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Long-Term Care and Nursing Home Coverage: Are Adult Children Substitutes for Insurance Policies?

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Abstract

Although the cost of nursing home care is estimated at $40,000 a year, less than five percent of the elderly have insurance policies that cover most nursing home stays. Given theories concerning the role of children as old-age security assets, and the evidence that children provide a great deal of informal long-term care, I ask whether the presence of children can explain why so few elderly purchase long-term care insurance. I examine whether the likelihood of having long-term care insurance varies with family characteristics in a sample of elderly respondents from the Study of Asset and Health Dynamics Among the Oldest Old (AHEAD). The effects of both the number of children and the presence of any children are statistically insignificant in models of long-term care insurance ownership for all respondents, and male and female respondents separately. Variables measuring the availability of female children in the family have significant positive effects on the ownership of long-term care policies in samples of elderly males. These findings are in contrast to the notion that family members serve as substitutes for long-term care insurance. Additional tests show that the presence of daughters does not significantly affect the purchase of other types of insurance, such as supplemental insurance for Medicare, and that gift-giving patterns of daughters cannot explain the higher incidence of purchase of long-term care policies among elderly males with female children.

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1.0. Introduction

Despite the high costs of chronic care and the increasing life spans of older Americans, few elderly are privately insured for long-term care expenses. Recent estimates place the cost of nursing home care at around $40,000 per year, and the percent of the elderly with insurance policies covering nursing home care at five percent. Traditional explanations for the low levels of private coverage include the high cost of these policies relative to the low income levels of the elderly, and inability of many elderly persons to anticipate their long-term care needs later in life (Wiener et al. 1994). Another suggested explanation is the presence of the Medicaid program, which may serve as a substitute for private financing when elders exhaust their own savings (Pauly 1990). On the supply side, moral hazard and adverse selection act as disincentives for insurance companies to aggressively market long-term care insurance policies.

Another suggested explanation has been offered by Pauly (1990), who hypothesizes that families with children rationally decide to forego the purchase of long-term care insurance. Parents who prefer to receive care from children will decline to purchase insurance, since it will create a disincentive for children to provide care (this is referred to as intrafamily moral hazard). Instead of purchasing insurance, parents will rely on the bequest motive to induce children to provide care. While empirical patterns do not entirely support the theory that intergenerational transfers from parents to children are made in exchange for care,[1] an element of the Pauly (1990) explanation finds some support in the literature, both theoretical and empirical. Researchers have often considered old-age security as a strong motive for childbearing, especially in developing countries. In addition, evidence from studies of caregiving in the U.S. shows that

[1] The evidence on the motivations behind bequest behavior is mixed. Bernheim, Shleifer and Summers (1985) found evidence that children who visit and call more frequently received larger bequests. Yet, Wilhelm (1996) reported that over three-fourths of bequests made by decedents are divided equally among heirs, which suggests that a large portion of bequests are independent of child behavior. Further analysis of unequal bequests did provide evidence consistent with the exchange motive. Two recent studies examining inter-vivos transfers, however, found evidence in support of altruistic motives for transfers, both finding that families transfer funds to their less well-off children (McGarry and Schoeni 1995a; McGarry and Schoeni 1995b).

adult children act as significant providers of long-term care. These patterns give support to the claim that children may be perceived as substitutes for long-term care insurance.

This paper empirically examines the issue of substitutability between children and long-term care insurance.[2] Motivated by theories concerning the role of children as old-age security, and the evidence that children provide a great deal of informal long-term care, I ask whether the presence of children can explain the puzzle of why so few elderly purchase long-term care insurance. I examine whether the likelihood of long-term care insurance coverage varies with family characteristics in a sample of elderly individuals from the Study of Asset and Health Dynamics Among the Oldest Old (AHEAD). The effects of both the number of children and the presence of any children are statistically insignificant in models of long-term care insurance ownership. Variables measuring the availability of female children in the family have significant positive effects on the ownership of a long-term care policy in samples of elderly males. These findings are in contrast to the notion that family members serve as substitutes for long-term care insurance.

I begin by describing previous research in this area, including a discussion of the literature on children as assets for old-age security. I then consider the relevance of this motive in the U.S. by highlighting patterns of informal care provided by children and by describing the market for long-term care insurance. This is followed by a discussion of the conceptual framework behind the individual's decision to purchase long-term care insurance coverage, and results from previously estimated models of long-term care insurance. I next describe the data source and the model used to address the main question of the paper. After presenting results from the estimation of this model and a series of additional specifications, I conclude with some discussion of the results and directions for future research.

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[2] Substitution between family-provided long-term care and market-provided long-term care has been examined previously. For examples, see Christianson (1986), Edelman and Hughes (1990), Greene (1983), and Tennstedt et al. (1993).

2.0. Children as Substitutes for Insurance

The Pauly (1990) hypothesis, that parents rationally decide not to purchase insurance for long-term care when children are present, is consistent with the hypotheses of an existing literature in population and development. Beginning with Leibenstein (1957), and more recently in Cain (1981, 1983) and Nugent (1985), research has examined whether fertility in developing countries is motivated by parents' desire to provide security for their old-age.

Research by Cain (1981) suggested that in environments where formal markets for insurance or societal support for old-age are absent, households view fertility as an adjustment to risk. With a specific focus on the risk of old-age, Cain (1983) incorporates the notion of children as security assets in his lexicographic safety-first (LSF) model of fertility. The LSF model suggests that parents define old-age security in terms of some minimum number of surviving children. Target fertility will vary with changes in child survival rates, with reductions in risk, and as children are replaced by other sources of insurance. Empirical patterns that show a direct relationship between fertility and infant mortality, and an inverse relationship between fertility and the presence of social security systems would be consistent with the LSF model of fertility. While several studies have found empirical support for the LSF model, the notion that children serve as insurance has also been criticized.[3]

The literature regarding children as old-age security assets has largely been written in the context of developing countries where other sources of risk insurance are incomplete or absent. Nugent (1985) provides a detailed discussion of cases where it is appropriate to think of children as security assets. His discussion of developing countries lists several conditions that might also be said to characterize the market for insurance for long-term care in the United States.

According to Nugent (1985), families in developing countries are more likely to perceive children

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[3] See Jensen (1990) for an empirical test of the LSF model; Robinson (1986) provides a critique of the old-age security motive for fertility.

as old-age security assets under a variety of conditions. Four of his conditions might be applicable to the case of long-term care in the U.S. The first of these is uncertainty about the assets that would have to be accumulated to protect against disability. Rising costs of long-term care and rising life expectancies both contribute to uncertainty regarding the necessary assets required to cover the costs of long-term care . A second circumstance that applies to the U.S. is the inefficiency of insurance programs. The problems of adverse selection and moral hazard, and their possible deleterious effects on the market for long-term care insurance have been noted above. Moreover, prior to the mid-1980s, a formal market for private insurance for long-term care did not exist in the U.S. A third circumstance affecting the old-age security motive for fertility is that children express loyalty to their parents. Patterns of child-provided care for parents suggest that "abandonment" is more of a myth than a reality in the U.S. A fourth circumstance mentioned is the existence of underdeveloped markets for the goods and services that elderly people consume. That is, services for long-term care are not available in the form that is desired, or the provision of these services in the market is less efficient. This would be the case if the elderly prefer children to provide for them, and if children are more efficient providers given their loyalty and dependability. Additionally, Nugent includes the absence of a younger spouse as a circumstance leading to the perception of children as old-age security. If younger spouses also serve as old-age security, it is important to examine the role of marital status, and sex as well. The old-age security motive for childbearing is perhaps stronger for women than men, since elderly women are less likely to have a younger spouse, or have any spouse.

