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WHY DOESN'T THE MARKET FULLY INSURE LONG-TERM CARE?

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ABSTRACT

This paper examines the failure of the private market to fully insure long-term care. I argue that the failure is a result of large intertemporal variability in the cost of long-term care. Unlike variability in cross section use, variability in the cost of care affects everyone in a pool and therefore cannot be diversified within a cohort. Further, since costs are serially correlated, the cost risk cannot be diversified across cohorts. Estimates suggest that the standard deviation of cost uncertainty is on the order of 4 to 14 percent for an average long-term care policy. In response to this cost risk, most long-term care policies do not insure real benefits. Policies generally pay a fixed nominal amount for care, which is updated using predetermined nominal rules. Many policies also have lifetime maximum payments and other restrictions on aggregate risk bearing by the insurer. The lack of complete long-term care insurance may be one explanation for the low rate of purchase of long-term care policies.

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While markets for insurance are in general highly developed, there are a number of risks for which there is little or no private insurance. Insurance for long-term care (nursing homes or home health care), for example, is about a decade old, yet only 4 percent of the elderly population and 1 percent of the total population have such policies (Employee Benefit Research Institute, 1991). Acute care medical insurance is recontracted annually, despite that fact that most individuals would like to insure medical risks beyond the current year.

This paper examines the failure of private insurance markets to adequately insure long-term risks. I argue that the key component of market failure is the presence of intertemporal risk instead of intratemporal risk. Insurance markets function well when the primary component of risk is the cross section hazard of an event in the population. The percent of people who will be hospitalized in a given year, for example, is knowable with some precision at the beginning of the year and thus can be diversified in private markets.

Intertemporal risks, in contrast, cannot be diversified since they generally involve aggregate rather than cross section hazards. The predominant risk in insuring future hospital spending, for example, is not the variance of future hospital stays in the population, but rather the price of hospital care in subsequent years. Similarly, while there is some uncertainty about the variance of nursing home utilization in the future, the key risk in providing long-term care insurance is the average cost of a nursing home at the time of use. In both of these cases, the main source of risk is

common to the set of insured individuals and thus uninsurable in private markets.

The first part of this paper shows that in the presence of intertemporal risk, private insurance will be absent or at best incomplete. For a single cohort of people, private insurers will be able to pool the cross section risk, but not the aggregate risk. Insurance for any cohort will necessarily be incomplete. Insurers can attempt to pool cost risk intertemporally, but pooling across cohorts is less effective as the serial correlation of costs increases. Indeed, if costs are a random walk, adding more cohorts increases the average risk of an insurer. Intertemporal may thus be non-diversifyable by the private sector.

In the second part of the paper, I document the failure of intertemporal insurance in a particular market -- the market for long-term care insurance. I show that changes in real nursing home costs are persistent over time, and that the variability of cost innovations is large. These two factors imply substantial aggregate risk in underwriting long-term care. Indeed, I estimate the standard deviation of the average liability of an insurance company at about 4 to 14 percent.

I then examine a sample of actual long-term care insurance policies to determine their provisions regarding cost risk. I find that the insurance provided by these policies is predominantly cross section rather than aggregate. Out of a sample of 73 long-term care policies in 1991, only 1 guaranteed the cost of care; most policies,

in contrast, pay a fixed dollar amount for care and use nominal rules to update payments over time. Some insurance companies also limit the time period over which benefit are allowed to increase, or cap maximum spending. Further, insurance companies reserve the right to increase rates in response to adverse cost shocks. All of these provisions limit the risk of the insurer but increase the risk of the elderly.

Finally, the willingness of insurers to bear aggregate risk is directly related to the insurance company's size. Larger insurers are more likely to increase benefits over time and to do so for a longer time period than are smaller insurers. This result is true even controlling for the overall rating of the insurance company, suggesting that it is the size of the aggregate risk that limits the ability to offer long-term care insurance, rather than a lack of knowledge of the market.

The importance of intertemporal risk suggests an explanation for the failure of long-term care insurance to be more prevalent. There has been a great deal of speculation about why long-term care insurance is not more widespread (Scanlon, 1992). The most common explanation is that Medicaid payments for nursing homes or the possibility of intra-family transfers to the elderly limit private demand (Pauly, 1990). The importance of intertemporal risk suggests an additional explanation. With insurance limited only to the cross section and not the aggregate risk, demand for insurance is low. If transactions costs are large, individuals may be unwilling

to purchase private insurance. I present some survey evidence suggesting that transactions costs are large in this market, and that incomplete benefit increases over time are quantitatively important in the decision not to purchase insurance.

The paper proceeds as follows. In the first section, I discuss the provision of intertemporal insurance in private markets. Sections II and III then estimate the extent of aggregate risk in the provision of long-term care insurance, and analyze the characteristics of long-term care policies currently on the market. Section IV discusses the failure of private long-term care insurance in light of this aggregate risk. The last Section concludes.

I. Intertemporal Risk in Private Insurance Markets

In this section, I consider the provision of insurance in a market with aggregate and cross section risk. To simplify the discussion, I suppose that all individuals are at risk of some event k years in the future, but that there is no risk before that period. Empirically, this specification captures well average nursing home use. In 1985, for example, 0.1 percent of people under age 65 were in a nursing home, compared to 1.2 percent of people aged 65-74, 5.4 percent of people aged 75-84, and 18.1 percent of people aged 85 and over.

I assume that the long-term care costs of an individual k years in the future will be $C_{i,t+k}=C^{*}_{t+k} \bullet e^{\varsigma}$, where C^{*}_{t+k} is the

average cost of nursing home care and ϵ_i is the individual component, for example the number of days of care than an individual will require.[1] To examine cost variability, it is natural to use the logarithm, so that variability can be interpreted in percentage terms. The logarithm of costs is:

$$C_{i,t+k} = C^*_{t+k} + \epsilon_i. \qquad (1)$$

For a group of N individuals, the logarithm of average costs[2] is $c_{N,t+k}=c^*_{t+k}+\Sigma\epsilon_i/N$.

There are a number of sources of variation in aggregate costs. Changes in the cost of a day in a nursing home are one source. Changes in the average probability of a nursing home admission, or in the average length of stay in a nursing home conditional on admission, will also show up as variation in c^*_{t+k}. Finally, changes in aggregate mortality or in the average morbidity

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[1] For simplicity, I ignore the probability that an individual will not require nursing home care. Adding a separate equation for the probability of any use is straightforward but brings little additional insight.

[2] This average is only true as an approximation. For N independent lognormal variables, the logarithm of the average is:

$$\log(\Sigma e^{\epsilon_i}/N) \approx \log(1) + \Sigma\epsilon_i/N = \Sigma\epsilon_i/N,$$

which is also the average of the logarithm. Since I assume that both the individual error terms (ϵ_i) and aggregate costs (C^*_t) are distributed lognormally, this approximation will hold for both the cross section and aggregate risk.

of the population may affect nursing home spending. All that is required for the theory is that the realization of risk is common to the set of insured individuals.

