A PRINCIPAL-AGENT MODEL OF OPTIMAL SEARCH EFFORT IN LIFE INSURANCE POLICY REPLACEMENT

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Abstract

We provide a two-period principal-agent model of optimal search effort (by the agent) within the life insurance policy replacement decision. The theoretical exercise helps to identify characteristics of compensation that improve upon the non-recourse, up-front commission system currently used in practice.

Keywords: Principal-Agent, Search Effort, Moral Hazard, Conflict of Interests, Life Insurance, Compensation
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INTRODUCTION

In the context of a principal-agent relationship, moral hazard may arise when the agent’s utility maximizing levels of effort are not the same as those that maximize the utility of the principal. Although moral hazard in insurance often is viewed as emanating from consumers/policyowners, moral hazard also is possible on the part of insurance agents in the sense that consumers may suffer financial loss due to inappropriate or unsuitable insurance agent recommendations. Consumer losses have been linked to a misalignment of interests between consumers and agents that some observers contend stems from inherent limitations in compensation such as contingent commissions and the straight commission compensation system. These consumer losses have led to legal fines and several lawsuits involving multi-billion dollar awards, as well as renewed efforts to address market conduct issues.1

In the insurance transaction, many factors potentially increase the principal-agent problem. One notable feature is the complexity of insurance products, particularly life insurance products.2 The resulting information asymmetry puts consumers at a distinct disadvantage with respect to product knowledge, and they must rely heavily on the knowledge and integrity of the agent.3

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1 For further discussion, see Cupach and Carson (2002), Cummins and Doherty (2005), and Carson, Dumm, and Hoyt (2006).
2 Schlesinger and von Schulenberg (1993) reinforce this notion in their examination of consumer decisions to switch insurers. Launie (1968) suggests that imperfections in the life insurance market can be explained solely in terms of a lack of information.
3 Although various ethical codes are associated with professional designations (e.g., CPCU, CLU, ChFC, CFP, etc.), empirical research fails to demonstrate that the alignment of consumer-agent interests is affected by the acquisition of professional designations (Rinetti, 2001), the existence of a corporate code of ethics (Eastman et al., 1996), or ethics education (Hoffman et al., 1991).
The unique nature of the insurance client-agent relationship further creates potential conflicts. An agency relationship occurs “between two (or more) parties when one, designated as the agent, acts for, on behalf of, or as a representative for the other, designated the principal in a particular domain of decision problems” (Ross, 1973, p. 134). Since the customer/client relies on the agent’s expertise and access to products, the agent and the client share an agency relationship. The consumer’s trust of the agent is based on his/her expectations regarding the fiduciary obligation of the agent towards the client (Barber, 1983).

The agency relationship between agent and client is complicated by the fact that the agent simultaneously serves another principal. Insurance agents serve as agents for the insurance company, with the insurer termed the "principal" in most insurance agency agreements. In these agreements, the agent is given certain contractual powers to bind the principal (insurance company) to pay claims in the event of a loss. As Kurland (1996b) indicates, the salesperson’s employing company constitutes a principal “because it compensates the salesperson for labor rendered” (p. 291). Thus, in addition to serving the client, the agent serves the institution as well. The fact that sales agents service two principals creates the opportunity for competing loyalties.

Despite the agent’s competing loyalties, the insurance agent is an economic actor and seeks to maximize his/her own expected utility. Most insurance agencies are, in fact, separate businesses that receive a percentage of the premium volume generated by the policies they sell. This commission (percentage) is generally fixed by the contract with the insurer, the consumer possesses no knowledge of this compensation, and the consumer is powerless to affect it. Thus, for purposes of our examination of the principal-agent model, the agent will be considered to be the agent of the policyholder, not of the insurer (the de jure principal).

Unlike agents, insurance brokers are explicitly under a legal obligation to act in the insurance consumer's best interest, not the interest of the company.
In the context of an agency relationship, the straight-commission compensation system used in life insurance creates a conflict of interest whereby the fiduciary obligation of the agent to the client is compromised (Basu et al., 1985; Kurland, 1991; Oakes, 1990). Skipper (1995) reinforces this view, stating that the practice contributing most to the life insurance industry’s low public regard and legal problems is the traditional agent compensation structure. The use of this system, which has been the norm for decades, stems from the belief that life insurance must be “sold” and the belief that high front-end commissions are essential to motivate agents to sell.