Outside of the development literature, there are other areas where is has been speculated that children may serve as substitutes for long-term care insurance. Pollak (1985) considers the case where children may be substitutes for insurance in a transaction cost framework that does not pertain exclusively to developing countries. Pollak notes that families may have significant advantages in the provision of insurance over both the market and the state; insurance for old-age is one such example. Within families, adverse selection is limited and monitoring of behavior is less costly. Concepts such as loyalty and cultural

norms tend to limit opportunistic behavior that might lead to inefficiencies in the market provision of insurance.

Most recently, Zweifel and Strüwe (1998) develop a theoretical model based on Pauly's assertion that intrafamily moral hazard reduces the parent's propensity to purchase long-term care insurance. Their model suggests conditions under which the purchase of long-term care insurance is not optimal for parents. Specifically, when the child's market wage is less than the cost of long-term care insurance, the purchase of insurance will result in welfare loss for the parent. Their interpretation of their theoretical results leads them to suggest that compulsory social long-term care insurance programs, such as that recently enacted in Germany, may have adverse consequences for welfare.

In the next two sections, I present some evidence regarding the provision of long-term care and the market for long-term care insurance in the U.S. that has lead authors to hypothesize about the possible substitution of children for long-term care insurance. Section 3 describes empirical evidence that children serve as informal providers of long-term care, and that much informal care is provided by female children. Section 4 describes the market for long-term care insurance in the U.S.

3.0. The Role of Children in the Provision of Long-Term Care

Long-term care refers to a wide range of activities involved in the everyday care and assistance of individuals whose functioning is limited due to age or chronic illness. Since long-term care does not involve technology-intensive medical care, a large percentage can be provided *informally* (outside the market) by family members. Cantor (1989) estimates that 80-90% of the care provided to impaired elderly persons is carried out by family members (p. 106-7).

Several other studies have found that a significant amount of informal care is provided to elders by family members, namely, spouses and children. The number of children has been shown to affect the incidence and amount of informal long-term care. Soldo, Agree, and Wolf (1989) found that the total

number of hours increased with the total number of caregivers; Wolf, Freedman, and Soldo (1997) report results consistent with the explanation that "as any given child increases his or her care effort by some amount, the other siblings reduce their aggregate care effort by a lesser amount" (p. 103).

The sex of the caregiver has also been shown to influence the amount of informal care provided. Stephens and Christianson (1986) described the characteristics of caregivers surveyed in the National Long Term Care Demonstration Informal Caregiver Survey. Of 1,940 caregivers of highly impaired elderly persons, 31.1% defined their relationship to the elderly recipient as that of daughter, the single largest response category to that question. Spouses, the next largest group, represented 22.7% of caregivers. Daughters-in-law represented an additional 4.4%. About 11% of caregivers reported to be sons of the elderly recipient.[4] In addition to the fact that daughters were more likely than sons to be caregivers, daughters also provided care more frequently and were involved in more caregiving activities than sons. On average, caregivers who were daughters spent 6 hours each day providing care, while sons spent 4.2 hours.[5] More recent analysis has been consistent with the greater level of involvement by daughters in caregiving activities. Using multivariate analysis of caregiving provided by children to parents in need of care reported in the AHEAD survey, Wolf, Freedman, and Soldo (1997) found that daughters were nine percentage points more likely than sons to provide care, and that daughters provided 10 more hours of care per month than did sons (p. 108). The persistent finding of women's significant role in the provision of long-term care has motivated much research on the impacts of caregiving on women's labor force participation and marriage and divorce patterns (for example, Ettner 1995; Wolf and Soldo 1994).

Various explanations have been offered for the difference in caregiving efforts between daughters

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[4] The remaining 30% of the caregivers was a group largely composed of siblings, siblings-in-law, grandchildren, friends, neighbors, and volunteers. These statistics appear in Stephens and Christianson (1986), p. 26.

[5] Stephens and Christianson (1986), p. 46-47.

and sons; several are summarized by Spitze and Logan (1990). Among leading explanations is society's assignment of gender roles, which designates nurturing activities to women more so than men. Other studies have suggested that the emotional bonds between daughters and their parents are greater than the bonds between parents and sons. Finally, the greater involvement of daughters has been attributed to women's lower rates of labor force participation compared to men, and women's lower opportunity cost of providing care due to lower wages. All of these explanations may contribute in part to the difference in caregiving efforts. Research has found that employed daughters spend more time with elderly parents than do employed sons (Stoller 1983), suggesting that differences remain when labor market status is held constant.

As stated by Nugent (1985), if we expect to see a relationship between fertility and old-age security, it will vary with the degree to which children provide care, either because they are motivated by family loyalties or because services provided by children are not available in the market. The studies cited above suggest that children, especially female children, are often involved in the provision of informal care.

4.0. Private Insurance for Long-Term Care

Nugent (1985) asserts that the perception of children as old-age security, or substitutes for formal insurance, is more likely to occur when private markets for insurance are either absent or inefficient. This section describes the market for long-term care insurance in the U.S., a market that has only recently developed.

The market for privately-financed long-term care insurance policies came into existence in the mid-1980s. By 1987, 75 companies had sold approximately 815,000 policies; by 1992 the number of companies had grown to 135 and the number of policies ever sold was estimated at 2.9 million.[6] While the

[6] A few employers began offering long-term care insurance policies around 1987. Though the number of employers offering such policies increased to 566 by 1992, employer-sponsored policies are in

actual percentage of the elderly possessing policies for long-term care is not exactly known because of lapses and deaths, a commonly-cited statistic from the Health Insurance Association of America (HIAA) states that only 4 to 5 percent of the elderly have private insurance policies for long-term care.

Long-term care insurance policies are expensive products, and the price of a policy increases dramatically with the age of the policyholder. In 1991, the average annual premium for individual long-term care policies that included inflation protection and some nonforfeiture benefits was $2,525 for a person 65 years old; the annual premium for the same policy purchased by a 79-year-old individual was $7,675 (Wiener et al., 1994). A survey of six insurance companies representing half the market for individual long-term care policies provides some information on the characteristics of the "average" policy actually purchased in 1990. Of the 14,400 individual long-term care policies examined in the survey, 63% covered expenses for nursing home care only; the remaining 37% covered home care expenses as well. The average daily benefit amount for nursing home care was $72; the average length of the elimination period was 20 days. Only 40% of the policies included inflation protection.[7] The length of most policies (96%) was at least two years; more than half of these policies had durations of five years or more. On average, the annual premium for policies in this survey was $1,071. The HIAA survey analysis did not provide information on the average premium by age of the policyholder (HIAA 1992).

