Life Insurance Products
And Consumer Information

by

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and

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EXECUTIVE SUMMARY

The purposes of this study are to describe the advantages and disadvantages of various types of life insurance policies and to assess the adequacy of information about them to consumers. The focus is on a comparison of two broad classes of life insurance products. The study's principal researcher was Dr. Michael Lynch. Dr. Robert Mackay contributed to the whole effort and produced Chapter VIII which compares life insurance policies to other financial instruments.

One class of policies provides only life insurance protection. This class, which we summarize under the term annual renewable term insurance (ART), typically involves a fixed face value death benefit paid for with annual premiums that rise over time, reflecting the positive relationship between mortality and age. These policies involve no savings component, in that benefits are paid only in the event of death and the policies have no surrender value or end-of-term cash value. The second class of policies that we consider is a long-term contract of fixed duration that involves a fixed face value death benefit plus a surrender value and an end-of-term cash value equal to the face value of the policy. This type of insurance typically is paid for with an annual premium that is constant over the period of the policy. This second class of policies necessarily combine insurance <u>and</u> savings, and so we term these policies "pay-in-advance" policies. Within the class of pay-in-advance policies there are three general types that are considered in this report: par and non-par Whole Life and Universal Life.

To attempt to compare different types of life insurance with each other and with other financial instruments the study begins by describing a simplified model of reality in which there is no uncertainty about interest rates. In such a simplified setting it is possible to describe a "bare-bones" (no special options) pay-in-advance policy as a simple combination of insurance and savings and to compare such a policy to an alternative financial strategy that we will call "Buy Term and Invest the Difference" (BTID). The BTID strategy involves buying term insurance and making a periodic contribution to a savings plan such that the cash outlay is the same under the two alternatives and such that the policy's beneficiary receives the same death estate under either alternative. The implied rate of return, or Linton yield, is that rate of interest that produces a BTID savings accumulation at the end of the period equal to the savings accumulation available through the pay-in-advance policy. Assuming that there is no uncertainty about future interest rates and that the pay-in-advance policy has no special options or features, it is possible to compare directly the performance of a particular pay-in-advance policy to the alternative BTID strategy. Then, if interest rate uncertainty and any special features and options in pay-in-advance policies can be argued not to have a significant effect on the costs of these policies, it is possible to compare the performance of pay-in-advance policies to a BTID strategy that uses common financial instruments such as savings or money market accounts or bonds, i.e., to compare the performance of the pay-in-advance policy to viable market alternatives.

Application of this method also, under the same assumptions, yields some indirect implications about the adequacy of consumer information about pay-in-advance policies. For example, if pay-in-advance and BTID policies can be meaningfully compared, then if the rate of return on pay-in-advance policies is significantly below that of equivalent BTID policies, a deficiency of consumer information may be the cause. Similarly, if pay-in-advance policies differ significantly from one another in their implied rates of return and if this cannot be explained by differences in options or special features of the policies, again there are indirect implications that consumer information about pay-in-advance policies may be inadequate.

Recall, again, that the comparisons just described depend on the validity of the assumptions permitting a meaningful comparison of pay-in-advance and BTID policies. In reality, the future course of interest rates is not known with certainty and most pay-in-advance policies have options or special features that are not easily obtained through other financial instruments. For example, the typical pay-in-advance policy guarantees a minimum implicit rate of return over the life of the policy even though the savings component of these policies is accomplished through annual increment. For example, in non-par policies where the implicit rate of return, say x%, is fixed, the equivalent financial instrument would guarantee a rate of return of x% on savings made each year for several years. Ordinary bank savings and money market accounts do not offer such options over a relatively long time. This suggests that a more appropriate benchmark for evaluating the performance of Whole Life savings would be a particular type of flexible annuity. Pay-in-advance policies have other unique features. For example, a typical non-par policy provides guaranteed cash surrender values in each of the years during the term of the policy. In addition, most pay-in-advance policies allow borrowing on the savings component of the policy at a rate below the implicit rate of return on the policy.

If interest rate uncertainty and options and special features of pay-in-advance policies are important determinants of the costs and consumer valuation of these policies, then a meaningful comparison between pay-in-advance policies and the BTID alternative cannot be made with any confidence unless the effects of these determinants on the costs and values of these policies can be separately measured. An attempt to conduct such measurements was beyond the scope of the present study.

Dr. Lynch believes that the assumptions necessary to allow a meaningful comparison of pay-in-advance policies with an alternative BTID strategy are approximately valid, and so he argues that the measurement of implicit rates of return of pay-in-advance policies in this study can be meaningfully compared to rates of return on other financial instruments. Dr. Lynch finds that the implicit rates of return on Whole Life policies are well below "market" rates of interest for the early years of these policies. (In fact, in the first years, implicit rates of return are negative, reflecting the penalty for early cancellation.) In addition, approximately one-quarter of Whole Life policies are canceled in the first few years of the policy, so that consumers who cancel early earn a very poor return on their premiums. From this Dr. Lynch concludes that some consumers may not be well informed about costs of early cancellation at the time they purchase a policy. The study also finds that the implicit rates of return on Whole Life policies held to term are also below "market" rates. However, when correcting for differential tax treatment of pay-in-advance policies relative to the BTID strategy, after-tax rates of return on pay-in-advance policies may be comparable to after-tax yields on other financial instruments.

The study also compares implicit rates of return across different companies' policies and finds considerable variation. Dr. Lynch concludes that consumers may be inadequately informed about the relative merits of different companies' policies. Finally, the study computes implicit rates of return on Universal Life policies. These rates of return are much closer to "market" rates of interest, although there is still considerable variation across companies. Dr. Lynch concludes that Universal Life policies may be an improvement over Whole Life policies but that information to provide a basis for comparison for consumers may not be adequate.

The second contributor to this study, Dr. Mackay, focuses on the potential differences between pay-in-advance policies and alternative financial strategies such as BTID. Dr. Mackay shows that pay-in-advance policies are long-term contracts with many unique features, and argues that these features may involve significant costs for insurance companies and may be of significant value to consumers. His conclusion is that without an adequate measure of the costs and values of these unique features of pay-in-advance policies, a meaningful comparison of pay-in-advance policies with other financial instruments is not possible. Measurement of the value of these unique features was beyond the scope of this study.

The study consists of ten chapters. The first chapter provides an introduction and overview of the study. Chapter I reports recent trends in the "ordinary" life insurance industry (which supplies pay-in-advance policies) and the "group" life insurance industry (which supplies term insurance), focusing on the period since the 1979 FTC Staff Report. Industry aggregates suggest that the share of total savings accounted for by life insurance in force fell over the period 1978-83. Apparently this trend reflected a shift away from savings-intensive policies without any fall in total insurance in force.

Chapter II sets out a simplified model in which pay-in-advance policies can be broken down into insurance and savings components. The model assumes that interest rates are known with certainty and that pay-in-advance polices do not have options or special features that consumers value over what is available from other financial instruments. Using this model it is possible to compute an implicit rate of return on a simple pay-in-advance policy by considering an alternative strategy of BTID in which the premium on the requisite amount of term insurance plus the savings component add up each year to the premium on the pay-in-advance policy. The rate of return on the BTID strategy can be calculated by well-known methods producing the Linton yield. With certainty about future interest rates and in the absence of any options or special features of pay-in-advance policies that consumers would value, a perfectly competitive insurance market would result in the implicit rates of return on pay-in-advance policies being equal to the return on a BTID strategy and equal to market rates of return on equivalent savings instruments. Chapter II concludes with a discussion of how relaxing the assumptions of the model would affect the comparability of yields on pay-in-advance policies and other savings instruments, assuming equivalence of contracting costs. When future interest rates are uncertain, a perfectly competitive insurance market no longer will result in equivalence between pay-in-advance policies and a BTID strategy, because, for example, pay-in-advance policies generally contain an implicit minimum rate-of-return guarantee. In addition, pay-in-advance policies have other unique features, which if valued by consumers, would result in the rates of return on pay-in-advance policies differing from "market" rates of interest even in a perfectly competitive insurance market. These arguments are laid out in detail in Chapter VIII.

Chapter III reviews previous studies of life insurance. Several recent studies, including the 1979 FTC Staff Report, have estimated Linton yields or other measures of costs or valuation of Whole Life products and have found yields below "market" rates and significant variability in yields, especially for short holding periods. In contrast, one study concluded that 20-year rates of return on Whole Life policies were on average in line with alternative financial instruments when account is taken of the increased transactions costs involved with other instruments.

Chapter IV describes the pay-as-you-go or annual renewable term (ART) insurance market. A sample of policies is selected and described, and these policies are used to compute average and variability of ART rates that are used in Chapter V to compute Linton yields on pay-in-advance policies. Chapter V uses a sample of Whole Life policies and with the ART rates derived in Chapter IV computes Linton yields for the Whole Life policies in the sample for holding periods of 5, 10 and 20 years. For a 5-year holding period the average after-tax Linton yields on the policies in the sample are negative, and there is substantial variation in yields across policies. For a 20-year holding period, the average Linton yields are approximately 4% for non-par policies and 7.3% for par policies. When the relatively favorable tax treatment of the interest build-up in Whole Life policies is accounted for, these rates of return are closer to market rates. There is a significant variability in 20-year Linton yields, but the variability is significantly smaller than for shorter holding periods.

Chapter VI examines evidence on Universal Life policies, a new product in the "ordinary" life insurance industry. These policies generally provide explicit disclosures about the costs of insurance and other expenses charged against the premium, and the implicit rate of return on the savings component of the premium. Linton yields are calculated for a sample of Universal Life policies and these yields are generally larger and less variable than the yields on Whole Life policies. As with Whole Life policies, initial short-term yields are negative, but after-tax long-term yields are comparable to alternative financial instruments.

In Chapter VII the costs and benefits of replacing pay-in-advance policies are examined. It is shown that the decision to replace should be based on a concept of marginal rate of return, not the prospective holding-period rate of return used to evaluate Whole Life and Universal Life policies in Chapters V and VI. Decisions to replace both par and non-par policies with BTID strategies are evaluated.

Dr. Mackay's contribution to this study is found in Chapter VIII. In this chapter the ways in which the "ordinary" life insurance industry differs from the model of Chapter II are discussed and the effect of these differences on the relationship between pay-in-advance policies and BTID strategies are examined. Dr. Mackay maintains that when future interest rates are uncertain, pay-in-advance policies provide guarantees and options not available from other financial instruments. Therefore, he concludes that a comparison of Linton yields on pay-in-advance policies with "market" rates of return are not necessarily valid, since unique features of pay-in-advance policies may have significant value to policy holders that would result in the Linton yields calculated in Chapters V and VI being lower than the "real" Linton yields on the policies. In addition, differences in options between policies may result in different valuations by policy holders, possibly explaining the variation in the Linton yields among policies calculated in this study. Dr. Mackay concludes that until researchers carefully measure the value of th·. unique features offered by pay-in-advance policies, a definitive conclusion on the efficiency of the "ordinary" life insurance industry cannot be made. Finally, Dr. Mackay cites some recent studies, which attempted to measure the value of some of the unique features of Whole Life policies, that indicate these features may, in fact, have significant value.

In Chapter IX Dr. Lynch sets forth his conclusions and suggests a possible type of model that may explain his conclusions. He maintains that the differences between the "ordinary" life insurance industry and the model of Chapter II are not significant enough to explain the difference between Linton yields and "market" rates. The initial negative short-term yields on pay-in-advance policies and the lapse rate of approximately 25% lead Dr. Lynch to conclude that consumers do not have adequate information with which to make judgments about the desirability of purchasing pay-in-advance policies. The variability of Linton yields on pay-in-advance policies lead Dr. Lynch to conclude that consumers have insufficient information to properly compare the relative values of different policies. Since Linton rates are generally higher and less variable for Universal Life than for Whole Life policies, Dr. Lynch concludes that Universal Life policies probably represent better values for most consumers. However, according to his assumptions and calculations, Linton yields for a BTID strategy may represent the best value to consumers.

Dr. Lynch then advances some hypotheses that might explain why the "ordinary" life insurance industry may, in his view, be performing poorly. The central issue to be explained is how a long-lived industry with many sellers and purchasers and with no impediments to entry or the creation of substitutes could stabilize over a very long period with the conjectured poor performance. Dr. Lynch puzzles over the fact that most other industries with similar structural characteristics are widely believed to perform well, and so what is necessary to create a theory consistent with his conclusions is that there be some particular features of the "ordinary" life insurance industry that lead to poor performance. Dr. Lynch conjectures that the difficulty that consumers might have in evaluating the benefits of pay-in-advance policies may lead to a situation known in the economics literature as the "lemons model". In this model inferior products drive out superior products because of the difficulty consumers have in evaluating the relative values of different products.

INTRODUCTION

This Report has been prepared in response to a resolution of the House Commerce and Energy Committee passed on May 12, 1983 requesting the FTC to study "...the advantages and disadvantages of each of the types of life insurance policies being offered by private insurance companies and the adequacy of the information made available to consumers by insurance companies respecting the policies...." This resolution was renewed on May 15, 1985 by the same Committee.

To respond to the first part of this request, staff obtained information concerning the benefits and costs of representative life insurance policies being offered for sale during 1983. The policy information came from public sources, occasionally supplemented by information obtained on a voluntary basis directly from the relevant companies. Additional information, at the company rather than the policy level, was obtained from the selected companies' filings with the various state insurance commissions, as compiled by a private company. Policies were divided into two major categories: "pay as you go" policies that have no significant savings component and "pay in advance" policies that do.

For "pay as you go" life insurance policies (annual renewable term insurance), costs for similar or identical benefit structures are compared directly with each other and also with an "ideal benchmark" cost based only on average census mortality rates. This "ideal" cost would only obtain in a world without administrative and selling costs, and with no problem of adverse selection.[1]

[1] A complete discussion of the "ideal" cost concept is given in Chapter II, where the some of the implications of dropping the restrictive assumptions are also presented. "Adverse selection" refers to the problem created by systemat-

It is "ideal" in the same sense that a gas "law" is said to be "ideal." It would obtain exactly only under conditions that are simpler than those that actually exist, but it may be useful as an approximation even so. It is not "ideal" in any ethical sense. Low, average, and high annual renewable term rates (ART's) are constructed and presented.

For "pay in advance" policies, those with a significant savings element, the representative term insurance rates developed earlier are used to compute the implicit rates of return being offered on the savings elements in these policies. These rates of return allow one to compare the pro's and con's of buying "pay as you go" policies and saving elsewhere to buying "pay in advance" policies with their built-in savings features. The costs of "pay in advance" policies are also compared to an "ideal benchmark" cost based on prevailing interest and mortality rates.

To respond to the second part of the request, one first has to grapple with what "adequate" consumer information means. One possible meaning would focus on whether it is possible for a highly sophisticated consumer equipped with a computer, actuarial knowledge and time, to make meaningful comparisons between policies and companies on the basis of publicly available information. Since we relied almost entirely on public information to make the 1983 policy comparisons, we were in fact in this very position. In the appropriate chapters, we point out where there are gaps in publicly available data, where available data is particularly hard to use because of inconsistent definitions, and other data problems. But although availability of information is impor ant, the deeper question is whether enough people use the available

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ically attracting a sample of people whose mortality experience will be worse than average. See Chapters IV and V for brief discussions of the issue.

information to make the whole market perform "as if" all consumers were fully informed.

The basic approach followed in this report is to develop testable implications of how the life insurance industry would behave if all market participants acted as if they had all relevant information. In efficient markets, buyers exploit all arbitrage opportunites and eliminate or force change in the offerings of sellers who attempt to charge higher prices for a given quality than others. For example, a simple "full information" model predicts that arbitrage on the part of knowledgeable consumers will force the implicit rate of return on "pay in advance" policies to be equal to the rate of return on other savings media. Of course, actual markets are unlikely to behave with perfect textbook-like efficiency. Rates of return in all actual savings markets, of course, vary considerably and some of this variation reflects compensating differences between contracts. Saving through pay in advance life insurance is not exactly equivalent to savings through other financial institutions because some options and guarantees offered or mandated on life insurance policies are not commonly offered by alternative savings media. Thus, the basic test must be whether or not there are unexplained and persistent differences between implicit rates of return on life insurance policies and explicit rates paid by other forms of savings institutions.

Chapter I provides some broad backround on the "ordinary" life insurance industry, the segment of the industry that is the focus of this report. The relative importance of this segment as a supplier of life insurance protection and as a savings medium is discussed. This segment is compared to "group" life insurance which provides only protection and does not employ salesmen. It is shown that the share of personal saving accounted for by saving through life insurance declined very sharply during 1979 to 1981 and recovered somewhat by 1983. Some possible explanations are given along with evidence on how the changes in saving come about by using detailed information on the aggregate income, expenses and changes in asset holdings, for the entire ordinary insurance line. These aggregate statistics reflect the experience of more than 1200 life insurance companies during the years 1978-1983. These figures are also used in later chapters to provide industry-wide average figures and trends on expenses for comparison to individual company experience.

Chapter II provides a basic economic analysis of the life insurance industry and so provides predictions of how the industry would behave if entry were free and consumers had all relevant information. The simplest economic model also turns out to reproduce many of the propositions given in any standard actuarial work. The main result is to show that, under certain conditions, and despite the seemingly immense variety and complexity of life insurance policies, all policies are in fact simple combinations of the same basic "atoms." Arbitrage by informed buyers will force seemingly different policy contracts to be equivalent, thus yielding a great many testable predictions. In particular it is shown that combining an ART policy with a systematic saving plan is mathematically identical to a "whole life" pay in advance policy. Arbitrage will force the implicit rate of return on the whole life policy to be identical to the market rate of interest. Also, given an interest rate and a set of mortality rates, the policy "atoms" can be explicitly computed and added up to produce an "ideal cost" for any given policy "molecule." These "ideal" costs are given for virtually all types of existing life insurance policies for various interest rates and the latest available mortality rates. In the last section of the chapter the ideal assumptions are relaxed, and the implications of more realistic conditions are discussed.

Chapter III reviews evidence from studies, some recent and some more than 150 years old, that indicate that price competition in the life insurance industry is not as effective as it is in most other industries in forcing firms to produce the qualities that buyers want at the lowest feasible price. Chapter III also briefly summarizes a long history of scholarly writing suggesting informational problems in this market, mentions the origins of some regulations in so far as they may have been related to perceived informational problems.

Chapter IV examines a representative selection of "pay as you go" or annual renewable term insurance policies. Marginal premiums at a given age, for smokers and nonsmokers, are compared to average census mortality rates and found to be very close. Average rates for males between ages 24-65 for two different policy size classes are given, along with measures of variability. The latter are used to construct low, average and high annual renewable term insurance rates for several different policy sizes. "Ideal" ART prices are computed and compared with the actual market prices.

Chapter V examines a representative sample of "pay in advance" or whole life policies. Similar policies are compared with each other and with the "ideal" costs reflecting 1983 market interest rates as presented in chapter II. Implicit rates of return on the savings elements are computed and the advantages and disadvanges of these policies, relative to "buying term and investing the difference", are presented and discussed. The ART rates from Chapter IV are used to estimate the cost of term insurance.

Chapter VI examines a representative sample of new policy types or new organizations that have grown rapidly during 1978-1983. In particular, a representative selection of "universal" life policies is examined and effective rates of return are computed using the term insurance rates developed earlier. Advantages and disadvantages of universal life are discussed relative to buying term and investing the difference and relative to buying traditional whole life policies.

Chapter VII examines the question of "replacement", the advantages and disadvantages of canceling an old policy in order to buy a policy being offered in 1983. Rates of return required to do just as well as with the existing policy are given for a sample of dividend paying and non-dividend paying policies issued in 1963 and in 1973. Examples of replacing these "old" policies with new ones are given. These examples are supplemented by examining a relatively large group of policies issued in 1950, 1960, 1970 and in 1976, for which actual dividends are available from the 1977 FTC Survey. With this data (which constitutes the most complete set of policy data with actual dividends paid that we know of) we can compare annual dividend rates with market rates of interest, and compute "break even" rates of return.

Chapter VIII is an extension of the basic model of Chapter to a world of uncertain and volatile interest rates. Stress is placed on several options in pay in advance policies that may be valuable when interest rates are uncertain. At least some the evidence that has been interpreted as indicating that price competition is ineffective in life insurance, may instead be consistent with an efficient market for policies that contain many complex financial options.

Chapter IX examines the question of information adequacy. The evidence provided in earlier chapters on policies issued in 1983 is reviewed with respect to whether prices and rates of return appear to be comparable with alternatives, whether policyholders appear to take advantage of potential benefits of their policies and are compensated for any unusual disadvantages associated with them and finally whether the potential savings available from further shopping seem similar to other savings media. This chapter also reviews survey evidence on consumer understanding of life insurance policies, on their shopping behavior and on the frequency with which they make use of the policy loan privilege contained in pay in advance policies. Work by economists on the theory of markets where it is costly for buyers to evaluate the quality of their purchases, even after the sale, is briefly reviewed, and its relevance to the life insurance market is discussed. The Chapter closes with some suggestions for a more satisfactory economic model of this market.

Chapter I

The "Ordinary" Life Insurance Business
Change and Continuity: 1978-1983

Although controversy concerning the value of its products and the effectiveness of competition has been a fairly normal part of business life for those in the life insurance industry over its more than 200 year history (in England and the United States, see Chapter III), the types of products offered and the manner in which they were sold appear to have changed little in the United States between 1906 and the mid-1970's.[1] In the view of some, the life insurance business has been undergoing "revolutionary" changes since the mid 1970's[2]. Policy types that had been the mainstay of the industry over many years appear to have declined sharply and suddenly. Firms well known in other fields, as stock brokers or money-market fund managers, entered the business, often with new policy types or sales strategies. The best known industry trade

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[1] The whole life policy, for example, has long been the most important type of policy sold, both in terms of sales revenue and numbers of policies for as long as we have statistics on the subject. Major features of the present day contract (such as guaranteed non-forfeiture values and the suicide and incontestability clauses) were in common use by the turn of the century. The extensive regulations passed in New York state in 1906 included mandatory cash surrender values. Other states passed similar requirements over the next 25 years, resulting in a considerable "liberalization" of the surrender benefits offered in most whole life contracts. Sales through commissioned agents began in the 1840's and by the turn of the century the commission structure on whole life policies resembled the modern commission structure both in form (a percentage of the premium, with a relatively high first year rate) and in amount (45 to 65% on the first year, 5 to 10% on renewals). See Chapter III and the references therein.

[2] See, for example, **Business Week's** cover story in their June 25, 1984 issue. For a discussion of the need for and the types of changes required, see the early internal industry debate between James Anderson, "Is the Life Insurance Industry in its Terminal Stages?," **Best's Review**, July, 1977 and E.J. Moorhead, "Doomsday Just Ahead for Life Insurance? Not Necessarily!," in the August issue of the same year.

journal described a new policy type known as "universal life" as "the most successful new product the industry has seen in decades." This new product showed an extremely high rate of growth, as did some companies and sales organizations that emphasized "buy term and invest the difference". Lower premium rates for non-smokers were introduced, as were the first industry mortality tables that provided separate rates for males and females. There was intense debate both in and out of the industry concerning the future of the industry, particularly with respect to its future as a major financial intermediary or as a savings institution. Both the solvency regulations and the Federal tax laws were changed in very important ways.

