Does the Secondary Life Insurance Market Threaten Dynamic Insurance?

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1 Introduction

There is a vast theoretical literature on dynamic contracts that has received very little empirical attention (exceptions are Chiappori, Salanie and Valentin (1999) and Hendel and Lizzeri (2003)). This paper describes how a recent development in the life insurance market further illustrates the usefulness and power of the dynamic risk-sharing/learning model originally proposed by Harris and Holmstrom (1982).

Life settlements are a recent innovation in the life insurance markets. Secondary markets for life insurance policies started in large scale in the late 80s in response to the AIDS epidemic. Terminally ill policyholder exchanged their coverage for liquidity provided by a third party, a viatical firm. In the late 90s a market for non-terminal settlements emerged creating a secondary market for long-term policies: a policy holder with a life expectancy not exceeding 15 years can sell the policy to intermediaries who continue to pay the premiums in exchange for becoming the beneficiaries.[1] Although estimates differ, the amount

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[1]Typically settlements target relatively large policies, by holders over 65 years old with some health impairment but life expectancy as high 15 years. Viaticals targeted smaller policies but with life expectancy below two years. See Doherty and Singer 2002 for more on the origins and evolution of the market.

of settled insurance has been growing rapidly from approximately 2 billion dollars in face amounts in 2002 to a recent estimate by Conning Research and Consulting (2007) suggesting settlements as high as 6.1 billion dollars in 2006. Settlements generate a health-contingent liquidation value for life insurance policies. This is an innovation in life insurance: term policies typically offer no liquidation value and Cash Value policies offer surrender values that are independent of health status (they reflect average mortality in the pool). The gap between surrender values and actuarial value of existing policies, which can be quite large, is the target of the settlement industry.[2] Currently the settlement industry targets the stock of long standing policies that were issued before the emergence of this market. However, life insurance companies are now beginning to react by modifying contracts.

In this paper we study the welfare and policy implications of settlements. We look at the new developments through an extension of the model used in Hendel and Lizzeri (2003) (HL henceforth). This is a dynamic insurance model of symmetric learning and one-sided commitment: reclassification risk is a potential consequence of the resolution of uncertainty about the risk characteristics of consumers. While insurance companies can commit to future premiums, consumers cannot commit to remain in the pool (good risks will accept competing offers from other companies); thus, in order to insure against reclassification risk consumers must front-load payments. The front-loaded resources guarantee a cap on future premiums that involve coverage at subsidized prices relative to spot market prices for the same risks.[3]

Front-loading is costly because it involves committing resources early in life when income is typically lower, and because these resources are partially wasted if the insured decides to drop coverage.[4] In spite of its costs virtually all policies offered in the US market involve

[2] Deloitte (2005) reports that the typical settlements in the period 2000 to 2003 paid 20 cents on the dollar of face amount, and generated an expected actuarial return of 64 cents.

[3] HL also provides evidence that the model fits well with several patterns in the term life insurance market. See also Finkelstein, McGarry and Sufi (2005) for similar evidence, as well as evidence of health-related lapsation in the long term care market.

[4] The cost of front-loading is emphasized by financial advisors: e.g., “As with fully-commissioned cash value policies... front-end charges range from high to sky-high” (Hunt (2007)), ”..these policies cost so much that, to stay within budget, you’d rather have to buy less life insurance than your family really needs.” (Quinn (2006)).

some degree of front-loading.

It is this front-loading, pervasive in Term policies and even more prominent in Cash Values, that creates the incentive to settle existing policies. In fact, absent front-loading, in a competitive market, policyholders would pay in every period premiums that reflect their actuarial risks and other costs, leaving no room for a secondary market for settlements. The market for settlements arises because there is a stock of policies whose surrender value is lower than their actuarial value.

In order to understand the consequences of the settlement industry, it is important to distinguish its impact on the existing stock of policies that were designed before the emergence of settlements, and the new equilibrium in the market involving policies that take into consideration the threat/constraints posed by settlements.