Outside the market for individual private long-term care insurance policies, there are few alternatives for covering the costs of nursing home care. Through the purchase of supplemental insurance for Medicare, or Medigap insurance, individuals have the option of adding some coverage for nursing home

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general less common than individual policies, and would be expected to be far less common among the current elderly in specific, due to their reduced labor force participation.

[7] An elimination period (also called a deductible or waiting period) is the number of days between entry into a nursing home and the date the insurance company begins paying expenses. Nonforfeiture benefits return to the buyer some of the investment in the policy if coverage is dropped. Inflation protection allows for the daily benefit to increase over time with some assumed rate of inflation.

care. About 75% of the Medicare-eligible population own Medigap policies, and a study by Rice, Graham and Fox (1997) showed that three-quarters of those policies included an option for additional coverage for skilled nursing home facility (SNF) care. These statistics may sound encouraging for private insurance for long-term care, but this type of Medigap coverage for skilled nursing home is actually very incomplete. The SNF coverage option covers only a $95 per day patient payment for days 21 to 100 in a skilled nursing facility, and only when such a stay is preceded by a Medicare-covered hospital stay.

Another means of insuring for long-term care outside the market for private long-term care insurance policies is through the purchase of life insurance policies that contain Accelerated Death Benefit/Living Benefit riders. These riders allow the policyholder to gain early access to death benefits to cover long-term care needs. Coverage is often conditional on the diagnosis of a specified "dread disease" or terminal illness, and is usually limited to 50% of the death benefit. Given that the average face value of a life insurance policy for individuals over age 65 was only $8,300 in 1984, these accelerated death benefit riders, like Medigap policies with SNF coverage, fall short of covering much of the costs of long-term care.

In summary, the market for private insurance for long-term care is relatively new, and still quite small. While it should be mentioned that the Medicaid program provides coverage for those individuals whose income and asset levels are low enough to qualify, Medicaid is often viewed as a lesser quality insurance system. Referring to another circumstance mentioned by Nugent (1985), when services for long-term care are not available *in the form that is desired*, or the provision of these services in the market is less efficient, then the perception of children as old-age security assets will be heightened.

5.0. Factors Associated with Long-Term Care Insurance Coverage

For the current elderly population, aged 65 and over in the 1990s, childbearing decisions were made prior to the introduction of the market for long-term care insurance, that is, prior to the mid-1980s

The current market for long-term care insurance presents the opportunity for elders to supplement their old-age security if the number of children or sex composition of children is insufficient. We might expect that for parents with low numbers of children, or with an insufficient availability of female children in particular, the probability of purchasing market-based long-term care insurance would be greater.

Various other factors can influence the decision of the elderly to purchase insurance. Projections by Wiener et al. (1994) about the future size of the market for private long-term care insurance are based on the assumption that the elderly will buy insurance if the premium is less than 5% of current income. In addition to income, another determinant of long-term care insurance is the level of assets. Insurance serves to protect the household's assets in the face of costly nursing home care, when out-of-pocket costs might force a family either to liquidate assets to pay bills and exhaust savings to qualify for Medicaid. As assets increase, individuals become more likely to purchase insurance. Beyond some peak value of assets, individuals could self-insure for long-term care, and assets would have less of an effect on the probability of having long-term care insurance.

Other factors associated with purchasing long-term care insurance pertain to the individual's perceived need. Previous research has found that whites use more days of nursing home care than nonwhites, either because of discrimination by nursing homes (Falcone and Broyles 1994), or because blacks have been shown to have a greater availability of unpaid caregivers among family members (Burton et al. 1995). Another proxy for the need for long-term care insurance is poor health status. A positive relationship between poor health status and insurance might exist if individuals with greater perceived needs are more likely to own policies. A negative relationship between the two could also exist if policies are more difficult to purchase for sick individuals, because of screening and eligibility restrictions, such as preexisting condition restrictions. Finally, marital status might be negatively associated with long-term care insurance if spouses also serve as providers of old-age security.

Most empirical analysis of long-term care insurance consists of simulations of demand based on

assumptions about income. There are few examples of research in which models of long-term care insurance are estimated. Two studies (Cohen, Kumar and Wallack 1993; Kumar et al. 1995) used data obtained from several insurance companies about individuals who had purchased private insurance for long-term care, and those who declined to purchase such policies when approached by insurance agents. Unfortunately, the results of these studies may not be generalizable to the population as a whole since no correction for selectivity was made. Individuals approached by agents are a non-random population; they are more likely to have higher incomes and to be in better health than most elderly individuals. With respect to the role of children, a measure of the presence of children living within 25 miles had a significant negative effect on the decision to purchase long-term care insurance (Kumar et al. 1995). Distance, however, is an endogenous measure, and the relationship between it and insurance coverage may reflect the choices of living arrangements by the elderly or their children when the need for case arises.

Another recent empirical study of the factors influencing long-term care insurance is Sloan and Norton (1998), which estimates a model of long-term care insurance also using the AHEAD survey. The number of children of the respondent is found to have no significant effect on the long-term care insurance coverage.[8] Other evidence of the role of children comes from studies of the living arrangements of the elderly, and has shown that measures of the availability of children had negative effects on whether an adult lived in an institutional setting (Hoerger, Picone and Sloan 1996; Stern 1995). Though suggestive of substitution between institutions and families, these studies pertain to the provision of long-term care itself,

[8] Both Kumar et al. (1995) and Sloan and Norton (1998) also include characteristics of state Medicaid programs in their models of long-term care insurance. Kumar et al. (1995) find that Medicaid estate recovery programs and income limits are positively associated with having long-term care insurance. As Medicaid per diem rates increase, individuals are less likely to purchase long-term care insurance. Sloan and Norton (1998) reported evidence of Medicaid crowd-out: a measure of the likelihood of ever getting on Medicaid (determined by income from pensions and annuities) was negatively associated with having long-term care insurance.

not to insurance for long-term care.

6.0. Data from the Study of Asset and Health Dynamics of the Oldest Old

To examine the determinants of long-term care insurance coverage, specifically the role of adult children, I use data from the Study of Asset and Health Dynamics Among the Oldest Old (AHEAD).[9] AHEAD is a nationally representative longitudinal study of community-based persons age 70 and older (in 1993) and their spouses, designed to collect data on a variety of social and economic issues that affect elders. The survey contains a wide variety of information on health conditions, insurance coverage, family composition, and financial resources of 8,223 individuals in 6,052 households. An important feature of the AHEAD survey is that elders are questioned about all living children, that is, both resident and non-resident children.[10]

To construct the sample used in this paper, three separate data files from the AHEAD survey were used. The household data file was used to extract household-level information on income and net worth. Information on health insurance coverage and demographic variables were obtained from the respondent file. Information on the number and characteristics of the respondent's children was obtained from the "Other Person" file of the AHEAD survey, which contains records of all resident and nonresident children of the householders.

