_2 \searrow 0} \sigma\left(h_2\right) = \infty$. If the costs are not paid, the agent dies and remaining wealth is bequeathed. Bequest utility $\phi(b)$ is of warm-glow form, which we assume to be strictly increasing, differentiable, and strictly concave in bequests. If the survival cost is paid, then the second effect of the health state kicks in. Living with lower second period health directly lowers utility according to function $z(h_2)$, with $z'(h_2) < 0$.

As Rosen (1988) notes, normalization of death utility to zero has significant implications for other levels of expected utility. One aspect of this we would like to insist on for our analysis to be of interest is that living in good health and consuming above some minimum amount is strictly preferred to immediate death and the corresponding bequest. To keep the analysis simple, we set the minimal amount to zero. In terms of model parameters, we therefore set $u(0) = 0$ and also insist that consumption utility is higher than bequest utility at all levels,

$$u(c) > \phi(c).$$

Conversely, we assume bequest motives to be strong enough so that there is a health state so bad that there will be strict preference for passing on and providing the bequest over continued living. Technically, this can be guaranteed by setting the disutility of (really) bad health to be sufficiently high such that, for any given $c > 0$,

$$\phi(c) > u(c) + \lim_{h \searrow 0} z(h).$$

To solve the model, consider second period state (w_2, h_2) with $w_2 > \sigma(h_2)$, and define $\hat{c}_2(w_2, h_2) \geq 0$ to be the unique optimal level of second period consumption if life extension is chosen,

$$\hat{c}_2\left(w_2, h_2\right) = \arg \max_{c_2 \in [0, w_2 - \sigma(h_2)]} \left\{ u\left(c_2\right) + z\left(h_2\right) + \phi\left(w_2 - \sigma\left(h_2\right) - c_2\right) \right\}.$$

With our assumptions, note that, for a given health state, incremental wealth is split between own consumption and bequests.

We are interested in identifying a cutoff value of health, $\bar{h}_2\left(w_2\right)$, at which an agent with that given second period wealth will resign themselves to an early death. This depends on the behavior of $V_2^A\left(w_2, h_2\right)$, the optimized value associated with staying alive in period 2,

$$V_2^A\left(w_2, h_2\right) = u\left(\hat{c}_2\left(w_2, h_2\right)\right) + z\left(h_2\right) + \phi\left[w_2 - \sigma\left(h_2\right) - \hat{c}_2\left(w_2, h_2\right)\right].$$

Viewed as a function of second period wealth, note that the RHS is strictly increasing, and that it has a derivative above $\phi'(w_2)$ due to the lower argument in the bequest function, and the fact that $\hat{c}_2(w_2, h_2)$ is increasing in w_2. Together with our other assumptions, this means that there is precisely one health state, $\bar{h}_2\left(w_2\right) \in (0, 1]$, at which life and death are indifferent at any given wealth level,

$$\phi\left(w_2\right) = V_2^A\left(w_2, \bar{h}_2\left(w_2\right)\right).$$

At this wealth level paying the cost to survive the second period is strictly worthwhile for health states $h_2 > \bar{h}_2\left(w_2\right)$, while the opposite is true for worse health states $h_2 < \bar{h}_2\left(w_2\right)$. This completes construction of the overall second period value

function $V_2(w_2, h_2)$, allowing us to specify the corresponding period 1 value function as,

$$V_1\left(w_1\right) = \max_{0 \le c_1 \le w_1} \left\{ u\left(c_1\right) + \int_{h_2} V_2 \left(w_1 - c_1, h_2\right) dQ\left(h_2\right) \right\}.$$

With this, we can solve exactly for the first period level of consumption, and with it identify second period wealth and the implied optimal choice of life or death in the second period.

B. *Disagreement and Control*

The above model is deliberately extreme. It countenances an individual who may run down a large inheritance to continue living if bequests are a low priority. At the other extreme, if bequests are a high priority, this is someone who would accept death even if relatively healthy. It is far from obvious that children who are in line for a bequest will have the same priorities in terms of life extension as does their parent. It is not unknown for children to become anxious about what is happening to a once large inheritance as the period of care continues. This is especially true in cases in which children are concerned about such events as remarriage that may impact spending priorities of parents.