These changes and controversies are inter-related; many were and are a response to a force that has produced great changes in other financial markets, namely inflation-induced high and variable rates of interest. This chapter tries to provide an overview of some of the main features of the industry, before we get too lost in the individual policy trees, and to describe how some of the major changes may have been produced in part by the same forces making for rapid change in commercial and consumer banking, and in the various brokerage and securities markets.[3]

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[3] A full treatment of either the recent changes in tax law or of the changes in the solvency laws is completely beyond the scope of this report. The later policy chapters will discuss aspects of both that are relevant to the particular policy types studied. We should note here, however, that the Federal tax treatment of life insurance companies and policyholders was changed in important ways by the passage the Tax Reform Act of 1984 (HR 4170, CR 130 #87-Part II, pp. 6433-6450). This Act replaces the fundamental tax legislation passed in 1959 and which was in full force up until 1976. The changes in the solvency regulations referred to in the text are those that allow companies to use higher (and in some cases variable interest rate assumptions) in making reserve and cash value calculations, to charge higher or variable interest rates on policy loans, and to use a new set of industry mortality tables which for the first time provide separate statistics on males and females in computing reserve requirements.

"Ordinary" Life Insurance: Savings and Sales Agents

In this Report, we focus on one particular segment of the industry, known as "ordinary" life insurance. Most of the controversy relates to policies sold by life insurance agents to individuals, rather than to groups, and particularly to policies that contain large savings elements. Most ordinary policies are sold by commissioned sales agents and a major portion of the benefits from these contracts arise from their savings features.[4] In contrast, most participants in "group" plans have not joined as a result of being actively solicited by a commissioned sales agent and group plans are generally "pay as you go" and so do not build any significant savings accumulation.[5]

G.K. Chesterton wrote that to know your home you must leave it. Similarly, to better understand the importance of the dual savings/protection nature of ordinary life insurance and the role of the agent/salesman, it is instructive to compare it to an industry that provides private life insurance protection,

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[4] The ordinary line does include relatively small amounts of "mass-marketed wholesale" insurance sold on an individual basis, but only to members of a group. See **Fact Book**, 1984, 24-25. The life insurance industry also includes both individual and group annuities and accident and health insurance. We shall not consider these latter lines since they do not provide any life insurance coverage. It is worth noting, however, that the position of the industry as an important savings institution is related to its annuities business as well as to its life insurance business. Accumulated savings through life insurance companies is closely related to total policy reserves. In 1960, about $4 out of every $5 held in reserves were for life insurance policyholders. By 1982, more than half of the reserves held by life insurance companies were for annuitants. Thus, annuities are an increasingly important part of the industry's role as a major savings institution.

[5] Sales agents do, of course, solicit employers and associations to set up group life insurance plans. The difference is that the selling cost is incurred once for the group as a whole, rather than for each individual policyholder, as with ordinary insurance.

but does so without significant savings accumulation or sales commissions.[6] Table I-1 provides a quantative comparison between ordinary and group life insurance. It contains information on the premiums, death benefits and reserves per $1,000 of coverage for the two lines. These two lines supplied 93% of private life insurance coverage in 1978, growing to 95% by 1983. Also by 1983, they each provided roughly half of the total of $4.7 trillion life insurance in force. Both covered many millions of persons and both were "mature", in the sense that they had been providing this coverage over many years. As can be seen from the table, except for 1983, both paid out remarkably similar death benefits per $1,000 of coverage. In 1981, for example, each paid about $3.36 in death benefits per $1,000 of coverage. This means that, weighted by the amount of coverage, on the average three and one third policyholders out of every one thousand died in that year. The similarity is consistent with the hypothesis that the age distribution and/or mortality rates are similar for the two insured groups.

[6] We should note that private life insurance itself is not the only source of protection. The effective amount of coverage provided by the Federal government through Social Security "survivor benefits" alone, surpassed all private life insurance coverage in 1973 (FTC, 1979, Table II-12, p. 69). In 1982, survivor benefits amounted to $33.6 billion (U.S. Statistical Abstract, 1985, p.359), compared to about $15 billion paid in death benefits on all private life insurance contracts. The difference in death benefits paid understates the difference in total value of coverage because Social Security survivor benefits are annual payments to survivors for life; whereas, private life insurance benefits are almost always taken in a lump sum. It seems likely that private life insurance provides less than one third of total life insurance coverage.

Table I-1

Ordinary and Group Life Insrance Compared
Amounts, Premiums, Death Benefits and Reserves
Per $1,000 of Coverage
1978-1983

	Ordinary			Group		
Year	Prem-iums	Death Benefits	Re-serves	Prem-iums	Death Benefits	Re-serves
1978	$18.48	$3.73	$110.07	$5.86	$3.81	$5.80
1979	$17.64	$3.50	$104.74	$5.64	$3.61	$5.71
1980	$16.74	$3.46	$99.58	$5.39	$3.59	$5.57
1981	$17.17	$3.36	$92.92	$4.73	$3.37	$4.98
1982	$16.17	$3.16	$85.81	$4.57	$3.36	$4.74
1983	$14.93	$2.87	$77.35	$4.31	$3.27	$4.57

SOURCE: 1984 FACT BOOK

NOTE: Numbers given in this table (from the American Council on Life Insurance) often vary from figures shown for the same named variable in other tables of this Report based on data obtained from the A.M. Best Co. There appear to be two important reasons for the discrepancies. First, the ACLI and Best's gather independent samples from the annual reports that the companies are required to file with the state insurance commissions. Second, while all the Best data is taken directly from these state mandated reports, the ACLI obtains some data directly through its own voluntary surveys of its membership. In the latter case, the ACLI definitions of, e.g., "number of policies", may exclude reinsurance and thus it differs from the statutory definition that companies use in their annual filings. Reinsurance agreements mushroomed in recent years because of tax considerations, causing an immense inflation in the "statutory" number of policies that is unrelated to the change in the actual number of policies held by the public, rather than by other insurance companies.

Given the great similarity, it may seem surprising to find that the premium rates per $1,000 are so different. Ordinary premium rates are three times higher than group premium rates. Why? One very important reason is that many of the ordinary policies combine a savings plan with the insurance protection. Policies with level premium rates have built-in savings features, because in the early years the premium rate must be higher than the pure cost of protection, one pays "in advance." [7] Assets are accumulated during this process and if the policy is canceled, the policyholder is entitled to a "refund" of the assets built-up, but not used. The magnitude of this difference in funding is seen not only in the premium rates, but also in the reserves per $1,000, a measure of the assets accumulated to meet contractual obligations to policyholders. As can be seen from the table, ordinary life policies accumulate about twenty times as many dollars of assets per $1,000 as do group contracts.

Much more detailed data on the flows and accumulations in the ordinary line is shown in Table I-3. This table shows quite directly that the dollar benefits paid or accruing to policyholders because of the savings role of ordinary life insurance far outweight the death benefits paid because of its protection role. Whereas death benefits vary from about $2.75 to $3.50 per thousand of coverage, savings benefits vary from about $9 to $12 per thousand, or about 75% of benefits paid or accumulated.[8]

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[7] The term "pay in advance" is used in the text to refer to a class of policies, and should not be confused with terms such as "advance premiums" or "prepaid premium agreements." We use the first term to refer to policies that generate significant savings accumulations. The other terms refer to specific agreements to pay the usual premium on a policy before it is due either because there is some tax advantage to doing so, or because the company will accept it on a discounted basis or for some other reason.

[8] See the outflow of benefits under the section "Flow to Policyholders" and the increase in the savings accumulations or balances under the section "Increase In Policyholder Assets" in Table I-3.

The vast majority of the life insurance savings dollars flow from ordinary policies or "pay in advance" policies, whereas group plans are basically "pay as you go" term insurance instruments. The fourth and last columns of Table I-1 show that savings intensity (as measured by reserves per $1000 of coverage) for both ordinary and group insurance declined by about 20% over the period. We shall discuss possible reasons for this decline in the next section.

Another quantitatively less important difference between ordinary and group life insurance is the role of the sales agent. Sales commissions and other agent expenses averaged about $2 per thousand of ordinary coverage, whereas all group expenses (other than death benefits) were $2 per thousand in 1978 and fell to about $1 per thousand by 1983. [9]

We note that if the ordinary industry continues to sell fewer savings intensive policies, the differences between it and the group business may well diminish. The statistical profile of the entire industry may then grow more and more to resemble the profile of its group insurance segment.

An Overview Of The Ordinary Life Business: 1978-1983

Having briefly examined the significance of the ordinary line in the overall private life insurance market, we turn to a more detailed examination of its components and to trends displayed by them over the last six years.

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[9] There are other differences between group and individual coverage that may account for some of the difference observed in the premium rates per thousand. A group plan is subject to termination (but it must be the entire group), whereas the individual plan is not; group rates are generally not guaranteed for long periods of time, whereas some individual policy rates are and group coverage is generally not renewable beyond the usual retirement age of 65, whereas many individual contracts are renewable through age 100. By "renewable" we mean that the insured can continue coverage by simply paying the premiums as due, without regard to medical condition.

Savings Role

As we noted above, the ordinary line accounts for most of the savings through life insurance, and most of the dollar benefits provided by ordinary life insurance stem from its savings function. Yet the savings intensity of ordinary life insurance has been declining. How important is ordinary insurance as a respository of annual personal saving? Has its share of personal savings been declining? The answers to these questions are given in Table I-2.

As can be seen in column (5) the share of new ordinary life insurance savings in annual savings plunged from about 7% of personal savings in 1979 to 2.5% in 1980 and reached a low of 1.3% in 1981. The slight recovery in 1982 was followed by a much stronger increase in 1983, which put the life insurance share of personal savings at about 4.8% of the total, or about two-thirds of its 1979 share.

Thus, the industry's share of the personal savings market plummeted by over 80% in only two years. It is not surprising that there has been a great deal of controversy and a search for new products. The decline in its share of savings coincided with a sharp rise in market interest rates as reflected in columns (7) and (8). The partial recovery in 1982-83 coincided with a fall in market interest rates. It is possible that these interest rate movements are causally related to the share changes. We will examine some of these possible connections below.

Table I - 2

Share of Ordinary Life Insurance of New Savings (Dollar Figures In Billions - Percentages As Indicated)

	(1) Life Insur. Savings Accum.	(2) Life Insur. Savings New	(3) Disp. Income	(4) Personal Savings New	(5) Personal Savings Insur. Share	(6) Personal Savings Rate	(7) Interest Rates Tax Free	(8) Interest Rates Short Term
1978	$137.9	---	$1458.4	$72.0	----	6.10%	5.90%	7.57%
1979	143.2	5.3	1624.3	73.8	7.18%	5.97%	6.39%	10.02%
1980	146.0	2.8	1828.9	110.2	2.54%	6.01%	8.51%	11.37%
1981	147.8	1.8	2041.7	137.4	1.31%	6.61%	11.23%	13.81%
1982	150.3	2.5	2180.5	136.0	1.84%	5.73%	11.57%	11.08%
1983	156.0	5.7	2340.1	118.1	4.83%	5.05%	9.47%	8.75%

Col.(1)- Accumulated Ordinary Life insurance Saving: Ordinary life insurance reserves plus dividend accumulations less policy loans. In billions of dollars. Source: Annual Statements as compiled by the A.M. Best Co.

Col.(2)- Change in col.(1). In billions of dollars.

Col.(3)- Personal disposable income. In billions of dollars. Source: Economic Report of the President, 1985, p.260.

Col.(4)- Personal savings, national income basis. Source: see col.(3), p.260.

Col.(5)- Share of life insurance savings in total personal savings. Col.(2) divided by col.(4) times 100.

Col.(6)- Personal savings rate. Col.(4) divided by Col.(3) times 100.

Col.(7)- Interest rate on (federal) tax free high grade municipal bonds. Source: see col.(3), p.310

Col.(8)- Interest rate on 6 month Treasury Bills. Source: see col.(3), p.310.

The life insurance industry was not alone in rapidly losing an important share of the savings market; banks and savings institutions subject to depository interest rate ceilings generally saw large outflows going to unregulated institutions that paid depositors higher rates of interest. Unlike these institutions, however, the life insurance industry was not subject to government imposed interest rate ceilings. Nor was it true that all "pay in advance" policies were inflexible in the effective rate of interest they could pay. Since, for this discussion, it is essential to understand the basics of how a life insurance policy can pay "interest," we will provide a rudimentary treatment here for those unfamiliar with the subject. More thorough discussions will be found in later chapters.

"Interest Rates" On Life Insurance Policies

A life insurance policy with a "level" premium, one that does not increase with age, must involve savings as well as insurance. The reason is that the cost of providing life insurance generally increases each year, since mortality rates generally increase with age. To break even, a company, would have to charge a level premium that is higher than the mortality cost in the early years, but lower than mortality costs in later years. The difference between the level premium and the mortality cost can be compared to a "deposit" in a savings account or in some other type of savings fund. These deposits accumulate at interest and are called the policy's "reserve." The policyholder can choose to withdraw this accumulation, though oft n he can do so only if he cancels or "surrenders" the policy. If withdrawn, the policyholder will generally be entitled to receive the policy's reserve less a surrender charge. The amount he is entitled to receive at the end of any year is stated in the policy and guaranteed by the company. This amount is called the policy's "cash surrender value." It depends on the interest rate guaranteed in the contract, the level premium agreed to, and the mortality cost assumed by the company. The higher the level premium relative to the mortality cost, the higher the interest rate for given premiums, the higher the cash surrender value at any point in time.

For some policies, called "non-participating", the guaranteed cash surrender values constitute the only savings benefit of the contract.[10] These "non-par" policies are analogous to fixed interest rate contracts such as a certificate of deposit with the interest rate fixed and guaranteed for a period of years at the inception of the contract.

Other policies are "participating." They pay dividends and are analogous to contracts that pay a current (but not guaranteed) interest rate that may be above the guaranteed minimum. Dividends are usually declared each year by the insurance company and depend on three components. First, the actual interest rate at which the company has invested the assets provided by the policyholders' deposits may be higher than the interest rate assumed and guaranteed in the formula used to generate the cash surrender values. In this case, the company may choose to credit some or all of the extra interest earnings to its policyholders in the form of dividends. Current dividends reflect the actual

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[10] The term "participating" seems to have originated in England, where it originally meant that the policyholders would "participate", that is, share in the company's profits. "Non-particpating" companies, then, guaranteed premiums, but did not share profits or losses with their policyholders. In the United States, most participating policies are issued by "mutual" companies, who in a legal sense of the word, earn no profits.

investment earnings of the company in any given year.[11] Second, mortality experience may turn out to be more favorable than was assumed in the formula that generated the cash values. Finally, the non-claim expenses of the company may turn out to be lower than assumed in the calculations, so again the company may decide share some or all of the expense savings with its policyholders. Dividends are obviously not guaranteed, since no one can know in advance what interest and mortality rates will turn out to be in the future. However, the possibility of paying dividends makes it possible for a life insurance company to pay interest rates on policyholder deposits that reflect current outside market interest rates. Thus, policies that pay dividends, "par" policies, are analogous to savings contracts with variable rates of interest such as money market funds.

Par, or dividend paying, policies are not the only type of variable interest rate life insurance contract; universal life contracts, interest "sensitive" policies and others that will be discussed in Chapter VI also either pay interest at a variable, non-guaranteed rate or have adjustable premiums that can be changed to reflect changes in interest rates.

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[11] Earning rates, however, are based on the entire "portfolio" of assets and therefore will generally not be the same as the "new" money rate, e.g. the rate on 30 day T-bills. In a time of rising interest rates, the portfolio rate will tend to be below the new money rate and in a time of falling rates, above. The average earning rate (before Federal taxes) for the industry as a whole, increased from 7.39% in 1978 to 9.06% in 1983 (**Fact Book**, p.60). The portfolio rate was generally below short term interest rates in all the years except 1983, when it was about equal to, or slightly above new money rates. Traditionally, dividends actually paid reflected the portfolio rate, that is, they did not depend on the timing of one's past investments or deposits. An alternative approach (known as the "investment year" method) has become far more common in recent years. Using this method, dividend rates can reflect new money rates for new money invested, but also reflect and pass on capital gains or losses on old assets purchased to those who made the investments in the past.

During the first part of this period, "par" policies accounted for about half of the total amount of new policies sold, and considerably more than half of all policies in force. The share of par policies declined over the whole period.

The traditional "non-participating" or "guaranteed cost" whole life policy (see Chapter V) appears to have a built-in fixed guaranteed rate of return structure. In fact, however, rates of return from the policyholders point of view can vary, within limits, if use is made of the "policy loan option" (the right to borrow against the cash surrender value at an interest rate stipulated in the policy). If the borrowed funds are not reinvested in the industry, however, life insurance saving would fall. With higher than anticipated interest rates being earned companies could also have unilaterally offered to lower the premium rates on existing policies to reflect higher current interest rates[12]. Another alternative could have been for non-par policies to have been converted into par policies, either by canceling and switching to a par policy from another or by companies voluntarily converting to a par form.

Thus, in contrast to banks and S&L's, rigidly fixed interest rates do not provide a clear and simple reason for the rapid outflow of savings dollars at a time when interest rates rose to higher than anticipated levels.

There are several broad possibilities that could account for the decline in savings. First, rates of return on life insurance savings may not have risen as much as rates in alternative savings media such as money market funds.

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[12] There are non-participating "indeterminate premium" policies which are similar to traditional non-par whole life, except that the company can lower or increase the premium up to some stated maximum. The "popular" form of this type of contract is attributed to Crown Life, which introduced it in 1972. See Samuel Turner, "Innovation in Life Insurance Products: The Pace Quickens", Best's Review, March, 1981.

Policyholders, perceiving this, might have taken steps to move their savings to institutions paying higher rates of return. Alternatively, they may have "replaced" their traditional savings intensive policies with newer varieties, perceived to be offering better value in an inflationary world. If this is the case, then we might ask why the differential between life insurance and other savings media widened? Were there regulatory constraints or tax changes that made it difficult or impossible for the industry to offer rates of return comparable to other institutions? Second, the observed decline in savings could have come about for a purely technical reason, namely, that higher interest rates generally imply that lower "reserves" are required at any given moment in time to fund future contingent liabilities.[13] If firms revalued their reserve requirements using higher interest rate assumptions, then reserves would have fallen even if there had been no change in policyholders' behavior at all. A third general possibilty is that the decline in saving merely reflects a decline in overall life insurance ownership, a decline that is common to all ordinary life insurance contracts, not just the savings intensive pay-in-advance type. This last possibility can be quickly ruled out, since life insurance ownership increased substantially.

Insight into how much explanatory power any of these possibilities have can be gained from examining the data contained in Table I-3. This table provides a comprehensive quantitative picture on all the flows and asset accumulations

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[13] A rigorous proof of the proposition was given by Lidstone in 1905. A corollary to his theorem states that an increase in the rate of interest produces a decrease in reserves, provided that reserves increase with duration. See Jordan (1967), pp. 118-121 for a discussion and a proof of this theorem.

for the entire ordinary life insurance industry between 1978 and 1983.[14] It is a double entry income statement and shows all the flows into the industry whether directly from policyholders (premiums and interest payments on policy loans) or indirectly from the investment earnings of policyholder generated assets; the outflows to policyholders (dividends, death benefits, cash surrender values and changes in policy loans), to home office expenses, to agents, to federal and state taxes, to profits for stock companies and to additional surplus for mutual companies; and, finally, to asset accumulations either for policyholders or stockholders. The sum of the inflows less the outflows must equal the change in asset holdings for policyholders and stockholders. The figures are totals across all companies, policyholders, face amounts of coverage and the number of years-in-force. Except for the rows toward the end of the table under the heading "other information," all figures are scaled in units of $1000 of insurance coverage. The dollar totals for each of the preceding rows of the "gain and loss" exhibit can be recovered by multiplying the row entry by the total coverage figure in the next to last row. The

[14] The data comes from mandatory annual reports filed by each company with the various state insurance commissions. The reporting form is virtually uniform across all the states. For detailed discussion of the annual statments see Strain (1977) and Noback (1969). Most of the figures in Table I-3 are taken from the "gain & loss" exhibit, analysis by lines of business. This exhibit is the subject of chapter 14 in the Strain book referred to above. Chapters 16 and 17 of that book contain a discussion of the differences between "statutory" and "GAAP" accounting. One important difference is that statutory accounting principles require that expenses be charged off when incurred, rather than pro-rated or amortized over a longer period of time, as is common in GAAP accounting. Since first year expenses for most life insurance companies exceed the first year premium, putting new business on the books actually reduces net gain or profits on the statutory accounting statements. Rapidly growing companies appear to be less profitable than stagnant companies. While not very satisfactory for judging the prospects of future company profitability, the statutory practice of charging expenses when incurred is an advantage if one is interested in tracking the actual income and outgo flows and the actual accumulation remaining.

rows beneath the gain and loss exhibit contain information on the total amount of insurance in force, on the average, for each of the year's shown, total premium inflow (before netting out dividends used to pay renewal premiums) and finally, the average value of assets held as policy reserves per thousand dollars of coverage.

Table I-3

Cash Flows and Asset Accumulations
Per Thousand Dollars of Coverage
Ordinary Life Insurance
1978-1983

	1978	1979	1980	1981	1982	1983
	Flow From Policyholders					
Premiums less div.	$17.22	$16.55	$14.79	$14.90	$13.52	$11.89
Other premiums	$1.37	$1.35	$1.60	$1.09	$.26	$.83
Int.-pol.loans(est.)	$0.98	$1.11	$1.16	$1.18	$1.09	$.98
Total	$19.57	$19.01	$17.56	$17.17	$14.87	$13.70
	Flow From Investments					
Net invest income (less pol.loan int.)	$7.55	$7.37	$6.76	$5.93	$5.34	$4.98
	Flow To Policyholders					
Surrender benefits	$2.82	$3.09	$3.08	$2.74	$3.52	$3.80
Death benefits	$3.60	$3.40	$3.20	$3.51	$2.82	$2.76
Other benefits	$1.63	$1.65	$1.54	$1.36	$1.24	$1.25
Change in pol.loans	$1.80	$2.86	$3.45	$3.09	$1.55	$0.35
Dividends (ex.renew)	$2.68	$2.88	$2.60	$2.44	$2.18	$2.18
Total to Polhdrs	$12.53	$13.89	$13.87	$13.15	$ 11.32	$10.33
	Flow to Non-Policyholders					
Agent comm.	$2.33	$2.27	$2.08	$1.91	$1.77	$1.83
Home off. exp.	$3.44	$3.39	$3.18	$2.84	$2.69	$2.60
Other exp.	$.33	$.27	$.50	$.75	$1.00	$.65
State taxes	$.48	$.46	$.42	$.38	$.35	$.35
Federal taxes	$1.38	$1.33	$.90	$.52	$.54	$.31
Total to Nonpolhdrs	$7.95	$7.72	$7.09	$6.40	$6.35	$5.74

Table I-3
Continued

Cash Flows and Asset Accumulations
Per Thousand Dollars of Coverage
Ordinary Life Insurance
1978-1983

	1978	1979	1980	1981	1982	1983
	Increase In Policyholder Assets					
Incr. in pol. reser.	$6.26	$5.52	$4.61	$3.52	$2.36	$2.09
Less policy loans	$1.80	$2.86	$3.45	$3.09	$1.55	$0.35
Net incr in res.	$4.47	$2.66	$1.16	$0.43	$0.81	$1.74
Incr. in other res.	$0.67	$0.58	$0.54	$1.55	$0.49	$-.15
Total Increase	$5.13	$3.24	$1.70	$1.98	$1.30	$1.60
	Net Gain After Dividends and Taxes					
Net Gain	$1.51	$1.53	$1.66	$1.57	$1.24	$1.03
	OTHER INFORMATION					
	Average Amount In Force ($Billions)					
Average in force	$1,462	$1,632	$1,904	$2,329	$2,719	$3,062
	Total Premiums ($Billions)					
Total Premiums	$26.3	$27.9	$29.4	$35.9	$38.1	$37.9
	Reserves Per $1,000 In Force					
Average Reserves	$111	$106	$96	$82	$73	$67

Source: Annual statement data as compiled by A. M. Best Company, except for interest payments on policy loans. Interest payments on policy loans were estimated by taking 5% of average policy loans outstanding in each year. The figures come from the "gain & loss exhibit", page 5, column 3, supplemented by information on policy loans and dividends used to pay premium renewals.