All respondents in the AHEAD survey were asked a group of questions regarding their health insurance in addition to Medicare. The health insurance section begins by asking the respondent:

"Do you have any (other) type of health insurance coverage?"

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[9] The specific version used in the analysis is version 2.1 from Wave I, collected in 1994 and released in March of 1998.

[10] This feature gives AHEAD an advantage over the Medicare Current Beneficiary Survey (MCBS) for this analysis; while the MCBS contains information on long-term care insurance, the survey provides a roster of only those children living with their elderly parents

For individuals who responded affirmatively, two questions can be used for measuring long-term care or nursing home insurance coverage. The first asks:

> "*What type of coverage do you have; is it basic health insurance, a supplement to Medicare (Medigap) or to other health insurance, or long-term care insurance, or what?"*

Respondents reported as many types of coverage as applied, and 188 individuals (or 2.3% of all respondents) reported that they had a long-term care insurance policy. While this number is lower than the HIAA estimate of between 4 and 5% of elderly individuals, the age of the AHEAD sample (at an average of 76 years) is consistent with a lower percentage of individuals with long-term care policies.

A second question on long-term care was asked to those individuals who did not report owning a long-term care insurance policy:

> *"Do any of your policies include long-term or nursing home care?"*

About 400 individuals did not know or refused to provide an answer to this question. Of those who did respond, 954 individuals (or 12.2% of respondents) reported having some policy that included long-term care or nursing home care. It is unclear how the respondents interpreted this question. This question does not seem to represent individuals with provisions for long-term care through Medicare supplemental insurance (Medigap) or through life insurance riders. Only 36% of the 954 individuals who reported this type of insurance also reported Medigap coverage; in contrast 76% of Medigap policies purchased in 1993 included the SNF coinsurance option (Rice, Graham and Fox, 1997). Nor is it likely that individuals were referring to Medicare, since prior to the insurance questions in this section of the AHEAD survey respondents were informed that they were being asked about health insurance other than Medicare. Finally, individuals were not referring to public insurance, or Medicaid, which does pay for nursing home expenses for recipients who meet the minimum income standard and "spend down" their assets. Of the 954 individuals who reported nursing home coverage, only 15 also reported Medicaid coverage. Because the responses to this question are inconsistent with other known long-term care insurance products, this

question was not used in the analysis.

The definitions and means of all variables are reported in Table 1 for a sample of 5,866 respondents from the AHEAD survey. One age-eligible respondent per household is included in this sample; this implies that in cases where the age-eligible respondent has a spouse who is also age-eligible, only the respondent is included. This group will be referred to as first respondents and only respondents, the latter meaning that there was only one respondent per household. The purpose of this selection is to eliminate the need to correct standard errors for the heteroscedasticity that would arise when household-level variables are used as explanatory variables, and when multiple household observations are used. Individuals with missing values for one or more of the variables are also excluded. The descriptive statistics are calculated using the respondent weights, and are shown separately for males and females. The weighted means indicate that 2.4% of the respondents have long-term care insurance. Of the explanatory variables included in the model are measures of per capita household income and per capita non-housing assets (defined as assets less debt, mortgage, and the value of the respondent's house). Mean annual income for the sample is about $18,000; the value of non-housing assets averages around $68,192, and is much higher for males than females.[11] The average age is about 77 years; individuals have on average 11 years of education. Race is measured with an indicator variable, nonwhite, which equals one if the individual reports race as nonwhite, and zero otherwise. About 12% of men and 14% of women are nonwhite. Health status is measured by an indicator variable equal to one if the respondent's self-reported health status was poor. About 13% of all respondents report poor health status, with the weighted mean being slightly higher among women than men. One of the most striking differences among men and women

[11] The AHEAD survey employs new survey methodologies in the collection of data on income and wealth. These methodologies substantially decrease biases arising from missing data on components of income and wealth. As a result, measures of income and wealth from other household surveys, such as the Current Population Survey, tend to be underestimated when compared to AHEAD survey data (Gustman and Juster 1995). It should also be noted that the median values for income and wealth are far below the means reported here.

is with respect to marital status. Seventy-one percent of men report that they are married or living with a partner; only 18.4% of women are married. Additional descriptive statistics are shown in Table 2, which separates the AHEAD sample into *all* age-eligible males and *all* age-eligible females. In this analysis, spouses are included.

Since the dependent variable is discrete, models of long-term care insurance coverage are estimated as probit models. Age is included in the model as a proxy for price, and since premiums for long-term care insurance policies rise so dramatically with age, I expect that as age increases the probability of ownership declines at an increasing rate. Age is admittedly an imperfect proxy for price since there is no information in the data set regarding the date when the policy was purchased. Yet given that the long-term care insurance market was just beginning to evolve in the mid-1980s and the AHEAD respondents were surveyed in 1993, the gap that might exist between current age and age at purchase is at most eight years. Income is expected to have a positive and significant effect on the likelihood of insurance coverage, and is included in the model using a series of indicator variables, relative to an omitted category of income less than $10,000.

To test the role of asset-protection, I include indicator variables measuring various levels of non-housing assets.[12] Categories of assets included in the model are: 1) from zero to $10,000; 2) from $10,000 to $40,000; 3) from $40,000 to $100,000; 4) from $100,000 to $160,000; and 5) over $160,000. The omitted category represents those with negative asset levels. The cutoff of $160,000 was chosen to represent the approximate cost of four years of nursing home care. If asset-protection is a motive, the coefficients on the asset indicator variables should be positive and significant. If individuals self-insure, the effect of assets will be nonlinear, and the coefficients will begin to decline in magnitude beyond some peak

[12] Since the Medicaid program does not require the individual to sell his or her home to become eligible for assistance, the value of the home is excluded from all asset measures here.

level of assets.[13]

Education is also included in the model; studies have shown that individuals with greater education levels are more likely to purchase individual health insurance policies (Marquis and Long 1995; Cartwright, Hu, and Huang 1992). As discussed in Section 5, need for insurance can also be proxied with measures of race, health status, and marital status. Controls for nonwhite race, poor health, and living with a spouse or a partner are included.

To test the role of adult children in the decision to purchase insurance, several model specifications will be estimated. The first will include an indicator variable equal to one if the respondent has any living children. The second specification will include an indicator variable equal to one if the respondent has at least one daughter. Finally, a model will be estimated in which a measure of the sex composition of all children in the family is included. Sex composition is defined as the number of female children divided by the number of total children, where children includes both resident and non-resident children. The use of sex composition of children has the advantage of being an exogenous measure of availability of care from children.[14] Choice variables such as the total number of children and the residence of children may be estimated with bias in single-equation models. Although the market for long-term care insurance developed after the fertility decisions of the individuals in the sample were made, correlation in the unobservables affecting family size and insurance might exist. When the daughter and the percent female variables are added to the model, an explanatory variable will be added to control for the total number of children that

[13] Means of the indicators variables for assets in the sample of 5,866 respondents are as follows: assets less than zero, 0.167; assets greater than zero and less than $10,000, 0.305; assets greater than $10,000 and less than $40,000, 0.202; assets greater than $40,000 and less than $100,000, 0.149; assets greater than $100,000 and less than $160,000 0.067; and assets greater than $160,000, 0.110.