Even in stable family settings, both the parent and the children may legitimately worry about the parent's ability to turn down expensive life-extending options when push comes to shove. It is one thing for a healthy individual to believe that life in deteriorated health would not be worth living. It is quite another for that person later to forego an option to extend life when in bad health. The possibility of time inconsistency raises the usual questions concerning whether or not a commitment device would be chosen by the parent. The viewpoint on this issue too may differ between generations. Possible cognitive decline makes these issues yet more fraught. Even if a parent currently places a low priority on spending on themselves in the face of cognitive decline, implementation of a low spending plan when the time comes may be altogether a different matter.

Making issues yet more complex is the possibility that parents may not have full control of late-in-life decisions. If care is being given to a single parent in the home of a relative, the relative may effectively have decision-making control. This is clearly also the case when a living will has been triggered that explicitly provides for a shift in control. There may also be children who have significant wealth available to pay for life-preserving options out of their own pocket. A wealthy child may possibly pay to keep a sick parent alive against their will. Further complicating the issue is the possible presence of private agents who provide care to the parent, and who may also have quite different incentives around life extension.

One final set of issues concerns possible interactions in preferences that are associated with such emotions as guilt and shame that both parties may feel well before it comes to life and death decisions. A parent may strongly desire the help of a child, but reject it out of guilt or shame at a perceived negative effect on the child's life. In reduced form, this would look much like not wanting the help of the child, but it would have very different comparative static properties. For example, if the child was paid enough to be indifferent, then the parent would happily accept the child's help. Analogously, a child might not want to offer as much help as they do, but do so out of guilt concerning how the parent would then feel. Once again, this may look the same as a purely warm glow desire to help in certain circumstances, but might produce a very different response to winning the lottery and therefore being able to afford to buy help for the parent that removed guilt. In studying the impact of such emotions, it would also be of interest to know their origins. For example, it is not unknown for gender to play a role in the attribution of blame and the experience of guilt. The extent to which this impacts differences in provision of and requests for care is not known.

Taken together, the above suggests that modeling late-in-life care-related and health-related decisions involves fierce complexities. How far is it worth going to extend the relatively simple, yet still computationally burdensome, models that dominate the applied literature? We believe that this depends in part on what one can hope effectively to measure, to which we now turn.

V. PROPOSED MEASUREMENTS

Estimation of rich models of care-related choices requires one to measure many features of behavior. In addition, it requires measurement of many aspects of preferences and beliefs that are hard to infer from standard behavioral data. In this section, we introduce various forms of data, based both on actual behavior and on less

standard measures, that would provide insight into the three above areas.

A. *Bequest and Transfer Motives*

Estimation of a suitably rich model of transfers and bequests rests first and foremost on direct measurement of current, past, and anticipated future patterns of monetary transfers, up to and including the bequest. Going more into the details, it is important to categorize spending flows to at least the level introduced in the VRI. This is true also for reverse transfers, in which care-related and other payments are made to and on behalf of parents by their children (e.g., partial payment for LTC facilities).

In addition to gathering information on actual and expected monetary flows, it is important to gather evidence on the underlying motivations. In estimating the effects of various comparative static changes on behavior, it is a key to understand patterns of substitution and/or complementarity between inter vivos giving and bequests. In the standard warm glow bequest model, there is no distinction between transfers and bequests. Hence, the best empirical counterpart to the modeled motive is the sum of moneys transferred and bequeathed. What this means in practice is that the model treats transfer payments for education, health, and so on, as perfect substitutes for bequests. At the opposite extreme, the simple model of Section II assumes that transfers on the basis of need during the lifetime having no impact on bequest motives. These two polar cases in no way exhaust logical possibilities. There is a clear need for hybrid models that allow for general patterns of substitutability between inter vivos transfers and bequests. For example, it may be that the deeper cause of both is an assessed overall need state of the children. In this case, higher overall needs (e.g., grandchildren with particular educational or health needs) may increase both the desire to give while the elder is alive and the importance of leaving a large bequest.

Note that the key reason to separate out the various forms of motive for transferring money to children is to allow for their possibly different comparative static properties, which lead to potentially very different policy implications. Take the response to an estate tax on bequests as an example. For individuals with a strong transfer motive during life but a weak bequest motive, most of the resulting bequests would be accidental rather than deliberate. An estate tax would not induce large behavioral responses in this scenario. However, individuals with a strong bequest motive would "avoid" the estate tax by moving part of the estates to inter vivos transfers.