Because the commission compensation system aligns the agent’s interests more closely with those of the employing institution and/or agent rather than the client, the agent’s behavior is likely to favor the interests of one principal (the institution/agent) over the other (the client). In essence, the agent presumably attempts to sell products that yield the maximal benefits to the institution and/or agent, rather than the products that necessarily are in the client’s best interest. The straight commission compensation system that is in place to motivate agents to sell “causes the agent’s interests to differ from those of the insurer and the policyholder” (Skipper, 1995, p. 40).

While alternative compensation systems have been proposed for insurance (e.g., level commissions or fees, see Gravelle, 1994) and for real estate (e.g., introducing an agent put option, see Jares, Larsen, and Zorn, 2000), one particular area that has not received attention is the potential for improved alignment of incentives between consumers and agents in the life insurance policy replacement decision. Agents make recommendations in several areas, including the appropriate type of product, amount of coverage, and the insurer that best suits the client’s needs. These recommendations are important initially (first purchase), and since
circumstances change and new products are introduced, the question of policy replacement becomes important as well.\(^6\) A policyowner might decide to replace a policy for many legitimate reasons, including decreased mortality rates, a highly competitive term insurance market, and the possibility of superior performance from new policies. However, extensive regulatory attention has been devoted to life insurance policy replacement (see Carson and Forster, 2000) suggesting that inappropriate policy replacement continues to be a persistent problem.

Past research (e.g., Kurland, 1995, 1996a; Carson and Cupach, 2002) has attempted to explore a connection between agent compensation and product recommendations in hypothetical situations. Although no compensation effects were observed, limitations in research design and measurement may have undermined the ability to detect such effects in these limited investigations. Moreover, these studies did not focus on practices such as policy replacement where the opportunity for moral hazard may be greater.

We examine properties of the optimal compensation contract between the consumer and the agent when the agent’s level of search activity for a superior replacement policy is unobservable by the consumer. The principal-agent model of the life insurance policy replacement decision highlights the misalignment of interests that can occur under the existing straight commission compensation system. The paper is structured as follows: the next section examines the problem of life insurance policy replacement. The paper then provides various

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\(^5\) A policy replacement occurs when a policyowner surrenders or materially changes an existing policy and, by reason of the transaction, purchases a new life insurance policy or some other financial instrument (see Carson and Forster, 2000).

\(^6\) Governed in most states by the NAIC Model Replacement Regulation (adopted by most states in 1985, and updated in 1998), the typical replacement transaction pits an existing policy's in-force illustration or benefit schedule against a sales illustration proposal projecting future benefits, possibly using unrealistically high rates of return. The agent will highlight the proposed policy's superiority as reflected in the projected cash values and death benefit at future dates. Since the policyholder usually will not be informed about the net benefit of surrendering in a high
models of the policy replacement decision, and the last section summarizes and concludes the paper.

**LIFE INSURANCE POLICY REPLACEMENT**

If the initial life insurance purchase decision is difficult for the consumer to fully understand, the policy replacement decision is even more challenging, given that two complex products now must be compared. Given the complexity of the financial product and the typical lack of price transparency, information asymmetries between the consumer and the agent typically exist. Policy replacement activity often is viewed as having little or no beneficial impact for the policyowner while generating a large commission for the agent. The relatively large, first-year commission gives the agent an incentive to recommend replacement even if this action is not in the best interest of the policyowner. Data suggest that nearly one-third of life insurance purchases are replacements of existing policies (Russell, 1997). However, unlike a mortgage refinancing in which monthly payments and a principal amount are fixed and easy to compare among alternative mortgages, life insurance replacements usually involve investments with uncertain future returns. In the face of this information asymmetry and uncertainty, many policyholders rely on the agent to provide a recommendation.

The policyholder may decide that the pecuniary gains from replacing the life insurance policy do not justify the costs and risks that may be incurred in the event of replacement. The costs and risks of replacement may include: 1) a surrender charge based on the length of time the policy has been in force; 2) the risk of being found uninsurable upon reapplication for insurance due to increases in age or bad health; 3) search costs; 4) unfavorable changes in the interest rate environment, the agent's recommendation to roll the surrender proceeds into a new policy (or competing investment) will be a major factor in the interest rate driven replacement decision.
slope and level of the yield curve; 5) reduced insurer credit quality; and 6) higher expense loadings in the replacement policy. In addition, the policyholder's decision to replace may change as the policyholder's circumstances change.

