Dynamic Inefficiencies in Insurance Markets: Evidence from Long-Term Care Insurance

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Most analyses of insurance market failures have been implemented in a one-period (static) setting, with considerably less attention devoted to problems arising in a multi-period (dynamic) context. In a dynamic framework, risk-averse individuals benefit not only from period-by-period "event" insurance, but also from insurance against becoming a bad risk and being reclassified into a higher-risk group with a concomitant increase in premiums. We refer to this latter possibility as "reclassification risk."[1] From an *ex ante* perspective, insurance against reclassification risk can provide substantial welfare benefits (Jack Hirshliefer, 1971).

Contracts that provide full insurance against reclassification risk are easily constructed in theory (John Cochrane, 1995; Mark Pauly et al., 1995), but it is unclear whether they exist in practice. We examine the private market for long-term care insurance in the United States and present empirical evidence suggesting that it does not provide full insurance against reclassification risk. Specifically, we find evidence of risk-based dynamic selection; individuals who drop their long-term care insurance contracts are, *ex post,* of substantially lower risk than originally identical-looking individuals who retain coverage. Because premiums must cover the expected cost to the insurer, those who become "bad risks" and stay in the market pay premiums reflecting the nature of the retained risk pool, thus precluding full insurance against reclassification risk.

The long-term care insurance market is a particularly attractive setting for studying these issues. Most insurance markets are heavily regulated, and Cochrane (1995) has argued that such regulation is the primary impediment to their provision of insurance against reclassification risk. However, the long-term care insurance market is essentially unregulated over the period of our study (Jeffrey Brown and Finkelstein, 2004).

There is also substantial reclassification risk in this market that might potentially be insured. In particular, individuals in observably poor health, such as those who have limitations of activities of daily living or require the assistance of devices such as a wheelchair, tend to be denied insurance coverage altogether (Christopher Murtaugh et al., 1995; Weiss Rating Inc., 2002).[2] Using data from the 2000 Health and Retirement Survey, we estimate that the risk of ineligibility increases sharply with age, from only 8 percent of 50–54-year-olds to 33 percent of individuals aged 75 and older.

More generally, the market for long-term care insurance is of substantial interest in its own right. With annual expenditures of $135 billion in 2004 (one third of which are paid for out of pocket), long-term care expenditures currently represent one of the largest uninsured risks facing the elderly in the United States (Congressional Budget Office, 2004). Only 10 percent of the elderly have any private long-term care insurance (Brown and Finkelstein, 2004). As the population ages, the nature of the long-term care insurance market will have profound implications for the well-being of both the elderly and their children. Our attention to the dynamic aspects of coverage highlights the problem of underinsurance not only against the "event risk" of long-term care use, but also the risk of reclassification. Our evidence of

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[1] Cochrane (1995) refers to it as "premium risk."

[2] This practice is surprising given the absence of pricing regulation preventing the offering of high prices. Brown and Finkelstein (2004) discuss a variety of potential explanations.

dynamic market failures also suggests a potentially important factor in limiting the market's size.

I. Market Failure for Reclassification-Risk Insurance: The Hendel and Lizzeri Model

Although discussions of the efficient operation of insurance markets tend to focus on the role of asymmetric information and the resulting problems of adverse selection and moral hazard, inefficiencies can also arise when information is symmetric. If information is symmetric and the market is competitive, the premium the individual faces will be actuarially fair conditional on his known risk. In a multi-period setting, additional information about the individual's risk will be (perhaps symmetrically) revealed over time, and his premium will be adjusted accordingly. An individual who is revealed to be of higher than expected risk will face a rise in price. Given this potential, risk-averse agents will wish to purchase insurance against the possibility of being reclassified as a higher risk. Optimal insurance contracts therefore provide protection against both the "event risk" and this "reclassification risk."

Igal Hendel and Alessandro Lizzeri (2003) show theoretically that the market for reclassification-risk insurance is unlikely to function efficiently if individuals and insurance companies learn symmetrically over time about the individual's risk type, individuals cannot commit to stay in a long-term contract, and there are liquidity constraints. Individuals who learn that they are of better than expected risk will have an incentive to select out of the original contract and into one with a more favorable premium structure. Thus even though *ex ante* they would have benefited from insurance against reclassification risk, *ex post* those who "win" the reclassification-risk lottery will have an incentive to act on their new information. Of course, if individuals were to pay the full expected presented discounted value of all future premiums up front, they would have no incentive to select out of the contract as new information is revealed, and the market could provide full insurance against reclassification risk. In practice, however, liquidity constraints are likely to prohibit the complete up-front payment of all premiums.