Using Table I-3, we can begin to assess the importance of the various possible explanations for the decline in life insurance savings. The third row up from the bottom, labeled "average amount in force," shows that the total amount of life insurance owned by the public more than doubled over the six year period.[15] As mentioned, we can rule out a fall in ownership as an explanation for the decline in saving. In fact, since insurance ownership grew faster than income, the share of life insurance in total personal saving would have increased if there had been no shift away from savings intensive policies. We can also directly appraise the importance of "technical" revaluations of reserves in the observed decline in saving. Reserves were reduced because of valuation changes in only two of the six years, and by less than a half a billion dollars each time.[16] Thus technical reserve valuations can play only a very modest role in explaining the savings decline.

The decline in life insurance savings was produced by a shift away from savings intensive policies. It seems likely that a major role in the savings decline was played by the failure of rates of return on life insurance savings to rise as much as alternative market rates and/or to the public's perception

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[15] During the same period, disposable personal income increased about 59%. Ordinary life insurance in force was about equal to disposable income in 1978, but 1.3 times disposable income in 1983.

[16] The two years were 1978 and 1982. In all other years valuation changes resulted in increased reserves. The data come from the "Analysis of Increase in Reserves During the Year" exhibit of the annual statement form, page 6, line 7, column 3 entitled "increase in reserve on account of change in valuation basis." The figures are not directly shown in Table I-3, but are reflected in the "increase in life reserves" line.

that this was the case.[17] Rates of return may not have kept pace with alternatives for many reasons, including regulatory constraints, inflation induced tax changes, or because the traditional policies themselves were not well adapted to retaining customers in an environment of rapidly changing interest rates.

To begin with, as mentioned above, non-dividend paying savings intensive policies are analogous to fixed, guaranteed interest rate savings contracts. One possibility is that companies couldn't or wouldn't unilaterally lower the premiums on these contracts (or otherwise "enhance" them) sufficiently to retain their built-in savings components. Policyholders could have transferred their savings either by canceling them or by borrowing against the cash value. In this scenario, the entire story would be of a flight away from the traditional non-par policies. Winter (1980) has suggested that the "solvency" regulations that are mandated by the state insurance commissions, may have made it expensive for firms to unilaterally lower premium rates.[18] If this were the

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[17] Policyholders' attention to and awareness of the question of the rate of return they were earning on savings through life insurance may have been increased by the publicity and controversy surrounding the FTC Staff Report (July, 1979), which was highly critical of the industry's performance as a savings medium. Not only was there widespread media coverage, but more importantly firms stressing rate of return on "universal life" plans or "buy term and invest the difference" made extensive use of the Report in their sales brochures (see chapter VIII for an account of new policy developments). **Consumer Reports**, for the first time in 1980, published prospective rates of return on new life insurance policies. The rates of return and the shape of the yield curve were similar to those found by the FTC. As they had since 1968, **Consumer Reports** generally advised their readers against savings through life insurance, unless they needed the discipline of "forced" savings or if they were in very high tax brackets.

[18] If, for the purposes of meeting the solvency requirement, reserves must be computed using conservatively low interest rates, then a premium rate that reflects current high interest rates will appear to generate insufficient reserves to fund the company's future liabilities. The regulations then require that firms selling polcies at "deficient" premium rates put up additional assets to make up for the reserve deficiency. Thus, if it lowers

case[19], we would have seen a significant increase in cancelations and in policy loan amounts for these "non-participating" policies, but either no change or an increase in the amount of partcipating policies.

In fact, both new sales and insurance in force increased more rapidly for non-par than for par.[20] We cannot, however, rule out the story of a flight from traditional non-par policies on the basis of this evidence. The statistical category "non-participating" includes not only the traditional, fixed rate policies, but also many of the new policy types such as universal life and "indeterminate premium" life, if these were issued by stock companies. The aggregate information on par versus non-par is, unfortunately, not very helpful in determining just how much of the decline in saving was due to a flight from the the traditional non-par policies.

It is true that non-par policyholders must have had a strong economic incentive to make maximum use of the policy loan option. If they borrowed extensively against their cash values, then measured life insurance saving

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premiums unilaterally, companies would have to invest additional capital and perhaps suffer some potential loss of investment earnings, since this capital would now be subject to investment restrictions. Deficiency reserve requirements may have had important effects on premiums charged both for term insurance and whole life insurance. See the discussion and references cited in FTC (1979), appendix VIII, 3-6.

19 We note two factors that raise some doubts concerning the practical importance of the solvency restrictions. First, "indeterminate" premium policies (sold widely since 1972) avoid the problem by using a "current", non-guaranteed low premium rate, but retaining the right to raise this rate up to some maximum stipulated in the policy. The maximum rate may be used for the solvency regulations, thus avoiding deficiency reserves altogether. Secondly, there is very little evidence that the investment restrictions significantly lower the potential rate of return (see **Investment Activities of Life Insurance Companies**, J. David Cummins (editor), 1977, and Kimball and Dennenberg (1969).

20 See **Best's Industry Composite of Life/Health Companies**, for 1982 and 1983, pages 61 and 47, respectively.

would decrease because policy loans would rise. Measured saving would decrease further if, in order to supply the cash needed on the policy loans, the companies were forced to realize some of the capital losses they had actually sustained on their holdings of long term assets fixed in nominal terms (corporate and government bonds, mortgages).[21] The strong economic incentive to engage in policy loans was due to the fact that, on policies issued prior to the mid-1970's, these loans could be made generally at 5% or 6% as stipulated in the policy. Once market rates rise above the policy loan rate, each policyholder can avail himself of the higher market interest rates and continue to receive the "inside" interest guaranteed in the policy. The fact that the interest payments on the policy loan are tax-deductible makes this strategy all the more attractive. Therefore, all non-par policyholders have an economic incentive to borrow, to the maximum extent possible, whenever the market interest rate rises above the policy loan rate.

The incentive is not as strong and may be non-existent for "par" policyholders. The rate of return on a participating policy can be separated into two components: a guaranteed rate reflecting the inside interest build-up in cash values and a non-guaranteed rate reflecting dividends. If dividends paid on an individual policy are independent of whether the individual has borrowed or not, then the par policyholder, exactly like the non-par, has an incentive to borrow as much as he can as soon as market rates rise above the policy loan rate. However, companies can and have made dividend payments contingent on

[21] Statutory accounting requires that bonds be carried on the books at their historic "par" values, rather than at market value. Thus measured saving will only be affected when such losses are realized.

not borrowing against the cash value.[22] In fact, dividend payments in toto must reflect the extent of policy loans and the policy loan rate. If all of the company's reserves were borrowed out, say at 5%, it could only pay 5% to cover both the guaranteed and the non-guaranteed portions of the contract. By reducing the dividend rate to reflect policy loans, a par policy seller can discourage or completely eliminate "arbitrage" loans.[23] Nevertheless, one possibly powerful reason for the drastic decline of saving could have been that very large amounts of policy loans were made, especially by non-par holders.

Policy loans did increase substantially, in absolute terms and relative to insurance in force and reserves, during this period. The absolute increases were greatest (about $5 billion) in the years of the highest interest rates (1979-80 and 1980-81). Policy loans were less than 20% of reserves at the beginning of the period and about 30% at the end.[24] Loans, however, were more

[22] This is known as "direct recognition" of policy loans. Life insurance companies do not "recognize" loans on an individual basis. Rather, they set up new groups or classes based on policy loan activity.

[23] For example, if a company paid the market rate on assets not borrowed and the policy loan rate on assets borrowed, they would completely eliminate the incentive to borrow. If the market rate were 10%, the policy loan rate 5% and the guaranteed rate 3%, then the rate of return to a borrowing policyholder in a 30% marginal tax bracket would be .7*(10-5) or 3.5% plus the policy rate "recognizing" the policy loan of 5% for a total rate of return of 8.5%. The rate to the non-borrowing policyholder would be 10%. Clearly, the compnay could pay less than 10% and still completely eliminate arbitrage loans.

[24] Policy loan figures are provided in the annual statutory statements. Aggregate figures are given in **Best's Industry Composite of Life-Helath Companies** for appropriate years. "Reserves", when not further qualified, refer to reserves for ordinary life insurance alone. The figures come from the "Analysis of Increase In Reserves During the Year" exhibit in the annual statement, page 6, column 3. Reserves for individual annuity contracts and for supplementory contracts are not included. We note that since a large portion of reserve assets consist of long term corporate and government bonds whose market prices fell sharply with rising interest rates, that the proportion of policy loans would have been considerably higher than it was, if market values, rather than book values had been used to value reserves. We do not know of any statistics on the market value of reserves.

common on par policies and they increased more sharply than those on non-par policies. Thus, policy loan activity could account for a substantial part of the fall and the absolute changes in them are consistent with the timing of interest rate changes. However, many policy loans do not appear to have been motivated by arbitrage. The rational arbitrager will borrow as much as he can against the cash value. The incidence of such rational arbitrage loans was low. Less than 6% of the policyholders borrowed out 80% or more of the cash value, and only 22% had a loan of any magnitude.[25] Also, loans appear to be more common on par than on non-par policies, the reverse of what one would have expected.[26] Thus, although there were substantial increases in policy loans on non-par policies, the decline in savings cannot be due to a trend away from non-par fixed rate policies alone.

While in theory it seems that companies could have raised the rate of return of dividend paying policies to reflect higher rates of interest, it may be that several factors prevented them from fully passing on the increase in market rates. First, companies have typically paid dividends on their entire portfolio, without regard to the year in which an investment was made. In a time of rising interest rates they would be at a disadvantage relative to companies paying "new money" rates. In chapters VII and VIII we lok at some of the ways companies responded to this problem. Second, the inflation induced high interest rates resulted in an unanticipated increase in federal taxes.

[25] See Crosby (1984), p. 46.

[26] As a fraction of reserves, loans increased from 21% in 1978 to 32% in 1982 for mutual companies, and from 16% to 23% for stock companies. Mutual companies accounted for 80% of the par insurance in force in 1982, while stock companies accounted for 97% of the non-par insurance in force. See Best's **Industry Composite of Life-Health Companies**, 1982, p. 21 for policy loans, pp.29-30 for reserves and p.47 for par versus non-par in force in mutual and stock companies.

Warshawsky (1984) has suggested that the latter was a major reason for the fall in the after tax rate of return on life insurance in the 1970's. As can be seen from Table I-3, however, federal taxes per $1,000 of insurance in force actually declined over 1978-1983 (from $1.38 in 1978 to $.29 in 1983), so it is unlikely that could explain the rapid decline in saving between 1978 and 1981 (though it help explain the recovery).[27] A third difficulty concerns the policy loan option. As mentioned above, if policyholders borrow assets at a lower than market policy loan interest rate, then company investment earnings fall below the overall market rate. Although "direct recognition" would allow companies to pay market rates to non-borrowing policyholders, it may have taken time for many companies to recognise and deal with the problem. There are other reasons why companies may have found it difficult or impossbile to pay current market rates of interest. These will be discussed in chapters V and VI.

The Partial Recovery of Savings and A trend Toward Lower Expenses

The industry's share of personal savings increased slightly in 1982 and then sharply in 1983. While policy loans decreased as interest rates fell, again their behavior cannot explain all of the shift. The figures also reveal a very substantial decrease in selling expenses (agent commissions, salaries etc.) from $2.33 per $1,000 in 1978 to $1.77 in 1982 and rose slightly to $1.83 in 1983. Home office expenses fell from $3.44 to $2.60 over the same period. Profits or surplus fell from $1.51 to $1.03. In part these changes are due to sharp increase in policy size, without a proportional increase in expenses. These changes, in conjunction with the new policy types introduced, may

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[27] The major reason for the relative decline in federal taxes appears to have been the increasing widespread use of a technique known as "modified coinsurance" to reduce tax liability. See the Treasury Report, .

explain, to some degree, how the industry succeeded in recovering some of their lost share of the savings market. The new policy types will be examined in Chapter VI and the extent to which they may have "replaced" the older types will be briefly examined in Chapter VII.

Summary

The ordinary life insurance industry not only provides life insurance protection, but is also an important repository of personal savings. In fact, during 1978-1983, over 75% of the benefits paid or accruing to policyholders arose from the savings role of the life insurance industry. During this period, however, there was a large shift away from traditional savings intensive policies over and above policy loan arbitrage which caused the life insurance industry's share of the personal savings market to decline by over 80% in the short space of two years. There was a sharp recovery in 1983 which may have been related to the success of a number of new types of products and the better adaptation of traditional products to a world of high and extremely volatile interest rates.

Chapter II

The Basic Economics of Life Insurance

To choose a life insurance policy or to analyze the market one must find a way to cope with the seemingly endless complexity of the policies offered for sale. An astonishingly long menu of different policy types confronts potential buyers. Policies differ by duration of coverage[1], by the number of premium payments[2], and by whether premiums are level (don't increase with age) or increasing.[3] Not only does the potential policyholder confront the problem of choosing the right mix of coverage duration, incidence and amount of payments, but also he is faced with different levels of guaranteed rates of interest paid on assets held, different guarantees or levels on interest rates at which funds can be borrowed, and different levels and guarantees on future premium payments. There are hundreds of companies to choose from, and each of these companies will usually offer many different policies.

One way to cope with the complexity is to focus on what one believes to be the essential elements or benefits provided by an insurance contract and ask how such benefits would be provided and priced in a simple idealized competitive market. In this chapter we develop a model of a competitive life insurance industry that offers both "pay as you go" policies and "pay in

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[1] Examples are: "whole life", "term to 65", and "one year non-renewable term."

[2] Examples are: "single premium life", "whole life", and "20 pay life."

[3] For example, most whole life policies entail the same annual premium per $1,000 of coverage for as long as one lives; "15 year level term" entails a level premium for 15 years; and life paid at 65 entails a level premium until age 65.

advance" policies in an idealized environment. We use the term "ideal" in the same sense as it is used in the concept of an "ideal gas." The ideal gas laws are only exactly true under conditions that are known to be generally false, but such laws may still be a source of deep insight and in some circumstances good first approximations to the true state of affairs. We do not use the term ideal as a synonym for desirable or something to be aspired to.

In this ideal model, both buyers and sellers are fully informed concerning all relevant financial facts and pursue their financial interests with relentless dedication. Policies in this ideal world can also exhibit great diversity in the incidence of premium payments, duration and so forth, but here the apparent complexity masks an underlying simplicity. Although the menu of different policies may be very long, every item on this complex menu is actually a different mix of the same ingredients, namely one year, or annual, term insurance contracts together with an option to renew the contract for a stated period of years (the "term") by simply paying the annual premium specified in the contract. Such a contract will be referred to as an "ART policy." The price of each item is a weighted average of the prices of the individual ART's out of which it is composed. The "weight" for each ART price turns out to be another price for a basic contract, namely the price for a contract that provides one dollar to you "i" years in the future if and only if you are alive to receive it. Such a contract is known as an "i_{th} year pure endowment". If each contract is viewed as a combination of ART ingredients, then its price is simply a weighted sum of its ingredients' prices.

Rather than having to separately analyze each of the myriad contracts to determine its price, we need only to determine the prices of the basic ingredients: ART's and pure endowments. The two basic ingredient prices are themselves each composed of two more basic components: mortality rates and the interest rate. The former are the two "molecules" of which all polcies are constituted; the latter are the irreducible "atoms" which compose the molecules. The atoms are mortality rates and the interest rate. From these, we can build the molecules and hence the "ideal" price for any contract from a year term insurance to a single premium whole life contract.

In spite of the great simplicity of the ideal model, it produces a substantial number of interesting results. For example, the question of whether and precisely how purchasers of whole life policies are "saving" has been very controversial.[4] Under ideal conditions, we can show that a whole life policy is exactly equivalent to buying annual renewable term insurance and systematically saving the difference with a bank. Competitive pressures will force the implicit rate of return on "pay in advance" policies to be exactly equal to the rate of return paid by banks. In Chapter VIII, we examine the question of how this equivalence will be altered under more realistic conditions.

One consequence of assuming a purely competitive market is that prices, for a given scale of output, will be determined solely by the costs of providing the benefits that such policies offer. Thus, in this chapter, we concentrate on the "supply side". As a first approximation, we examine a world where mortality rates are the same for all and known with certainty, as are current

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[4] See, for example, the statement of John Filer, then president of the Aetna Life Insurance Company, that a whole life policy is not "...partially insurance and partially savings. It is wholly insurance." Hearings on FTC Life Insurance Cost Disclosure Report (1979). Also see the American Council on Life Insurance response to the FTC staff's use of the term "savings through life insurance" in Ibid., 133-134, and the distinction made therein between savings in a macroeconomic sense and the benefits contained in a whole life policy.

and future interest rates.[5] Later we drop the assumption that future interest rates are known and discuss how certain policy features, such as the policy loan option and the guaranteed cash surrender values, become potentially valuable "options" that may make life insurance saving different from other common savings media. Using the latest mortality tables and average interest rates prevailing during 1978-1983, we computed ideal prices for the most common kinds of policies. These "ideal" prices will be compared with actual premiums in Chapters IV through VI. These computations also show that the actual changes in market interest rates over this period imply very large reductions in ideal premium rates, whereas recent reductions in mortality rates imply relatively small reductions.

Before getting into the details of the ideal model, we first discuss the atoms of the system: a known interest rate and known mortality rates.

Known Interest Rate

An interest rate, under ideal conditions, allows us to unambiguously assign a dollar value today to a contract that promises (with no chance of failure) to deliver a dollar in the future. In a world where everyone could borrow or lend at 10% per annum for any future period, the price of a dollar delivered one year from now would be 91 cents. If it were more, everyone would want to sell such contracts since they would yield more than 10%; if less, every one would want to buy. Hence the equilibrium price is exactly 91 cents. Thus if the rate of interest is known to all, the current equilibrium market price of obtaining a dollar at any future time can be easily calculated by

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[5] While the mortality rate for a given group of people of the same age and sex is assumed to be exactly correct, it is also assumed that no one knows which members of the group will die. Without this assumption there can be no risk spreading or insurance.

using the interest rate. The current value of promises to deliver dollars in the future is therefore easily ascertainable. Note that the assumption that future rates of interest are known with certainty is crucial for this conclusion; that the futures rates are all equal to the current rate is not. With different future rates, the calculations are more complicated, but it is still true that the current value of dollar delivered in the future can be explicitly calculated from the interest rates applicable between now and the delivery date.

Known Mortality Rates

Similarly, probabilities (in this case mortality rates), under ideal conditions, allow us to compare dollars delivered under different contingencies or in different "states of the world". If, for example, the owners of insurance companies value contingent contracts at their "expected" or average value, and if there are no contract costs other than claims, then the price of a contract that promises to pay (without fail) one dollar if and only if contingency A occurs will simply be $1 times the probability that A occurs. If one out of every 200,000 35 year old men alive today will die before midnight tommorrow, then a contract that obligates the insurer to pay $200,000 to the estate of a 35 year old man if and only if dies tomorrow will cost (almost) exactly one dollar today. If the price was higher than one dollar, insurers would seek to sell more of these contracts and thereby drive the price down, since at a price above one dollar these contracts would, on the average, be profitable. The only equilibrium price is one dollar. Probabilities, under ideal conditions, therefore allow us to compare dollars delivered under different contingencies just as a known rate of interest allows us to compare dollars delvered at different points in time.

basic constituents of all prices.

The "Ideal" Competitive Model

We assume that: (1) there is a single known interest rate at which all individuals and companies can borrow or lend now or in the future; (2) mortality rates are known and that deaths occur exactly as the table predicts; (3) aside from age there are no other known factors related to mortality, that is, there is no basis for "selection" within a given age class; (4) there are no costs other than claim costs; (5) entry into the industry is easy, so in equilibrium, prices of all policies offered must equal their claims costs. Further, for the sake of simplicity we assume that (6) all deaths occur at the end of the year and that (7) premium payments, if they are made at all in a given year are made at beginning of the year. The "competitive" prices determined under these circumstances can be found in virtually any insurance textbook, where they are known as "net premiums", i.e., premiums just sufficient to cover claim costs.[6] Since we will make intensive and rather unfamilar use of these prices we need to develop them in detail.

One Year Term Contracts

One of the earliest[7], and most basic, types of life insurance contracts written was what is now called a one year term insurance policy. In exchange for a premium paid at the inception of the policy, the company obligates itself to pay a named person (the "beneficiary") an agreed upon sum of money (the

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[6] See Menge and Fisher (1965) or Jordan (1967).

[7] The earliest policy type offered by a company was different from any currently marketed. The face amount or death benefit was variable, depending on how many members died in any given year. For details see Francis Bailey's (1813, vol.II, 479-483) discussion of the **Amicable**, which was chartered in 1706. For a brief survey of the early history of life insurance see Chapter III.

written was what is now called a one-year term insurance policy. In exchange for a premium paid at the inception of the policy, the company obligates itself to pay a named person (the "beneficiary") an agreed upon sum of money (the "face amount" of the policy) if the insured person dies within the year. If the person insured survives beyond the one year "term", the company pays nothing. The word "term" refers to the fact that the contract has a fixed duration (in this case, one year) in contrast to a contract that can be renewed at the buyer's option for as long as he or she lives.

The price or the "premium" for a one year term contract, under the conditions stated, will be closely related to the probability that the insured dies before the year is up. For example, in 1980, about 1.83 out of every 1000 white males aged 35 died before reaching age 36. If we ignore all other expenses and assume that insurers sell or "issue" policies to a random selection of the white male population, then the insurer would need to charge a premium of $1.83 per $1000 of coverage or "face amount" to break even.

The "Whole Life" Contract

Another contract, also dating from early times, is the "whole life" contract.[8] In return for a constant or "level" premium paid yearly, the insuror is obligated to pay the beneficiary the face amount when the insured dies. This differs from the annual term contract in two ways: the premium does not rise with age and there is no fixed term. The latter condition implies that, so long as the premiums are paid, there is no uncertainty about whether a death claim will be paid, but only as to when it will be paid. This raises the question of how, in exchange for a premium that is small relative to the amount

[8] The first whole life policy appears to have been written by an English company called the **Equitable** in 1762. See Chapter III for a brief survey of the early history of life insurance.

insured, all policyholders can nevertheless be made better off. It may also suggest that whole life and annual term contracts must be different in kind, since with the latter there is generally a very good chance that no benefits will be paid. But there is no fundamental difference in kind, at least not when term insurance is combined with a particular systematic saving plan. A simplified example may help to make these points clear.

