ADVANTAGEOUS SELECTION IN LIFE INSURANCE MARKETS

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15 July 2015

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ABSTRACT

We test for the existence of advantageous selection in insurance markets with data that allow us to identify backdated (and not backdated) life insurance contracts. We empirically examine the hypothesis that consumers signal their higher quality upfront by backdating that ultimately is associated with lower policy lapse rates. While prior literature explains backdating as a market response to the inefficiency of discrete annual pricing, we broaden the understanding of backdating and add to the growing body of work on advantageous selection in insurance markets (e.g., Finkelstein and McGarry, 2006; and Gang, Keane, and Silverman, 2008).

JEL Classification: D80, G11, G22
Keywords: Advantageous Selection, Asymmetric Information, Signaling, Insurance Markets

INTRODUCTION

Adverse selection has been uncovered in some markets (e.g., Dahlby, 1992; Puelz and Snow, 1994) and not in others (e.g., Bond, 1982). More recently, research on selection in insurance markets has focused on what Hemenway (1990) termed as "propitious" selection, and what is now more commonly referred to as "advantageous" selection. For example, Finkelstein and McGarry (2006) show the existence of advantageous selection in the long-term care insurance market: individuals that are more cautious tend to invest more in precautionary behavior and are less likely to use a nursing home, but also are more likely to purchase LTC insurance. Similarly, Fang, Keane, and Silverman (2008) provide evidence of advantageous selection in the market for Medigap coverage: individuals with higher cognitive ability often are able to make better decisions, which then translate into both greater coverage and lower healthcare expenditures.

We test for advantageous selection in the life insurance market in the context of a common practice known as backdating. Life insurance backdating occurs when an insurance contract bears a policy date that is prior to the application date. From the applicant's perspective, the primary motivation for backdating is the reduction in premium that occurs because the price is based on an age that is less than the applicant's age at the time of application. The obvious disadvantage of backdating is the necessity of paying a premium for time that already has elapsed and for which no insurance coverage existed. Carson (1994) shows that the present value of backdating can be positive after relatively short periods of time, and the actuarial present value of backdating also generally is positive (Carson and Ostaszewski, 2004).

While backdating ultimately is a zero-sum game, the immediate and potential benefits of backdating lead insurers, agents, and consumers to participate (Carson, Clark, and Ostaszewski, 2012). In particular, because first-year expenses often exceed first-year premiums for a life insurance contract, insurers (and agents) strive for high persistency rates: A lapse in the first year (or longer) is costly for the insurer without any hope of recovery of such costs in later policy years. Backdating effectively shortens the first policy year, thus lowering the expected cost of early lapse.

Backdating has the same effect as a front-end load on the policy, which the consumer cannot recover. In case of lapse, this payment may be viewed as a *phantom surrender charge* (see Carson et al., 2012). Having made such a payment, the consumer is less likely to lapse, largely because the front-end load / phantom surrender charge of the initial payment encourages the consumer to keep the policy in force, similar to having paid "points" on a mortgage in order

to obtain a reduced interest rate.[1] Further, the consumer who purchased a backdated policy will experience its lower premium cost only by persisting in owning the policy and paying the premium. The front-end load is recouped only in the form of lower future premiums. In addition to promoting persistency, which is the cornerstone of profitability of life insurance, this incentive to persist acts to offset/mitigate the adverse selection aspect so common in life insurance: Those consumers who enjoy good health purchase new coverage, while those remaining are necessarily higher risks.

Backdating therefore appears to be a very natural mechanism for helping a life insurer achieve its customary goals: attracting consumers who will maintain the coverage and increasing aggregate profits. We observe that life insurers have used similar mechanisms, such as dividends and persistency bonuses, and backdating would appear to be a further mechanism for encouraging life insurance persistency and controlling adverse selection. Of course, if consumers hold their life insurance "too long" and life insurers' assumptions about lapse rates prove incorrect (too high), then the persistency benefit becomes an albatross (see Gottlieb and Smetters, 2013).[2]

Thus, backdating arguably leads to improved alignment of incentives among the three parties involved in the game—namely, insurers, agents, and consumers. The consumer makes an initial payment for non-existent life insurance coverage in order to obtain a potentially lower net cost of insurance and, on an actuarial basis (see Carson and Ostaszewski, 2004), achieves that lower cost even after adjusting for the front-end load of the initial payment. On the other side of

[1] Indeed, various aspects of the points / interest rate decision have been examined in the real estate literature by Keenan and Kau (1987), Stone and Zissu (1990), Cannaday and Yang (1995), and Chang and Yavas (2009). In particular, Brueckner (1994) examines borrower mobility in relation to discount points paid by borrowers.