Once a precise model is formulated that allows for all important margins, one can identify contingencies that are particularly valuable for distinguishing model parameters. At this point, the SSQ methodology is of value in formulating questions about future behavior in those contingencies. While the precise questions can never be prespecified, it is clear that they will involve contingent trade-offs between transfers and bequests. As has been the case in the past, the questions will need to be engineered with great care, and tests designed to assess both comprehension and reasonableness of response. Another fundamental question on which more evidence is needed concerns how transfers and bequests are impacted by the economic circumstances of children.

B. *Time Allocation*

Just as estimation of a model of bequests rests strongly on behavioral data, so does estimating a model of children's allocation of time rest on measurement not only of their care provision per se, but also of other uses of time. Moreover, it is necessary also to measure time use prior to the care period not just during the period. Only in this way one can assess whether or not this input of time is incremental, or instead represents a change in role in a largely unchanged schedule of visits. To get a deeper perspective on the impact of parental care need on the child's behavior, we also need to ask questions about expected future care, which may cast a shadow on current decisions. In addition to studying work decisions, it is important to study issues of geographic location, which themselves may relate to the desire to be an appropriate distance away from a parent who is now or in future might be in need of care. Obviously, this can work either as an attractive or a repulsive force.

There are also policy-relevant reasons to study the impacts of care provision on caregivers' time allocation. For instance, expanding coverage of home health care could crowd out family care and thus result in a transfer to adult children rather than to the elderly. Social Security may be of value to adult children who would otherwise care for parents out of love or obligation. Improved identification of preference parameters would help better understand the impact of these and other policy effects.

As with bequest and transfer motives, the facts alone are not enough. One needs also to assess

motivations in order to understand how various shocks would impact care provision. In that regard we would want to understand the preferences of the child as between personally providing care in the parent's home, getting paid help in the home, moving the parent to a dedicated care facility, as well as the rich options within each of these general categories. Again, SSQs may be of value in separating out the various possible forces at work in simple models of children's labor supply decisions. With regard to the strategic bequest motive, it would be of interest to know whether children believe that transfers to them would be seriously impacted by the time that they spend with parents when in need of care. It would also be important to know how a large increase in wealth would impact children's behavior. One possibility is that it would lead them to pay for additional outside help to relieve them of the burden of care. However, they may instead respond to a positive wealth shock by quitting other work obligations to dedicate themselves to caring for their parent. With this wide range of possibilities, it appears likely that the response to questions of this form would be very informative about intergenerational motives.

C. Disagreement and Control

As indicated in Section IV, disagreements toward the very end of life may be particularly severe. It is hard to know what standard behavioral data could possibly shed light on these issues. For that reason, questions of motivation are particularly vital. Again, the precise questions depend on having an implementable model. To provide a simple illustration of how this might work, consider a variant of the life-and-death model of Section IV in which the role of ill-health is replaced by aging itself. For many, the value of one more day, week, or month of life will change along with age itself. Even if there is no explicit illness, there are various frailties that may impact the importance of a brief continuation of life at a great age. This might make it reasonable to explore the trade-off between a brief life extension and a higher bequest as seen from the viewpoint of the parent. To get a sense of whether or not there is full intergenerational agreement in this respect, one could also ask the parent whether they would be willing to give money to a child in a trust that could only be spent on them until death and see if they believe the decision would change. We could also ask the parent what would happen if they just handed their money over without placing it in trust.

Note that the above data design allows one to assess whether or not parents believe that there is a conflict of interest with children. This is a narrow view. One would also like to assess whether or not the children believe that there is such a conflict of interest. Of course, even if they both believe there is no such conflict, there may in fact be. Hence, one wants to get data revealing the existence of conflict and the extent of each party's insight into that conflict. To that end, it would be of interest to turn the question asked of parents around and ask an analogous question of children. Concretely, one would ask children how they believe their parents would behave in practice in the given situation, how they believe they themselves would behave in control of a trust fund, and how they believe they would behave if given the money free and clear.

Questions on life extension are exploratory in nature, and designed to investigate the presence and possible importance of allocative tension at the end-of-life. A model of how this plays out in earlier life would be of interest should such tensions be in evidence, which would itself motivate a fresh round of data gathering. In other areas of possible conflict, economic modeling is already more advanced, as in the case of the strategic bequest motive of Bernheim, Shleifer, and Summers (1986). Testing and estimating this model involves identifying any tension in relation to the allocation of bequests and inter vivos gifts, as well as the allocation of time.