An Example: When the Interest Rate is Zero

Imagine a group of nine thousand men of the same age (a "cohort") who will live for at most another nine years. They die in an unusual, but arithmetically convenient, pattern; exactly one thousand die at the end of each of the nine years. The current and future interest rate is zero. Each man wishes to be certain that his beneficiary will have exactly $1,000 when he dies. Each man is able and willing to save $200 out of earnings at the beginning of each year, but has no assets to begin with. There are many companies that offer ART or whole life policies and there are "banks" that serve as depositories for savings accumulations.

Company "Whole"

Consider a company called "Whole" that sells whole life policies. What level annual premium would it have to charge to break even if it sold whole life policies to everyone in this group? In this case, it is not very hard to compute the answer. Since the company will eventually pay $1,000 to each of the nine thousand beneficiaries, the total inflow or premium income over the nine years must be $9 million. At the beginning of the first year, all nine thousand will pay, but in the second yeear only the eight thousand survivors will pay, in the third year, only seven thousand and so on. Hence the total number (of thousand) premium payments received by the company will be[9],

$$9 + 8 + 7 + \ldots + 1 = (10*9)/2 = 45$$

Hence, if the company charges a level premium of $200 per $1,000 of face amount per year for life, it will just break even.[10] Competition will force it to charge no more. Its "gain and loss" statement[11], restricted to the entire history of this one cohort, is shown in Table II-1.

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[9] More generally, for a cohort of N = T*D people of the same age, where T is the maximum number of years lived, and D is the number that die each year, the net level premium per dollar of face amount is 2/(T+1).

[10] The break-even premium of $200 per thousand is called the "net annual" premium in the actuarial literature. See Jordan, p. 81.

[11] As mentioned in Chapter I each life insurance company is required to provide a "gain and loss" exhibit to the various state insurance commissions each year. The table for company "Whole" in the text above is a very rudimentary version of such an exhibit. Table I-3, of Chapter I, provides a somewhat aggregated version of the actual exhibits for the entire industry over the years 1978-1983. Note that in each year, company Whole shows a net gain of zero, that is, premium income less death benefits less the increase in reserves equals zero. Unlike the actual industry, there is no investment income, no other benefits such as cash surrender values, dividends: no other outflows to home office expenses or agent commissions and finally, no net gain or profit. When we allow for a positive interest rate, investment income would become positive but net gain will still be zero. The reason for zero net gain is that all capital necessary for the business is supplied by the policyholders.

Table II-1
Gain and Loss Exhibit
Company "Whole"
All Numbers in Thousand

Year	Number Alive	Insur. In Force	Prem. Income	Resrv. BOY	Death Ben.	Resrv. EOY
1	9	9000	1800	0	1000	800
2	8	8000	1600	800	1000	1400
3	7	7000	1400	1400	1000	1800
4	6	6000	1200	1800	1000	2000
5	5	5000	1000	2000	1000	2000
6	4	4000	800	2000	1000	1800
7	3	3000	600	1800	1000	1400
8	2	2000	400	1400	1000	800
9	1	1000	200	800	1000	0

Note: BOY = beginning of year, before that year's premium income is received.
EOY = end of year

This example shows how it is possible to provide insurance at annual premium that is small relative to the death benefit in spite of the fact that the death benefit will eventually be paid on all the contracts. What must be true is that, since some insured's claims far exceed the premiums thay have paid, other claims must amount to far less than premiums paid. The table shows that this is indeed the case. For example, the beneficiary of a person who dies at the end of the first year receives $1,000 when the insured paid only $200 in premiums, a net gain of $800. The beneficiary of a person who dies in the ninth year, however, also receives $1,000, in spite of the fact that the insured paid $1,800 in premiums. In fact, it is clear that the excess of total premiums paid over benefits paid by those insureds who live longer than average is exactly equal to the shortfall in total premiums paid by those who die "prematurely".

Does this mean that not everyone in the cohort gains from life insurance? Not at all. The insurance contract provides a way for every individual to guarantee a death estate of $1,000. It is true that those of the cohort that survive to the average age at death or longer, can through their own savings leave a death estate of at least $1,000. But almost half of the cohort will die prematurely, and will be unable to save enough to fund the required death estate. Since no one knows whether or not they will die prematurely, no one can be sure of leaving the desired amount to their beneficiaries unless they share the risk of premature death through an insurance contract. The insurance contract makes it possible for each individual to leave the estate he would have left had he lived to exactly the average age at death for the cohort.

Will rational people cancel the contract ("lapse") once it is clear that they will live longer than average? No. Sunk costs are sunk. No one knows whether they will die in the next year (except for the last), and so they will continue to pay $200 to get back expected benfits of $200.

Company "Term"

Now compare another set of 9000 individuals who are in all ways similar to the first cohort except that they "buy term and invest the difference." Many companies, of whom "Term" is representative, offer term policies on an annual basis. Competitive term premium rates are easy to calculate. Since one out of nine will die in the first year, the first year breakeven premium will be $1,000/9 or about $111; the second year premium will be $1,000/8 and so on. How much will each member of the cohort purchase each year? The amount purchased must always be just enough, given an annual cash outlay of $200, to provide a $1,000 estate no matter which year he dies in. Clearly, even in the first year, he does not need to purchase insurance in the amount of $1,000. That would cost $111, so he would "bank" $89. If he died in the first year his estate would be $1,089. So he buys less. If he buys a face amount of $900, the term premium charge will be $100 and his estate will be exactly $1,000 as required.[12] In the second year, he will buy $800 coverage at a cost of $100. The term cost will be constant at $100 per year, but the amount purchased will continually fall. A statement showing the cash flows and asset accumulation for an individual who lives the maximum length of life is shown in Table II-2.

Table II-2

Buy Term and Invest the Difference
Individual With Maximum Life Span
All Numbers in Dollars

Year	Insur. In Force	Term Charge	Bank Depos.	EOY Bank Balance	Estate
1	900	100	100	100	1000
2	800	100	100	200	1000
3	700	100	100	300	1000
4	600	100	100	400	1000
5	500	100	100	500	1000
6	400	100	100	600	1000
7	300	100	100	700	1000
8	200	100	100	800	1000
9	100	100	100	900	1000

With this simple example, it is clear that combination of term insurance and investing the difference is, from the point of view of the cohort, exactly equivalent to buying whole life insurance. If one combines the "gain & loss statements" for companies "Term" and "Bank", you reproduce the statemnt for company "Whole." The gain and loss exhibits for "Term" and "Bank" are shown in Table II-3. In the first year, each of the 9000 individuals buys $900 worth of

[12] More generally, the amount of term insurance purchased in any given year "i" is $1,000 x (T + 1 - i)/(T + 1), where T is again defined as the maximum number of years a member of the cohort lives.

coverage, and so there is $8.1 million of insurance in force. In the second year, each of the 8000 survivors' buys $800 in coverage, so the amount in force is $6.4 million, and so on. Notice, that aside from the initial year, the amount in force is always lower in the "term" industry than in the "whole" industry. End of the year reserves in the term industry are always zero, since death benefits paid each year equal premiums paid. However, if we consolidate "Bank" with "Term", we exactly reproduce "Whole". For example, if we add "term insurance in force" and "Bank balance" at the beginning of any given year, we get "Whole insurance in force." The end of year "Bank" balance is always equal to the end of year reserves held by "Whole." The amount of death benefits paid by "Term" plus the withdrawals made from "Bank" are always exactly equal to the amount of death benefits paid by "Whole". Thus the combination of term insurance contracts with a "bank" produces exactly the same outcome as whole life contracts, providing that the amount of term insurance is chosen in a way that provides for the same death estate. "Saving" through whole life insurance is precisely equivalent to a bank account, if by "saving" we mean the reserve per surviving policyholder (the policy's "cash value" in our ideal world) and if by "insurance" coverage we mean the face amount of the policy less its cash value.

Table II-3

Gain and Loss Exhibit
Companies "Term" and "Bank"
All Numbers in Thousands

Year	No. Alive	Insur. In Force	Prem. Income	Death Ben.	BOY Bank Balance	With-Drawals	EOY Bank Balance
1	9	8100	900	900	900	100	800
2	8	6400	800	800	1600	200	1400
3	7	4900	700	700	2100	300	1800
4	6	3600	600	600	2400	400	2000
5	5	2500	500	500	2500	500	2000
6	4	1600	400	400	2400	600	1800
7	3	900	300	300	2100	700	1400
8	2	400	200	200	1600	800	800
9	1	100	100	100	900	900	0

Notes: BOY= beginning of year, prior to annual deposit; EOY= end of year

Like whole life, buying term and investing the difference (BTID) enables all to guarantee the estate that they could have left had they lived the average number of years by redistributing income from those who live longer than average to the beneficiaries of those who die prematurely. Again those that die prematurely provide their estates more cheaply than those that live longer, and the differential is exactly the same as with whole life. "Gains" from premature death are paid for by those "unlucky" enough to survive longer than the average span.

How NOT to Compare Whole Life and Term

Suppose a member of one of the cohorts is unsure of the equivalence and wants to analyze whether he would be better off with either Whole or BTID. How does he determine whether one is "cheaper" than the other? Since he is sure to keep the policy for life, since he wants to leave an estate of exactly $1,000 and since the interest rate is zero, it seems as though he could simply compare total premiums under the two plans. If he does, he will make the false "discovery" that the two plans do not cost the same. If he lives for the entire 9 years, he will pay $1,800 in total premiums for whole life coverage, compared to $2,831 for term coverage.[13] If he lives for 7 years or less, the term coverage appears cheaper. Yet the two plans have been constructed to be equivalent; what is wrong with comparing total premiums? The problem is one of comparing "apples" with "oranges." By simply adding up premiums, one is implicitly assuming that $1,000 of whole life coverage is the same as $1,000 of term coverage, but it is not. As pointed out above, if an individual bought $1,000 of term insurance in the first year for $111 and "banked" the difference of $89, his death estate at the end of the first year would be $1,089 rather than $1,000. Since the premium is lower and the death estate is higher for for term, term is cheaper than whole life, at least if one dies prematurely. However, the advantage of term insurance cannot last. If one tries to buy $1,000 worth of term insurance in every year, those in the cohort who live considerably longer than average will discover that they cannot afford to buy enough insurance to leave a $1,000 estate. At the beginning of the eighth year for example, a man who bought $1,000 of term insurance in every previous year and banked the difference between the premium and his $200 annual savings,

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[13] More generally, if cash surrender values are taken into account, ART held for more than the first year always falsely appears to be more expensive than whole life. For example, suppose an individual cxancels his "Whole" policy at the end of the second year. His share of the reserve is ($1400/8) or a cash surrender value of $175. He has paid $400 in two annual premiums and receives a refund of $175, so his two years of coverage have cost him a net of $225. His ART premium for a thousand dollars of coverage would have been $111 in the first year and $125 in the second, for a total of $236 or $11 more than for Whole coverage. This is an example of why the "interest adjusted surrender cost" indexes mandated in many states should not be used to compare whole and ART, or any policies with significantly different savings intensities. They are strongly bised against the less savings intensive product. See FTC (1979) Appendix III, pp. 21-23 for a general proof.

would have a bank balance of only $71, whereas the term insurance premium for $1,000 of coverage would be $500. Thus, the price of leaving a larger estate if one dies prematurely, is leaving a smaller estate or perhaps no estate if one lives longer than average. To guarantee an estate regardless of when you die, to compare apples with apples, one must recognize that it is sum of the term insurance coverage and the bank balance that is comparable to whole life coverage, not just the term coverage alone.

The Right Way To Compare Premiums

It is incorrect to compare premiums between whole life and term directly, but it is correct to compare a weighted average of term premiums to the level whole life premium. To see this in our example, first note that providing each member of the cohort with $1,000 worth of coverage each year will result in exactly the same amount of death claims each year, regardless of whether the coverage is through term insurance or whole life. If the two forms are to be equally profitable, then the market value of the expected number of whole life premiums received must be equal to the market value the expected number of term insurance premiums received. In the first year, all 9000 in each cohort will pay the premium, in the second year, only the 8000 survivors will pay, and so forth. The present value of future dollars paid if and only if you survive are pure endowments. In the example, the present value of a dollar due immediately from those living is clearly $9/9 (${}_0E_1$); the present value of $1 contingent on an individual aged one living to age 2 (${}_1E_1$) is $8/9; of $1 contingent upon an individual now age one living to age 3 (${}_2E_1$) is $7/9, and so on. Thus the present expected value of a whole life contract per dollar of coverage is,

$$(WLP)*(9/9 + 8/9 + 7/9 + \ldots 1/9) = 5 * WLP$$

where WLP stands for "whole life premium." For the term insurance contract, all will pay the the first year term rate (TR_1 = \$1/9), the present value of the second year premium is its dollar amount (TR_2 = \$1/8) times a one year pure endowment from an individual of age 1 ($_2E_1$ = \$8/9), and so on. Thus the present expected value of term insurance contracts for the whole of life will be,

$$_1E_1{}^*TR_1 + {}_1E_1{}^*TR_2 + \ldots + {}_8E_1{}^*TR_9 \text{ or,}$$

$$(9/9)^*(1/9)+(8/9)^*(1/8)+\ldots(1/9)^*(9/9) = 9^*(1/9) = 1$$

Hence, given the term premiums charged by company Term, the equivalent whole life premium twenty cents (\$1/5) per dollar of coverage, or \$200 per year for a \$1,000 of coverage. One can see that, to be equivalent, the whole life premium must be equal to a weighted average of the annual term rates, where the weights are equal to the appropriate year pure endowment divided by the sum of the pure endowmwents across all the years. The result remains true when the interest rate is positive.

Cancelation or "Lapsation"

Now consider the possibility that members of the cohort may want to cancel the policy while still alive. Unless the whole life contract provides for a "refund" (equal to that individual's share of the reserve fund), the term plus bank contract will provide the same benefits at a lower cost. Thus, in the ideal model if there some possibility of lapse, competition would force whole life companies to provide "refunds" or "cash surrender values" equal to the reserve build-up, or to what the same thing, the bank balance available under a BTID strategy.[14]

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[14] If company Whole knew, or was willing to bet, that some of its policyholders would lapse, that is, the face amount on some policies would not be paid and if the company provided no refunds at all, it could and presumably would have to offer whole life insurance at less than the net level premium of \$200 per thousand. In the ideal model, however, such a strategy will fail. Lapse

The Effects of Interest Rates

Some of the simplicity of the example discussed above above was due to assuming a zero interest rate. But actual interest rates are far from zero and and produce large effects on level premium policies such as whole life, life paid-up at 65, level term to 65 etc. Unlike ART policies, these are "pay in advance" policies. One pays more than the annual cost of coverage in early years, less in late. How much more depends very strongly on the interest rate implicitly used by the company. To understand why, one must understand the economics of the level premium. Here we will use algebra as well as arithmetic examples to explain how these effects are produced and to show the equivalence of whole life versus buy term and invest the difference in the more general case when the rate of interest is positive. There are many equivalent ways of describing the equation that determines the premium for the simplest whole life contract. We will find it useful to discuss two of these ways: (1) as a decreasing amount of ART plus the difference invested in a side fund and (2) as equivalent to buying a series of one year policies term policies of a constant face amount weighted by an appropriate "pure endowment".

As already mentioned, the price structure of an ART policy is simple. The

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is matter of choice to the buyers. If buyers know their own probability or certainty of lapse, but insurance companies don't, then companies that charge lower premiums on the expectation of average lapse will be subject to adverse selection. Those policyholders who know they will have lower than average lapse experience, will buy their policies at rates premised on average lapse experience; those who know they will experience higher than average lapse will either BTID or buy whole life from companies that pay full "refunds." Thus, in the ideal model, companies will be forced to supply full cash values, equal in amount to the bank balance under the BTID strategy. It is interesting to note, that both in the United States and in England, companies did not generally provide cash values or refunds as a matter of contract. In this country, the general provision of cash values was imposed on companies by regulation. See Chapter III for a brief review of the origins of regulation in this country.

term rate at a particular age, say x, is equal to,

$$(1) \qquad TR_x = v^* d_x / l_x, \quad v = 1/(1+r)$$

where TR_x is the premium per dollar of coverage, r is the rate of interest, l_x is the number of people alive at the begining of their $(x+1)^{th}$ year, d_x is number of them who die on the last day of that year and r is the rate of interest. It is easy to see that if all l_x pay the premium TR_x at the beginning of the year, then the total fund to pay claims at the end of the year is d_x dollars or just exactly enough to pay one dollar to the estates of each of the decedents. If the mortality rate increases with age, then so does each annual premium. The only interest effect comes from the within year accumulation, so this is an almost pure "pay as you go" policy. (It would be pure if the premium payments were made continuously).

Consider a case at the opposite extreme: a policy that provides coverage for the whole of life but where the coverage is paid for by a single premium ("single premium" policies). In order to arrive at a formula for the net price of a single premium (its NSP) policy issued to a person who has just reached age x we need to define the notion of a "pure endowment", ${}_iE_x$, to take interest as well as mortality into account. Such a contract is a commitment to pay one dollar to the annuitant, who has just reached age x, if and only he or she survives to age x + i. What is the net price (${}_iE_x$) of this contract? Let l_{x+i} stand for the number of people alive at age x + i.[15] Clearly the total amount paid for the endowments now must be just sufficient, when augmented by i years of interest earnings to pay $\$l_{x+i}$ to the survivors, or

$$(2) \quad {}_iE_x = v^{i*}(l_{x+i}/l_x), \quad \text{note: } {}_0E_x = 1$$

For example, if the interest and the one year mortality rate are both 10%, then

[15] Note that $l_{x+1} = l_x - d_x$, $l_{x+2} = l_{x+1} - d_{x+1}$, etc.

the price of a one year pure endowment will be .9/1.1 or about 82 cents. Notice that the price of a dollar one year from now is higher - 91 cents. That's because a dollar put into a savings account gets paid to depositor if he survives or to his estate if he dies. In fact the term insurance premium (.1/1.1) of 9 cents plus the endowment price, 82 cents, must always equal the price of one dollar one year from now, because the joint purchase of an one year term and one year endowment produces the same thing as a savings contract- one dollar one year from now, whether the purchasor is alive or dead.[16] Arbitrage will enforce this equality at every issue age, therefore we have,

$$(3)\ {}_1E_x + TR_{x+1} = v$$

How is the net single premium, NSP, determined? One approach to the answer is to realize that firms will be indifferent between selling ART and NSP policies. Thus the present value of the premium payments under the two policies must be the same. From the firm's point of view selling an ART is equivalent to buying a series of pure endowments, the first ($TR(x)) payable immediately, the second ($$TR_{x+1}$) one year from now contingent on the survival of the insured, etc. The value of the second premium to the firm today is just the one year pure endowment times the number of dollars received if the policyholder survives, or ${}_1E_x{*}TR_{x+1}$. This is the amount the firm could sell the second year premium income for on the open market. Thus the value today to the firm of a whole life ART contract is the sum of each annual term premium weighted by the appropriate pure endowment. This sum must be equal to

[16] This is a special case of Arrow's (1953) complete contingent markets-w'th "money." The sum of the prices, p_i, of $1 to be delivered if and only if state i occurs must equal one if the states are mutually exclusive and exhaustive. See Kenneth Arrow, "Le role des valeurs boursieres pour la repartition la meilleure des risques", Centre National de la Recherche Scientifique, Paris, 1953, equation II, p. 45.

the single premium for such a contract, payable now, or,

$$(4)\ NSP_x = \sum_{0}^{99-x} {}_iE_x * TR_{x+i}$$

Now consider a policy with whole life coverage, where premiums are paid each year, but the premium is the same or level each year ("whole life" policies). This type is known as"ordinary" or "straight" or "whole" life. We will use the last name in refering to a contract with whole life coverage, paid for by annual level premiums. The value to the firm of a sequence of constant payments contingent on the survival of the policyholder is clearly equal to that premium multiplied by the sum of the pure endowments to the end of the mortality table. This value in turn, must be equal to the value today of a single premium policy or to an ART policy. The constant whole life premium (WLP_x) at issue age age x, is therefore equal to the single premium divided by the sum of the pure endowments taken to the end of the mortality table.

$$(5)\ \ WLP_x = (1/\textstyle\sum {}_iE_x * (\sum_{0}^{99-x} {}_iE_x * TR_{x+i})$$

The same reasoning shows that the prices for "term" policies, which provide coverage for less than the whole span of life, are analogous to the formulas (4) and (5) given above, except that the summation is only through the last year of coverage, rather than through the last year of the mortality table. For example, the price formula for a level premium term insurance policy providing coverage to age 65 is,

$$(6)\ LT65_x = (1/\textstyle\sum {}_iE_x) * \sum_{0}^{64-x} {}_iE_x * TR_{x+i}$$

Under the conditions stated, we have shown that the prices for all life insurance contracts, regardless of coverage duration, regardless of the time path of premium payment are simple sum or ratios of sums of the annual term insurance rates weighted by the appropriate pure endowment. Given a set of ART prices and the market rate of interest, the prices of all combinations are strictly determined and given by formulas like (4)-(6) above. It is also true, that given a set of ART prices, we could solve for or "recover" the rate of interest implicit in the of any or all of the life insurance policies offered on the market, whatever their coverage period and whatever the time pattern of their premium payments.

Refunds, Reserves and Cash Values

An ART "pay as you go" policy clearly leaves the option of renewal to the policyholder. If the policyholder decides not to renew in any given year, he simply does not pay the premium due and that is the end of the matter. He has received the insurance coverage for the previous years and he has paid for it. It is different with the "pay in advance" policies, since now the canceling policyholder has paid in advance for coverage he now decides he does not want and so is entitled to a refund. Notice that the refund is equivalent to a "savings" account because it will accrue to the policyholder or to his estate whether he lives or dies. Hence "pay in advance"" policies involve a combination of savings and insurance. We shall show that the refunds in our ideal model are the same the "net level reserves" found in actuarial textbooks and have a simple explanation. Cash values are closely related to reserves in actuality and in our simple world they are equivalent.

Consider the refund due after one year on a whole life policy. The refund is specified in the original contract. Competition will force profits to be zero, so the refund at the end of any year will be just equal to a survivor's equal share of the reserve. For example, in the first year l_x policyholders will pay WLP_x at the beginning of the year (the premium income) which will ear the rate of interest "r." At the end of the year, the company will pay d_x death claims and the remaining sum will constitute the reserves per dollar of insurance in force $(l_x * WLP_x * (1+r) - d_x)$. This reserve will be equally divided among the **surviving** policyholders (l_{x+1} of them). But notice that $(l_x*(1+r)/l_{x+1})$ is equal to $1/{}_1E_x$ and d_x/l_{x+1} is equal to $TR_x/{}_1E_x$. Hence, the cash value per surviving policyholder per dollar of coverage will be,

$$(5)\quad {}_1CV_x = (l_x * WLP_x * (1+r) - d_x)/\ l_{x+1} = (WLP_x - TR_x)/\ {}_1E_x$$

that is, the expected present value of the the cash surrender value due at the end of the year and available only if one survives $({}_1E_x * {}_1CV_x)$ is exactly equal to the differnce between the annual whole life premium and the annual term premium (WLP_x-TR_x).