One important feature of equation (1) is that the variability is in the cost of nursing home care, not the markup of nursing home operators. If the change in spending were just due to changes in profits, the risk could be diversified by owning and operating nursing homes. When the variability is due to changes in costs, however, there is no way to diversify this risk.

Using equation (1), the variance of the logarithm of costs is:

$$Var(C_{i,t+k}) = var(C^{*}_{t+k}) + \sigma^2_{\epsilon}. \qquad (2)$$

Similarly, for a group of N individuals, the variance of the logarithm of average costs is:

$$Var(C_{N,t+k}) = var(C^{*}_{t+k}) + \frac{\sigma^2_{\epsilon}}{N}. \qquad (3)$$

Equations (2) and (3) are the basis for the provision of insurance in this market. There are several features of note.

Result 1: For any cohort of individuals, private long-term care insurance will pool cross section but not aggregate risk.

Every individual faces the cross section risk of nursing home utilization (σ^2_{ϵ}), while a group of people face only the average cross section risk (σ^2_{ϵ}/N). As the size of the insured pool (N) increases, the cross section risk becomes smaller. In an insurance market with no moral hazard, individuals will be fully insured against cross

section risk.[3]

Since the aggregate risk is common across individuals, the variance of average costs for a group ($\mathrm{Var}(c^*_{t+k})$) is the same as the variance of average cost for an individual. The aggregate risk of nursing home utilization thus does not decline with group size. Within a cohort, therefore, there can be no insurance for the average cost of nursing home care.

Result 2: The ability to pool cohorts intertemporally falls as the correlation of costs increases.

Even if there is aggregate risk in the cost of any cohort, an insurance company could attempt to pool the risk of different cohorts. If costs are serially uncorrelated, this effectively diversifies aggregate risk. As the serial correlation of costs increases, however, the ability to diversify risk by pooling cohorts falls.

Suppose, for example, that the logarithm of aggregate costs of long-term care are given by $c^*_{t+1}=\rho c^*_t+\eta_{t+1}$. For a large enough insurance company (large N), this will also be the average cost of the cohort at risk in t+1. Then, the logarithm of nursing home costs for the cohort at risk h years in the future is $c^*_{t+h}=\rho^h c^*_t+\Sigma_{j=0}^{h-1} \rho^j \eta_{t+h-j}$. Adding across cohorts, the logarithm of average costs for an insurance company pooling cohorts at risk from t+1 to t+k is $c^*_{t+1,t+k} = (\Sigma_{i=1}^{k} \rho^i)/k\ c^*_t + \Sigma_{i=1}^{k}(\Sigma_{j=0}^{i-1} \rho^j)/k\ \eta_{t+k+1-i}$. The first term

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[3] In the presence of moral hazard, the optimal insurance contract would involve a deductible and coinsurance rate, as in Zeckhauser (1970). I ignore these issues here.

is the predictable component; the second term is the unexpected component. The variance of this average is therefore:

$$var(C^{*}_{t+1,t+k}) = \frac{[\sum_{i=1}^{k}(\sum_{j=0}^{i-1}\rho^{j})^{2}]*\sigma^{2}_{\eta}}{k^{2}}. \qquad (4)$$

The average risk depends on the serial correlation of costs and the number of insured cohorts. If costs are serially uncorrelated ($\rho=0$), the variance of the average cost is σ^2_η/k, which is decreasing in k. This type of intertemporal smoothing is exactly analogous to cross section smoothing in standard insurance contexts.[4] If aggregate nursing home costs are a random walk ($\rho=1$), however, the variance of the average cost is $(\sigma^2_k/k^2)(\Sigma^k_{i=1}\ i^2)$, which is increasing in k. Thus, as the correlation of costs increases, pooling across cohorts increases the risk borne by insurers.

If costs are highly serially correlated, insurers will thus be unable to fully diversify aggregate risk. This is likely to lead to substantial restrictions on observed insurance policies. For example, insurers might guarantee a fixed dollar payment rather than a fixed level of care, to avoid exposure to cost risk. Similarly, insurers might not cover very long nursing home stays (for example, people

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[4] A typical example of such a risk structure would be a regionally-concentrated insurance company offering earthquake insurance. In the event of a claim, aggregate payments are likely to be large, but the total cost over many years can be forecast reasonably accurately.

with Alzheimer's Disease). Finally, insurers may set limits on total liabilities for any policy. In Section III, I document the use of many practices of this form in long-term care insurance.

II. How Large Is Aggregate Risk?

To examine the variability of aggregate risk empirically, one would ideally like data on the cost of a day in a nursing home over time. Unfortunately, these data are not available. I instead utilize a number of alternative sources of price data. The first source is average Medicare spending per day of nursing home care, which is available annually from 1967 to 1988 (Silverman, 1991).[5] Since Medicare pays for most of nursing home costs for recipients who qualify,[6] this should be a reasonable approximation to an average daily cost.

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[5] One could also construct average Medicaid spending per day. Since the amount that Medicaid pays varies by state and income of the recipient, this estimate is less likely to reflect the cost of a nursing home day.

[6] For the first twenty days of a Medicare-eligible admission, Medicare pays for the entire cost of care. For the next 80 days, Medicare pays cost less a coinsurance amount (about $67.50 per day in 1988). As Garber and MaCurdy (1991) report, about three-quarters of nursing home patients who qualify for Medicare are discharged by the 20th day. Thus, for at least most of the Medicare-eligible admissions, Medicare payment for nursing home care will be the total payment.

The Medicare data is only available for 21 years, however. I thus utilize alternative measures of medical care costs, taken from the components of the medical care CPI, which are available for a longer period of time.[7] I use a number of cost indices: the aggregate medical care CPI; the commodities component of the index (generally prescription drugs and other medical devices); the services component (medical personnel and hospital costs); and the indices of physican and hospital room charges (both components of the medical services component). Nursing home costs may be most similar to the cost of a hospital room, although some part of the cost is likely to reflect professional help and medical devices as well. The data from the medical care CPI are available annually from 1947 to 1991.

The first column of Table 1 shows the average nominal price increase for each cost series. Since the average inflation rate over the period was 4.1 percent, Table 1 demonstrates a large degree of relative price growth. The next three columns reports estimates of the first order autocorrelations for real medical costs. The equations are of the form:

$$\log(C_t^*) = \alpha + \rho * \log(C_{t-1}^*) + \eta_t. \qquad (5)$$

All of the cost series display a great deal of serial cor-

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[7] Several authors have noted that the medical care CPI is an imperfect measure of true health care costs (see Newhouse, 1989). I ignore these issues for this purpose.

relation. The estimates using nursing home costs imply that about 90 percent of a cost increase in a given year persists into the next year. The coefficient is statistically significantly different from 0, but not significantly different from 1. Since the measure of costs is formed with some error, even this degree of persistence is likely to be an underestimate.