[2] For the term life insurance market, for which death claims are rarely paid, the potential for consumers holding their policies too long appears remote, thus making improved persistency a benefit for the insurer, and why we view identifying lower likelihood of lapse as a form of advantageous selection.

the transaction, the agent and the insurer provide a discount to the consumer (on an actuarial present value basis)—a type of persistency bonus—if the consumer chooses to backdate, and thereby the agent and insurer hope to achieve improved sales and lower lapse and mortality rates. Prior research has not provided empirical evidence on whether or not this advantageous selection actually exists, and this is the focus of our study.

EMPIRICAL MODEL AND DATA

The central question we investigate is whether advantageous selection occurs within the life insurance market in the context of backdating. In particular, we examine whether backdated policies do, in fact, exhibit lower lapse and mortality rates. We examine two different versions of equation (1) to investigate this question.

$$LAPSE_i = f\,(BACKDATE_i \mid \#DAYS_i, ISSUEAGE_i, FEMALE_i, FACEAMT_i, ANNPREM_i, UWCLASS_{ij}, YEAR_{ij},) \quad (1)$$

We employ a Probit model (as well as OLS and Cox / Hazard models) for the analysis. LAPSE is equal to one if the policy has lapsed and 0 otherwise. For the independent variables in the model, BACKDATE is a binary variable equal to 1 if the policy was backdated, and 0 otherwise. AGE is the age of the insured at time of application. FACEAMT is the face amount of life insurance. UWCLASS is a series of dummy variables for the underwriting class of the insured (with four dummy variables for five different categories), with UWCLASS1 being the best. FEMALE is a binary variable equal to 1 if the insured is female, and 0 otherwise. YEAR is a series of dummy variables for the year of policy issuance. The data for the analysis comes from a medium-sized and geographically diversified mutual life insurer in the U.S. and spans the years

2000 through 2013. The sample includes data for 98,293 term life insurance contracts, of which 28,841 were backdated (at least 30 days).[3]

EMPIRICAL RESULTS AND CONCLUSIONS

As shown in Table 1 below, empirical results provide initial evidence of advantageous selection in the life insurance market. Controlling for various factors such as age at policy issue, face amount, and underwriting class, results indicate a significant and negative relation between backdating and policy lapse.

TABLE 1

Advantageous Selection and Life Insurance

Analysis of Maximum Likelihood Estimates						
Parameter		DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	***	1	-3.464	0.00468	547793.045	<.0001
Backdate	***	1	-0.0941	0.00642	214.5987	<.0001
BDDays	***	1	0.00123	0.000065	358.1831	<.0001
IssueAge	***	1	-0.00243	0.000104	550.2016	<.0001
Female		1	-0.00273	0.00317	0.7433	0.3886
FaceAmt	***	1	-7.22E-08	8.57E-09	71.077	<.0001
AnnPrem		1	-1.65E-06	1.19E-06	1.9154	0.1664
UWRank1	***	1	-0.1609	0.00674	569.1633	<.0001
UWRank2	***	1	-0.1187	0.00453	686.2357	<.0001
UWRank3	***	1	0.0708	0.0136	26.9371	<.0001
UWRank4	***	1	0.1633	0.0046	1260.5471	<.0001

[3] Because some policies are backdated for reasons other than saving age (e.g., to align dates across life insurance policies and estate planning trusts, we count the policy as backdated only if the policy was backdated at least 30 days (we note that the results are not highly sensitive to this approach).

Policyowners who choose to backdate their life insurance contracts signal their higher likelihood for greater persistency by their willingness to pay for time that already has elapsed in order to pay lower premiums that only result in net saving if the policy is held for a relatively long time period. If policyowners terminate the policy early, they do not reap the benefit of the lower premium scale that is based on an earlier age due to the consumer's willingness to backdate and pay extra upfront. Such a willingness translates into a significantly lower likelihood of lapsing, thus aligning the interests of the consumer with the insurer and agent, and providing initial evidence of advantageous selection in the life insurance market.

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