[14] The age of individuals in this sample precludes their access to techniques such as ultrasound and amniocentesis that might be used in performing selective abortions and thus choosing the sex composition of their children.

the individual has, since the number and percentage of female children may vary with total family size.[15]

7.0. Results

Table 3 reports results of probit models of long-term care insurance using the three specifications discussed above. In all models, education has the expected positive and significant effect, as does income. Individuals with income ranging from $15,000 to under $50,000 are more likely to own policies. Income has the greatest effect for individuals with income ranging from $25,000 to $50,000. As asset levels increase, the probability of owning a long-term care insurance policy increases and is significant in all but the lowest asset category. Poor health has a significant negative impact on long-term care insurance coverage; while being married and being female each increase the likelihood of having long-term care insurance (only marital status is significant). The effects of age and nonwhite race are statistically insignificant.

Regarding the role of children in the decision to purchase long-term care insurance policies, the first model specification tests whether the presence of any children is associated with the purchase of long-term care insurance. The marginal effect of having any children is insignificant, with a t-statistic of 0.45. The second column reports the estimated effect of having at least one daughter, controlling for family size. In contrast to expectations that female children might serve as substitutes for insurance and reduce the likelihood of coverage, the estimated marginal effect is significant and positive. The positive relationship between female children and long-term care insurance is also reflected in the significance of the percent female effect reported in column (3). As percent female increases from 33 to 66 in a family with three children (2 sons and 1 daughter compared to 1 son and 2 daughters), the probability of having long-term

[15] Eighty-five percent of the sample has at least one child; sixty-eight percent of the sample has at least one daughter. Mean number of children is 2.62 and ranges from 0 to 15; mean number of daughters is 1.33 and ranges from 0 to 10. The mean of the percent of female children is 0.436.

care insurance increases by 0.33 of a percentage point, or by 15%. In all specifications, marginal effects of the total number of children show no significant relationship between total children and long-term care insurance; the effect of children appears to be related to the sex of the children exclusively.

I next separate the sample by sex of the parent and test whether the effect of children and female children varies among men and women. Given differences in marital status of men and women, and possible differences in parent-child relationships, we might expect differences in the estimated marginal effects. Table 4 reports results from two groups of men: i) first and only age-eligible males, and ii) all age-eligible males; Table 5 shows results for two groups of women. Differences by sex of the parent are observed: for men, the presence of female children and the percent of children that are female continue to have significant positive effects on the probability of having long-term care insurance. For women, none of the measures of children, including sex composition, has any significant effect on owing long-term care insurance. The effect observed in the full sample and shown in Table3 is driven by the male sample results.[16]

These results suggest that the substitution of informal care providers in the family (children and daughters) for long-term care insurance is not taking place. The presence of any children and the total number of children do not affect insurance coverage. When the effect of children is measured by focusing on daughters and the percent of children that are female, results are also inconsistent with the substitution motive. In fact, among elderly males the presence of any daughter is associated with a higher probability of insurance coverage. These results strongly counter the suggestion that the elderly decline to purchase insurance because they perceive children as potential substitutes.

In the remainder of this section, I give further attention to two areas. First, I examine whether the

[16] Other differences in the estimated effects appear when the sample is split by sex of the respondent. Among men, marital status has a significant positive effect and poor health status has a significant negative effect. Both are insignificant in the sample of women. The effect of education is significant and positive among women, but insignificant among men.

observed zero effect of the number of children is due to unobserved heterogeneity in single-equation models. Second, I examine more closely possible reasons for the observed positive effect of female children on the insurance status of their fathers.

Instrumenting for the Number of Children

The estimated effect of the number of children may be biased toward zero if there is some omitted variable that is positively correlated with both insurance and family size. To correct for this type of bias in the estimation of the coefficient on the number of children, I estimate an instrumental variables (i.v.) model of long-term care insurance. The instrumental variables used in the first stage are: 1) an indicator variable equal to one if the respondent's religious preference is Catholic; and 2) an indicator variable equal to one if the respondent has been married more than once. Both variables are predicted to have no direct effect on long-term care insurance, but to increase the total number of children. The measure of the number of marriages in a lifetime is a separate measure from the respondent's current marital status, which is already included in the model of long-term care insurance.

Though the dependent variable is discrete, and the potentially endogenous regressor is continuous, I use for simplicity two-stage least squares (2SLS) as the i.v. estimation strategy. Results from the first-stage estimation and two-stage least squares estimation are shown in Table 6. Both instrumental variables have large, positive and highly significant effects on the total number of children, as expected. In the 2SLS model of long-term care insurance ownership, results show that instrumenting for the total number of children increases the coefficient on family size in absolute value, and changes the sign from positive to negative. However in all samples (all respondents, males, and females) the i.v. estimate of the number of children remains statistically insignificant.

These results give mixed evidence of the importance of the number of children. While the estimated effect remains statistically insignificant, the change in the sign and the magnitude of the effect should not be overlooked. Perhaps in a larger sample of respondents, where the standard error of the

estimated marginal effects were reduced, the effect would be significant. At the same time, these results should also be interpreted with some caution. In the full sample, the probability that the chi-square from a test of overidentifying restriction exceeds the critical value is 0.06, thus we can reject at the 10 percent level the hypothesis that the instrumental variables do not belong in the structural model. While this hypothesis in not rejected for the individual samples of males and females, the t-statistic of the number of marriages in the sample of women is only 1.18. Evidence such as this suggests that better instruments need to be used to control for unobserved heterogeneity in long-term care insurance decisions.

Why Do Daughters Have a Positive Effect on Long-Term Care Insurance Ownership?

The presence of female children had a positive effect on their fathers' long-term care insurance status. This section explores this finding, first by examining whether this pattern exists for other types of insurance. Finding that the effect of daughters is only present in models of long-term care insurance, I ask whether this effect is related to the asset protection motive. That is, does asset protection differ between individuals with daughters (and other dependents) and those without? Finally, I examine whether the positive coefficient on percent female indicates that families with more female children receive greater financial assistance in purchasing insurance and for that reason are more likely to own policies.

Effect of Sex Composition on Insurance for Acute Care

Is the positive effect of daughters specific to insurance for long-term care, or does it exist for other types of insurance? Another type of insurance coverage included in the AHEAD survey is Medigap insurance, a supplemental coverage for Medicare, which provides added insurance for acute health care. As stated earlier, any nursing home care covered by Medigap is quite limited, thus distinguishing it from long-term care insurance.