For the existing stock of policies, settlements are a transfer from insurance companies to settling policy-holders, hence, the emergence of life settlements naturally benefits current policy holders. Doherty and Singer (2002) argue that, absent a settlement market, primary insurers enjoy ex-post monopoly rents since they are monopsonists relative to their own policy holders.

The impact of the settlement industry on the future functioning of the primary industry is less clear. We make the minimal departure from the HL model that allows us to incorporate a role for settlements: we add uncertainty about future needs for coverage. The combination of front-loading and uncertain needs for coverage creates the potential for life settlements.

Absent settlements, the fact that an insured may not need coverage in the future generates lapsation.[5] In the optimal contracrt, front-loading allows subsidization of future premiums in states in which the insured is a bad risk. Such lapsation in these events is profitable to the insurance company.[6] This implies that the required amount of front-loading is lower than in an environment where future needs of coverage are certain and therefore such lapsation

[5]According to Deloitte (2005, p. 12) 75% of Universal policies lapse.

[6]For evidence on the benefits of this kind of lapsation (i.e., actuarial costs of low lapsation) see The Record, Society of Actuaries (1998).

does not take place. Settlements reduce such beneficial lapsation and its associated benefits to the insurance companies, thereby raising the required amount of front-loading. In the terminology of the model of section (2) settlements constrain the ability of the insurance company to transfer resources between periods.

The easiest way to see the potential impact of settlements on welfare is to consider a term policy. The settlement industry determines cash flows, hence welfare, in the event of settling. Thus, the optimal term contract can no longer involve lower utility in those states than the utility on offer on the settlement market. This means that, implicitly, the settlement market enforces a transfer of resources from the initial periods to the settling events. If income is rising over time, and because the insured is no longer paying premiums in the settling events, this transfer can be welfare reducing. The post-settlement equilibrium thus involves either less insurance against reclassification risk, or more front-loading for any given amount of insurance against reclassification risk. This is the potential negative welfare consequence of settlements in the long run.[7]

The settlement industry currently mainly targets Cash Value policies, but term policies also involve actuarially favorable bets. Once term policies are targeted more intensely, these will: 1) have to include more front-loading or suffer reclassification risk, or 2) stop offering renewal options. It is the renewal to later ages that will be most costly to front-load. Eliminating the option to renew (say after 20 years of coverage for an LT20) will limit the appeal to settlements. The consequence for consumers is more restricted choices, where contacts with a renewable option will be more costly or not offered. In addition Cash values and term policies may become qualitatively similar. Both will need substantial front-loading, both will involve health contingent surrender values (either offered by the initial policy or, implicitly, by the market). The main distinction between policies will be the extent of savings (e.g. front-loading), which then translates into the profitability of the settlement and the surrender values.

[7] Welfare effects depend on the exact reason for settling. We will come back to this later.

2 Model

Consider a market with insurance buyers and sellers. Buyers wish to insure a stream of income for their dependents. When considering a future period, a buyer has two distinct sources of utility. Utility while alive is given by $u(c)$, where $c \geq 0$ is consumption. The bequest motive is captured by utility function $v(c)$ where $c \geq 0$ is consumption by dependents after the death of the policy holder. u and v are assumed to be strictly concave and twice differentiable.[8]

In period 1 buyers have identical death probabilities p. There can be several risk categories captured by different values of p. Within each period: i. insurance companies offer contracts, ii. buyers choose a contract, iii. uncertainty about death is resolved and consumption takes place. Between the two periods, uncertainty about the health status of each buyer is resolved. A consumer with health status i dies with probability p_i in period 2. We order indices so that $p_1 < p_2 ... < p_N$, and we assume that $p_1 \geq p$ (health worsens over time). The probability of being in state i is denoted by π_i. Uncertainty (learning) about the second period risk category creates reclassification risk, since it potentially leaves the buyer facing uncertain premiums in the second period. We assume that information is symmetric: all insurance companies observe the health status of buyers at the beginning of the second period.