Similar formulas can be derived for all years, policy durations and payment patterns. Equation (5) can also be used to solve for the implicit interest rate being paid on the whole life contract, given the two premium rates and the first year's cash value. Though (5) depends on the one year pure endowment, we know from equation (3) that arbitrage will force it to be equal the difference between v and TR_x. Substituting for ${}_1E_x$ in (5) and rearranging, we get,

$$(6)\quad 1+r = CV_1/(WLP_x - TR_x*(1-CV_1))$$

The rate of return (r) determined by equation (6) is the implied one year average rate of return (or "Linton" yield) on the whole life policy. This one year rate is equal to a conventional one year rate of return, so long as one recognizes that nominal dollars of whole life coverage are not the same as term coverage.. The numerator is simply the end of year savings balance and the denominator is the "deposit", the difference between the whole life and term premium for an equivalent amount of insurance. At the end of the year the "amount at risk" or the true amount of insurance maintained with company Whole is $1 - CV_1$ times the nominal number of dollars of whole life coverage.

Therefore the amount one must pay for equivalent term coverage is not $\$TR_x$ per dollar of whole life coverage, but $\$TR_x*(1 - CV_1)$ per dollar of whole life coverage. We will compute such implicit average rates of return on many actual policies in Chapters VII, VIII and IX.

Ideal Prices, 1978-1983

The importance of the interest rate in determining the prices of these different ways of paying for the same coverage is demonstrated in Table II-4, using the industry mortality table in most common use in 1983. Table II-5 presents similar figures, using the latest available government mortality rates. These tables contain the ideal "single premium" cost, the ideal "life annuity" cost and the ideal whole life premium, all per thousand dollars of face amount. These prices are given at three issue ages and interest rates ranging from 3% to 12%. The tables also show non-ideal premiums that incorporate various expenses. We will briefly discuss these below.

Table II-4

"Ideal" Premiums At Various Issue Ages and Interest Rates Using the 1958 Industry Mortality Table

	Interest Rate				
Issue Age	**3%**	**4%**	**5%**	**6%**	**10%**
25					
Single premium	$279.14	$192.53	$136.65	$99.86	$37.62
Life annuity	$24.75	$20.99	$18.13	$15.90	$10.59
Net level premium	$11.28	$9.17	$7.54	$6.28	$3.55
Gross premium-$25K	$12.71	$10.51	$8.80	$7.49	$4.70
" " - $100K	$12.30	$10.07	$8.35	$7.02	$4.14
Issue Age					
35					
Single premium	$358.66	$265.46	$200.54	$154.60	$65.93
Life annuity	$22.03	$19.10	$16.79	$14.94	$10.27
Net level premium	$16.29	$13.90	$11.95	$10.35	$6.42
Gross premium-$25K	$18.18	$15.60	$13.64	$11.98	$7.91
" " - $100K	$17.75	$15.24	$13.18	$11.50	$7.35
Issue Age					
45					
Single premium	$458.90	$364.96	$294.56	$241.13	$123.14
Life annuity	$18.58	$16.51	$14.81	$13.41	$9.65
Net level premium	$24.70	$22.10	$19.88	$17.99	$12.77
Gross premium-$25K	$27.42	$24.72	$22.41	$20.44	$15.06
" " - $100K	$26.99	$24.27	$21.95	$19.96	$14.49

NOTES: 1.) 1958 CSO MORTALITY TABLE
2.) EXPENSES FOR GROSS PREMIUM CALCULATIONS:
a.) 1st yr commission = 60%
b.) renewal rate = 5% all years
c.) selection & issue expense

nonmedical	$45.00	per policy
medical	$110.00	per policy
age 25	$58.00	
age 35	$71.00	
age 45	$97.00	

From Richardson (1977), p.44

The dramatic effect of changes in the interest rate can be seen from either Table II-4 or II-5. In the former a rise in the interest rate from 3% to 10% causes the ideal whole life premium at issue age 35 to fall from $16.29 to $6.42, or a decrease of more than 60%. Using more current mortality tables, the comparable figures from II-5 are $15.08 at 3% and $5.43 at 10%, a decline of about 64%. The changes due to the lower mortality rates in 1980 are more modest. The ideal whole life premium at issue age 35 is about 9% lower when computed using the lower 1980 rates rather than the 1958 rates, at an interest rate of 3% and about 15% lower at interest rate of 10% .

Table II-5

Ideal Premiums At Various Interest Rates and Issue Ages Using the 1980 NCHS Mortality Table

	Interest Rate				
Issue Age	3%	5%	6%	10%	12%
25					
Single premium	$264.06	$124.55	$89.42	$31.86	$22.20
Life annuity	$25.27	$18.38	$16.09	$10.65	$9.13
Net level premium	$10.45	$6.77	$5.56	$2.99	$2.44
Gross premium-$25K	$11.81	$7.97	$6.70	$4.07	$3.54
" " - $100K	$11.40	$7.51	$6.23	$3.52	$2.94
Issue Age					
35					
Single premium	$341.18	$184.59	$140.05	$56.36	$39.65
Life annuity	$22.63	$17.12	$15.19	$10.38	$8.96
Net level premium	$15.08	$10.78	$9.22	$5.43	$4.42
Gross premium-$25K	$16.86	$12.36	$10.73	$6.80	$5.78
" " - $100K	$16.44	$11.90	$10.25	$6.24	$5.18
Issue Age					
45					
Single premium	$440.85	$276.33	$223.79	$110.33	$83.15
Life annuity	$19.20	$15.20	$13.71	$9.79	$8.56
Net level premium	$22.96	$18.18	$16.32	$11.27	$9.72
Gross premium-$25K	$25.51	$20.53	$18.59	$13.37	$11.78
" " - $100K	$25.08	$20.06	$18.10	$12.81	$11.18

NOTES: 1.) 1980 NCHS MORTALITY TABLE
2.) EXPENSES FOR GROSS PREMIUM CALCULATIONS:
a.) 1st yr commission = 60%
b.) renewal rate = 5% all years
c.) selection & issue expense

nonmedical	$45.00	per policy
medical	$110.00	per policy
age 25	$58.00	
age 35	$71.00	
age 45	$97.00	

From Richardson (1977), p.44

Leaving the Ideal Model

We now begin to examine the consequences of dropping some of the simplifying assumptions made in the ideal model. In particular, in contrast to the ideal world, there are very substantial non-claim expenses, there are a host of selective factors that insurance companies use to distinguish between risks of the same age and sex, and finally and most importantly, interest rates are highly variable and no one knows them with any more certainty than he knows the date of his own death. The least complications are caused by dropping the assumption that non-claim expenses are zero. In the next chapter we will examine the much more complicated problem of uncertain and highly variable interest rates.

Non-Claim Expenses

In the ideal model, premiums on pay in advance policies are greater than death benefits paid in early policy years because the inflow into reserves from survivors exceeds the outflow used to pay death benefits. In later policy years, the outflow for death benefits exceeds the inflow of premium payments from the remaining survivors and total reserves begin to fall. If there were the same number in each cohort and if there were no trend in mortality rates, the ratio of death benefits to premiums would be roughly one, regardless of the mix of pay in advance to pay as you go policies. There is no margin for normal competitive profits on invested capital in the ideal model, because there is no "invested" capital. The assets required to build reserves are provided by the policyholders. Hence, in the steady state ideal model, premiums paid in will be matched by death benefits paid out.

In fact, however, as pointed out in Chapter I (Table I-1), the ratio of death benefits to premiums is substantially less than one for group insurance (.65 to .76, with an upward trend) and very much less than one for ordinary insurance (about .20 with no trend). The discrepancies are due to the fact that there are substantial non-claim expenses, that there are additional ("living") benefits paid and (probably) because neither industry is in a steady state. For convenience, Table II-6 reproduces all the non-death claim expenses per $1,000 of coverage, experienced by ordinary life insurance companies during 1978-1983.

Table II-6
Non-Claim Expenses
All Ordinary Life Insurance Companies
1978-1983
Per $1,000 of Face Amount

Flow To:	1978	1979	1980	1981	1982	1983
Home Office Expenses	$3.44	$3.39	$3.18	$2.84	$2.69	$2.60
Agent's Commissions	2.33	2.27	2.08	1.91	1.77	1.83
Other Expenses	.33	.27	.50	.75	1.00	.65
State Taxes	.48	.46	.42	.38	.35	.35
Federal Taxes	1.38	1.33	.90	.52	.54	.29
Total Non-Claim Expenses	$7.95	$7.72	$7.09	$6.40	$6.35	$5.71
Flow To: Death Benefits:	$3.60	$3.40	$3.20	$3.51	$2.82	$2.76

Source: Table I-3 in Chapter I.

Several points need to be made concerning these non-claim expenses. First, on a per thousand dollar of coverage basis they are too large to neglect, even as a first approximation. Home office expenses alone are about as large as death benefits paid and total non-claim expenses are more than twice as large.

Second, it is important to note that some expenses do not vary with the amount of coverage (they are "fixed"), while others do. The expense figures contained in the notes to Tables II-4 and II-5 illustrate the important fixed and variable expenses. For example, issue expenses (the administrative costs of physically issuing and recording the policy) are virtually independent of the policy size. Selection expenses depend most importantly on whether a medical examination is required and how thorough it must be. While medical exams may be common on larger policies, for any given policyholder, the selection costs are independent of the size of the policy chosen. Thus a medical evaluation of $110 will add more than $4 per thousand to the first year cost, if the policy is for $25,000, but will add only about $1 if the policy amount is $100,000. Agent sales commission rates have traditionally been flat percentages of the premium and thus vary directly with policy size. Thus, a $25,000 policy with a level premium of $10 per thousand would entail a first year sales commission of $150, but a sales cost of $600, if $100,000 worth of coverage were purchased.

Third, it is important to realize that a large proportion of the expenses are incurred in the first year, that is to say that expenses are "front loaded." Not only are selection and issue expenses incurred at the beginning, but agent sales commissions are typically much larger in the first year than in subsequent renewal years. These relatively large early expenses may mean that companies do not "break-even" on new polices until several years of premiums have been paid. In so far as companies try to pass these expenses on to policyholders in the form of lower savings accumulations in the early policy years, the implication of front end expenses for policyholders is low or negative rates of return during early policy year~. Both for the company and the policyholder, early lapse or cancelation results in losses.

Does the presence of substantial non-claim expenses invalidate the major implications of the ideal model, in particular, the equivalence between whole life and BTID? The answer is "no" so long as we maintain the assumptions concerning full information about market alternatives and so long as the economies of scale in non- claim costs are not be so large that firms can achieve significant market power. Both empirical studies and the fact that firm market shares are low indicate that economies of scale are not great enough to confer any market power. The equivalence between whole life and BTID will still hold, since individuals since still combine ART contracts with a systematic saving plan that will provide a death estate of a given amount and a cash accumulation reflecting the current rate of interest. Arbitrage will again force cash values on pay in advance plans to be least as great as the cash accumulation available through bank saving. Costs of providing insurance and banking services will ensure that it be no greater. Thus, the rate of return offered on pay in advance policies must equal the market rate of interest, though the market rate will now reflect the cost of providing banking services and the ART rates and pay in advance ideal prices will reflect non-claim costs.

Interest Rate Uncertainty*[17]

The previous sections show that under ideal conditions the performance of the whole life product can be replicated by a strategy of buying ART insurance and investing the difference in premiums in a side fund. Under these conditions, the apparent complexity of the whole life contract simply reduces to a particular pattern of deposits to a side fund, earning the market rate of interest, coupled with purchases of decreasing amounts of term insurance. Other features of the whole life contract can be ignored, either because they

[17] This section draws on the material presented in Chapter VIII and was written by Robert J. Mackay.

fail to take on value or else are costless to provide under the extreme assumptions of the ideal model. Under more realistic conditions, however, various terms in the whole life contract--particularly certain policy options and guarantees--not only have economic value for the policyowner but also are costly for the insurer to provide. In these cases, the simple equivalence between whole life and BTID no longer holds.

If future rates of interest are uncertain, then the previous analysis, stressing the equivalence between whole life and BTID, ignores important policy options and guarantees provided in the whole life contract. With uncertainty about future rates of interest, two of the most important options provided by whole life contracts in the U.S. are:

a. A policy loan option whereby nearly all the cash surrender value can be borrowed at a rate of interest that may be subject to a contractual maximum; and,

b. A surrender option whereby the policy can be surrendered for its guaranteed cash surrender value.[18]

Both of these options provide an opportunity for the policyowner to financially select against the insurer--exercise the option when the course of interest rates makes it to the policyowner's advantage and insurer's disadvantage to do so. As a result, these options provide significant value to the policyowner while simultneously impose significant cost on the insurer. Under competitive conditions in the life insurance market, each of these options would be priced so as to reflect the expected cost of providing the option.[19]

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[18] This section briefly discusses these options while Chapter VIII provides a fuller and more detailed discussion of the wide range of options offered in life insurance contracts.

[19] These options could be paid for through a separate charge at the time the policy is issued. Given the long term nature of the whole life contract and the inseparability of the options from the contract, the insurer could receive compensation for the

The potential for the loan option and the surrender option to provide significant economic value to the policyowner can be illustrated with a simple example.[20] Consider the owner of a nonparticipating whole life policy that currently has $50,000 in cash surrender value. Suppose the guaranteed rate of return being paid on the policy is 5 percent; the guaranteed maximum policy loan rate is 8 percent; the current market rate of interest is 12 percent; and that the policyowner faces a marginal tax rate of 50 percent. Without either the loan option or the surrender option, the policyowner would be stuck with earning only the 5 percent rate of return guaranteed in the policy, despite the large increase in the market rate of interest to 12 percent. With the loan option, however, the policyowner could borrow the $50,000 in cash value, paying $4,000 in interest expense to the insurer. The proceeds of the loan, in turn, could be invested at the current market rate of interest, earning $6,000 in interest income for the policyowner. The spread between the market rate of interest and the guaranteed maximum loan rate would then generate $2,000 in taxable income or $1,000 in after-tax income. The policyowner's total, after-tax income would be $3,500, composed of the tax-free, inside interest build- up of $2,500 and the after-tax return from the loan transaction of $1,000. In short, the loan option would allow the policyowner to leverage the total after-tax rate of return earned on the policy to 7 percent. This return is also greater than the after- tax rate of return of 6 percent that could be earned by surrendering the policy and investing the entire proceeds at the 12

options by pricing the whole life contract so that it paid a rate of return on the savings element somewhat less than the going market rate at the time of issue.

[20] This example is developed and discussed at length in Chapter VIII. It draws on Smith (1982).

percent rate of return prevailing in the market.

While benefiting the policyowner, the loan option obviously imposes a cost on the insurer. There are two aspects to this cost. First, because of the loan transaction, the insurer loses the opportunity to earn the market rate of interest (i.e., 12 percent) and, instead, must settle for earning only the guaranteed loan rate (i.e., 8 percent). Second, if the insurer is "lending long" to meet the interest rate guarantees in the whole life policy, then the increase in the market rate of interest that induces the policyowner to request a policy loan also will depress the market value of the insurer's portfolio. The insurer, then, may have to liquidate part of its portfolio at depressed prices suffering a capital loss. Insurers, of course, would not (and, in competitive markets, could not) bear the risk of these losses without compensation--without somehow being able to charge the policyowner for the expected cost of the loan option.

This example can also be used to illustrate the potential value of the surrender option. Suppose the policyowner faced a marginal tax rate of 30 percent insted of 50 percent. Exercising the loan option would now leverage the total after-tax rate of return earned on the policy to 7.8 percent. With the option to surrender, however, the policyowner could surrender and invest the proceeds at the market rate of interest (i.e., 12 percent), earning a total after-tax rate of return from surrender of 8.4 percent. Moreover, depending upon how new whole life policies are being priced, the policyowner may find it worthwhile to surrender the policy and simply replace it with a new policy paying (and, possibly, guaranteeing) a higher rate of return.[21] The ability of the policy-

[21] The replacement decision is analyzed in some detail in Chapter VII. This example clearly indicates that the value of an option may well depend upon the particular characteristics of

owner to select against the insurer can also be seen by considering an alternative scenario in which market rates of interest fall, say, to 3 percent. In this case, the policyowner can lock-in the higher 5 percent rate of return guaranteed in the policy by simply retaining the policy and continuing to make premium payments.

As the previous example suggests, the loan option and the surrender option provide important and potentially valuable opportunities for the policyowner to financially select against the insurer and, thereby, gain in environments of rising interest rates. Miniumum rate of return guarantees, in addition, provide important protections to policyowners in environments of falling interest rates. Using the previous example, this point can be seen by considering an alternative scenario in which market rates of return fall, say, to 3% instead of rising to 12%. Under this scenario the policyowner can lock in the higher 5% rate of return guaranteed in the policy by simply retaining the policy and continuing to make premium payments. Instead of settling for 3% rate of return, the policyowner will be able to earn a 5% rate of return on the amounts he saves under the policy. With significant volatillity in interest rates, the minimum rate of return guarantee can impose significant cost on the insurer offering the guarantee. This is especially so if the insurer is attempting to offer long-term guarantees based on the current level of interest rates.

As the above discussion makes clear, whole life and BTID are no longer

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and circumstances facing the policyowner (e.g., the policyowner's marginal tax rate). It also indicates that options may interact with one another so that the value of cost of options combined as a package is not simply the sum of their costs evaluated separately.

equivalent when future rates of interest are uncertain.[22] Two important implications follow from this lack of equivalence. First, measures of Linton yields that ignore the cost and value of policy options, such as the loan option and the surrender options will systematically understate the implicit rate of return actually being paid on the savings element of the whole life policy. By failing to deduct not only a charge for mortality expenses but also a charge for the cost of the policy option, the conventional Linton yield calculation will overstatethe amount "saved" each period and, hence, understate the estimated rate of return paid on the policy. Second, since the fundamental features of key policy options may vary between one whole life policy and another and between different types of policies, measures of Linton yields that ignore the presence of these options and, hence, ignore variations in the relative value and cost of these options will introduce spurious variation into the estimates of the rates of return being paid on saving- intensive policies.[23] These points are considered in detail in Chapter VIII.

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[22] Other circumstances under which the simple equivalence breaks down are discussed in Chapter VIII. Some of the circumstances relate to differences in product design while others relate to differences in company experience.

[23] There is tremendous variation, for example, in the key features of the policy loan option. Some non-participating whole life policies carry 8 percent maximum loan rates, while others carry 6 percent maximum rates, and still others carry 5 percent maximum rates. Some newer policies carry variable loan rates that adjust to changes in an index of market rates. Some participating policies, while carrying a guaranteed maximum loan rate, directly recognize loan activity in determining the dividends to be paid on the policy. Similarly, many universal life policies directly recognize loan activity in determining the amount of interest to credit under the policy. These differences in contract terms have important implications for the relative value of the loan option. Similar variability exists in the surrender options and interest rate guarantees implicit in various life insurance policies. See Chapter VIII for further discussion.

Summary

Under ideal conditions, we have shown that a whole life policy is exactly equivalent to buying term and investing the difference in a bank account, providing that the correct amount of term insurance is purchased. We have shown how an implicit rate of return can be calculated and that, under ideal conditions, the implicit rate of return will always be equal to the market rate of interest, regardless of the duration of the policy holding period. We have also shown that to compete with companies offering annual term insurance whole life companies will be forced by competition to offer cash values at every duration. Given a market rate of interest and market term insurance rates, we showed how one could compute an ideal price for any policy, given any premium paying period, duration or incidence of premiums charged. The ideal price of any such policy is simply a weighted average of its term insurance ingredients. Using various interest rates and an average mortality table for 1980, we computed ideal prices for three important policy types, single premium, whole life, and term to 65. These ideal prices are strongly affected by interest rate changes. A rise in interest from the 3% that was common in the early 1960's, for example, to the 12% heights in the early 1980's implies a more than 60% fall in the ideal whole life insurance premium for a male age 35. The effect of lower mortality rates in 1980's as compared to the late 1950's is much less pronounced, implying premium reductions of generally less than 10%.

In the next chapter, we review various evidence that suggests that there are wide discrepancies between some of the implications of an ideal competitive model and actual industry behavior. In subsequent chapters, we examine a more realistic competitive model and also models or explanations that suggest that life insurance buyers are not well-informed enough to exert the usual market discipline that forces high cost, inefficient companies either to become efficient or to be forced out of business entirely.

Chapter III

Debate Concerning the Effectiveness Of Price Competition In Life Insurance

Many studies, some recent and some more than 150 years old, have provided evidence that suggest wide discrepancies between actual industry behavior and the ideal competitive model of the preceding chapter. It is hardly surprising to find that some of the implications of so simple a model are at variance with the observed facts. At issue, however, are findings that may be indicative of a failure of competition in this market to produce the efficient outcomes we generally associate with the normal operations of a competitive market. In particular, it has been argued that price competition is ineffective because comparing prices is so difficult that consumers often do not discipline high cost sellers by taking their business elsewhere. Of course, not all students agree that the evidence proves that there is any real inefficiency in this market. In particular, it has recently been suggested that the many options contained in most life insurance contracts have received too little attention and that some of the findings that have been interpreted as being evidence of inefficiency may be consistent with the workings of an efficient, but complex options, savings and insurance market. This possibility will be discussed in Chapter VIII. In this chapter we will briefly summarize recent studies providing evidence for or against the proposition that the industry operates efficiently. To provide perspective for these studies, we first discuss the origin and evolution of the business of life insurance and briefly recount some of the criticisms made very early of the effectiveness of competition in this market.

There are a substantial number of students of the industry who believe the perceived inefficiencies are real and are basically due to buyer's inability to understand the product sufficiently to provide the normal market feedback that disciplines high cost sellers. Mr. E. J. Moorhead, a past president of the Society of Actuaries, a former Vice-President of a large insurance company, and chairman of the first industry committee set up to provide recommendations concerning cost disclosure, has expressed this view succinctly.

> "Life insurance marketing seems to be demonstrating that it is an exception to the pronouncement made two centuries ago by Adam Smith--his contention being that the choice made by buyers in a free market have the effect of rewarding the efficient seller whose prices are low, and correspondingly penalizing the inefficient or greedy seller whose prices are high."[1]

Consumer Ignorance and Life Insurance

While it may be true that questions concerning the efficiency of the life insurance business have been raised more frequently and have received more attention more in the last decade than in previous decades of low interest rates, it is also true that such questions have been raised many times in the past.[2] Scholarly criticism of the way competition works, or fails to work, is almost as old as the business of life insurance itself (see below). The criticism concerns savings intensive life insurance policies. Much of it could be summarized by the following: "buyers do not understand the joint savings/-protection features of pay in advance policies and they pay dearly for their ignorance."

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[1] See **Hearings On Life Insurance Marketing and Cost Disclosure**, Subcommittee on Oversight and Investigations, House Committee on Interstate and Foreign Commerce, 95th Congress, 2nd Session, 1978, p.509.

[2] There have been many books on the subject written for a general audience of which Andrew Tobias' book, **The Invisible Bankers** (1982) which was on the best-seller list for many weeks is doubtless the most entertaining and the best known.

In this chapter we first sketch the origins of savings intensive life insurance in England and review some concerns raised by some of the leading mathematicians and political economists of the time. We then discuss developments in the U.S. including the origins of some of the important regulations that are still in existence. Some of the arguments made in favor of these regulations were based on the alleged lack of consumer understanding of the products involved. These regulations were among the earliest and the most "interventionist" in the United States. The fact that some of them were passed in an era known for its laissez-faire entrepreneurial spirit should make them of special interest to all students of regulation.