One potentially valuable angle on disagreement would be provided by developing for the child a variant of the SSQs that are developed for parental gift preferences, and for the parent a variant of the question on preferences over time allocation. Possibly the single most salient finding would involve the child wishing to receive larger and less constrained inter vivos transfers than the parent wishes to supply. There may equally be disagreement in terms of care provision, with parents possibly wishing to receive more help from children than they are willing to provide. If so, then the implicit trade of care for bequests that underlies the theory would be very much worth gauging. One aspect of this would be asking parents whether an inter vivos versus gift or a bequest to a child would be reduced or eliminated if the child did not participate adequately in the provision of care. It would also be relevant to ask about children's beliefs concerning the provisionality of bequests. Another important reason for gathering data on the entire family is to assess

possible disagreement among children about who should provide care, how that should be related to bequests and transfers, and so on.

What the analysis highlights is that the issues that arise in late-in-life family interactions are fiercely complex. For that reason it may be of particular value to gather qualitative information on the main concerns through such devices as cognitive interviews, focus groups, and qualitative and open-ended surveys. While these cannot be a substitute for quantitative measurement, they may be a very important precursor and complement.

VI. CONCLUDING REMARKS

The data collection proposed above is extremely ambitious. It requires a long and rich behavioral history, and the ability to interact with thoughtful survey participants motivated to advance understanding by answering highly nontrivial questions with honest purpose. In addition, many details of the family structure need to be known. For example, one must have a good inventory of the family unit involved. It may constitute grandchildren, children-in-law, and perhaps siblings and their families. For those without children, the "family" of potential caregivers may be defined far more broadly than for those with children. One must further enrich this with many details of the children when the information is coming from the parent, and vice versa. One must know where all parties live, what they do, how much wealth they have, and also gather information on mutual empathy and other-regarding preferences. One would also like to measure the actual history of interactions and time spent together and communicating over the years leading up to the survey start. Ideally, one would measure these from more than one perspective since the difference may also be revealing and of value in econometric analysis (Ashenfelter and Rouse 1998). Similarly, it is important to have measures over a life course, as transfers to children earlier in life (such as caregiving for grandchildren) may be reciprocated with later LTC.

It is obvious in this era that massive data gathering efforts of the required form are feasible, e.g., Azmak et al. (2015). There are many other panels that may be of value, including but not limited to future generations of the HRS and corresponding surveys the world over. The potential is particularly high in Scandinavian registries (e.g., Briggs et al. 2015; Cesarini et al. 2015).

REFERENCES

AARP. "Valuing the Invaluable: 2011 Update—The Growing Contributions and Costs of Family Caregiving." Technical Report, 2011. Accessed July 12, 2016. http://www.aarp.org/relationships/caregiving/info-07-2011/valuing-the-invaluable.html.

Aguiar, M., and E. Hurst. "Measuring Trends in Leisure: The Allocation of Time over Five Decades." *Quarterly Journal of Economics*, 122(3), 2007, 969–1006.

Aguiar, M., E. Hurst, and L. Karabarbounis. "Recent Developments in the Economics of Time Use." *Annual Review of Economics*, 4(1), 2012, 373–97.

Altonji, J. G., F. Hayashi, and L. J. Kotlikoff. "Parental Altruism and Inter Vivos Transfers: Theory and Evidence." *Journal of Political Economy*, 105(6), 1997, 1121–66.

Ameriks, J., A. Caplin, S. Laufer, and S. van Nieuwerburgh. "The Joy of Giving or Assisted Living? Using Strategic Surveys to Separate Public Care Aversion from Bequest Motives." *Journal of Finance*, 66(2), 2011, 519–61.

Ameriks, J., A. Caplin, M. Lee, M. D. Shapiro, and C. Tonetti. "The Wealth of Wealthholders." NBER Working Paper No. 20972, National Bureau of Economic Research, Inc., February, 2015a.

Ameriks, J., J. S. Briggs, A. Caplin, M. D. Shapiro, and C. Tonetti. "Late-in-Life Risks and the Under-Insurance Puzzle." Working Paper, 2015b.

Ameriks, J., J. S. Briggs, A. Caplin, M. D. Shapiro, and C. Tonetti, "Long-Term Care Utility and Late in Life Saving." NBER Working Paper No. 20973, National Bureau of Economic Research, Inc., February, 2015c.