We now introduce the new element relative to HL. In each state i there is a probability q_i that the insured no longer needs coverage. This is modeled as $v(c) \equiv 0$. This captures several possible sources of uncertainty regarding the need for coverage. First, the bequest motive may have ceased, due to divorce, widowing, dependents becoming financially independent. Second, the policyholder may no longer generate income, leaving nothing to insure. In both cases the insured prefers to avoid moving resources from the life to the death state. These

[8] In our model, all agents are forward looking and standard expected utility maximizers. We thus abstract from potential violations of 'rational' behavior. Our view is that considerations such as regret or misperceptions of probabilties may very well be relevant in this market. However, as a benchmark, we find it useful to understand the implications of the standard approach.

two alternative reasons lead to potentially different welfare conclusions.[9]

We first consider term policies because they are simpler but some of the insights are relevant for cash values. A first period term contract consists of first period premium Q_1 and face amount F_1, and a vector of premiums and face amounts $(Q_2^1, F_2^1), \ldots, (Q_2^N, F_2^N)$ indexed by the second period health status of an individual. Contract terms can depend on the information revealed in the second period. A second period contract consists of a premium and face amount (Q_2^i, F_2^i) indexed by the second period health status: in the second period firms can offer different contracts to buyers in different risk categories. A first period contract is a long term contract to which the company unilaterally commits, whereas a second period contract is a short term (spot) contract.

We capture consumer heterogeneity by assuming differences in the income process. If alive, the consumer receives an income of $y - g$ in the first period and $y + g$ in the second period, with $g \geq 0$. Thus, all consumers have the same permanent income, but may differ in income growth, represented by g.

2.1 Industry Structure and Contract Profiles

We assume that there is perfect competition between insurance companies. While insurance companies can commit to future premiums consumers freely choose between staying with their period 1 contract and switching to one of the spot contracts offered in period 2. Therefore, the set of feasible first period contracts is the set of unilateral contracts, i.e., those contracts that terminate the moment the buyer stops paying the premiums. Moreover, we assume that the need for coverage in period two is not verifiable. Thus, contracts will not be contingent on need.

Lack of consumer commitment per se need not preclude the possibility of achieving full insurance. In a world with no frictions, consumers would pre-pay their premiums to eliminate

[9] Of course, each of these effects need not be absolute: a reduction in the need for insurance is also possible. We will come back to this later.

their incentive to drop out of the contract in the future. An implication of such a solution is that all consumers would be fully insured against reclassification risk. Furthermore, there would be no contract variety: all consumers would choose the same contract.

In practice however, consumers will be reluctant to front-load. Credit constrains may limit their willingness to pay up-front. In addition, uncertain future need for coverage makes front-loading costly. More specifically, absent need-contingent contracts the front-loaded amount is lost with probability $\sum_{i=1}^{N} \pi_i q_i$.

In a competitive equilibrium, premiums and face amounts must maximize consumers' expected utility subject to the zero profit condition ensuring that insurance companies break even on average:

$$(1-p)Q_1 - pF_1 + (1-p)\sum_{i=1}^{N} \pi_i q_i[(1-p_i)Q_2^i - p_i F_2^i] = 0 \tag{1}$$

and **no-better offer** constraints that ensure that in no state of period 2 will the consumer accept an offer from a competing insurance company. These constraints are required because of lack of buyer commitment, and can be written as follows: for $i = 1, \ldots, N$, and for all $\tilde{Q}_2^i, \tilde{F}_2^i$ such that $(1-p_i)\tilde{Q}_2^i - p_i\tilde{F}_2^i > 0$,

$$p_i v(F_2^i) + (1-p_i)u(y_2 + g - Q_2^i) \geq p_i v(\tilde{F}_2^i) + (1-p_i)u(y_2 + g - \tilde{Q}_2^i). \tag{2}$$

We say that a consumer is fully event insured in state i of date 2 (the definition for date 1 is analogous) if $v'(F_2^i) = u'(y_2 + g - Q_2^i)$. We call $Q_2^i(FI)$ the fair premium for full insurance in state i, namely, the premium that guarantees zero profits.