In Table 7, I present results from probit models for Medigap coverage, where an indicator variable for having at least one daughter and a variable measuring the percent of children that are female are

included as regressors in separate specifications.[17] All models use the same set of covariates included in the model of long-term care; evidence from Short and Vistnes (1992) suggests that age, race, and education are significant determinants of Medigap coverage. In the Medigap models, unlike the models for long-term care insurance, the coefficients on the variables measuring any daughters and the percent of children that are female are statistically insignificant, for all samples examined. The effect of daughters appears to be specific to coverage for long-term care.

One of the most significant predictors of long-term care insurance is asset-levels, as shown in the results presented earlier in Table 3. The importance of assets has been tied to motives of asset-protection, that is, adults who wish to protect their asset from the spend-down process that takes place when one qualifies for Medicaid will purchase private insurance. I next consider whether the positive effect of having a daughter is tied to these asset-protection motives. In a series of hypothesis tests reported in Table 8, I test whether the effect of assets (or the asset-protection motive) varies by the presence of a spouse, any children, or at least one daughter.[18] Results from likelihood ratio tests of the joint significance of interaction terms of the asset levels with a dummy for either spouse, any child, or daughter, can not reject the null hypothesis that the coefficients of the interaction terms are jointly equal to zero. When tested using Chow tests, parameter values do not significantly differ when the model is estimated using samples of 1) married and non-married individuals; 2) individuals with any children and those without, and 3) individuals with at least one daughter and those without. Thus, the asset-protection motive in long-term care insurance does not significantly differ by the existence of female dependents.

The Role of Financial Transfers

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[17] Levels of Medigap coverage reported in the AHEAD survey are lower than have been reported in other data sets. The age of the AHEAD population, which is significantly older that populations for which other statistics have been cited, may explain this difference.

[18] The reported tests are carried out using the sample of elderly males.

Perhaps the effect of female children on insurance coverage for long-term care can be explained by the fact that daughters are more likely to provide elderly fathers with financial resources to purchase nursing home coverage (as opposed to other health insurance like Medigap, since percent female was found to be insignificant in the models shown in Table 7). To explore whether parents with more daughters are more likely in fact to receive financial assistance in purchasing insurance, I examine the gift-giving patterns in AHEAD. The ideal measure for this type of test would be transfer behavior that is specifically designated for long-term care insurance. In the absence of this information, I examine transfer behavior in closely related areas.

Two sets of questions in the AHEAD survey allow for examination of the ways in which children provide financial assistance to their parents. The first of these questions asked households:

> *"Has anyone helped you [and your (husband/wife/partner)] pay for your health care costs {apart from what was covered by insurance} in the last 12 months?"*

Households that respond affirmatively are asked who it was that helped them specifically, either a child, child-in-law or grandchild, another relative, someone else, or all of the children.

A second question asks householders about the sources of their income:

> *"In 1992/93, did you [and your (husband/wife/partner)] receive $500 or more from any child, relative or friend?"*

Respondents were then asked whether the largest sum was provided by a child, child-in-law, or grandchild, another relative, or someone else.

These questions can be used to examined financial transfers directed toward health care expenses and financial transfers in excess of $500. The effect of the presence of the female children in the family on these measures of financial transfers is shown in Table 9. Elderly females are significantly more likely to receive help from children in paying for health care expenses when they have more female children. However, in the sample of elderly males, the effect of percent female on gift-giving is insignificant in both models, and thus financial transfers from children to parents do not explain the estimated positive effect of

daughters on fathers' long-term care insurance.

8.0. Discussion

This paper represents an empirical examination of some of the factors associated with the purchase of long-term care insurance. The answer to the question of whether adult children serve as substitutes for long-term care insurance seems to be "no." While there is a great deal of evidence about the role of daughters in the provision of informal care, and while there is some evidence that the care they provide is a substitute for formal nonmarket care, the results of this paper do not suggest that their availability discourages parents in any way from obtaining market-purchased insurance for long-term care needs. The hypothesis offered by Pauly (1990), which suggested that presence of children would reduce the likelihood of owning insurance for long-term care, is not supported by the results of models for long-term care policies.

For the answer to this question to be a definitive no, two areas might be examined more closely. The analysis in this paper focused on an exogenous measure of child availability. Sex composition of children in the family was used to approximate the availability of care. Other measures might be considered, such as the proximity of children, or the labor force attachment of female children. These types of variables are choice variables for the child, which may be affected by unobservable factors influencing long-term care insurance ownership. Nonetheless, when included in models not reported here, alternate measures of child availability (the percent of children living within 10 miles, the percent of all children working less than full time, and the percent of daughters working less than full time) were insignificant for males. Only for women did the percent of children living with the parent or within 10 miles of the parent have a significant negative effect on long-term care insurance. Further analysis shows that the significant effect of the proximity measure is driven by children *living with the parent*. Clearly such a measure is likely to be determined itself by whether the mother has insurance for nursing home care, and this result is

not interpreted as evidence of substitution of children for long-term care insurance.

A second area that requires further attention is potential bias in the estimated effect of any children or the number of children. While it is clearly the case that daughters are not substitutes for long-term care insurance, and while daughters are more likely candidates for substitutes given the abundant evidence of their role in caregiving efforts, there remain a few reasons to continue to consider the possibility of "rational nonpurchase" of long-term care insurance based on child availability. Further work is required to test the orthogonality of the variables measuring the presence of any adult children. The estimation of 2SLS models showed a sizeable increase in the magnitude on the effect of the number of children, and a sign change from positive to the expected negative. Although the coefficient was not statistically significant, future research using a larger sample size might allow for the more precise measurement of such an effect.

Instead of finding that child availability decreased the likelihood of long-term care insurance ownership, models estimated for elderly males found that men who have at least one daughter and men who are married are *more* likely to have long-term care insurance. The marginal effect of being married is an increase in the probability of coverage of about 64%; having at least one daughter increases the likelihood of coverage by 100%. These results could not be explained by asset protection motives or financial transfers within the family. Perhaps one motivation for purchasing long-term care insurance has been overlooked. Recent surveys of elder attitudes suggest a great reluctance to lose independence in old age and become a burden on one's children. In a survey of purchasers of long-term care insurance in 1990, 75% reported that a "very important" reason for purchasing long-term care was to avoid depending on others for care and to preserve independence. The same survey showed that 86% of long-term care purchasers "strongly agreed" that they did not want to rely on children to pay for long-term care; 84% of nonpurchasers responded similarly, and the survey notes a significant difference in the response levels (HIAA 1992). Evidence of this sort suggests that elders might be motivated to purchase insurance to

protect family members from burdensome caregiving efforts. In this case, one might expect to see that in the presence of daughters and spouses who would provide care, elders would be more likely to own an insurance policy for long-term care, the pattern that is observed here.