Ameriks, J., J. S. Briggs, A. Caplin, M. Luo, M. D. Shapiro, and C. Tonetti, "Inter-generational Transfers and Precautionary Saving." Working Paper, 2016.

Amirkhanyan, A. A., and D. A. Wolf. "Parent Care and the Stress Process: Findings from Panel Data." *The Journals of Gerontology: Series B*, 61(5), 2006, S248–55.

Andreoni, J. "Impure Altruism and Donations to Public Goods: A Theory of Warm-Glow Giving?" *The Economic Journal*, 100(401), 1990, 464–77.

Ashenfelter, O., and C. Rouse. "Income, Schooling, and Ability: Evidence from a New Sample of Identical Twins." *Quarterly Journal of Economics*, 113(1), 1998, 253–84.

Assistant Secretary for Planning and Evaluation (ASPE). *Understanding Medicaid Home and Community Services: A Primer*. Washington, DC: U.S. Department of Health and Human Services, 2010.

Azmak, O., H. Bayer, A. Caplin, M. Chun, P. Glimcher, S. Koonin, and A. Patrinos. "Using Big Data to Understand the Human Condition: The Kavli HUMAN Project." *Big Data*, 3(3), 2015, 173–88.

Becker, G. S., and R. J. Barro. "A Reformulation of the Economic Theory of Fertility." *Quarterly Journal of Economics*, 103(1), 1988, 1–25.

Benartzi, S., A. Previtero, and R. H. Thaler. "Annuitization Puzzles." *Journal of Economic Perspectives*, 25(4), 2011, 143–64.

Bernheim, B. D., A. Shleifer, and L. H. Summers. "The Strategic Bequest Motive." *Journal of Labor Economics*, 4(3), 1986, S151–82.

Briggs, J. S., D. Cesarini, E. Lindqvist, and R. Östling, "Windfall Gains and Stock Market Participation." NBER Working Paper No. 21673, National Bureau of Economic Research, Inc., October, 2015.

Brown, J., G. S. Goda, and K. McGarry. "Heterogeneity in State-Dependent Utility: Evidence from Strategic Surveys." *Economic Inquiry*, 54(2), 2016, 847–61.

Cesarini, D., E. Lindqvist, M. J. Notowidigdo, and R. Östling. "The Effect of Wealth on Individual and Household Labor Supply: Evidence from Swedish Lotteries." NBER Working Paper No. 21762, National Bureau of Economic Research, Inc., 2015.

Coe, N. B., M. Skira, and C. Van Houtven. "Do Couples Self-Insure? The Effect of Informal Care on a Couple's Labor Supply." Working Paper No. 2011-16, Boston College Centre for Retirement Research, 2011.

Davidoff, T., J. R. Brown, and P. A. Diamond. "Annuities and Individual Welfare." *American Economic Review*, 95(5), 2005, 1573–90.

De Nardi, M. "Wealth Inequality and Intergenerational Links." *Review of Economic Studies*, 71(3), 2004, 743–68.

De Nardi, M., E. French, and J. B. Jones. "Why Do the Elderly Save? The Role of Medical Expenses." *Journal of Political Economy*, 118(1), 2010, 39–75.

Engers, M., and S. Stern. "Long-Term Care and Family Bargaining." *International Economic Review*, 43(1), 2002, 73–114.

Ettner, S. L. "The Impact of 'Parent Care' on Female Labor Supply Decisions." *Demography*, 32(1), 1995, 63–80.

———. "The Opportunity Costs of Elder Care." *Journal of Human Resources*, 31(1), 1996, 189–205.

Fahle, S. "Harnessing the Potential of Family Caregivers: A Solution to the U.S Informal Care Crisis?" Working Paper, 2015a.

———. "Informal Care, Actual Bequests and Housing Assets." Working Paper, 2015b.

Finkelstein, A., E. F. P. Luttmer, and M. J. Notowidigdo. "What Good Is Wealth without Health? The Effect of Health on the Marginal Utility of Consumption." *Journal of the European Economic Association*, 11, 2013, 221–58.

Groneck, M. "Bequests and Informal Long-Term Care: Evidence from the HRS Exit Interviews." *Journal of Human Resources*, March 8, 2016 [Epub ahead of print]. doi: 10.3368/jhr.52.2.1214-6839R1

Grossman, M. "On the Concept of Health Capital and the Demand for Health." *Journal of Political Economy*, 80(2), 1972, 223–55.