The following Proposition, adapts Proposition 1 in Hendel and Lizzeri (2003) to the new environment.

PROPOSITION 1 In the equilibrium set of contracts: (i) All consumers obtain full event insurance in period 1 and in all states of period 2. (ii) For every g there is an s such that $Q_2^i = Q_2^i(FI)$ for $i = 1, \ldots, s-1$, and $Q_2^i = Q_2^s$ for $i = s, \ldots, N$ where $Q_2^i < Q_2^i(FI)$

for $i = s+1, \ldots, N$. (iii) More front-loaded contracts provide more insurance against reclassification risk: contracts with higher Q_1 involve a lower s. Buyers with higher g choose contracts with less front-loading. (iv) The higher $\sum_{i=1}^{N} \pi_i q_i$ the fewer resources are required to front-load in order to obtain the same amount of insurance against reclassification risk.

This proposition says that, in exchange for some front-loading, contracts offer a cap on premiums that provides some insurance against reclassification risk. The basic structure of contracts is qualitative similar to those in HL. The possibility that consumers may no longer need coverage generates a (potentially important) quantitative effect on the contracts and on allocations because it affects the set of states in which the no-better offer constraints bind. Part (iv) is the main difference with respect to HL. Since the policy is renewed in state i only with probability q_i, and front-loaded contracts make losses on average in the second period, lapsation is beneficial to the insurance companies, implying that fewer resources need to be front-loaded in period one. On the other hand, the insured finds front-loading more costly since it is a waste of resources with probability $(1- q_i)$. Namely, it is a transfer of first period resources to the second period, but, in the event of no bequest motive those resources are not enjoyed.

We use this result mainly as a benchmark to understand the effect of settlements. However, it is also useful to explain the existence of lapsation based products. Within the canonical model of insurance one presumes that due to adverse selection lapsation is bad for insurers: the insurer would rather keep in the pool those that prefer to lapse since they are typically the good risks. In the life insurance market however, there are products that are lapsation supported. For a discussion of lapsation based Term see Society of Actuaries (1998 a and b). According to Proposition 1 lapsation is profitable (and may occur) in states $s+1$ to N.

3 Impact on the Primary Market: Contract Profiles

Let us now consider the effects of a life settlement market. We assume a competitive market. This extreme assumption is not warranted at present (estimates suggest that settlements occur at large discounts) but it allows a stark contrast with the prior model. This assumption is also likely to become more accurate as more participants enter the market. For simplicity, we also abstract form all costs including commissions.

At the beginning of period 2 an insured can liquidate the policy by settling it. Under perfect competition, the value of a settlement is given by the actuarial value of the face amount minus the premium that must be paid to maintain the policy in force: $V^i = p_i F_2^i - (1 - p_i) Q_2^i$.

Remark: A settlement market cannot emerge if (i) Life insurance contracts are exclusively spot contracts; or (ii) There is no uncertainty about future needs for insurance.[10]

To see why (i) must hold, note that spot contracts cannot give losses to insurance companies: $V^i \leq 0$ for every health state i. Thus, nobody would make profits by offering to settle a spot contract.

To see why (ii) must hold, assume that the insured has no uncertainty about his need for insurance. Then, F_2^i reflects the desired face amount contracted for in period i. Consider a state in which $V^i > 0$. The highest settlement offer that the insured can receive is V_i. But, after having settled the contract, the insured can only receive coverage on the spot market at price Q_{spot}^i no lower than $\frac{p_i}{1-p_i} F_2^i$. If we let G^i be the financial consequences from these transactions we obtain: $G^i = V^i - (1 - p_i) Q_{spot}^i \leq p_i F_2^i - (1 - p_i) \left(Q_2^i - Q_{spot}^i \right) = - (1 - p_i) Q_2^i$. Thus, in order to obtain coverage, he would spend at least the price he would have to pay if he kept the contract, implying that this is not an advantageous transaction.