The results of this paper suggest that two key determinants behind coverage are levels of assets and income. Individuals with asset-levels more than $100,000 are several *times* more likely to have insurance coverage than those with negative assets. Relative to individuals with income less than $10,000 a year, individuals with between $10,000 and $40,000 are 63% more likely to have coverage for long-term care; those with assets ranging from $40,000 to $100,000 are 100% more likely to have long-term care insurance. The marginal effects of high assets and income far outweigh the effects of most demographic variables, such as education and race, and age; the effects of assets and income also outweigh the role of health status. These results are consistent with existing explanations for low-levels of long-term care insurance coverage among the elderly. Both the high cost of coverage relative to income levels of the elderly, and the fact that the Medicaid program provides coverage for individuals with little wealth, have often been cited as key reasons for the lack of long-term care coverage. With respect to policies on long-term care insurance and long-term care financing, the results of this paper provide evidence of the limitations of the private market for insurance. While most policy makers agree that the potential for private financing is limited, there are efforts to expand private financing through public-private partnerships, which would liberalize Medicaid eligibility for individuals who purchase some private insurance. This paper finds support for the significance of assets in the ownership of long-term care insurance, but given the low asset levels of most of the elderly, it is unlikely that private insurance will play a large role in the financing of long-term care.

Table 1
Variable Definitions, Means and Standard Deviations

Variable Name	Variable Definition	First or Only Age-eligible Respondents	Male Subsample	Female Subsample
LTC Policy	Equal to 1 if respondent reports having a long-term care insurance policy	0.024 (0.15)	0.024 (0.15)	0.023 (0.15)
Age	Age of respondent at interview	77.86 (6.07)	76.59 (5.48)	78.67 (6.30)
Education	Years of education of respondent	10.86 (3.70)	11.12 (3.89)	10.69 (3.56)
Income	Household income from all sources, per capita	$18,452 (22,350)	$18,785 (26,030)	$18,237 (19,620)
Non-Housing Assets	Assets (not including value of home) less total debt in thousands of dollars, per capita	$68,192 (213,750)	$89,410 (280,370)	$54,529 (154,970)
Nonwhite	Equal to 1 if respondent reports race as nonwhite	0.131 (0.34)	0.117 (0.32)	0.140 (0.35)
Poor Health	Equal to 1 if respondent reports poor health status	0.128 (0.33)	0.118 (0.32)	0.134 (0.34)
Married or Partner Present	Equal to 1 if respondent is married or living with a partner	0.391 (0.49)	0.712 (0.45)	0.184 (0.39)
Any Children	Equal to 1 if respondent has any living children	0.854 (0.35)	0.888 (0.32)	0.832 (0.37)
Number of Children	Total number of resident and non-resident children of respondent	2.62 (2.13)	2.88 (2.17)	2.45 (2.09)
Any Daughter	Equal to 1 if respondent has any female children	0.687 (0.46)	0.731 (0.44)	0.659 (0.47)
Percent Female	Percent of respondent's resident and non-resident children that are female	0.436 (0.36)	0.452 (0.35)	0.425 (0.37)
Number of Daughters	Number of respondent's resident and non-resident children that are female	1.33 (1.37)	1.47 (1.43)	1.25 (1.32)
Sample Size		5,866	2,375	3,491

Notes: The first column reports descriptive statistics for age-eligible AHEAD respondents who are either the only respondent per household, or the first respondent per household. The next two columns separate this group into males and females. Descriptive statistics are calculated using the respondent weight.

Table 2
Additional Means and Standard Deviations

Variable Name	Variable Definition	All age-eligible males	All age-eligible females
LTC Policy	Equal to 1 if respondent reports having a long-term care insurance policy	0.026 (0.16)	0.024 (0.15)
Age	Age of respondent at interview	76.71 (5.39)	77.93 (6.10)
Education	Years of education of respondent	11.06 (3.84)	10.91 (3.47)
Income	Household income from all sources, per capita	$18,026 (24,375)	$17,742 (19,006)
Non-Housing Assets	Assets (not including value of home) less total debt in thousands of dollars, per capita	$85,326 (260,860)	$60,320 (160,130)
Nonwhite	Equal to 1 if respondent reports race as nonwhite	0.111 (0.31)	0.125 (0.33)
Poor Health	Equal to 1 if respondent reports poor health status	0.125 (0.33)	0.124 (0.33)
Married or Partner Present	Equal to 1 if respondent is married or living with a partner	0.759 (0.43)	0.346 (0.48)
Any Children	Equal to 1 if respondent has any living children	0.894 (0.31)	0.851 (0.36)
Number of Children	Total number of resident and non-resident children of respondent	2.88 (2.14)	2.50 (2.05)
Any Daughter	Equal to 1 if respondent has any female children	0.734 (0.44)	0.678 (0.47)
Percent Female	Percent of respondent's resident and non-resident children that are female	0.451 (0.35)	0.436 (0.37)
Number of Daughters	Number of respondent's resident and non-resident children that are female	1.46 (1.42)	1.27 (1.30)
Sample Size		2,888	4,493

Notes: Descriptive statistics are calculated using the respondent weight.

Table 3
Effect of Children on Ownership of Long-Term Care Insurance
Marginal Effects from Probit Models with T-statistics in Parentheses

Explanatory Variable	Model 1	Model 2	Model 3
Age	0.010	0.010	0.010
	(1.02)	(0.98)	(1.01)
Age squared	-0.00007	-0.00007	-0.00007
	(1.09)	(1.05)	(1.09)
Education	0.003	0.002	0.002
	(3.40)	(3.26)	(3.28)
Income from $10K to $15K	0.009	0.009	0.009
	(1.41)	(1.40)	(1.40)
Income from $15K to $25K	0.012	0.012	0.012
	(1.85)	(1.86)	(1.85)
Income from $25K to $50K	0.025	0.025	0.025
	(3.80)	(3.81)	(3.81)
Income greater than $50K	-0.021	-0.021	-0.020
	(1.39)	(1.37)	(1.36)
Assets from 0 to $10K	0.014	0.013	0.014
	(1.47)	(1.43)	(1.48)
Assets from $10K to $40K	0.016	0.016	0.016
	(1.69)	(1.67)	(1.69)
Assets from $40K to $100K	0.023	0.023	0.023
	(2.37)	(2.36)	(2.39)
Assets from $100K to $160K	0.027	0.027	0.028
	(2.57)	(2.57)	(2.59)
Assets greater than $160K	0.031	0.031	0.031
	(3.11)	(3.09)	(3.12)
Nonwhite	-0.004	-0.004	-0.004
	(0.48)	(0.47)	(0.51)
Poor Health	-0.020	-0.020	-0.021
	(2.07)	(2.06)	(2.07)
Married	0.009	0.009	0.009
	(1.74)	(1.67)	(1.71)
Female	0.008	0.008	0.008
	(1.61)	(1.62)	(1.59)

Table 3
(Continued)
Effect of Children on Ownership of Long-Term Care Insurance
Marginal Effects from Probit Models with T-statistics in Parentheses

Explanatory Variable	Model 1	Model 2	Model 3
Any Children	0.003		
	(0.45)		
Daughter		0.010	
		(1.91)	
Percent Female			0.010
			(1.81)
Number of Children		-0.001	-0.0004
		(0.97)	(0.39)

Notes: All models are estimated using a sample consisting of 5,866 observations. The mean of the dependent variable is 0.022. Marginal effects are calculated as $\beta \varphi(z)$, where $z=\Phi^{-1}(p)$, p is equal to the sample mean of the dependent variable, and β is the probit coefficient.