Origins of the Business of Life Insurance

Life insurance, as a business[3], began in England in 1706 with the charterin of a company called the **Amicable**. It was originally limited to 2,000 members or shares, each of whom paid a one time entrance fee and an annual premium as

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[3] By using the term "business" we mean to exclude (mainly religious) burial associations formed for the exclusive benefit of the members of a pre-existing religious or occupational group and contracts that are more "wagers" than what we now know as life insurance policies. For example, everyone from Pearson to Tobias tells the story the "first" life insurance policy, a one year term policy issued to William Gybbons on June 18,1583. Gybbons died on May 9th of the following year. The story is that the "company" refused to pay, arguing that by "year" they meant "lunar year" and that Gybbons had survived for the entire lunar year. While most of the facts cited are correct, the "story" is potentially misleading. First there was no "company" in our sense of the word; second, Gybbons though the insured, did not pay the premium and may not even have known of the existence of the "policy"; third, a 28 day month was a common unit at that time except in contracts between merchants (see Raynes, 51-53). ThemandemandingpaymentwasanAldermanofLondonandhadnoknownconnection with Gybbons (a well known elderly political figure of the time) other than his wager that he would not survive the year. One did not have to an "insurable interest" in a person to take out an assurance on his life. Con'racts on the lives of well known public figures seemed to be common. The defendants were 16 individual underwriters. There were no companies writing life insurance in 1583. The article on "life insurance" in the classic 11th edition of the **Encyclopedia Brittainica** suggests that the whole transaction was more akin to "wagering" than to modrn life insurance.

long as they were alive. The net annual income from the annual payments made each year was equally divided among the "nominees" (beneficiaries) of the members who died during the year. Thus "premiums" were independent of age (though membership was restricted to those between ages 12 to 45) and the death benefit was variable. The first "company" supplied life insurance policy was neither whole life nor term and its premiums made no use of age graded mortality tables.

This is not surprising. In essence, probability theory did not exist before 1650 and the first inferences about mortality observations were not made until 1662 by that "extraordinary tradesman" John Graunt.[4] Mathematicians of the stature of De Moivre made a living by answering questions on life "assurances" and annuities.[5] There were sometimes heated disputes among leading mathematicians as to the correct answer for what are now regarded as extremely routine, practical and mathematically uninteresting questions.

The first "scientific" company was the **Equitable Society**, chartered in 1762. This was the first company to use a mortality table and a mathematical formula to compute premium rates. The economy was being transformed by the business applications of scientific discoverys and here was the first practical application of the new science of probability. Francis Baily (1813) wrote that it "was formed in consequence of Mr. Simpson's lectures, recommending such

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[4] Graunt (1620-1674) was the first commoner elected to the Royal Society. When the King was asked whether such a person should be admitted, he replied by all means and that if the Society could find any other such "extraordinary tradesmen" they too should be admitted forthwith. On the origins and development of probability theory, see the very interesting account by Ian Hacking (1984), especially chapters 12 and 13.

[5] Abraham De Moivre (1667-1754) is best known as the discoverer of the "law of large numbers" around 1711. In 1725, he published a book called **Annuities On Lives**, probably the first "textbook" on the subject.

an institution."[6] It used mortality tables constructed by James Dodson and offered both term policies and policies for the "whole of life." The latter were far more numerous and important than the former. It was a mutual company, periodically sharing "profits" equally among the whole life policyholders. The profits were not distributed in cash, but in additions to the face amount of the insurance.

The Equitable was very successful and other institutions soon "sprang up" that were, according to Baily, "gross impositions on the public; proceeding from ignorance or knavery, and encouraged by credulity and folly." The allegation was that these companies charged excessively low prices in the expectation that the organizers would die before most of the policyholders' claims came due. An influencial pamphlet by Richard Price (1771) is said by Baily to have put these companies out of business.[7] Baily's concern (in 1813), is the opposite; that the public might "suffer themselves to be enticed into the payment of exorbitant rates, under the delusive plea of stability and security."(492). His main concern was "...that the rates of Assurances on lives do not differ, in the least, at any of the officies: so that when a

[6] Francis Baily (1774-1844), was a well known astronomer (one of the founder's of the Royal Astronomical Society), actuary and businessman. His two volume treatise on life insurance and annuities (1st edition, 1810) was the standard work in the field for many decades according to the author of the Enc. Brit. 11th Ed. entry on Baily. The quotes in the text are taken from the edition of 1813, v.2, p.486. Thomas Simpson's name should be well known to students of elementary calculus who even today struggle with his "rule." Simpson published a volume on annuities and reversions in 1742.

[7] Richard Price (1723-1791) was known as a political economist, a mathematician, and a minister. His letter to his friend Benjamin Franklin on the expectation of human life is the earliest use of that concept. His (1771) pamphlet, "Observations on Reversionary Payments", contained some important mathematical contributions to actuarial theory. He also was the compiler of the "Northhampton" mortality tables, which were still in common use among English companies in 1826 (see Babbage's book referred to below).

person makes an assurance at the Equitable Society where the sum insured is continually increasing in value, or whether he effects it at any other Office where no additional advantage is derived, **he pays precisely the same premium!** Surely this important fact cannot be sufficiently known by the public, else it is difficult to concieve how any of the newly established Offices should ever have been able to extend their business beyond the limits of their own propriety." (Emphasis in original; the last term refers to the owners or the people who share the profits; Bailey supplies data on premium rates for all the major companies and presents calculations giving examples of the substantial advantage to the buyer of sharing in the profits). Baily is also critical of the "disgraceful practice of **bribing** solicitors, agents and others to effect assurances at their Offices" (507, emphasis in original). It should be noted that Baily was objecting to secret commissions for solictors, not the explicit sales commission paid to sales agents today. There were no life insurance salesmen in 1813 and would not be for another 40 years. Individuals seeking coverage were sometimes "referred" to a particular company, but any potential policyholder had to be personally interviewed by an officer of the company. We should also make it clear that Baily, like all the other scholarly critics mentioned here, was a strong believer in the importance and merit of life insurance.

Baily clearly hoped his two volume tome would make these important facts known to the public and force the other institutions to offer terms competitive with the Equitable. But more than a decade later, Charles Babbage, now chiefly known as the father of the computer, is saying almost precisely the same thing in even greater quantitative detail.[8] After mentioning that Baily, in the book quoted above, "has anticipated me in giving a sketch of the offices then existing: so many new ones have have arisen ...that they require a volume rather than a chapter for their analysis. In exposing the disgraceful practices which prevail at some of them, I am merely repeating sentiments which he has more forcibly expressed: ...I feel confident that little more is requisite, than by rendering those practices generally known, to make them universally condemned."(1827, p.ix) The practices Babbage referred to were similar to those mentioned by Baily, companies charged similar premium rates (58-71), but returned very different portions of the profits (or dividends) to the policyholders, solicitors and others were paid a 5% commission (which the potential insured was unaware of) for referring business to some of the companies.

Finally, we mention a work of Augustus De Morgan, one of the founders of modern symbolic logic, essayist, biographer of Newton etc.[9] In 1838, he published a book on probability theory with special reference to life insurance. He quotes some examples of specious advertising in the introduction to his book and writes "Public ignorance of the principles of insurance is the

[8] Charles Babbage (1792-1871) is known today chiefly as the first man to conceive of a general machine that could be programmed to solve general mathematical problems. He spent much of life trying to build a workable "analytical engine." He did find time to write an extraordinary book on the use of machinery in manufacturing industries, published numerous papers in mathematics and engineering, in addition to his book on life assurance.

[9] Augustus De Morgan (1806-1871), was well known as a mathematician, as a literary critic and as a reviewer and critic of some of the imaginative products of the "lunatic fringe" of 19th century science and mathematics. His best known book is a collection of pieces on the latter subject called **A Budget of Paradoxes** (London, 1872). He was one of the founders of modern symbolic logic ("De Morgan's Laws" are in every textbook of logic), as well as a skilled actuary who often acted as a consultant to the life insurance companys of London.

thing to which these advertisements appeal: when it shall come to be clearly understood that in every office some must pay more than they receive, in order that others may receive more than they pay, such attempts to persuade the public of the certainty of universal profit will entirely cease."(xvi) A major purpose of the book is to stimulate the public to learn what is "essential for them to know on a subject, of which, though some of the details may be complicated, the first principles are singularly plain."(xvi) One of those essentials has a very familiar ring.

> " Probably, if the following question were put to all those whose lives are now insured, What is the **advantage** which you derive from investing your surplus income in an insurance office? more than half would reply, The **certainty** of my executors receiving a sum at my death, were that to take place to-morrow. This is but half an answer; for not only does the office undertake the equalization of life, as above described, but also the **return of the sums invested, with compound interest.**
>
> No one can form an accurate idea of such an establishment, who does not consider it as a savings bank, yielding interest on interest."(239)

De Morgan also mentions the distinction between mutual and proprietary (corresponding to our "stock") companies and notes that since the public is beginning to see that little non-policyholder capital is necessary and that the bonus paid to the proprietors comes at their expense "without adequate benefit received in return", the proprietary companies will be forced to to share profits or they will lose business.(272,273) His discussion of the Equitable is interesting in that he discusses the very large surpluses built up because of a far too conservative mortality table and high lapse rates.(279-281) He suggests that modern offices not use the **Equitable** as a guide.

Early U.S. Developments

Five years after De Morgan's book was published, there ocurred in the

United States what one historian has called the "revolution of 1843."[10] Up to this point life insurance sales were small and companies few. This period saw the advent of the first full time life insurance salesman in the United States and perhaps anywhere. Until then, Stalson writes, "...American life insurance men had been content to announce that they were prepared to underwrite lives and wait for the business to walk in the door or arrive with the postman."(156) Morris Robinson, founder of the Mutual Life of New York, began personally calling on friends and acquaintances to persuade of the virtues of life insurance in 1843. He soon appointed others to do the same. His success soon brought imitators and these new companies "...made general the practice of calling at homes and offices, interrupting prospective buyers at work or play to urge the merits of life insurance upon them."(156) At first, full time agents were paid the same commission rates as the part time solicitors, but with increased competition, commission rates increased substantially. In 1846, agents of the Mutual Life were paid a commission of 5% of all premiums paid.[11] Sales of life insurance rapidly increased. The first year commission rate was raised to 10% in 1854, with renewals remaining at 5%. By the 1890's commission rates had risen to something like their modern levels, 45% to 65% on the first year premium and 10% on the first 5 to ten renewals.(523)

The next decade saw both the first insolvencies and the beginning of

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[10] Stalson, chap. VI.- IX, 103 -216, covers the "revolutionary period of 1843 to 1847.

[11] Stalson, ibid., 259. No figures are given for earlier years.

government regulation.[12] The earliest state regulations were concerned with keeping "foreigners" (Englishmen and anyone from out-of-state) from doing business in the state and were generally outright prohibitions. The first general insurance law was passed in New York state in 1849 and imposed minimum capital and reporting requirements on life insurance companies. In 1851 a new act was passed which imposed higher capital requirements and more extensive reporting requirements. Twelve out-of-state companies withdrew, rather than comply with this law. It is not clear what events led to these laws, though at least one of their concerns seems to have been with company solvency.

In 1853, the most important figure in the history of life insurance regulation, Elizur Wright completed and published a series of tables, which among other things, contained the "reserves" that should accumulate year by year for pay in advance policies for Wright's chosen mortality, expense and interest rate assumptions. By 1855, Massachusetts created the first state insurance department and Wright was named as its head three years later. In 1858, Massachusetts passed the first "net valuation" law, the precursor of current solvency regulations. The law required the companies to submit sufficient data to the Commission so that a "valuation" of all policies could be made. This permitted a comparison to be made between the company's actual asset holdings and its future liabilities as computed by the net valuation method. Wright's interest in the comparison was twofold. He was concerned

[12] The only book length treatment of the history of life insurance regulation is by Edwin Wilhite Patterson, **The Insurance Commissioner in the United States**, Cambridge, Harvard U. Press, 1927. Stalson (p.297) notes with app·oval Patterson's assertion that the full story of this regulation had not been written and that a vast amount of research would have to precede any such undertaking. So far as we know, a general history of regulation in this industry is still lacking. We have relied mainly on Stalson, 285-326, for the facts in this section.

that the companies show enough assets to be solvent, but not so great an "overaccumulation" that the early members are "defrauded".[13] As he wrote later, he wanted "to protect the public from the possibility of such unconsionable plunder as I had seen constantly going on in England."[14] In his annual Reports he identified companies that were over-accumulating and urged that they pay greater dividends or provide paid-up additions with their "surplus surplus."

The next major regulatory change was the 1861 "Non-forfeiture Act" passed again in Massachusetts and authored by Wright. This act was the first in a series of state laws that led to the present system of mandated minimum cash surrender values.[15] It may have been the first instance in the U.S. when a government body required that certain contract provisions be included in every private contract entered into by an entire industry. The problem it addressed was as follows: if a (whole life) policyholder missed paying even one premium (i.e. if he allowed his policy to lapse), he forfeited all benefits of the policy in spite of the fact that his previous payments may have provided for a considerable accumulation of assets. In the language of Chapter II, there were no policies that created a legal obligation on the insurance company to "refund" the excess paid over the cost of coverage on pay in advance

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[13] See the first of Wright's reports, the **Fourth Annual Report** to the Massachusetts state legislature, January, 1859, esp. pp.14-25. The first seven of Wright's Reports have been reprinted, together with a short hagiography of Wright, in **The Bible of Life Insurance**, The American Conservation Company, Chicago, 1932.

[14] As quoted by Stalson at 309.

[15] The Act itself did not mandate cash values; it required extended term insurance, the term depending on the "valuation" reserve and the attained age of the lapsing policyholder. For a brief overview of evolution of cash values, see the monograph on the subject by J. David Cummins (1974).

policies. Wright had been taken to an auction market in London which had a strong impact on him.[16] Every Thursday afternoon, the Royal Exchange held an auction where old life insurance policies were "sold." We can illustrate the situation by examining one policy advertised for a similar auction. The insured, a man 87 years old at the time of the auction, had purchased a whole life policy for an annual premium of about 5 pounds in 1829. The face amount of the policy plus bonuses amounted to 436 pounds. If the man either could not did not want to pay the next premium, he and his named beneficiaries lost all benefits of the polcy. If on the other hand, the insured changed his named beneficiary to Mr. X in return for an immediate payment in cash, then Mr. X would collect the face amount plus bonuses when the insured died so long as Mr. X continued to pay the premiums.[17] The auction therefore was a market for the "reassignment" of the named beneficiary on these policies to the purchaser, in exchange for a sum that presumably would bear a close relation to the expected present value of future benefits net of future premium payments.

Stalson describes the period from 1868 to 1905 as one of "revolt, recession and resurgence." There were insolvencies and accusations of bad faith; there were regulations passed that may or may not have helped with the perceived

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[16] Wright, who was a well known abolitionist, compared the London market for old life insurance policies to a "slave auction." Charles Dickens painted a scathing portrait of such an auction in Martin Chuzzlewit. Although one may agree that such an auction may have been personally demeaning, it was also an understandable and efficiency promoting market reaction to the absense of contractually defined cash surrender values. The puzzle is why competition did not force companies to provide refunds comparable to the cash accumulations that could have been achieved through buying term insurance and saving the difference.

[17] A photographic reproduction of an auction ad appears on p.68 of the "Bible...". The year in which the auction took place is not given, but it must have been after 1868, the latest date of purchase of any of the policies advertised. The attained ages of the 42 men in the ad ranged from 38 to 87.

problems; new types of enterprises (fraternal and mutual assessment societies, and industrial insurance companies) entered the market and grew rapidly; and after 1880 ordinary insurance written grew rapidly up and beyond the turn of the century.

To close this thumbnail sketch of U.S. life insurance history, we must mention the Armstong investigation in New York in 1905. Virtually every part of the current regulatory framework was either produced by or changed by the recommendations of this committee. Armstrong chaired a special committee of the New York State Legislature formed to investigate a long list of allegations of misconduct on part of officers of the leading companies of the day. Of the many allegations we mention three major ones. First, it was alleged that the companies, in spite of claims to "mutuality"- claims that they were owned by and remitted all profits to their policyholders, were in fact totally controlled by and run for the benefit of a few officers in each company. These officers were accused of disbursing large sums without proper accounting and auditing, making loans to friends or relatives at low rates, keeping large cash balances in low interest bearing accounts at banks that the officers had personal interests in etc. Second, it was alleged that the costs of obtaining new business were excessive, that among other things, the competition for the best agents had been detrimental to the policyholders and third that "rebates", i.e. a partial refund of the premium returned to the policyholder by the agent who sold it, were common and unfairly discriminated among policyholders.[18] The Committee recommended that new election machinery be set up for all mutual

[18] "Rebates", of course, can be viewed as evidence of price competition among sales agents and "anti-rebate" statutes as similar to "resale price maintenace laws." We know of no detailed studies of rebates in the life insurance business.

companies, that additional disclosure requirements be imposed, that policy contracts be standardized, that acquisition expenses be limited and that "rebates" to policyholders be prohibited. All of these recommendations and more were transformed into law in New York State and were influencial in other states as well. In particular, section 213 of the New York State insurance code imposed limitations on acquisition expenses and was interpreted to apply to all of a company's policyholders, whether resident in the state or not. Through the "Appleton rule" any company licensed in New York State, must abide by the New York code in all the states in which it does business. We note that all of the allegations made, implicitly assume that the policyholders were poorly informed and were receiving less than a market rate of return on their life insurance savings.

Recent Studies

Studies published within the last 30 years have often provided evidence interpreted by their authors to mean that normal competitive market forces do not work in the normal fashion in the life insurance industry. The evidence falls into several major categories: (1) pay in advance policies provide rates of return far below alternative market rates; this, in spite of the arbitrage available through a combination of ART and alternative saving media; (2) despite very severe penalties for early withdrawal, one out of every four policyholders lapses within the first two years; (3) despite their very low rates of return, non-par policies compete sucessfully with par policies; and (4) rates of return (and other measures of costliness) on pay in advance policies vary greatly, suggesting substantial gains from further search, but little search is done. The great variation in prices or rates of return may be a measure of consumer ignorance in this market.

Rates of Return Low Relative to Market Alternatives

As explained in the preceding chapter an ART insurance policy in conjunction with a systematic savings plan is, under ideal conditions, fully equivalent to a pay in advance policy. Therefore one would expect these alternatives to be priced in an approximately equally attractive fashion, since buyers will arbitrage until their "package" prices net of any differences are equal.[19] Empirical studies have shown, however, that the implicit rates of return on pay as you go policies were substantially below market rates of return. The discrepancies were extremely large when short holding periods were considered.

The FTC staff (1979 FTC Report On Life Insurance Cost Disclosure) reported the results of computing implicit prospective rates of return on a large number of the best selling life insurance policies newly issued in 1973 and 1977 for various holding periods.

The rates of return on policies issued in 1973 and in 1977 showed great variation by duration. Policies held for five years and then canceled averaged between **minus** 9% to **minus** 19%[20], at a time when five year Treasury bonds were yielding about 7% and federal tax free municipal bonds were yielding between 5% and 6%. Many policies paid no cash surrender values at all for policies canceled in the first two years, implying an implicit rate of return of close to minus 100%. The average ten year rates of return ranged between minus 2.5% and plus 2%. Only after 20 years were the implicit rates of return almost

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[19] Note, however, that the rates of return discussed in the text do not explicitly take into account guarantees or options that may be available on pay in advance policies, but not on the alternative saving plans. The next chapter discusses this possibility extensively.

[20] A negative rate of return occurs when the cash surrender value at the end of a period is less than the sum of the deposits that have been made to that point.

always positive. For males age 35 buying $100,000 of coverage, for example, the average prospective rate of return on non-par policies was 1.87% in 1973 and 2.64% in 1973. The comparable figures on par (dividend-paying) policies were 2.93% in 1973 and 4.06% in 1977.

Similar results showing relatively low rates of return on newly issued policies with substantial savings components have been reported in Canada by Matthewson and Winter (1982), by **Consumers' Report** for policies issued in 1981 (1982), and by the National Insurance Consumers Organization (1982,1984).

Babel and Staking (1983) took a somewhat different approach, but reached similar conclusions on the relative unattractiveness of the savings policies relative to pay as you go term insurance. Using a technique that has some similarities to the "ideal" price method explained in Chapter II, they computed "markups" on a sample of newly issued whole life and term policies for the years 1950 to 1979. They found a very large increase in the markup on both par and non-par whole life policies, e.g. from 48% in 1950 to 279% in 1979 for non-par whole life policies, using the corporate bond yield as the reference interest rate. On the other hand they found a substantial reduction in the real markup on non-renewable term insurance over the same time period. Most of the change in markups occurred after 1965 (i.e. when general market interest rates began to rise).

One study has reached different conclusions concerning relative rates of return. Klamath (1982) followed the actual experience of a sample of par whole life policies issued in 1959 and compared their rate of return after 20 years with eight different market alternative investments. He concluded that the 20 year rate of return for the whole life policies was 3.36% compared to 3.18% for the eight alternatives. Thus life insurance policies yielded about the same or even a little more than alternatives. Several observations are in order. First, unlike all the other studies cited above, Klamath followed the same set of policies over time, using actual dividends paid. He has estimated rates of return that would actually be realized by policyholders that survived and persisted for 20 years. All the studies referred above estimated prospective rates of return, i.e. what the rate of return would be in 20 years if the dividend formula was unchanged. Thus Klamath looked at an important, but different question than the one explored in previous studies.[21] Second, his estimate of the 20 year rate of return is (surprisingly) quite consistent with the earlier findings on prospective rates, since the average for par policies was about 3% in 1973 and 4% in 1977. What is surprising is the low rate of return he finds on the eight alternatives. The reason is that Klamath has reduced the rate of return on the alternatives by about 40% to reflect "transaction costs and taxes." Thus, not only does he assume the rates offerred on the alternatives are gross of transactions costs when some are net, but more importantly, he offers no evidence to support the magnitude (15%) of his adjustment. He also assumes that all of the alternatives are fully taxable at 30%, whereas the whole life policies are assumed to be completely free of federal taxes. He does not show market rates of return for alternative savings instrument that may be attractive to individuals in relatively high taxes brackets, for example, investing the same amount of money in high grade municipal bonds over the period in question.

Early Lapsation

Canceling or "lapsing" a pay in advance policy in the first two years is

[21] In Chapter IX, we report yearly, marginal rates of return on par policies issued in 1950, 1960, 1970 and 1976, based on actual dividends paid and using an extensive data set that has not previously been used.

very costly to the buyer since he forfeits all or much of what he has paid in advance. Unlike "early withdrawal penalties" imposed in other financial instruments, which entail a reduction in the rate of interest earned, life insurance surrender charges entail a large reduction or even elimination of the principal in early policy years. Yet in 1983, one out every four policies lapsed within two years, and this rate has been never been less than 18% since 1968.[22] It is difficult to reconcile the behavior of people who choose to cancel savings intensive policies in the first two years after purchase with the notion of generally well-informed, rational consumers. While some lapsation will always occur due to unforseen changes (loss of job, divorce), the incidence of early lapse seems far too high to be explained on these grounds. If instead of canceling, policyholders had persisted for a few more years the annual increase in the "cash value" would be very rapid, so rapid, that it would almost always be above the market rate of interest (We show in Chapter IX, that the annual rate of return in the third policy year often is very high.). Indeed, it would generally be profitable to borrow at market rates of interest, if necessary, to finance the premium payment even if the "insurance" component was worthless to the policyholder.