While the replacement decision typically involves both a principal (the policyholder) and an agent (the life insurance agent or investment salesperson), the replacement decision does not lend itself to a typical principal-agent model in all cases. The principal-agent relationship in the replacement decision differs from the classical problem in that the agent's compensation is determined by parties outside the principal-agent relationship. If the policyholder chooses to take the advice of the agent and replace his/her policy in favor of another policy or investment, the agent's compensation is based on a schedule developed by the company. Very few policyholders actually know the commission earned by their life insurance agent since commissions in the United States are not disclosed. Life insurance agent commissions, as well as other investment fees, usually are not negotiable at the consumer level. Without negotiable commissions, there is no opportunity for the policyholder to design a compensation schedule for the agent to encourage optimal agent behavior as suggested by Ross (1973).  

**Modeling the Life Insurance Policy Replacement Decision**

The policyholder may depend exclusively on the advice of the agent in many life insurance policy replacement decisions. Therefore, any model of policyholder behavior should include the compensation arrangement, search effort, and interests of the agent. Although some financial planners / agents charge fees for their advice, our analysis will focus on commissions as the form of agent compensation.

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7 The existence of legalized rebating may have allowed some room for negotiation of the agent’s compensation, but rebating is not widely promoted and likely occurs in rare circumstances (for a fuller discussion, see Russell, 1997).

8 Although some financial planners / agents charge fees for their advice, our analysis will focus on commissions as the form of agent compensation.
agent may face moral hazard. The agent faces this moral hazard primarily because he or she typically stands to benefit much more from a policy replacement than from maintenance of the status quo.  

Several factors make the policyholder's replacement decision difficult to model. First, the decision to replace often is an "all or nothing" proposition, meaning the policyholder typically does not choose to replace some fraction (e.g., partial surrender) of the policy. Second, most policyholders do not have the information or ability to analyze the surrender decision in an optimal fashion. Third, a life insurance agent who renders advice is compensated only if the policyholder surrenders and purchases a new product from that same agent, leading to a conflict of interest between the policyholder and agent. If the policyholder does replace the existing policy, the agent receives a commission based on the new premium rather than on the net benefit to the policyholder. Fourth, the life insurance agent commission is not negotiable nor does it depend on the quality of the agent's performance. Finally, the agent may be bound by state guidelines or by the voluntary Replacement Questionnaire to demonstrate that, if the surrender proceeds are to be used to purchase a new policy, the new policy is a better value than the old one.

Principal-agent models developed by Luenberger (1995), Puelz and Snow (1991), Anglin and Arnott (1991), Kreps (1990), Holmstrom (1979), Shavell (1979), Mirrlees (1975) and others have investigated the conflict between one party (the principal) and an agent engaged to act on their behalf. Most work has focused on the issue of compensation in the face of moral hazard,

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9 Treaster (1996) notes that “At the close of a sale in New York, agents receive up to 55% of the first year’s premium; in some states, the commission is more than the first year premium.”
10 These regulations are designed to prevent agents from "churning" their clients' life insurance policies to generate commissions. This practice, sometimes called "twisting," refers to a twisting of the facts in order to obtain a client's agreement to replace an existing policy against the client's interests.
which in this case is the problem of compensating an insurance agent for actions or effort when the agent's search effort cannot be monitored.

In the life insurance policy replacement transaction, the life insurance agent receives compensation for evaluating an existing policy and replacing it with a new and supposedly better policy. The agent may expend search effort evaluating the existing policy and potential replacements, but the level of effort expended (and skill level) cannot be observed. On the other hand, the actual outcome of the replacement transaction can be observed, but the outcome may take some time to manifest itself. Moreover, the agent may expend considerable resources on search effort and still recommend a replacement that is unsuccessful because of factors beyond his or her control. In summary, the ultimate outcome of any replacement transaction has an element of randomness and is positively related to search effort, but measurement of the ultimate outcome can be delayed significantly.

Whatever the outcome, current industry practice dictates that the agent's compensation, excluding renewal commissions (and rebating), be based largely on a fixed, non-negotiable, up-front commission. If the replacement turns out, perhaps years later, to have been a mistake, the agent already has been compensated long ago and there is little recourse for the policyholder to recover against the agent. This results in an incentive for agents to “churn” policies in order to earn these up front, non-recourse commissions. Even if recourse against the agent were easier, most policyholders do not possess the technology nor are they inclined to identify a poor replacement when it becomes apparent some five years or more after the transaction takes place.

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11 For exclusive agents, the menu of replacement policies may be limited by what is offered by the insurer they represent. For independent agents, the menu of replacement policies may be more extensive and afford a greater probability of a successful replacement transaction. However, exclusive/captive agents may suffer a commission penalty for replacing policies issued by their own company. This penalty, if any, varies from company to company and varies by agency contract.
Some egregious replacement activity can result in regulatory sanctions and/or damage to an agent's reputation and the insurers they represent. If the regulatory penalty and/or settlement cost burden for failed replacements falls not on the agents that sold the policies but on the insurance companies that issued the replacements, then these potential "failure costs" are likely to be under weighted in agent replacement recommendations.