The estimates using the medical care CPI indicate even a greater degree of persistence. All of the estimates are extremely close to 1, ranging from .97 (medical care commodities) to 1.05 (physician services). As with the nursing home cost series, all of the equations easily rejects the hypothesis that costs are serially uncorrelated. The random walk assumption thus appears to be more accurate than the assumption of independent costs over time.

In addition, the variance of the error term in nursing home costs and medical care costs is large. The standard deviation of the residual using the nursing home cost series is 5.2 percent. The standard deviation of cost innovations in the medical care CPI ranges from 1.5 to 2.9 percent. Large shocks to nursing home costs are not an uncommon occurrence.

A second important alternative to the random walk model is that costs are stationary around a constant trend. In this case, there would be substantially less uncertainty about future costs than in the random walk model. In the trend stationary model, the only source of risk would be the divergence of costs from trend, which is constant at all time horizons. In the random walk model, in

contrast, the uncertainty about future costs increases as the time horizon increases. To test the difference stationary model against the trend stationary alternative, I estimate augmented Dickey-Fuller tests (Dickey and Fuller, 1981). The test is based on an augmented form of equation (5):

$$\log(C_t^*) = \alpha + \rho * \log(C_{t-1}^*) + \beta * t + \delta * \Delta \log(C_{t-1}^*) + \eta_t, \qquad (5')$$

where I use 1 lag of cost innovations to control for residual correlation.[8] The null hypothesis of difference stationarity is that $\rho=1$, $\beta=0$. The alternative hypothesis is that costs are stationary around a constant trend ($\rho \neq 1$ or $\beta \neq 0$), potentially with an autoregressive component.

The last column of Table 1 shows the F-statistic for the null hypothesis that costs are difference stationary. The 5 percent critical value is 5.91 with 25 observations, and 5.61 with 50 observations. In both cases, the test fails to reject difference stationary. Most of the statistics are substantially below the critical value. The evidence thus strongly supports the difference stationary model for medical care costs over the trend stationary model.

Equations (4) and (5) naturally yield an estimate of the variability of average costs for an insurance company. Table 2 presents estimates of the standard deviation of the logarithm of

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[8] Adding additional lags of the change in costs had no effect on the test statistic and were not statistically significant in the regressions for cost growth.

average costs. The rows of the Table report different degrees of serial correlation, ranging from 0.8 to 1.0. The point estimates in Table 1 suggest that values of 0.9 to 1.0 are most appropriate. The columns report the number of cohorts insured, ranging from 10 to 30. Since most purchasers of long-term care insurance are just past retirement age, this is the appropriate horizon. The standard deviation of cost shocks is assumed to be that for the nursing home cost series, 5.2 percent.

The Table suggests a substantial amount of variability in average cost. For an insurance company insuring 20 cohorts of people, with a serial correlation of costs of 0.9, the standard deviation of average costs is 7.6 percent. This increases to about 14 percent if costs are a random walk, and does not change appreciably with the number of cohorts. Even using the medical care CPI series, with a serial correlation of 1 but a standard deivation of cost innovations one-quarter to one-half as large, yields a point estimate of the standard deviation of average costs of 4 to 8 percent. Cost uncertainty is thus an important component of nursing home risk.

A second source of aggregate risk is the average rate of nursing home utilization. Changes in the average institutionalization rate are likely to be particularly persistent since they largely reflect increases in the aggregate number of beds, rather than transitory increases in the need for nursing home care (Cutler and Sheiner, 1992).

Unfortunately, no annual data on nursing home days are

available. Table 3 presents evidence on average nursing home utilization for four years in which surveys were conducted: 1963, 1973-74, 1977, and 1985. The first row of the Table shows the aggregate institutionalization rate. The institutionalization rate increased about 75 percent from the early 1960s to the early 1970s, and since then has been relatively constant, at about 4.5 percent of the elderly population. The fact that so few elderly live in a nursing home is potentially a great source of risk to private insurers. Even a five percent increase in the share of the non-institutionalized elderly that required nursing home care, for example, would double private sector nursing home liabilities. For most medical care risks, in contrast, the share of people requiring care is larger, and thus the potential for large adverse cost shocks is smaller.

The next three rows show the institutionalization rate by age, and the last row shows the ratio of institutionalization of the oldest elderly to that of the younger elderly. The increase in utilization was reasonably constant across ages. In 1963, the oldest elderly were 19 times more likely to be in a nursing home than the younger elderly. In 1985, the oldest elderly were 18 times more likely to be in a nursing home. The fact that the institutionalization rate of the oldest elderly relative to the younger elderly has been essentially unchanged suggests that the dominant concern of private insurers is the aggregate risk of institutionalization, not the age-specific rate.

While the aggregate nursing home utilization rate has been constant since the 1970s, this stability may not be a long run

phenomenon. Throughout the 1970s and early 1980s, many states sought to control spending on nursing home beds by limiting the Certificate of Need determination that must accompany a Medicaid-certified bed (Neuschler and Gill, 1987). The stability of the aggregate nursing home utilization rate may largely reflect this political balance.

The importance of government policy in limiting utilization suggests that the variability of long run utilization may be greater than the short run variability. In response to public concern about the availability of long-term care, for example, governments may be induced to expand the number of nursing home beds. Indeed, increasing the extent of private insurance coverage may even increase the probability of this event, since the cost to Medicaid of bed expansions would fall as more people are insured. The possibility of large bed expansions, potentially due to increased private insurance, was cited by one actuary as a large source of risk in long-term care insurance.

III. Aggregate Risk in Long-Term Care Insurance Policies

In this section, I examine the provisions in long-term care policies relating to the diversification of intertemporal risk. I consider how existing long-term care policies insure aggregate risk, and the characteristics of insurance companies that offer the most extensive intertemporal insurance. I use data on the characteristics

of 73 long-term care policies sold by 38 companies in 1991. All of the policies are sold to individuals. Forty-six policies cover home health care as well as nursing home care; the remainder cover only nursing home care. The data were compiled by the Consumers Union (1988, 1991), as part of their recommendations on long-term care insurance.

Many more companies sell long-term care insurance than are contained in this sample. About 150 companies marketed long-term care insurance in 1991. Sales of long-term care policies are highly concentrated, however. The Health Insurance Association of America estimates that in 1991 the top 12 sellers of long-term care insurance accounted for three-quarters of all policies.[9] The nine largest sellers of long-term care insurance account for over half of sales. Eight of these companies are in my sample; the ninth (Aetna) no longer sells individual policies. Indeed, in the state of Massachusetts, which has a relatively old population,[10] only 7 companies are licensed to sell long-term care insurance (6 are in the sample; the seventh obtained approval after the sample was

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[9] The HIAA does not release the name of these companies, however, so I do not know if all of them are in my sample.