Table 4
The Effect of Children on Ownership of Long-Term Care Insurance
By Sex of Respondent

	Elderly Males					
	Age-Eligible First or Only Males N=2,375			*All Age-Eligible Males N=2,888*		
Explanatory Variable	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Married	0.012	0.011	0.012	0.015	0.014	0.014
	(1.41)	(1.28)	(1.40)	(1.73)	(1.61)	(1.71)
Any Children	0.009			0.009		
	(0.75)			(0.72)		
Daughter		0.025			0.021	
		(2.53)			(2.37)	
Percent Female			0.017			0.014
			(1.77)			(1.61)
Number of Children		-0.003	-0.001		-0.001	0.0005
		(1.56)	(0.68)		(0.60)	(0.32)
	Mean. Prob of Long-Term Care Insurance=0.023			Mean Prob. of Long-Term Care Insurance=0.024		

Notes: All Models include covariates measuring age, age squared, education, income, non-housing assets, nonwhite race, and poor health status. Marginal effects are calculated as $\beta\,\varphi(z)$, where $z=\Phi^{-1}(p)$, p is equal to the sample mean of the dependent variable, and β is the probit coefficient.

Table 5
The Effect of Children on Ownership of Long-Term Care Insurance
By Sex of Respondent

	Elderly Females					
	Age-Eligible First or Only Females N=3,491			*All Age-Eligible Females N=4,493*		
Explanatory Variable	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Married	0.006 (0.96)	0.006 (0.89)	0.006 (0.90)	0.0010 (0.19)	0.001 (0.20)	0.001 (0.21)
Any Children	-0.0004 (0.05)			-0.001 (0.21)		
Daughter		0.001 (0.18)			0.001 (0.21)	
Percent Female			0.005 (0.72)			0.002 (0.31)
Number of Children			0.0004 (0.24)		-0.0008 (0.52)	-0.0007 (0.54)
	Mean Prob. of Long-Term Care Insurance=0.021			Mean Prob. of Long-Term Care Insurance=0.023		

Notes: All Models include covariates measuring age, age squared, education, income, non-housing assets, nonwhite race, and poor health status. Marginal effects are calculated as $\beta\,\varphi(z)$, where $z=\Phi^{-1}(p)$, p is equal to the sample mean of the dependent variable, and β is the probit coefficient.

Table 6
Effect of Number of Children on Long-Term Care Insurance Coverage
OLS and Two-Stage Least Squares Results
(Estimated coefficients with t-statistics in parentheses)

Specification	Sample		
	First or Only Age-Eligible Respondents	Male First or Only Age-Eligible Respondents	Female First or Only Age-Eligible Respondents
First-Stage Model of Number of Kids			
Married more than once?	0.451 (6.92)	0.936 (9.26)	0.100 (1.18)
Catholic?	0.301 (4.58)	0.311 (3.07)	0.285 (3.30)
Single-Equation Estimation of Long-Term Care Insurance			
Coefficient of Number of Children	-0.00006 (0.064)	-0.0006 (0.40)	0.0004 (0.303)
Two-Stage Least Squares Estimation of Long-Term Care Insurance			
Coefficient of Number of Children	-0.011 (1.22)	-0.011 (1.44)	-0.029 (1.29)
Chi-square value from test of overidentifying restrictions	3.47	0.86	1.56
Sample Size	5,618	2,300	3,318

Notes: All models include as covariates: age, age squared, education, race, income, assets, marital status, and health status.

Table 7
Effect of Sex Composition of Children on Other Insurance Coverage
Marginal Effects from Probit Models with T-statistics in Parentheses

Explanatory Variable	*Medigap Insurance*		
	First or Only Age-Eligible Respondents	Male First or Only Age-Eligible Respondents	Female First or Only Age-Eligible Respondents
Specification I			
Daughter	-0.002	-0.023	0.013
	(0.12)	(0.97)	(0.65)
Number of Children	-0.003	0.003	-0.008
	(0.83)	(0.63)	(1.71)
Dependent Mean	0.26	0.25	0.26
Specification II			
Percent Female	-0.010	-0.015	-0.006
	(0.58)	(0.56)	(0.23)
Number of Children	-0.003	-0.001	-0.006
	(0.88)	(0.29)	(1.48)
Dependent Mean	0.26	0.25	0.26
Sample Size	5,866	2,375	3,491

Notes: All models include as explanatory variables: measures of income, assets, age, education, marital status, and health status. Marginal effects are calculated as $\beta \varphi(z)$, where $z=\Phi^{-1}(p)$, p is equal to the sample mean of the dependent variable, and β is the probit coefficient.

Table 8
Hypothesis Tests
Do Asset Effects Vary by Family Characteristics?

H_o	Test Statistic	Critical Value	Reject H_o?
Asset effects vary by marital status?			
Interaction terms (married*asset levels) jointly equal to zero	5.88	11.07	No
Model parameters equal in samples of married and unmarried	1.26	1.67	No
Assets effects vary by presence of children?			
Interaction terms (any children*asset levels) jointly equal to zero	5.52	11.07	No
Model parameters equal in samples of individuals with children and those without	0.35	1.67	No
Assets effects vary by presence of daughters?			
Interaction terms (any daughter*asset levels) jointly equal to zero	5.51	11.07	No
Model parameters equal in samples of individuals with daughters and those without	0.43	1.67	No

Notes: Sample is 2,375 first or only age-eligible males from AHEAD survey.

Table 9
Effect of Sex Composition on Financial Transfers To Parents

Explanatory Variable	*Received help from children for health care expenses*			*Received income from children in excess of $500*		
	First or Only Age-Eligible Respondents	Male First or Only Age-Eligible Respondents	Female First or Only Age-Eligible Respondents	First or Only Age-Eligible Respondents	Male First or Only Age-Eligible Respondents	Female First or Only Age-Eligible Respondents
Specification I						
Daughter	0.010	0.008	0.012	0.006	0.0009	0.009
	(1.54)	(0.97)	(1.29)	(1.02)	(0.14)	(1.15)
Dependent Mean	0.028	0.014	0.038	0.024	0.011	0.032
Specification II						
Percent Female	0.015	0.014	0.017	0.003	-0.003	0.006
	(2.25)	(1.61)	(1.73)	(0.57)	(0.42)	(0.70)
Dependent Mean	0.028	0.014	0.038	0.024	0.011	0.032
Sample Size	5,822	2,357	3,465	5,738	2,315	3,423

Notes: All models include as explanatory variables measures of income, assets, age, education, marital status, and health status and number of children. Marginal effects are calculated as $\beta \varphi(z)$, where $z=\Phi^{-1}(p)$, p is equal to the sample mean of the dependent variable, and β is the probit coefficient.

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