In the following principal-agent models of policy replacement, the models assume that the agent has the opportunity to evaluate potential replacement opportunities for the policyholder. A successful replacement is defined as one in which the replacement transaction leaves the policyholder better off than before. A failed replacement is defined as one that does not produce any positive benefit for the policyholder; in reality, a failed replacement could generate a negative result for the policyholder.

For purposes of modeling, we consider two cases of failed replacement activity:

1) Agents suffer no consequences from failed replacement transactions; and

2) Agents suffer regulatory and/or reputation losses that do not directly benefit the victim.

Model of Case 1: Agents Suffer No Consequences from Failed Replacements

To demonstrate an agent's incentive to churn policies, consider the following model of policy replacements. Policyholder replacement activity is in the hands of agents who advise policyholders to execute replacement transactions. Assume an abundant supply of policies to replace. The only constraints on agent activity are the costs of search to evaluate the net benefit of a variety of potential replacement policies and the potential penalties associated with blatantly
misrepresented replacements.\textsuperscript{12} The agent's objective function is given below in equation (1) as an expected utility maximization problem:

\[
\text{Max } \int_{\theta} U(W + C - s - R \cdot r(\theta, s)) d\theta
\]

where

\begin{align*}
U &= \text{Utility function of Agent } \ U' > 0, \ U'' < 0 \\
W &= \text{Agent's initial endowment} \\
C &= \text{Commission paid on replacement of policy} \\
s &= \text{Agent's search costs on evaluation of potential replacements} \\
R &= \text{Penalty assessed by regulators} \\
\theta &= \text{State of the World} \\
r(\theta, s) &= \text{Probability density function of being assessed penalty R} \\
&\quad \text{which depends on state of the world } \theta \text{ and the effort level } s
\end{align*}

The probability of being assessed a regulatory penalty depends on the state of the world, which is a random variable, and the agent's search expenditures, which reduces the probability of regulatory action. This flows from the prospect that regulators will be less likely to take action for a failed replacement if the insurance agent can demonstrate due diligence in the search process. However, in Case 1, the expected penalty is assumed to be zero since the mechanisms by which agents and companies are penalized are not effective. Regulatory monitoring is extremely difficult since the agent must only convince the policyholder of the desirability of the replacement without any oversight. With the uninformed policyholder as the only line of defense against churning, poor replacements are unlikely to be discovered by authorities.\textsuperscript{13}

Therefore, expected penalties for the agent on replacement churning \textit{may} approach zero.

\textsuperscript{12} Puelz and Snow (1991) also examine agent search behavior, but their focus is on the agent’s search for new customers, as opposed to agent search for a superior replacement policy for consumers.

\textsuperscript{13} Even when misleading sales practices are uncovered, penalties imposed during the mid-1990s on companies such as the Metropolitan Life Insurance Company and the Prudential Life Insurance Company of North America are negligible when compared with their assets and volume of transactions. For example, in mid-1997, John Hancock
If the penalty function is assumed to be zero for all levels of effort, the maximization problem becomes equation (2):

$$\max_s U(W + C - s)$$  \hspace{1cm} (2)

Taking wealth as given, the agent will choose to maximize his/her commissions net of search expenditures. However, the agent will minimize search expenditures since they are costly and no benefits accrue to the agent—all benefits of search expenditures accrue to the policyholder. As a result, the maximization problem becomes equation (3):

$$\max U(W + C)$$  \hspace{1cm} (3)

Equation (3) implies that the agent should maximize commissions without searching on behalf of the policyholder, which is the definition of churning. While this model may be cynical, evidence of churning and relaxed regulatory supervision is abundant, according to Treaster (1996). An alternative compensation structure would seem to have the potential to better align the interests of the policyholder with those of the agent, in hopes of improving the likelihood of beneficial policy replacement transactions.

Model of Case 2: Agents Suffer Penalties That Do Not Benefit the Victim

Assume that the agent's maximization problem is the same as Case 1, except that the penalty function is no longer assumed to be zero. Once again, the agent's maximization problem begins with equation (4):

$$\max \int_\theta U(W + C - s - R \cdot r(\theta, s))d\theta$$  \hspace{1cm} (4)

agreed to pay more than $350 million to settle a class action lawsuit alleging deceptive sales practices and unsuitable policy replacements (WSJ Staff 1997). At the end of 1995, John Hancock had more than $50 billion in assets. Moreover, the penalties typically are paid by the insurer rather than the agent.
Also assume that there is an abundant supply of replaceable policies. Now the imposition of regulatory penalties against the agent is possible. While the magnitude of the penalty is assumed to be fixed at R, the probability of penalty assessment is given by \( r(\theta, s) \), which indicates that the probability of a penalty is a random variable but decreases with search effort. Therefore, an increase in search effort shifts the probability density function to the right. The shape of this probability density function depends on the degree to which regulators are overburdened, distracted, or sensitive to consumer welfare.