Let us now come to the interesting case in which there is room for a settlement market. Given the shape of optimal term contracts given by Proposition 1, $V^i = 0$ for $i = 1, .., s - 1$,

[10] Part (ii) assumes that participants have the same underwriting assessments. We are thus abstracting from what some call mortality arbitrage.

i.e., the contract has no settlement value in the states in which the no-lapsation constraints are binding, and $V^i > 0$ and increasing in i for $i \geq s$. Thus, the existence of a settlement industry binds whenever the insured would otherwise have dropped coverage, and $V^i > 0$.

PROPOSITION 2 (i) Under a competitive insurance market, the insured settles the contract in period 2 if and only if his health state is sufficiently bad ($i \geq s$ from Proposition 1), *and* he no longer needs coverage. (ii) The presence of a settlement market raises the amount of front-loading that is required to obtain the same amount of reclassification risk. (iii) Welfare is reduced by the presence of a settlement market.

To see why part (i) must hold, note first that in states $i = 1, ..., s-1$, second period premiums are actuarially fair, so there is no gain from trade in the settlement market. The previous remark above shows that settlement do not occur if the insured plans to renew coverage even if the health status is bad. To see why part (ii) must hold, consider the difference in zero profit constraints with and without settlements: With settlements: $pF_1 + (1-p) Q_1 + \sum_{i=1}^{N} \pi_i \left[p_i Q_2^i + (1-p_i) F_2^i\right] = 0$. Without settlements: $pF_1 + (1-p) Q_1 + \sum_{i=1}^{N} \pi_i (1-q_i) \left[p_i Q_2^i + (1-p_i) F_2^i\right] = 0$.

For the sake of illustration, consider for a moment a hypothetical (and counterfactual) case in which premiums and face amounts are the same in the two scenarios. Because of the no lapsation constraints, the difference between the two equations is then given by $\sum_{i=1}^{N} \pi_i q_i V^i$. Roughly, this means that any given amount of insurance against reclassification risk now requires a higher amount of front-loading.

To provide an intuition for part (iii), observe that this increased front-loading is costly in an environment in which consumers are credit constrained. Absent the settlement market, from the point of view of period 1 expected utility in state i is

$$(1-q_i)(1-p_i)\, u\left(y + g - Q_2^i\right) + p_i (1-q_i)\, v\left(F_2^i\right) + q_i (1-p_i)\, u(y+g),$$

whereas with a settlement market it is

$$(1-q_i)(1-p_i)\,u\left(y+g-Q_2^i\right)+p_i(1-q_i)\,v\left(F_2^i\right)+q_i(1-p_i)\,u\left(y+g+V^i\right).$$

Note that income is highest in the state in which insurance is not needed. This discussion makes clear that, when insurance companies respond to the presence of a settlement market, the outcome is a transfer resources from period 1 (where income is lowest) to period 2 in the events that insurance is not needed in which income is highest. With capital market imperfections, consumers cannot undo these transfers without changing consumption in a welfare reducing fashion.

So far we assumed that the need for coverage vanished due to lack of bequest motive. Another reason it may vanish is because the income is substantially reduced. In such circumstances the insured will not renew even under actuarially favorable terms.[11]

Once we allow for the possibility that period 2 income is may be substantially lower than period 1 income it is possible to obtain that settlements can be welfare enhancing, thereby overturning part (iii) of Proposition 2. In particular, settlements may be welfare improving if need for insurance and health status are both correlated with income. This may be particularly relevant for income net of health spending, in which case settlements allow for partial insurance against uncertainty in health expenditures, a source of risk that is considered particularly important.

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[11] However, if the bequest motive persists, the insured may still want to renew coverage if odds are favorable. Observe that in all states in which the no-lapsation constraint is due to bind involve favorable odds. In other words, a less extreme version of uncertain needs for coverage may involve renewal of coverage, absent need, if odds are favorable.

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