[10] In 1989, 13.8 percent of the population of Massachusetts is above age 65, compared to 12.5 percent nationally.

compiled).[11] In Florida, only 31 companies are licensed to sell long-term care insurance (17 are in the sample). Thus, the policies for which I have data appear to be representative of the types of policies outstanding.

Long-term care policies are generally distinguished along four dimensions. The first dimension is the set of services covered. A typical policy, for example, will cover skilled, intermediate, and custodial care facilities up to $80 per day, and home or other noninstitutional care up to $40 per day. The facilities covered are relatively standard; there is generally a range of options for the base payment, from about $50 to $150 per day for institutional care.

The second dimension is the waiting period for pre-existing conditions. Many policies, for example, impose a 6 month period before which pre-existing conditions are not covered. Others exclude some types of pre-existing conditions entirely. The third dimension is the requirement for receiving benefits. Most policies require a deductible of about 20 to 30 days of institutionalization before insurance pays. Some policies require that the institutionalization be preceded by a hospital stay, although this is now illegal in many states. In most states, policies are also required to cover institutionalized due to Alzheimer's disease, although prior

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[11] Many additional companies have recently applied to sell long-term care insurance in the state, as regulations have become more standard nationally.

to state mandates many policies did not.[12] Finally, many policies require specific illnesses or levels of sickness to qualify for payment. A common practice, for example, is to require a given number of impairments in Activities of Daily Living before insurance can begin.[13] These types of restrictions are designed to limit the moral hazard resulting from insurance.

The final dimension is the increase in benefits over time. Policies with generous increases in benefits over time are at greater risk from potential increases in nursing home costs or utilization. I thus use the provisions for benefit increases as the measure of the insurability of aggregate risk. Table 4 shows these provisions. The table reports the number of policies having each characteristic in 1988 and 1991.

The first characteristic is the way that benefits are updated over time.[14] Most policies offer some ability to increase benefits. Of the 73 policies outstanding in 1991, for example, only 1 had no allowable increase in benefits. The benefit increase can take several

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[12] In 1988, 30 of the 53 of the policies did not cover nursing home use related to Alzheimer's disease.

[13] There are nine potential impairments in Activities of Daily Living: eating; getting in or out of bed; getting in or out of chairs; walking around inside; going outside; dressing; bathing; using the toilet; and controlling bowel movements or urination.

[14] This characteristic is often termed an "inflation-protection" provision. Since I distinguish between nursing home and general inflation, I do not use this terminology.

forms, however. Some policies (11 percent) offered the right to buy increased coverage (for example to increase payment from $80 to $100 per day) in the future, at the then-current prices. Under this policy, all of the price risk is assumed by the purchaser.

More commonly, policies allow for a pre-determined increase in benefits over time, generally 5 percent annually. In 56 percent of the policies, the benefit increase is a simple annual amount (for example, an increase of $4 annually). Thirty percent of the policies have a compound benefit increase. From a risk perspective, the difference between these two options is the weight placed on near-term versus future nursing home stays. The compound benefit increase pays relatively more for stays farther in the future. If forecasts of nursing home utilization many years in the future are less certain than forecasts in the short term, the compound updating increases the risk of the insurer.[15]

The last row shows the number of policies offering to pay the cost of care.[16] Strikingly, only one policy (offered by the

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[15] In addition to utilization risk, there is uncertainty about the share of people that will allow their policy to lapse. Most insurers assume that up to 50 percent of policyholders will let their insurance lapse within 10 years, and that lapse rates will remain about 5 percent in steady state.

[16] A number of policies offer to pay full costs up to some designated amount (for example, $80 per day). Other policies offer to update benefits using the increase in Consumer Price Index. I do not count these policies as paying the cost of care, since the risk of nursing home price increases is not fully borne by the insurance

Atlantic and Pacific Insurance Company) has this feature.[17] In fact, however, by early 1992 the company had failed and the policies were taken over by the state insurance regulator. There are thus no current policies which guarantee the cost of nursing home care at the time of need. Clearly, the market does not want to insure the price risk in long-term care.

The second characteristic is the time period over which benefits increase. Not all policies increase benefits for the life of the policy. Thirty-two percent of the policies, for example, have a fixed time period (generally 10 to 20 years) during which benefits increase. Since the typical purchaser of a long-term care insurance policy is about 70 years old, the benefit increases are thus designed to last until about age 85, just when high utilization begins. Several of the policies (5.5 percent) make this link explicit, by increasing benefits until age 85 or age 86. Finally, some policies use a combination of age- and year-based mechanisms to determine the period of benefit increase.[18] Less than half of the policies increase benefits throughout the lifetime of the individual.

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company.

[17] This policy did impose a $500,000 maximum payment over the lifetime of insured.

[18] One type of combination mechanisms is that benefits increase for either 20 years or the person reaches age 85. The other mechanism is that benefits increase until the later of 20 years or age 85.

These restrictions on benefit increases also serve to limit the insurance company's exposure to aggregate risk. If benefits increase only until age 85, the insurance company can accurately forecast the nominal benefit payment at time of high utilization. If benefits increase past age 85, however, the risk of increased utilization is magnified by the level of benefits people will receive at use.

The third characteristic is whether the premiums are guaranteed over the life of the policy. In most states, long-term care insurance policies must be guaranteed renewable -- the insurance cannot be cancelled in response to changes in health status or utilization.[19] Further, most policies guarantee the price of the policy provided there is no increase in aggregate loss. Almost all of the policies, however, allow the insurance company to increase the rates of everyone in a class if the loss experience is greater than anticipated.[20] A number of companies have used this provision in the past several years. In 1990, for example, there were an average of 2.4 rate increase requests per state, of which most (92 perccent) were granted. Only three policies guarantee no rate increase for three years (two from New York Life and one from Standard Life

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[19] In 1988, in contrast, 13 of the 53 plans did not offer this feature.

[20] A class of people is generally considered all the people with a given policy in a state, although there is no requirement that the group be defined in this way.

and Accident), and only two policies guarantee the rate forever (both from CONSERV, a subsidiary of Blue Cross of Western Pennsylvania). The remaining policies all allow for price increases if costs increase beyond expectations.

The last characteristic is the maximum payment of the insurance company. While some policies have no restrictions on lifetime use of long-term care, other policies impose a cap on total use. The caps are either on nursing home care and home health care separately, or on total use of either benefit. Unfortunately, the data for 1991 do not indicate how many policies allowed unlimited amounts of care. In the 1988 survey, however, only 30 percent of the policies offered unlimited benefits as an option. In a 1990 survey, the Health Insurance Association of America found that only 5 of the 12 largest long-term care insurers (42 percent) offered an unlimited benefit option (Health Insurance Association of America, 1991).