II. Preliminary Evidence of Dynamic Inefficiencies in the Long-Term Care Insurance Market

A straightforward implication of the Hendel and Lizzeri (2003) model is that, in equilibrium, insurance contracts should exhibit at least some degree of front-loading, in order to reduce individuals' incentives to seek a new contract if they learn that they are of better than expected risk. The extent of feasible front-loading will depend on the buyer's liquidity constraints and may therefore vary across contracts; more front-loaded contracts should be more likely to retain consumers. Hendel and Lizzeri (2003) provide empirical evidence for these predictions in the life insurance market. Here we show their applicability to the long-term care insurance market as well.

All long-term care insurance premiums are paid on a periodic (usually annual) basis at a prespecified fixed, nominal rate. While premiums are thus declining over time in real terms, the expected value of a year of coverage rises as health deteriorates. Thus long-term care insurance contracts are substantially front-loaded; individuals pay premiums that are initially higher than the actuarial cost, but as their risks rise, the ratio of premium to risk falls. Holders of long-term care insurance policies typically make payments for quite a while before the risk of needing care becomes high. For example, a typical individual purchases a policy at about age 67 but will not enter a nursing home on average (if he enters at all) until about 15 years later (Brown and Finkelstein, 2004).

Most policies do not have a surrender value. Dropping or changing policies therefore results in the forfeiture of any future benefits and, given the front-loaded nature of the premium profile, can therefore be quite costly (Brown and Finkelstein, 2004). Nonetheless, about 7 percent of in-force policies each year are canceled (i.e., "lapse") for living policyholders (Society of Actuaries, 2002). Many of those who drop coverage exit the private market completely, rather than switch to a new policy (Health Insurance Association of America, 1993). "Lapsation" rates are a U-shaped function of policy duration (Fig. 1). Numerous protections exist to guard against unintentional dropping of coverage (Kaiser Family Foundation, 2003); therefore most of these lapses are likely deliberate.

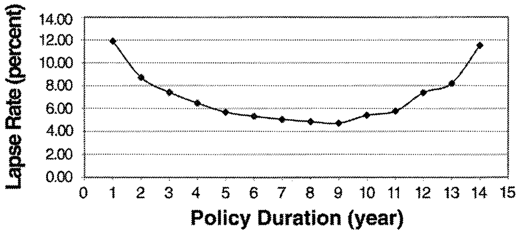

FIGURE 1. LAPSE RATES WITH RESPECT TO POLICY DURATION

Source: Society of Actuaries (2002)

Policies vary in their degree of front-loading. Some contracts specify a constant nominal benefit profile while others specify benefits that are escalating over time in nominal terms; such contracts are more front-loaded than contracts with constant nominal benefits. Lapse rates are higher among less front-loaded policies (Society of Actuaries, 2002).

III. Evidence of Dynamic Selection Out of Long-Term-Care Insurance Contracts

We now examine directly whether individuals who let their policies lapse are *ex post* revealed to be lower risk than those who retain coverage. This prediction follows straightforwardly from the Hendel and Lizzeri (2003) model, although it is not one they test in the life insurance market. Our data are from the Health and Retirement Study (HRS), a nationally representative panel survey of the elderly and near-elderly. We use data from 1995 through 2000. Detail on the construction of our sample, as well as robustness analysis, are in Finkelstein et al. (2005).

A unique advantage of the HRS is that it asks individuals whether they have lapsed on a policy: "Have you ever been covered by any long-term care insurance that you cancelled or let lapse." We define our sample of "potential lapsers" to include individuals who report having a long-term care insurance policy, individuals who report ever having let a policy lapse, or both. The total sample consists of 3,649 individuals, of whom 987 report lapsing. We then compare the subsequent nursing-home use (the major source of long-term care expenditures) for those who drop coverage with those who retain their policy. We estimate

TABLE 1—THE RELATIONSHIP BETWEEN LAPSING AND SUBSEQUENT NURSING-HOME USE

Statistic	No controls	Controls[a]
Coefficient on LAPSE	−0.024*	−0.025**
	(0.010)	(0.009)
N	3,546	3,322

Notes: The table reports results from linear probability estimation of equation (1). Robust standard errors are in parentheses. The dependent variable is a binary indicator for subsequent nursing-home use (mean 0.07). LAPSE indicates whether the insurance policy lapses. Results from probit estimation are similar.

[a] Controls for insurance company risk classification.

* Statistically significant at the 5-percent level.