Hall, R. E., and C. I. Jones. "The Value of Life and the Rise in Health Spending." *Quarterly Journal of Economics*, 122(1), 2007, 39–72.

Hiedemann, B., and S. Stern. "Strategic Play among Family Members When Making Long-Term Care Decisions." *Journal of Economic Behavior & Organization*, 40(1), 1999, 29–57.

Hoerger, T. J., G. A. Picone, and F. A. Sloan. "Public Subsidies, Private Provision of Care and Living Arrangements of the Elderly." *Review of Economics and Statistics*, 78(3), 1996, 428–40.

Hubbard, R. G., J. Skinner, and S. P. Zeldes. "Precautionary Saving and Social Insurance." *Journal of Political Economy*, 103(2), 1995, 360–99.

Kopczuk, W., and J. P. Lupton. "To Leave or Not to Leave: The Distribution of Bequest Motives." *Review of Economic Studies*, 74(1), 2007, 207–35.

Kopecky, K. A., and T. Koreshkova. "The Impact of Medical and Nursing Home Expenses on Savings." *American Economic Journal: Macroeconomics*, 6(3), 2014, 29–72.

Kotlikoff, L. J. "Intergenerational Transfers and Savings." *Journal of Economic Perspectives*, 2(2), 1988, 41–58.

Leigh, A. "Informal Care and Labor Market Participation." *Labour Economics*, 17(1), 2010, 140–49.

Lockwood, L. M. "Incidental Bequests: Bequest Motives and the Choice to Self-Insure Late-Life Risks." Working Paper, 2014.

Marshall, S., K. M. McGarry, and J. S. Skinner. "The Risk of Out-of-Pocket Health Care Expenditure at End of Life." NBER Working Paper No. 16170, National Bureau of Economic Research, Inc., July, 2011.

McGarry, K. M. "Inter Vivos Transfers and Intended Bequests." *Journal of Public Economics*, 73(3), 1999, 321–51.

———. "Does Caregiving Affect Work?," in *Health Care Issues in the United States and Japan*, edited by D. A. Wise and N. Yashiro. Cambridge, MA: National Bureau of Economic Research Inc., 2006, 209–88.

———. "Dynamic Aspects of Family Transfers." NBER Working Paper No. 18446, National Bureau of Economic Research, Inc., October, 2012.

Murphy, K. M., and R. H. Topel. "The Value of Health and Longevity." *Journal of Political Economy*, 114(5), 2006, 871–904.

National Alliance for Caregiving and AARP. "Caregiving in the U.S. 2015." Technical Report, 2015. Accessed July 12, 2016. http://www.caregiving.org/caregiving2015/.

Norton, E. C., L. H. Nicholas, and S. S.-H. Huang. "Informal Care and Inter-Vivos Transfers: Results from the National Longitudinal Survey of Mature Women." Working Paper No. 18948, National Bureau of Economic Research, Inc., April, 2013.

Pezzin, L. E., R. A. Pollak, and B. S. Schone. "Efficiency in Family Bargaining: Living Arrangements and Caregiving Decisions of Adult Children and Disabled Elderly Parents." *CESifo Economic Studies*, 53(1), 2007, 69–96.

Pinquart, M., and S. Sorensen. "Correlates of Physical Health of Informal Caregivers: A Meta-Analysis." *The Journals of Gerontology: Series B*, 62(2), 2007, P126–37.

Poterba, J., S. Venti, and D. Wise. "The Composition and Drawdown of Wealth in Retirement." *Journal of Economic Perspectives*, 25(4), 2011, 95–118.

Rosen, S. "The Value of Changes in Life Expectancy." *Journal of Risk and Uncertainty*, 1(3), 1988, 285–304.

Skira, M. M. "Dynamic Wage and Employment Effects of Elder Parent Care." *International Economic Review*, 56(1), 2015, 63–93.

Sloan, F. A., G. Picone, and T. J. Hoerger. "The Supply of Children's Time to Disabled Elderly Parents." *Economic Inquiry*, 35(2), 1997, 295–308.

Wolf, D. A., and B. J. Soldo. "Married Women's Allocation of Time to Employment and Care of Elderly Parents." *Journal of Human Resources*, 29(4), 1994, 1259–76.

Yogo, M. "Portfolio Choice in Retirement: Health Risk and the Demand for Annuities, Housing, and Risky Assets." NBER Working Paper No. 15307, National Bureau of Economic Research Inc., September, 2009.