Maximum benefit periods typically range from 2 to 5 years. A large share of people, and even larger share of potential costs, are likely to be affected by these caps. Dick, Garber and MaCurdy (1992) estimate that 10 percent of the population reaching age 65 will be in a nursing home over two years, and about 5 percent will be in a nursing home over 5 years. One large long-term care insurer charges 31 percent more for a 5 year maximum than a 2 year maximum, and 73 percent more for unlimited benefits relative to a 2 year maximum.

The imposition of maximum benefits on insurance payments is not unique to long-term care, although the limitation of benefits to fixed dollar amounts appears to be. As the United States House of Representatives (1988) reports, only 26 percent of employer-provided health insurance plans have an unlimited lifetime service benefit. Three percent of plans have a cap under $250,000, 11 perccent have a cap of $250,000, 16 percent have a cap between $125,000 and $750,000, and 44 percent have a cap of $1 million or more. Thus, in the component of general health insurance policies that is not specific to one year, insurers impose limitations similar to those for long-term care.

Although current insurance policies do not fully insure long-term care risk, one might wonder whether this is just because the field is relatively new. As knowledge of underlying risks increases, the market might incorporate more adequate insurance. One way of addressing this question is to look at the development of policies to date. There have been substantial changes in long-term care provisions over time (Health Insurance Association of America, 1989). Explicit triggering events, such as prior hospitalization requirements, have generally been replaced by assessments of functional status or physician certification of need for nursing home care. Coverage for cognitive impairments has also expanded.

The changes regarding benefit increases over time have been smaller, however. As the first panel of Table 4 indicates, there has been a dramatic decline in the number of policies not allowing any

benefit increase, from 50 percent in 1988 to 1 percent in 1991. The addition of benefit increases, however, has been exclusively towards predetermined increases. While only 32 percent of the policies had a predetermined increase in 1988,[21] almost 90 percent had such an option in 1991. In contrast, there has been no increase in the number of policies paying the cost of care. Indeed, while two of the policies guaranteed actual costs in 1988, only one did so in 1991.[22] There has thus been no increase in the willingness of private insurers to fully insure nursing home costs.

A. Which Companies Offer the Most Extensive Insurance?

While the evidence above is consistent with the intertemporal risk explanation, it is not conclusive. An alternative explanation is that consumers are uninformed about true risks and thus do not demand policies with better indexed benefits. Several insurance companies, for example, have cited insufficient demand as the reason for not offering more generous benefit increases (Consumers Union, 1991).

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[21] Data are not available on the specific form of the benefit increase for these policies, but most of the increases during this period were simple increases over time.

[22] One of the companies in the 1988 survey dropped that provision by the 1991 survey. The other company dropped individual policies entirely.

One test of the intertemporal risk explanation is to examine which companies offer more generous benefit increases. Since long-term care insurance is a relatively small part of total insurance, companies with greater reserves should be less averse to bearing aggregate risk than companies with smaller reserves. Thus, the probability of more generous benefit increases should increase with company size.[23]

To examine this prediction, I gathered data on the size of companies offering long-term care insurance. For each of the companies except those affiliated with Blue Cross (4 companies, representing 5 insurance policies), A.M. Best (1991) provides a financial size category, defined as policyholders' surplus plus reserve funds.[24] Firms are grouped into 15 categories, with higher numbers signifying greater surplus. The mean policy is by a firm in category 7.

Since larger firms also tend to be more stable and are potentially more knowledgable about the industry, they may be able to introduce riskier policies for other reasons. To control for other

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[23] A more accurate measure of ability to bear risk would be the share of the company's expected costs that are accounted for by long-term care policies. Since this ratio is unavailable, however, I use the firm size instead.

[24] Best's cautions that "to provide stability and safety, an insurer should limit its maximum loss exposure on a single risk (or group or related risks) to a small percentage of its policyholders' surplus, normally less than 2 percent" (p. xiii).

factors, I include an indicator variable for whether the firm received an A or A+ rating from Best's. The rating is based on measures of profitability, leverage, risk spreading, and similar features. The theory predicts that the financial size of the firm, not its overall rating, should affect the ability to bear aggregate risk. More knowledgeable firms, or firms that are more stable, may be better represented by a good rating than by large size. Twenty-three firms received an A or A+ from Best's; 11 were below that level.

I use these variables to predict two characteristics in Table 4.[25] The first is the type of benefit increase: the right to buy coverage at future prices; simple benefit increases; or compound benefit increases.[26] Since these choices follow a natural progression, I use an ordered logit model. The second characteristic is whether benefits are allowed to increase every year, or whether the increases stop at a given age or year. I estimate a logit model for this choice.

Table 5 presents results predicting these characteristics. The Table shows that financial size does predict the decision to bear some intertemporal risk, but that the overall rating does not. Firms that are larger financially are more likely to offer better indexed

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[25] The third characteristic, whether rates are fixed for the life of the policy, had too little variation to be estimated.

[26] I include the one firm that had no benefit increase in the first group and the one firm that paid the cost of care in the last group. These changes had no effect on the results.

benefits. Moving from category 7 to category 8, for example, increases the probability of offering compound benefits by 4.3 percentage points.[27] Since the mean probability of offering compound benefits is about 35 percent, this increase is about 12 percent of the average probability. Similarly, firms with greater surplus are more likely to offer unlimited benefit increases. The change in this probability is about 2.6 percentage points, about 14 percent of the base level. These results thus suggests that a firm's ability to diversify cost risk is important in explaining the policies that the firm offers.

B. What Is The Risk Premium In Long-Term Care Insurance?

An additional test of the intertemporal risk explanation is to examine the risk premium required by insurers underwriting long-term care. If long-term care is riskier to underwrite than other lines of insurance, the risk premium on long-term care policies should be greater than for other risks. Conversely, if long-term care insurance is no riskier than other forms of insurance, the risk premium should be similar to that for other policies.

To determine the risk premium in long-term care insurance, I examined the actuarial memoranda of the seven companies licensed to sell long-term care insurance in Massachusetts. Before selling

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[27] This calculation assumes the firm is rated A or A+ overall.

insurance, companies must document the actuarial assumptions they use, including a justification of the premium. Generally, the premium for a policy issued to a person of age x is based on an equation of the form:

$$P(x) = \frac{\sum_{t=0}^{T} N_t(x)[C_t(x)+F_t](1+r)^{-t} + \sum_{t=0}^{T} N_t(x)[R_t(x)-R_{t-1}(x)](1+r)^{-t}}{\sum_{t=0}^{T} N_t(x)[1-v_t-\pi](1+r)^{-t}}. \quad (6)$$

There are three components to the premium. The first is the expected cost of the policy, which is the sum of claims costs (C_t) and fixed costs of acquisition and marketing (F_t). Costs are discounted both for time (r) and for the number of policies in force ($N_t(x)$). The second component is the present value of the change in life reserves ($R_t(x)$). The last component is the variable cost, including commissions, taxes, and claims processing (v_t), and profits (π).