** Statistically significant at the 1-percent level.

$$\text{(1)} \quad \text{NH\_USE} = \mathbf{X}\boldsymbol{\beta}_1 + \beta_2 \, \text{LAPSE} + \varepsilon.$$

The dependent variable NH_USE is a binary variable for whether the individual had any subsequent nursing-home stays (sample mean of 7 percent). The key coefficient of interest is that on LAPSE, our indicator for whether the individual has let his policy lapse. Individuals who lapse are substantially poorer and less educated than individuals who do not lapse but are of similar age (average age of 66) and gender (45 percent male).

We would like to control for the risk classification of the individual when he purchased insurance. We use our best approximation to this by conditioning on what the individual's risk classification would have been in the first wave of data used. We therefore include in the **X** vector in equation (1) the characteristics of the individual used by the long-term care industry to predict expected nursing-home use: age, gender, number of limitations to instrumental activities of daily living (IADLs), number of limitations to activities of daily livings (ADLs), and the presence of cognitive impairment (see Finkelstein and McGarry [2003] for details). We include these controls flexibly, with indicator variables for each age, number of ADLs, and number of IADLs. For comparison purposes, we also report the results from estimating equation (1) with no additional controls (i.e., X's).

Table 1 shows the results. The relationship between a policy lapse (LAPSE) and subsequent

TABLE 2—NURSING-HOME USE OF THOSE WHO LAPSE TO NEW CONTRACT VERSUS THOSE WHO LAPSE TO NO CONTRACT

Statistic	No controls	Controls[a]
Coefficient on LAPSEINS	−0.009	−0.002
	(0.016)	(0.017)
N	711	668

Notes: The table reports results from linear probability estimation of equation (2). The sample is limited to individuals who lapse. Robust standard errors are in parentheses. The dependent variable is a binary indicator for subsequent nursing-home use (mean 0.035). LAPSEINS is an indicator for whether the individual bought a new insurance policy after letting the policy lapse. Results from probit estimation are similar.

[a] Controls for insurance company risk classification.

nursing-home use is negative and statistically significant; those who drop coverage are less likely to use a nursing home than those who maintain coverage. The difference is substantively large; given average nursing-home use in our sample of 7 percent, the coefficients in Table 1 imply that nursing-home entry probabilities are 35 percent lower among lapsers than non-lapsers.

While this finding is consistent with the type of dynamic selection predicted by Hendel and Lizzeri (2003) due to the symmetric arrival of new information, an obvious alternative explanation is the presence of moral hazard. Individuals with long-term care coverage face lower costs for nursing-home stays relative to those who drop coverage and do not purchase another insurance policy. They may therefore be more likely to use a nursing home. To test this possibility, we compare nursing-home use among the three-quarters of lapsers who lapse to no insurance with that of the one-quarter who lapse to another insurance product:

$$\text{(2)} \quad \text{NH\_USE} = \mathbf{X}\boldsymbol{\beta}_1 + \beta_2 \,\text{LAPSEINS} + \varepsilon.$$

LAPSEINS is an indicator variable for whether an individual who lapses also reports having insurance subsequent to the lapse; LAPSEINS is 0 if the individual who lapses does not subsequently report insurance coverage. Moral hazard would predict that those with coverage would have higher usage rate than those without.

Table 2 shows the results. Contrary to the moral-hazard hypothesis, those who lapse to another insurance policy are *less* likely to use a nursing home than those who lapse to nothing, although the difference is neither substantively nor statistically significant. We conclude that those who lapse are leaving the risk pool at least in part because they are of lower risk than initially believed.

IV. Conclusion

The difficulty with providing private insurance against reclassification risk is that while *ex ante* it is valued by individuals, *ex post,* individuals who learn that they are of lower than anticipated risk have an incentive to drop out of their original insurance contract. Consistent with this type of market failure, we find that individuals who let their long-term care insurance policies lapse are about one-third less likely to have a subsequent nursing home admission than those who maintain their coverage. These results do not appear to be explained by *ex post* moral-hazard effects of maintaining insurance coverage.

While the lapsation behavior is consistent with dynamic selection based on the arrival of new information, we do not believe dynamic selection can fully explain this behavior. For example, Figure 1 indicates a high initial lapse rate immediately following purchase; it seems unlikely that new information could arrive sufficiently soon after the initial purchase to make it optimal to drop coverage immediately. This behavior may indicate a realization that the original purchase was a mistake. In addition, uninsured negative wealth or income shocks may create difficulties in one's ability to pay premiums and contribute to lapsation. Exploring the empirical relevance of these other factors is an important direction for future work.

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