Low Correlation Between Market Share and Policy Cost

Policies that pay no dividends (non-par) have consistently been found to offer substantially lower (by 40% or more) prospective rates of return for every issue year, issue age and holding period.[23] Yet non-par policies not only persist, but account for a growing share of the market. In general, there

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[22] 1983 Fact Book, p.54. For an estimate of the total cost to all lapsing policyholders in 1977, see appendix V of FTC Report (1979)

[23] See, for example, **Analysis of Life Insurance Cost Comparison Methods**, The Society of Actuaries (1974); FTC Report (1979), and **Consumer Reports** (1982).

is little or no correlation between low policy cost and market share.[24]

The lack of correlation may again reflect the presence of different policy characteristics, especially different options and guarantees (Smith, 1982). Walden (1985) tested this proposition by regessing the premium rates on 59 whole life policies on various policy and company characteristics. He found a highly significant[25] positive relationship betwween cash values, dividends and premiums and a highly negative relation between policy size and premium per thousand. He also found significant[26] positive relationships between the average minimum interest rate on settlement options (see Chapter IV for a discussion of these), company assets, the company's rate of return on its portfolio and the policy's premium. He found a negative significant relationship between the company's surplus funds and the policy's premium. He did not find significant relationships between premium and the policy loan interest rate, the number of settlement options, between smoker and non-smoker and other policy and company features. The question adressed by Walden's regression is whether the premium rate is affected at all by policy size, by the present value of illustrated dividends and so forth. The major question at issue however, is whether the difference in the value of the characteristics can plausibly account for the differences in the over-all rate of return between two policies. We know, for example, that the average premium on a non-dividend paying policy is lower than the premium for a par policy, but we also know that it is not lower enough to provide the same rate of return. The question, then,

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[24] See appendix IV of FTC Report (1979).

[25] "Highly significant" means that the hypothesis that the true coefficient is different from zero would be rejected at a 1% level of significance or below.

[26] At the 5% level.

is whether there are features common in non-par policies that could compensate for their lower rate of return. Walden's regression does not provide any answer to this question.

A partial answer might be found in the fact that non-par rates are guaranteed, whereas the par rates depend on dividends illustrated using the current formula. Thus the difference might be attributed to the guarantee. Par policies also have guaranteed rates, however, so only the difference between the par and non-par guaranteed rates, if any, could explain the difference in current rates. None of the studies referred to above investigated for systematic differences between par and non-par companies on the mortality pools they may draw from, differential advisory services performed, and so forth. These possibilities will be considered in Chapter IV.

Large Variations In Costs or Rates of Return

Modern research indicating large variation in the prices or consumer costs of life insurance began with the work of Belth in the early 1960's.[27] In his Ph.d dissertation he had compared the effective prices of participating whole life policies issued by mutual companies to similar participating policies issued by stock companies.[28] He found substantial price variation and wrote,

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[27] As mentioned above, detailed premium and benefit comparisons had been made for English companies by Baily and Babbage before 1850. Belth's dissertation was completed in 1961 and a revised and updated version of it was published in 1965 under the title **Particpating Life Insurance Sold by Stock Companys.** A year later his **The Retail Price Structure in American Life Insurance** was published. These two books constituted what was undoubtedly the largest and most thorough study of life insurance pricing that had ever been undertaken.

[28] Belth used a measure he called the "level price" per thousand as the effective price of coverage. To obtain the level price one first calulates the "yearly price." The level price is an average of the yearly prices, discounted for interest, mortality and lapse. The yearly price is an estimate of the pure cost of protection for that year and requires an assumption concerning the rate of interest that could be earned if the savings element were invested elsewhere.

"A certain amount of price variance in participating life insurance is to be expected. For example, no two companies enjoy exactly the same mortality experience, have exactly the same investment experience, or make exactly the same estimate of the "appropriate" degree of consrvatism in retaining and distributing surplus. Futhermore, the age of the companies, their growth rates, the territories in which they operate, and many other factors may have a bearing on their relative prices.

Nevertheless, the limited data gathered in this study seem to refute the theory that price competition is effective in particpating life insurance.[29]

Belth generalized this conclusion in his later study, in which he had analyzed data on virtually all the types of life insurance policies being sold in the early 1960's.

"Most of the data in this book suggest a large amount of price variation in life insurance, not only on similar plans of insurance in different companies but also, in some cases, on different plans in the same company. Indeed, the variation is large enough to suggest that price competition in many areas of life insurance has not been effective. Thus companies that charge prices substantially in excess of the prices charged by some of their competitors for comparable contracts apparently are able to secure customers. Similarly, companies whose price structures raise questions of equity because some of their customers are charged more for protection than others in the same mortality classification apparently do not have to offer any justification for their practices."[30]

Later work (Society of Actuaries (1974), FTC (1979), Mathewson with Todd (1982) also found substantial price or cost variation, regardless of the measures of cost used. The first study did not comment on whether the variation seemed inconsistent with efficient price competition but the last two suggested that some sort of price disclosure system might make price competition more effective.

One recent study (Winter, 1981) concluded that the conventional wisdom that

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[29] Belth (1965), p.47.

[30] Belth (1966), p. 238.

price dispersion is "large" in life insurance markets is incorrect. Providing that price dispersion is measured correctly, he argues, it is smaller for whole life insurance markets than for any other variations reported for other products. Reanalyzing Belth's data but using Winter's measure of dispersion, he concluded that the "extent of price dispersion is not an indication of market failure...."[51]

To understand why Winter reaches different conclusions than earlier investigators, in spite of the fact that he was looking the same data, requires some further discussion both of the ways in which price and cost are measured and the ways in which their variability is measured . All of the previous studies used the standard deviation as a measure of the variability of the price or cost indexes used. Most also computed the ratio of the standard deviation to the average price or cost observed. The ratio of the standard deviation to the average is called the "coefficient of variation." This ratio is independent of the scale used to measure price or costs. For example, suppose the average price of an automobile is $10,000 with a standard deviation of $1,000, and that the average price of a turntable is $100 with a standard deviation of $10 and that the average rate of return of a three year IRA is 10% with a standard deviation of 1%. Then all three of these "price" distributions would have the same coefficient of variation, namely, 10%.

[51] p. 94. Winter adds that the absense of excessive price dispersion does not imply that market performance is "acceptable or could not be improved upon." In a footnote he refers to another paper (Winter, 1980) wherein he offers evidence that "price rigidity in the response of the market to rising interest rates is a much more important problem than price dispersion." One can agree with the latter position, even when disagreeing with the former. It also seems puzzling that policyholders can apparently compare policies accurately enough to keep effective cost variation and effective rate of return variation very low within policy groups, but seem to fail to notice that life insurance rates as a whole are becoming lower and lower relative to market rates of return.

Belth used a cost measure he called "company retention" to measure cost or the effective price. Retention is an estimate of the value of the total amount spent by the policyholder that will not be returned to him in the form of benefits. It is also an estimate of the present expected value of the amount the company will "retain" to cover expenses and to make a profit. Belth computed both the average retention and the standard deviation for many different whole life policies issued in 1970, for different issue ages, face amounts and by whether the policy paid dividends or not. For example, he found that the average retention for a $100,000 par policy sold to a 35 year male was $3,940, and the standard deviation of the retentions for the 48 policy examined was $701. The coefficient of variation of the retentions was therefore about 18% (701/3940 times 100) for this category. The average expected present value of all premiums paid over the lifetime of the policyholder was $21,501.

Winter argues that the coefficient of variation of the retentions overstates the true price dispersion, and that a better measure is obtained by dividing the standard deviation of the retention ($701), not by the average retention, but instead by the average of all the premiums paid ($21,501). Thus Winter's estimate of the coefficient of variation is about 3% rather than 18%. He argues that since benefits vary even in policies of the same type, that one must scale the actual premium to reflect the same average benefit package for all policies being compared. His "adjusted premiums" then only differ in the amount the company retains. The standard deviation of the adjusted premiums is the same as the standard deviation of the retentions, and the average of all the adjusted premiums is simply the average of all the premiums. The latter follows since since policies with benefits above the average are by definition exactly offset by ones with benefits below the average.

Thus one gets a very different estimate of price dispersion, depending on whether one chooses the coefficient of variation of the company retentions or of the adjusted premiums as one's measure. Which is the better measure of true price dispersion? We think the answer is neither. No coefficient of variation alone provides a measure of what one really wants to measure, namely, the expected dollar saving made possible, if the buyer locates a better buy through further search. For example, suppose that on the average, canvassing one more seller would produce a price quote that is lower than your best previous quote by 50% of the standard deviation of prices. In the case of an automobile with an average price of $10,000, one additional quote would be expected to save the buyer $500 compared to a $5 dollar saving on a turntable with an average price of $100. Though both these markets display the same coefficient of variation (10%), clearly search is far more valuable in the first market than in the second.

The real issue here is whether the observed price dispersion for life insurance policies is consistent with normal "friction" in a world where information is not free or whether the potential savings are so large as to raise a question as to why buyers do not exploit and therefore reduce them. We can obtain a rough measure of potential savings from the computations supplied by Belth and used by Winter. If we assume that company retentions are distributed in a bell-shaped or Gaussian fashion, then Stigler (1961) has shown that the expected savings to canvassing two sellers instead of one is equal to about 56% of the standard deviation.[32] In the case of $100,000 par policy mentioned

[32] See p. 171 of the reprint (chapter 16) in the Organization of Industry. The normal may not be a very good approximation to the actual price distributions since many are skewed to the right. Stigler's seminal article takes the

above, the potential savings would be about $395 (.56 times $701) for canvassing two sellers instead of one. This potential saving was far larger than for any of the other products mentioned by Winter.[33] The average hourly wage was about $4 in 1970. At that rate a buyer could have researched for a single additional quote for more than two weeks and still come out ahead.

Potential savings from search thus seem to be large relative to other markets and yet buyers engage in little or no search. The potential savings may not be exploited either because buyers are unable to evaluate alternative policies, except at very great cost, or because the savings are more apparent than real. We discuss these alternatives further in Chapters VIII and IX.

Summary

Many studies, some recent and some more than 150 years old, have provided evidence that price competition may not be as effective in life insurance as in most other industries. The authors of these studies have singled out consumer information problems as the source of the difficulty. While the evidence is not definitive, most recent work confirms that prospective rates of return on life insurance savings are lower than most market alternatives, especially for short holding periods, that penalties for early withdrawal are severe, yet early withdrawal is common and that potential savings to further shopping are large, yet most buyers do not shop at all.

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distribution of prices as given. For a model that incorporates seller responses to buyer search and provides explicit equilibrium price distributions see Butters (19). Survey evidence has consistently shown that most people do not shop at all for life insurance; they deal with only one agent. See Chapter IX.

[33] See table III on p. 93.

Chapter IV

Pay As You Go Policies

As discussed in Chapter II, annual renewable term (ART) contracts are one of the fundamental building blocks of all life insurance contracts. All more complex contracts can be analyzed, at least in part, as "packages" of ART's. In combination with a current interest rate, they be used to construct "equivalent" premiums for almost any type of pay in advance contract. Alternatively, ART rates can be used to solve for the implicit rates of return being offered on pay in advance or savings intensive contracts. ART contracts are the closest the market comes to providing "pure" pay as you go policies and so are the focus of this chapter.

We will begin, however, by briefly examining the broader "term insurance" market, even though the broader market reflects some policies with significant savings components. We document that the trend toward greater market share for term insurance peaked in 1980 and may have ended in 1983. Market shares are presented for 30 large companies, including all of those whose policies are studied in this chapter.

ART rates charged by 18 of these companies in 1983 were analyzed. These form the basis for the ART rates used to compute rates of return on savings intensive policies in Chapters V through VII. Information is provided on the variability of these term rates and used to produce "low", "average" and "high" ART rates. Average premiums at each age are compared with their ideal price (essentially the census mortality rate at that age), and mortality rates are found to be a remarkably good guide to average market ART rates. The renewability option is discussed and a possible adverse selection issue raised. No evidence of adverse selection is found.

The equivalence equation of Chapter II is used to compute whole life premiums which are "equivalent" to buying term at the 1983 average ART rates and investing the difference at the rates of interest that prevailed in 1983. These will be compared to actual whole life and other pay in advance policies in later chapters.

The Term Insurance Market

"Term" insurance, literally interpreted, refers to any insurance contract whose duration of coverage is less than for the "whole" of life. It is, therefore, not perfectly suited to distinguishing between policies which intrinsically involve savings as well as insurance protection and those that involve only protection. For example, "level term to 65" is a policy type that provides coverage for a term that ends at age 65 or at death (whichever comes earlier) at a premium rate that remains constant over the entire period that the policy is in force. Clearly, it is not a "pay as you go" policy. Rather, like whole life, you "pay in advance" and therefore the policy contains a savings component. On the other hand, more than one quarter of the ART policies summarized in this chapter were renewable at least to age 95 and most (like whole life policies) were renewable to age 100. Technically, these "pay as you go" ART policies are not "term" (though they are classified as term on the companies annual statements) policies at all. While not perfect, the division in the industry statistics between whole life and endowment (WL&E) and term policies is the closest we can come to dividing saving intensive policies from those with little or no savings.

Other common types of term insurance include 5 and 10 year renewable and convertible policies. These are similar to ART policies, except that premiums remain constant over 5 or 10 year periods. Again such policies include savings components, but they are usually small. We should also note that term insurance coverage is frequently sold in conjunction with whole life policies, as "riders" to the basic coverage. Term insurance policies, then, do include some savings components but are much less savings intensive than whole life (including universal life) and endowment policies. Term insurance is not necessarily a substitute for a savings intensive policy, but very often is a complement to a "basic" savings intensive policy.

Table IV-1 shows the relative amount of term insurance newly issued and remaining in force between the years 1978-1983.

TABLE IV-1

Amounts of Term Insurance Issued and In Force Relative to Total Ordinary Insurance, 1978-1983 (In Millions of Dollars)

	Amount Issued			Amount In Force		
Year	WL&E	Term	Term Share	WL&E	Term	Term Share
1978	141,387	149,559	51.40%	923,722	611,923	39.85%
1979	153,827	182,718	54.29	1,004,345	716,441	41.63
1980	172,799	222,536	56.29	1,182,736	898,570	43.17
1981	247,492	248,692	50.12	1,472,157	1,093,891	42.63
1982	331,918	279,264	45.69	1,660,492	1,212,191	42.20
1983	434,833	335,838	43.58	1,844,070	1,410,700	43.34

Source: Annual Statement Data, as complied by A.M. Best Co.

Several patterns are revealed in the table. First, the term insurance share of the total amount issued is always larger than its share of the total amount in force. This indicates a trend toward term insurance. Also, except for the last two years shown, more than half of the of new insurance sold was provided by term insurance policies. Second, this trend toward term insurance peaked in 1980. The modest increase in the market share of term of new insurance issued, therefore did contribute to the decline in savings documented in Chapter I up to 1980. But life insurance's share of personal saving continued to fall in 1981, when the term share of new business fell. Thus, it appears likely that a substantial part of the fall in life insurance saving was due to replacement of old savings intensive policies by new ones. New pay in advance policies are examined in Chapter IVII and replacement in Chapter X.

By 1983, term insurance sales as a percentage of new sales was about equal to its share of the in force business. The share of term insurance in force has changed little in the last five years, hovering around 42%.

Tables IV-2 and IV-3 provide information on the total amounts of term insurance held and newly issued in 1982 by the top 30 companies. Other companies whose policies are analyzed in this report are also included. The number in the second column, following the company name, is the rank the company held in 1982, based on total ordinary insurance in force (IV-2) or issued (IV-3). The next column shows the amount of term in force or issued by the company named in column one. The last column shows the company's share of term in force or issued. For example, Lincoln National ranked second in the amount of term insurance in force in 1982, but seventh in the amount of all ordinary in force. It held 3.53% of the total amount of term insurance in force. The same company ranked 27th in the amount of term insurance issued and 33rd in the total amount of ordinary insurance issued in 1982. It issued about half of one percent of the amount of new term insurance in 1982.

TABLE IV-2

Term Insurance
Amount in Force in 1982
(In Millions)

Company	Rank All In Force	Total In Force	Term In Force	Term Market Share
Total Industry		2,872,680	1,212,190	100%
Prudential	1	183,679	70,434	5.81%
Lincoln Nat.	7	61,030	42,844	3.53
New York Life	3	118,813	42,736	3.53
Occidental	6	68,079	36,713	3.03
State Farm	8	60,937	36,274	2.99
Metropolitan	2	119,422	32,550	2.69
Equitable Life	5	69,634	29,439	2.43
Security Life	18	25,399	24,261	2.00
Security Conn.	11	37,363	21,262	1.75
John Hancock	9	53,508	20,259	1.67
Nwtrn Mutual	4	79,027	17,595	1.45
Allstate	19	23,430	16,171	1.33
Milico	27	15,573	15,488	1.28
Old Line Life	25	16,351	14,941	1.23
Phoenix Mutual	15	27,499	13,199	1.09
Mass. Mutual	10	43,160	13,063	1.08
Conn. General	16	27,201	11,647	.96
Beneficial Nat'l	31	13,043	11,384	.94
Conn. Mutual	12	35,101	11,278	.93
M.O.N.Y.	13	31,007	10,473	.86
Franklin Life	24	16,679	10,067	.83
Businessmens	32	13,039	9,111	.75
Philadelphia Life	30	13,419	8,619	.71
New England Mut.	14	27,922	8,358	.69
Family Life	43	8,240	8,225	.68
United Investors	38	8,969	8,085	.67
USAA Life	42	8,333	7,272	.60
Farmers New World	21	18,910	7,081	.58
Guardian Life	23	16,928	7,066	.58
Nationwide Life	34	11,574	7,042	.58
Penn Mutual PA.	22	18,883	5,577	.46
Integon Life NC.	39	8,552	5,541	.46
Travelers CT.	20	23,064	5,458	.45
Natl Life TN.	26	16,098	5,015	.41
Bnkers Nat. TX.	44	8,017	4,822	.40
Minn Mutual MN.	45	7,164	4,321	.36
N. Amer L&C MN.	48	5,485	4,306	.36
Firemns Fund CA.	46	6,532	4,142	.34

TABLE IV-2, continued

Company	Rank All In Force	Total In Force	Term In Force	Term Market Share
Home Life NY.	33	12,753	4,131	.34%
Westn & Stn OH	28	14,566	4,098	.34
Fed Kemper IL.	17	25,914	3,942	.33
Jackson Nat MI.	40	8,468	3,387	.28
North Amer Co IL.	29	14,317	3,322	.27
First Colony VA.	35	10,377	2,459	.20
Alex Hamtn MI.	49	4,569	2,244	.19
Liberty Nat AL.	36	9,836	2,158	.18
Aetna L&a CT.	37	9,147	1,700	.14
Amer Gen L TX.	50	4,423	1,678	.14
E.F. Hutton CA.	47	5,525	1,131	.09
Exec Life CA.	41	8,433	847	.07

TABLE IV-3

Term Insurance
Amount Issued in 1982
(In Millions)

Company	Rank All In Force	Total In Force	Term In Force	Term Market Share
Total Industry		611,182	279,264	100%
New Life	2	27,563	16,889	6.05%
Prudential	1	29,061	13,217	4.73
Milico	10	10,247	10,246	3.67
State Farm	7	13,773	9,838	3.52
Security Conn.	9	10,868	9,823	3.52
Equitable Life	4	15,637	9,811	3.51
Beneficial Nat'l	12	9,302	8,447	3.02
N'western Mutual	6	14,213	6,852	2.45
Conn. Mutual	11	9,465	6,361	2.28
Old Line Life	21	5,785	5,515	1.97
Metropolitan	3	16,025	5,081	1.82
Allstate	19	6,201	4,728	1.69
Mass. Mutual	15	7,467	3,826	1.37
John Hancock	14	8,197	3,635	1.30
Franklin Life	26	4,247	3,490	1.25
Conn. General	18	6,360	3,356	1.20
Philadelphia Life	28	4,056	3,030	1.09
United Investors	35	2,715	2,649	.95
Businessmens	30	3,506	2,625	.94
M.O.N.Y.	22	5,351	2,394	.86
New England Mutual	24	4,622	2,336	.84
Family Life	41	2,225	2,224	.80
Minn Mutual MN.	42	2,172	1,988	.71
Penn Mutual PA.	29	3,510	1,840	.66
Firemans Fund CA.	38	2,517	1,647	.59
USAA Life	46	1,716	1,561	.56
Lincoln National	33	2,981	1,465	.52
Farmers New World	16	6,655	1,416	.51
Home Life NY.	40	2,367	1,367	.49
Occidental	5	15,017	1,357	.49
Integon Life NC.	34	2,974	1,353	.48
Nationwide Life	45	1,890	1,237	.44
Natl Life TN.	31	3,450	1,205	.43
Westrn & Soutnrn OH	37	2,553	1,003	.36
Aetna Life & Ann CT	17	6,365	1,000	.36
Jackson Natl MI.	27	4,199	982	.35
Alex Hamilton MI.	43	1,993	956	.34

TABLE IV-3, continued

Company	Rank All In Force	Total In Force	Term In Force	Term Market Share
North Amer L&C MN.	48	1,155	850	.30
Travelers CT.	23	4,642	848	.30
North Amer Co IL.	13	8,338	818	.29
Bankers Natl. TX.	47	1,618	797	.29
Guardian Life	44	1,895	789	.28
Liberty Natl AL.	32	3,167	748	.27
Security Life	50	749	365	.13
Phoenix Mutual	39	2,463	365	.13
Fed Kemper IL.	8	13,369	360	.13
First Colony VA.	25	4,408	308	.11
E.F. Hutton CA.	36	2,645	233	.08
Amer Genl Life TX.	49	1,042	160	.06
Exec Life CA.	20	6,092	98	.04

Comparsion of Tables IV-2 and IV-3 also shows the rapidly increasing importance of certain companies that appear to specialize in term insurance. The most striking example is the Massachusetts Insurance and Indemnity Company (MILICO in the tables). This company was ranked 27th by amount of all ordinary insurance in force, but was third in the amount of new term insurance issued in 1982. In the year 1980 alone, the amount of insurance in force increased from $324 million on January first, to almost $3.4 billion, an increase of over 13,000% in a single year. Premiums increased by 900% in the same year.

Annual Renewable Term Insurance

The simplest ART policy has been described and it ideal price set out in Chapter II. Actual policy premiums will, however, reflect not only administrative and selling expenses, but also the possibility of lowering claim costs through selection. For example, in 1980, about 1.83 out of every 1000 white males aged 35 died before reaching age 36. If we ignore interest, all other expenses and assume that insurers sell or "issue" policies to a random selection of the white male population, then the insurer would need to charge a premium of $1.83 per $1,000 of coverage or "face amount" to break even. There are two reasons why the actual average claim cost to the insurer would be less than $1.83. These will offset, to some extent, the non-claim expenses that will raise total costs.