With enough detail on expenses and claim costs, it is in principle possible to estimate the profit rate in equation (6) for each company. Table 6 presents estimates of administrative costs in these policies. The first column shows a summary measure of total administrative costs, the load factor for the policy. The load factor is defined as the present value of expected premiums divided by the present value of expected claims. On average, premiums are expected to be 65 percent greater than paid claims. The middle

columns show the variable cost component of expenses. Variable costs account for 75 percent of the first year premium, 18 percent of the subsequent four years premiums, and 14 percent of premiums after that. Variable cost is substantially accounted for by commissions. Commissions average almost 50 percent of the first year's premium and about 10 to 15 percent of the premium in renewal years. The last two columns detail the fixed costs. One time costs such as marketing and processing are about $200. Annual maintenance costs are about $40.

These estimates of administrative costs are similar to others in the literature. Shearer (1989) found that administrative costs account for about 50 percent of long-term care insurance premia. Similarly, the United States House of Representatives (1991) estimated that commissions were 60 percent of fist year premiums and 11 percent of renewal year premiums.

While administrative costs are presented in some detail, only three of the companies provided information about profits in their filings. The first company indicated a profit rate of 9.56 percent on its nursing home policy and 10.11 percent on its companion home health care policy. The other two companies indicated profit margins of 5 percent on their long-term care policy.

To examine whether these profit rates are large or small, a natural alternative is to estimate the risk premium on other lines of insurance, where there is no intertemporal risk. For two of the three companies, I obtained profit rates for Medicare supplemental

insurance (termed "Medigap" policies) for the elderly.[28] This policy covers hospital deductibles and physician copayments required by Medicare, as well as prescription drugs and other medical devices; it does not cover extensive nursing home care.[29] For the company with a 9.56 percent profit rate on long-term care, the profit rate on its Medicare supplemental insurance was 5.35 percent. For one of the companies with a 5 percent profit rate on long-term care, the profit rate on its Medicare supplemental insurance was 3 percent. Indeed, the same company also targetted a 3 percent profit rate for catastophic medical coverage and individual accident coverage as well. Long-term care insurance thus appears to command a larger risk premium than other forms of health insurance without the intertemporal risk, even when the group that is insured is the same.

While these profit rates are indicative of additional compensation for bearing intertemporal risk, they are likely to be substantially understated. Since actuarial memoranda are publicly available in many states, companies may want to minimize their reported profit and increase expected costs in other areas. Similarly, many states mandate maximum load factors on long-term care insurance,

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[28] The other company did not file sufficiently detailed information to determine the profit rate.

[29] The policies do, however, cover the Medicare copayment required during part of a stay reimbursed by Medicare. This portion of nursing home coverage is relatively minor, however.

or equivalently, minimum "loss ratios", the ratio of expected claims to expected premiums. A common mandate, for example, is for a 60 percent loss ratio (corresponding to a load factor of 1.67). Since most insurers are at the minimum loss ratio, they are prohibited from increasing their profit margin. In response, insurers may inflate expected claims and thus increase premiums without lowering the loss ratio.[30] This would increase true profits but not reported profit margins. Unfortunately, it is difficult to detect this type of behavior in regulatory filings, although there has been some speculation that it occurs (Trapnell, 1990).

Even if claim costs are overstated, however, long-term care policies still appear to have a greater load factor than other forms of insurance. The Congressional Research Service (1988), for example, estimates that load factors for acute care medical insurance bought by groups of four or fewer people is 40 percent.[31] Since three-quarters of long-term care purchasers are individuals rather than groups (Employee Benefit Research Institute, 1991), this load

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[30] One way this can be done is to lower the expected interest rate, thus placing greater weight on future costs. Alternatively, companies may lower the expected lapse rate, to increase the pool of claimants relative to initial purchasers. Since lapse rates are generally very large (between 15 and 25 percent in the first year and about 5 percent per year in steady state), this also has a large effect on expected costs.

[31] For groups of over 10,000, in contrast, the average transactions cost is about 4 percent.

factor is the most relevant comparison. Similarly, Friedman and Warshawsky (1988) estimate that the load factor on sales of annuities is about 1.18 to 1.33. Like long-term care insurance, annuities are generally sold individually and to people near retirement age, implying that administrative costs for the two lines of insurance may be similar. The fact that the load factor is greater on long-term care insurance than on either of the other forms of insurance suggests that long-term care insurance may require a greater risk premium than insuring other risks.

Thus, two distinct methods of estimating the risk premium on long-term care both suggest greater risk than other lines of insurance. In their actuarial filings with states, insurance companies typically indicate a larger profit margin for long-term care than for insurance without the intertemporal risk. Similarly, the load factor for long term care is larger than for major medical insurance and substantially larger than for individual annuities, markets with much less intertemporal risk. Both of these findings add to the view that aggregate risk is one cause of the lack of complete long-term care insurance. In the next section, I consider the implications of intertemporal risk for the low rate of long-term care purchase.

IV. Explaining the Low Rate of Private Insurance

Long-term care insurance policies were first sold in the early 1970s but did not become popular until the mid-1980s. The Reagan

Administration encouraged the development of private polices as a means of financing long-term care (Health Care Financing Administration, 1984), and many states have done so as well (Somers and Merrill, 1991; McCall, Knickman, and Bauer, 1991; Freudenheim, 1992). To date, however, the long-term care insurance market has not been particularly extensive. Less than 1 percent of the total population, and only 4 percent of the elderly currently have long-term care insurance (Employee Benefit Research Institute, 1991). In contrast, about three-quarters of the elderly purchase Medicare supplemental insurance policies (which cover deductibles and copayments required under Medicare), and about 75 percent of the non-elderly have private health insurance coverage.

This failure of insurance has puzzled many observers because the variability of long-term care needs is so large (Scanlon, 1992). In a random sample of deaths in 1986, for example, two-thirds of the population dieing over age 65 had no nursing home utilization in their life. Among those that did use a nursing home, however, 34 percent were in the nursing home between 1 and 5 years, and 21 percent were in the nursing home beyond five years (Kemper and Murtaugh, 1991). Similarly, Dick, Garber, and MaCurdy (1992) estimate that the median person reaching age 65 will die without any nursing home utilization, but that five percent of the population will be in a nursing home over 50 months, and 1 percent will be in a nursing home over 111 months. The range of long-term care needs is thus substantial.