To maximize the agent's utility, a solution for optimal search is derived by taking the first derivative with respect to \( s \) and setting it equal to zero, which (as expected) is increasing in \( R \). To find the optimal level of search, let the probability density function of regulatory action be given by equation (5), which is declining with search effort and has regulatory sensitivity parameters \( \gamma \) and \( \beta \). \( \gamma \) operates as an intercept term; higher values of \( \gamma \) reduce the chance of any regulatory action at all. The higher the parameter \( \beta \), the more search effort reduces the chance that regulators will take action given state of the world \( \theta \). These parameters, which are codependent, will depend on the regulatory environment for the jurisdiction in question.

\[
r(\theta, s) = 1 - \gamma - \theta \beta \frac{1}{s}
\]

Inserting the explicit value of the density function (5) into the agent’s expected utility function (4), taking the first derivative with respect to \( s \) and setting it equal to zero, it can be shown that for a given state of the world \( \theta \), the optimal level of search \( s^* \) is given in (6):

\[
s^* \approx \sqrt{\beta R}
\]

Therefore, as long as the fixed regulatory penalty \( R \) is minimally positive, agents have an incentive to expend some amount of search. The higher the penalty assessed, the higher the optimal level of search. The agent's optimal amount of search also depends on the parameter \( \beta \), which defines the sensitivity of the regulatory environment to search effort. Since penalties in this model do not benefit the policyholder, the policyholder must rely on regulatory threat of
license revocation, fines, and damaged reputation to encourage the agent to properly evaluate the replacement options. *Ceteris paribus*, a policyholder would prefer to live in a jurisdiction that has sensitive regulators and high penalties to increase the agent's optimal search effort. Since the model shows that commissions are fixed and are not based on costs imposed by the regulatory environment, the policyholder loses nothing from increased regulatory supervision. Therefore, consumers that operate in an environment without the opportunity to impose their own fines on the agent (not on the *insurer*) prefer an aggressive regulatory authority.

**Summary and Conclusions**

Conflicts of interest often arise between consumers and agents. We examine properties of the optimal compensation contract between the consumer and the agent when the agent’s level of search activity for a superior replacement policy is unobservable by the consumer. Each principal-agent model of the replacement decision has distinct implications for agent search effort and for the volume of replacement transactions, which could affect the volume of replacement activity. Depending on the jurisdiction, the contemporary life insurance market most closely resembles the non-recourse environment of Case 1 or the state-imposed penalties of Case 2. Clearly, the circumstances of Case 1 do not behoove the agent to expend search effort and therefore encourage the maximum amount of surrender activity since this type of market environment does not discourage churning nor does it penalize poor advice. The optimal amount of search effort under the regulatory environment examined in Case 2 depends heavily on the probability of regulatory action. Since replacement activity is expected to be inversely related to
In future research, we will examine a third case, namely, a retrospective compensation model that could have a number of attractive qualities: 1) the agent is encouraged to undertake an optimal level of search, and thus the likelihood of churning is reduced; 2) better replacement opportunities result in higher levels of search effort; and 3) policyholders are indemnified to some degree if the replacement transaction is a failure.

Under the current system of non-recourse up-front commissions, an increase in optimal search effort would be expected to decrease the number of replacement transactions since this extra search effort is unlikely to be rewarded. Extra search effort and the resultant pressure on profit margins could be expected to decrease agents’ incentive to engage in these transactions. A bonus/malus system of compensation (such as under a possible retrospective compensation system) also likely would decrease the volume of transactions since many transactions currently classified as churning would not take place due to the risk of failure imposed on the agent.

**REFERENCES**


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14 Data on the state regulatory environment for replacement transactions, if available, may allow a formal test of this hypothesis. However, the sanctions imposed on large insurers such as Prudential, Metropolitan, and John Hancock for deceptive sales practices usually encompass multi-state settlements that may not allow a state-by-state analysis. Since some of these insurer settlements include relief for individual policyholders, their characteristics may resemble a third case that is not considered here, namely, the case in which penalties assessed on agents/insurers are paid directly to victims.