A variety of explanations have been offered for the failure of widespread long-term care insurance. One explanation is problems of information -- the elderly may not know they are at risk for long-term care expenses. In 1984, for example, about three-quarters of the elderly believed that Medicare would cover long-term care expenses. In a 1986 survey, one-quarter of the elderly responded similarly. In fact, Medicare covers nursing home stays only if use is rehabilitative and related to an acute care hospital admission, and only for a maximum of 100 days. It is difficult to believe that information problems are the source of low insurance rates, however. In other surveys, between 40 and 70 percent of the elderly express interest in purchasing long-term care insurance, suggesting some knowledge of private risk. Further, if information problems were the only barrier, one would expect advertizing by insurance companies to inform the elderly of the true risk.

A second explanation for the failure of insurance is that it would be prohibitively expensive. With insurance costs of about $2000 annually (if purchased at age 65), many elderly may be unable to afford a policy. Rivlin and Weiner (1988) estimate that up to 20 percent of the current elderly have at least $10,000 in assets and could purchase insurance for less than five percent of current income, and that 50 percent of the elderly will be able to purchase insurance by 2000. Similarly, a Families USA study suggested that 27 percent of the elderly between ages 65 and 79 could purchase long-term care insurance for less than 10 percent of

current income (Hagen, 1990). Lack of income does not appear to be a large barrier to the purchase of long-term care insurance.

A third explanation for the failure of insurance is moral hazard and adverse selection. These problems are likely to be particularly severe since many of the disabilities of the elderly are chronic, making it difficult to identify an exact time when institutionalization is necessary. Insurance companies may thus be unable to limit use appropriately. In addition, views about the value of a nursing home are likely to vary in the population, suggesting the potential for adverse selection.[32]

Several arguments suggest that moral hazard and adverse selection are not the dominant factors in this market, however. First, as the last section noted, insurance companies have substantial latitude to impose pre-existing conditions or other costs before beginning payment for long-term care. One large insurer estimates that these exclusions lower claims by 40 percent in the first year of a policy, 16 percent in the second year of a policy, and 10 percent in the third year of a policy. Indeed, insurers commonly use annuity-adjusted life tables in forecasting the mortality experience of

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[32] In a survey of the disabled elderly in 1982, for example, 7 percent of the respondents disagreed with the statement that "People go to nursing homes only when there is no other place to live". Similarly, 22 percent disagreed that "Nursing homes are lonely places to live in", and 30 percent agreed that "There are lots of things to do in a nursing home to keep people busy". A large share of the elderly may thus be predisposed to enter a nursing home when they get older.

long-term care insurance purchasers.

Second, if adverse selection were a large problem, one would expect policies to be oriented more to the young than to the old, since younger individuals are less likely to be able to forecast their health status late in life. In fact, however, the average age of a long-term care policy holder is 69 years old (Employee Benefit Research Institute, 1991), and the average age of an individual purchaser between 65 and 70. Indeed, many insurance companies have a minimum age below which they will not insure people (generally about 40 years old). Evidently, insurance companies prefer an older pool of buyers to a younger pool.

Third, while existing empirical evidence suggests some adverse selection in insurance purchasers, other evidence suggests that the amount of selection is not particularly large. In a sample of individuals who purchased a long-term care insurance policy in 1990, for example, 34 percent thought they were at least 50 percent likely to use a nursing home for longer than six months. Among individuals who inquired about a long-term care insurance policy but did not purchase one, 27 percent thought they were likely to need that level of care (Lifeplans, 1992).[33]

A fourth explanation for the failure of long-term care

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[33] In a question about the probability of needing home health care, 32 percent of the purchasers thought they were likely to use this service, compared to 31 percent of the non-purchasers. This suggests that the difference in the likelihood of institutionalization accurately reflects the size of adverse selection.

insurance is that individuals know that the government will pay for them if they need substantial care, or that individuals want to insure appropriate treatment by other members of the family should they need chronic care (Pauly, 1990). Most government payment occurs only if an individual is poor enough to qualify and only after the individual has devoted most of their income to nursing home care (Cutler and Sheiner, 1992). For individuals expecting government payment, private long-term care insurance is like a tax on total income. The individual can either pay for private coverage, or use the money for other purposes and receive government support. To the extent that Medicaid pays for less generous care than private insurance, there will be some demand for private insurance, but the inability to buy policies that supplement Medicaid would make the cost of increments to Medicaid coverage very large.

It is difficult to evaluate the importance of this effect with existing data. Data on the income elasticity of insurance demand are likely to combine variation in desired quality of nursing homes with variation in the probability of receiving government funding. Since Medicaid eligibility rules differ by state, it is in principle possible to examine how these rules affect the decision to purchase insurance. Unfortunately, data on the distribution of insurance purchasers by state are not available. Exploring this hypothesis empirically is an important direction for future research.

The results here suggest an additional explanation for the failure of private insurance. Because price risk is not fully covered

in existing insurance contracts, insurance is limited in value. With large transactions costs, this limited value may be less than the cost of the policy, resulting in a low rate of insurance.

Indeed, there is some survey evidence suggesting the failure of benefits to increase with costs is important in not purchasing long-term care insurance. In a Lifeplans (1992) survey of approximately 1800 people who obtained information about long-term care insurance but did not purchase one,[34] 88 percent of the respondents thought that "I don't think benefits will keep up with inflation" was important or very important in their decision.[35] This explanation was tied for the second highest percent, along with the response that "It is hard for me to know what a good policy is". The explanation that most non-purchasers cited as important or very important was "The policy costs too much" (91 percent). A great deal of the elderly thus do not have confidence in the ability of long-term care benefits to meet future costs.

V. Conclusions

A great deal of interest has been generated by the failure of private markets to adequately insure long-term care. With a

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[34] The sample is not random among the elderly, but does reflect the opinions of those contemplating purchase.

[35] The other choices were not very important, and not at all important.

substantial increase in the aged population expected in the next half century, the ability of the private sector to provide for old-age has become a substantial policy concern (Cutler, Poterba, Sheiner, and Summers, 1990).

This paper suggests that the failure of widespread long-term care insurance is endemic to the private market. Since aggregate risks are large in this market, private insurance is hampered by an inability to diversify a substantial risk component. Empirically, almost no long-term care insurance pays for the actual cost of long-term care. Rather, insurers appear to target the nominal price that they will pay, through limits on cost increases over time, through maximum lifetime benefit payments, and through reserving the right to adjust premiums in response to adverse cost shocks. This inability to fully diversify long-term care risk may potentially explain the failure of private long-term care insurance.

The inability of the private market to fully insure long-term care also suggests a natural role for government policy. The government may be better able to insure long-term care because it can adjust the payment of different generations *ex post* in response to unobserved cost shocks. If nursing home costs increase in a market with private insurance, for example, those currently insured must receive less in the way of benefits. Under a government program, however, taxes on the young can be raised, or debt can be issued. In this way, the additional liabilities can be spread across any number of generations.

The drawback to government insurance is the deadweight loss associated with the tax collection. This loss is absent in the private market, where individuals perceive the value of their insurance contribution when they make it. The net benefit of the public program is thus the value of aggregate insurance less the deadweight costs of public provision. Empirically estimating the size of these effects is an important unresolved issue in evaluating the merits of social insurance.

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Table 1: Serial Correlation of Medical Care Costs

Cost Measure	Average Annual Cost Increase	Constant	$\log(C^*_{t-1})$	σ_η	F-value: Difference Stationary
1. Nursing Home Costs (1967-1988)	8.3%	.558 (.518)	.867 (.129)	.052	1.32
2. Medical Care CPI (1947-1991)	5.9	.028 (.004)	1.049 (.013)	.015	1.94
A. Medical Care Commodities (1947-1991)	3.5	.000 (.006)	.970 (.019)	.029	1.11
B. Medical Care Services (1947-1991)	6.2	.030 (.004)	1.030 (.010)	.016	1.80
(1) Physicians Services (1947-1991)	5.6	.025 (.004)	1.050 (.013)	.015	2.01
(2) Hospital Room (1947-1991)	8.9	.048 (.007)	1.001 (.007)	.028	4.46

Note: The table reports coefficients from regressions of the form:

$$\log(C_t^*) = \alpha + \rho * \log(C_{t-1}^*) + \eta_t.$$

The last column presents the F-statistic for the null hypothesis that costs are difference stationary relative to the alternative hypothesis that costs are trend stationary. The test is an augmented Dickey-Fuller test (Dickey and Fuller, 1981). The 5 percent critical value is 5.91 with 25 observations, and 5.61 with 50 observations.

Table 2: Standard Deviation of Average Costs

Correlation of Costs (ρ)	Numbers of Cohorts Insured (k)		
	10	20	30
0.8	.056	.049	.043
0.9	.075	.076	.072
1.0	.103	.141	.170

Note: The Table shows the standard deviation of the logarithm of average nursing home costs for an insurance company. The standard deviation is

$$\sigma_{C^{*}_{t+1,t+k}} = [\sum_{i=1}^{k} (\sum_{j=0}^{i-1} \rho^{j})^{2}]^{1/2} * \sigma_{\eta}/k.$$

The number of cohorts (k) is in the column, and the serial correlation of costs (ρ) is in the row. The standard deviation of cost innovations (σ_{η}) is 5.2 percent.

Table 3: Institutionalization Rates by Age
(per 1000 population)

	Year			
Age	1963	1973-74	1977	1985
All	25.4	44.7	47.1	46.2
65-74	7.9	12.3	14.4	12.5
75-84	39.6	57.7	64.0	57.7
85+	148.4	257.3	225.9	220.3
Ratio: 85+/65-74	18.8	20.9	15.7	17.6

Note: The institutionalization rates are calculated from national surveys in the indicated years. Data are compiled in U.S. Department of Health and Human Services, Public Health Service (1988).

Table 4: Characteristics of Long-Term Care Insurance Policies

Characteristic	1988		1991	
	Number	Percent	Number	Percent
Number of Policies	53	100%	73	100%
Method of Benefit Increase Over Time				
None	28	52.8	1	1.4
Right to buy more at future price	6	11.3	8	11.0
Simple benefit increase	17	32.1	41	56.2
Compound benefit increase			22	30.1
Pays cost of care	2[1]	3.8	1	1.4
Time Period During which Benefits Increase				
Fixed number of years (10,15,20)	---	---	23	31.5
Fixed age (85,86)	---	---	4	5.5
Combination of (years,age)	---	---	13	17.8
Unlimited increase	---	---	33	45.2
Allowable Rate Increase				
Rates not guaranteed	---	---	68	93.2
Rates guaranteed for 3 years	---	---	3	4.1
Rates guaranteed for life	---	---	2	2.7
Maximum Benefits				
Limited Benefits	37	69.8	---	---
Unlimited Benefits	16	30.2	---	---

Note: The Table shows the provisions of long-term care insurance policies for insuring aggregate risk. Data are from Consumers Union (1988, 1991).

[1] One policy pays 75 percent of nursing home charges.

Table 5: Predictions of Insurance Provisions

Dependent Variable	Model	Firm Characteristics: Financial Size	Firm Characteristics: Rating of A or A+	Constant: Constant	Constant: Cutoff-1	Constant: Cutoff-2	Pseudo-R^2
Method of Benefit Increase	Ordered Logit	.182** (.091)	.159 (.717)	---	-1.175** (.565)	2.033** (.566)	.045
Time Period of Benefit Increase	Logit	.163* (.097)	-.612 (.876)	-2.008** (.634)	---	---	.079

Note: The first row reports ordered logit estimates for the method of benefit increase: no increase or the right to buy at future prices; simple benefit increase; and compound benefit increase or payment of cost of care. The second row reports logit estimates for the time period of benefits increases. A 1 indicates an unlimited time period, and a 0 indicates any time restriction. The financial size category ranges from 1 to 15. Both the size class and the overall rating are from A.M. Best (1991).

* Statistically significant at the 10 percent level or better.
** Statistically significant at the 5 percent level or better.

Table 6: Administrative Costs In Long-Term Care Policies

Company	Load Factor	Variable Costs (percent of premium)						Fixed Costs ($)	
		Commission Expense			Total Expense				
		Year 1	Years 2-5	Years 6+	Year 1	Years 2-5	Years 6+	Year 1	Years 2+
A	1.67	65.0%	19.0%	19.0%	67.5%	21.5%	21.5%	$230	$50
B	1.54	35.0	10.0[1]	5.0	42.9	19.9	12.9	229	16
C	1.67	65.0	20.0	20.0	67.5	22.5	22.5	108	24
D	---	38.0	10.0	1.4	117.0	19.8	9.1	370	70
E	---	50.0	15.0	15.0	97.0	7.0	7.0	64	14
F	1.67	40.0	10.0	10.0	67.5	22.5	22.5	149	25
G	1.67	43.75	10.6	2.5[2]	66.75	10.6	2.5[2]	235	50
Average	1.64	48%	14%	10%	75%	18%	14%	$198	$36

Note: The table shows administrative costs for long-term care policies. The load factor is the ratio of expected premiums to expected costs over the life of the policy. All data are from actuarial memoranda filed by the companies.

[1] Commission is 15 percent in the second year, 10 percent in the third year, and 5 percent in the fourth and fifth years.
[2] Cost is 10 percent in years 6 through 10 and 2.5 percent beyond 10 years.