First, the insurer can do better than purely random selection by employing screening or "underwriting" techniques such as requiring applicants to pass a medical exam or by rejecting those whose health history indicate to be poorer risks. "Selection" can substantially reduce an insurance company's actual mortality expense, especially in the same year as the screening technique was employed.[1] Reductions of 30 to 50% of the first year average mortality rate are not uncommon, at least judging by the select tables in use. The favorable effect of selection disminishes over time, with some tables showing selection effects for only 3 to 5 years after issue, but others showing effects for 10 to 15 years after issue. Thereafter it is assumed that mortality experience is no better than average, that is, the rates become "ultimate." [2] Most policies (84% by number and 80% by amount)[3] are written at "standard" rather than "extra-risk" rates, though different companies may have differing underwriting criteria for their "standard" rates. In recent years, companies have also introduced smoker and non-smoker rates. Non-smoker mortality rates and their corresponding premiums are considerably lower than those for smokers.[4]

Second, if the premium is paid in full at the inception of the coverage then the company can earn interest on these funds until the claim payments must be made. If deaths are distributed uniformly over the year, then on average the company earns interest for six months on premiums paid. Thus market interest rates should affect even one year term premiums, though the effect will be generally be small. In 1983, short term (taxable) interest rates were about 8%, so the expected claim expenses of $1.83 would be reduced by about 7

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[1] The NCHS table covers the entire population of white males in the U.S., including all who are institutionalized in hospitals and those who are in intensive care units. While the number of high risk institutionalised individuals is small relative to the population as a whole, such individuals may well constitute a substantial share of the deaths in that year. Insurance companies presumably would not insure high risk individuals at standard rates, so insurance company mortality experience will be better than the average experience.

[2] See Dukes and MacDonald (TSA,1980) and the select tables in FTC (1979, append. VI).

[3] See Life Insurance Fact Book, 1983, p.98.

[4] Dukes and MacDonald, 1980 and figures II-1 to II-3 or table II-1.

cents of interest earnings.

Of course, there are other expenses. There are administrative expenses associated with issuing and maintaining the policy, sales or agent commission expenses, selection expenses and taxes. Some of these are one time only (medical expense on new business), some are recurrent but independent of the policy size (monthly billing) and still others will vary with policy size (agent commissions, federal and state taxes). As indicated in Chapters I and II, non-claim expenses for the ordinary line as a whole are in fact considerably more than death claim expenses. The ART policies analyzed here all charge a constant annual policy fee (of about $20) plus a premium rate per $1,000 of coverage that depends on sex, age and amount of coverage.

For the moment we will neglect these policy fees and concentrate on mortality expenses alone. Figures I-1, I-3 and Table IV-4 show the close relationship between mortality rates and annual renewable term insurance rates at a given age. Consider Figure I-2. It shows that the average premium (excluding the policy fee) per thousand dollars of coverage for a non-smoking male of age 35 is $1.76, compared to the average mortality rate of 1.83 per thousand. This point is plotted as a solid "dot" and is shown somewhat below the 45^0 line, since the premium is actually somewhat less than the mortality rate. On the other hand, the rate for a smoker is $2.27, so it is shown (plotted as an "x") above the 45^0 line. If premium rates just equaled mortality rates, as they would in the ideal case with zero interest rates, then all the points plotted would fall along the 45^0 line. On average, as Figure I-1 shows most clearly, actual smoker premium rates follow average mortality rates quite closely, that is they all fall pretty close to the 45^0 line. Table IV-1 shows, rather surprisingly, that between the ages of 45 and 65 the smoker rate is never more than 10% above, or 6% below the average mortality rate at that age. Non-smoker premium rates are about 20 to 25% lower than the corresponding mortality rate, and so they plot as a straight line with a slope less than one.

TABLE IV-4

Mortality Rates Compared with One Year Term Insurance Rates

Age	Male Mortality 1980	Term Rates		Ratios of	
		Smoker	Non-Smoker	Smoker Rate to Mortality Rate	Non-Smoker Rate to Smoker Rate
25	1.84	1.96	1.58	1.07	.80
26	1.78	1.98	1.59	1.11	.80
27	1.73	2.00	1.60	1.15	.80
28	1.69	2.02	1.61	1.19	.80
29	1.67	2.04	1.62	1.22	.80
30	1.65	2.06	1.64	1.25	.80
31	1.64	2.08	1.66	1.27	.79
32	1.65	2.11	1.67	1.28	.79
33	1.69	2.15	1.69	1.27	.79
34	1.75	2.20	1.71	1.26	.78
35	1.83	2.27	1.76	1.24	.78
36	1.93	2.38	1.83	1.23	.77
37	2.06	2.53	1.91	1.23	.75
38	2.21	2.70	2.01	1.22	.74
39	2.38	2.89	2.13	1.21	.74
40	2.59	3.12	2.26	1.20	.72
41	2.83	3.37	2.43	1.19	.72
42	3.11	3.64	2.61	1.17	.72
43	3.43	3.93	2.82	1.15	.72
44	3.79	4.26	3.06	1.12	.72
45	4.19	4.61	3.33	1.10	.72
46	4.64	5.04	3.65	1.09	.72
47	5.15	5.48	3.99	1.06	.73
48	5.72	5.95	4.36	1.04	.73
49	6.36	6.47	4.76	1.02	.74
50	7.05	7.06	5.21	1.00	.74
51	7.80	7.69	5.69	.99	.74
52	8.60	8.36	6.19	.97	.74
53	9.46	9.10	6.76	.96	.74
54	10.38	9.89	7.35	.95	.74
55	11.37	10.78	8.04	.95	.75
56	12.44	11.81	8.89	.95	.75
57	13.61	12.90	9.75	.95	.76
58	14.89	14.03	10.71	.94	.76
59	16.27	15.38	11.77	.95	.76
60	17.75	16.83	13.03	.95	.77

TABLE IV-4, continued

Age	Male Mortality 1980	Term Rates: Smoker	Term Rates: Non-Smoker	Ratios of: Smoker Rate to Mortality Rate	Ratios of: Non-Smoker Rate to Smoker Rate
61	19.34	18.65	14.62	.96	.78
62	21.10	20.41	16.08	.97	.79
63	23.06	22.34	17.68	.97	.79
64	25.21	24.40	19.47	.97	.80
65	27.51	27.08	21.46	.98	.79

Sources:

Mortality rates - National Center for Health Statistics, 1980 life table for U.S. white males. This was the latest table available in 1983.

Term insurance rates - average of 18 companies offerings in 1983- does not include policy fee- minimum amount at these rates, generally $100,000 .

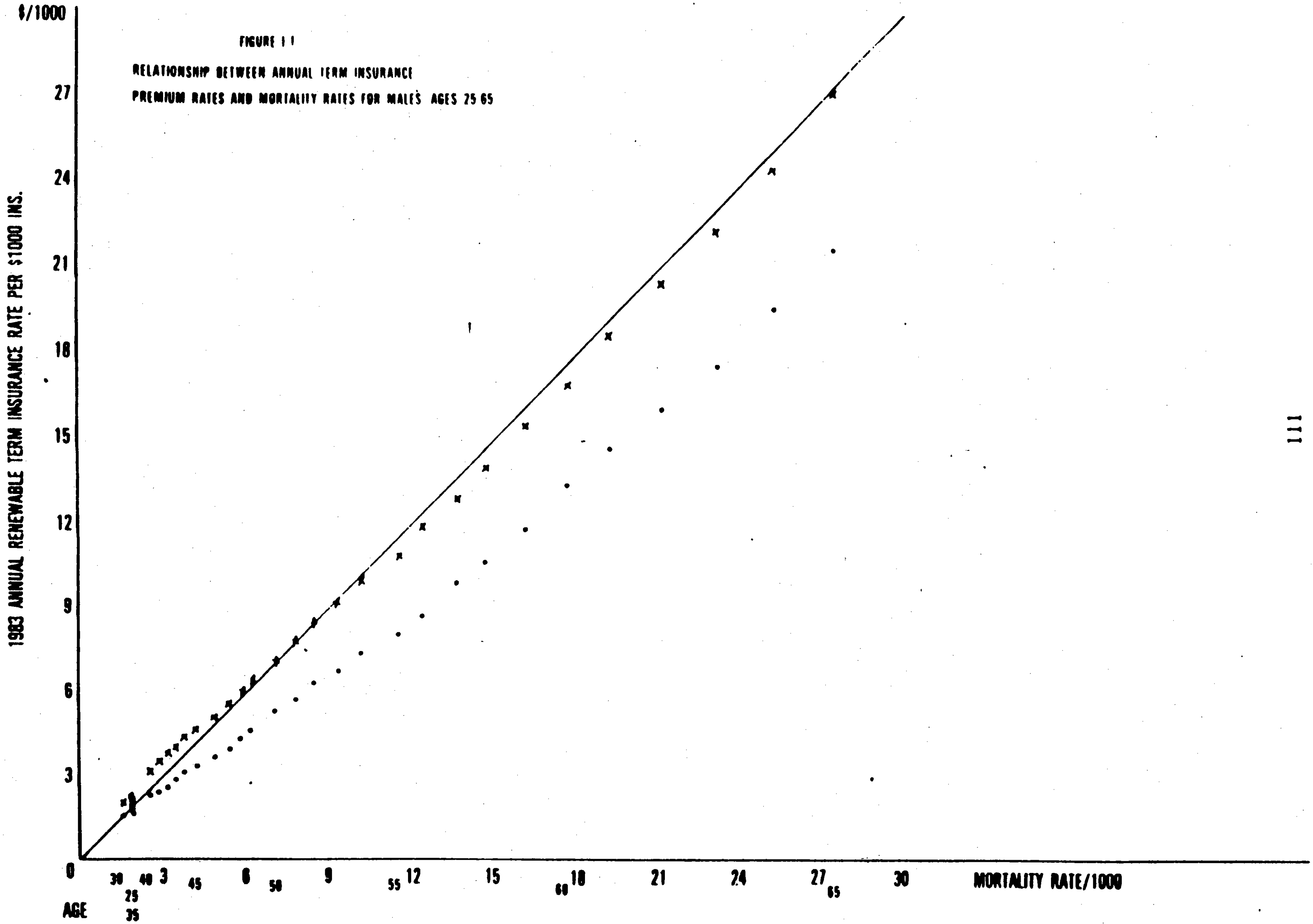
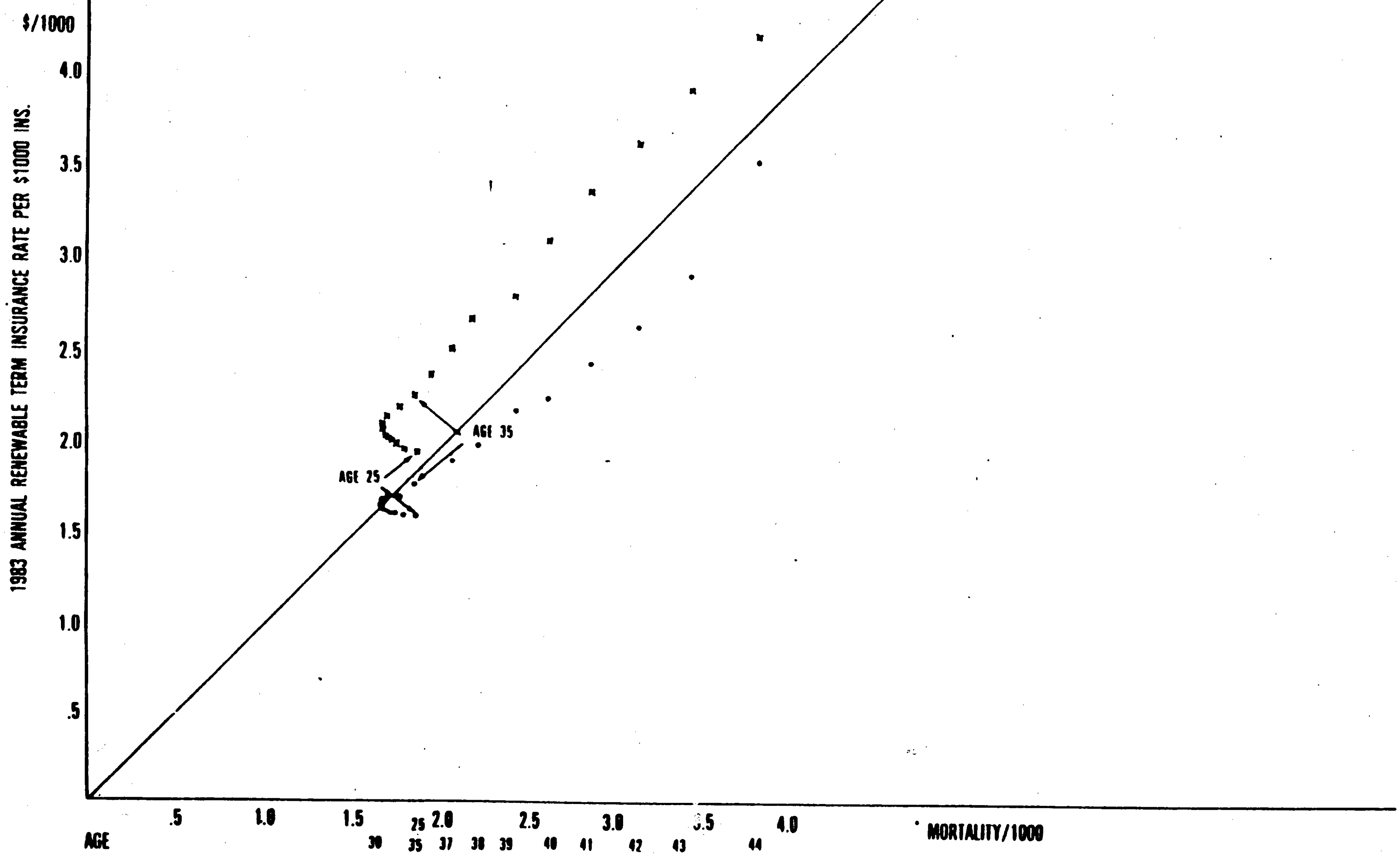


FIGURE 11

RELATIONSHIP BETWEEN ANNUAL TERM INSURANCE PREMIUM RATES AND MORTALITY RATES FOR MALES AGES 25 65

FIGURE 1 2

DETAIL OF THE RELATIONSHIP BETWEEN ANNUAL TERM INSURANCE PREMIUM RATES FOR MALES, AGES 25-44



Between the ages of 25 and 31, mortality rates and term rates go in different directions, causing the "twist" seen most clearly in figure I-1. According to government figures, mortality rates for males actually decline between ages 25 and 31, whereas premium rates increase smoothly over the whole time period. The failure of the decline in mortality to be reflected in premiums is puzzling, especially given the otherwise very close relation between the two series. It may be due to successful "selection" against high risk males in their early twenties (perhaps even self-selection, high risk young males may not be interested in buying life insurance). We don't have precise figures on the frequency or amount of coverage sold on male lives between the ages 25-34, but these are the peak sales years and probably account for more than 30% of all sales. As a practical matter the discrepancy is small. The mortality differential between age 25 and age 31 is only 20 cents per $1000. Premium rates at all ages between 25 and 35 vary considerably. (The standard deviation is about 50 cents per $1000).

Why Are ART So Low?

Although potential selection savings and high market interest rates can explain the possibility of ART rates at or below census mortality rates, they cannot account for the seemingly low level of non-claim expenses reflected in these rates.[5] Average nonclaim expenses, for the industry as a whole, amounted

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[5] There is some evidence that ART premiums have declined substantially relative to mortality rates since 1976. In 1977, as part of the work on our previous Report, we ran some regressions of premium rates on the 1969 Census mortality rates. The sample consisted of rates for standard (no companies in our sample offered nonsmoker discounts) ART policies from 39 companies listed in **Best's Flitcraft Compend** for 1976. If this data were plotted on Figure I-1, it too would fall along a straight line (R^2=.996), but the line would start above the 45^0 line and its slope would be greater than one (about 1.6). Thus, in 1976, average ART rates were about 50% to 100% higher than census mortality rates.

to $5.74 per thousand of coverage (Table I-3) in 1983, yet ART rates for 35 year olds were often under $2 per thousand. Even if selection savings and interest on the float reduced the breakeven ideal price to $1, we would still have to explain why less than one-fifth of the average non-claim costs are reflected in the ART rates. Some explanations are apparent. Both federal and state company taxes are lower on ART products than on more savings intensive products. Federal taxes apply mainly to investment income and ART policies generate little such income compared to pay in advance policies. State taxes are a percentage of premium and so are much less on the much premium per thousand ART contracts. But taxes only accounted for $0.66 out the $5.74. Agent commissions are also a percentage of premium and the evidence that exists suggests they are substantially smaller per thousand on ART policies than they are on savings intensive policies. That might be a reflection of systematically lower servicing or selling costs for ART buyers. There seems to be no obvious reason why home office expenses ($2.60) should be lower on ART policies, except one very important reason-scale. If the average size of the ART policy is high relative to pay in advance policies and if home office expenses are independent of size, then home office expense will be lower per thousand on ART than on whole life.

It is not clear that all of these considerations are sufficient to explain the relatively low ART rates observed. If not, then the one possibility left is that companies choose to allocate less of their total expenses to ART policies than to savings intensive policies. They might so choose for two reasons; if ART policies are usually sol^d in conjunction with, or on top of, savings intensive policies, then the latter might be allocated most of the fixed costs; or the pricing may reflect the sort of price discrimination that will be discussed in Chapter IX. In the former case the distribution of the fixed costs is basically irrelevant, unless many people choose only to buy the less expense loaded product, in which case the premise breaks down. In the latter case, it will be profit-maximizing to allocate less overhead expense to the more knowledgible buyers. If more knowledgible buyers prefer ART policies, then the low ART prices would be explained.

At this point, however, we don't whether the cost based arguments alone are sufficient to explain the ART prices. This would be a good subject for further study.

Options to Renew

The term rates as given in figures I-1, 2, 3 are for annual renewable policies, meaning that they are renewable to at least age 65. "Renewable" means that the buyer can maintain the coverage in the policy simply by paying the premium specified in the policy for that policy year. The buyer need not be in good health to continue coverage at the rates specified in the original policy. Thus a "renewable" policy is more than a series one year contracts. It also provides a series of one year "options" entitling the bearer to purchase an equal amount of coverage for the following year at the rate specified in the policy. The options, if exercised, must be exercised in sequence. Failure to renew in any year leads to cancellation of the contract. Such options may be valuable to the policyholder and costly for the company to provide. Hence one would normally expect the whole structure of one year renewable insurance rates to be higher than the corresponding structure of non-renewable rates, because each annual rate should include the cost of that year's coverage and the price of future sequence of options.

What would the costs of providing such options depend on? Suppose the renewal rates in the contract were equal to the corresponding rates on non-renewable policies. Then renewable policies would prove to be unprofitable to the company, if only the poorer risks chose to renew. Other things equal, it is more likely that policyholders who know they are in poor health and are no longer standard risks will renew than those who remain standard risks. First, since their health has deteriorated the expected value of the insurance is higher now than when the policy was issued. Second, if they wish to continue their insurance coverage, the renewal price must be lower than the corresponding price for sub-standard risks. If not, then the renewal option is worthless to the buyer. Will those who continue to be standard risks be willing to renew? If they wish to continue coverage with renewability options, then the answer, ignoring the transaction costs of switching, is that they will switch if other firms are offering renewals at lower rates. But there is no reason to believe that the initial firm is at any disadvantage relative to competing firms. The "adverse selection" problem is the same for all firms. For reasons given, poorer risks are likely to renew in greater numbers than better risks, but all firms have the same problem and so the renewal premium for each succeeding year should include a rising price for the option to reflect the increasingly poorer quality risks who remain in the pool. Thus the only source of adverse selection is the relatively greater number of standard risks who may decide to drop their coverage altogether. The cost of providing the renewal option is the annual increase in the the groups mortality experience due to adverse selection. If standard risks choose tc renew with only slightly lower frequency than sub-standard, then the cost of providing the renewal option will be close to zero.

The rates graphed in Figures IV-1, 2 & 3 suggest that adverse selection, if present at all, is small. If it were large, then each successive renewal rate would include an increasing charge reflecting the worsening mortality experience of the group relative to average experience. On the graph, this translates to a line with a slope that is steeper than the 45 degree line shown in figure IV-3, since the renewal rates should rise relative to the average mortality experience. But in fact the actual slopes, both for smokers and non-smokers is less steep than the 45 degree line. This suggests that the adverse selection charge is small or zero. Consistent with this hypothesis, the rates shown are also "ultimate", in the sense that they do not incorporate any initial "selection" discount. The same rate applies to a male aged 35 whether he just bought the policy or if he has been paying premiums since he was age 25. Up until the mid-1970's, virtually all renewable policies were sold on an "ultimate" basis. The coming of policies with lower "select" entry rates and low "re-entry" rates may have created problems for these ultimate policies. This is yet another topic for a separate study.

ART Rates - 1983

The main purpose of this chapter is to provide various sets of ART rates that will later be used as benchmarks to estimate the rates of return being offered on traditional whole life policies and on the new universal life policies. These rates per thousand dollars of coverage are shown in Tables IV-5 and IV-6 for $25,000 policies for male non-smokers and smokers respectively; Tables IV-7 and IV-8 for similar $100,000 policies. Tables IV-9 though IV-12, provide the raw data necessary to compute the premium rates for any face amount from $25,000 to $249,999. The same tables provide the information needed to compute the standard deviation of ART rates at each issue age between 25 and 65.

How Policies Were Selected

The selection process was as follows. We selected only companies that offered ART policies in the 1983 **Best's Flitcraft Compend.** Moreover, the rates in the policy had to be "ultimate" and guaranteed in the policy. These ultimate rates are independent of the time elapsed from the issuance of the policy. We rejected "select and ultimate" ART policies or policies with "re-entry" term rates. We looked for policies available in two broad ranges of coverage amount, $25,000 to $99,000 and $100,000 to $249,999. We classified a set of term rates as applicable to "nonsokers" if (a) it said so or (b) if the rate structure was called "preferred" and was lower than a "standard" rate. If a company had both a "preferred non-smoker" and a "non-smoker" rate, the lowest rate structure was chosen and treated as simply applicable to non-smokers. Similarly, the highest rate structure was chosen to be applicable to smokers if a company had both a "preferred smokers" and a "standard smokers". For every amount class and mortality class, we tried to find policies offered by at least 15 out the top 20 companies as measured by the amount of terminsurance issued in 1982, as shown in Table IV-3. If a chosen top 20 company did not offer an appropriate policy listed in the **Compend**, then the next largest company was selected. In addition, 5 additional companies were chosen at random from a list of the next 130 largest term insurance companies, measured by amount issued. If a chosen company did not have an appropriate policy listed, another company was randomly selected (with replacement) from the list.

Even with a potential 150 companies to draw from, we were unable to find 20 policies that met all the criteria within the amount of time we could afford to spend on the search. In particular, it was difficult to find non-smoker policies in the $25,000 range that satisfied the criteria. Thus Table IV-5 is based on 11 companies, whereas Table IV-6 is based on 15 companies. The $100,000 range proved easier; Tables IV-7 and IV-8 are both based on 18 companies.

The premium rates shown in Tables IV-5 though IV-8 are per thousand dollars of coverage and include the "policy fee". The "pure premium rates" shown in Tables IV-9 though 12, exclude the policy fee. As discussed in Chapter II, some policy expenses are independent of the coverage amount (e.g. the cost of billing and other servicing of the policy account etc.). All of the policies selected charged a fixed annual policy fee, plus a rate per thousand dollars of coverage. For example, the rate shown for a 25 year old male smoker is $3.07 per thousand or $76.75 per year for $25,000 worth of coverage (Table IV-5). The average policy fee is $18.20 per year and the pure term rate is $2.34 per thousand (see Table IV-9). Thus the fixed policy fee adds about 73 cents to the cost of a thousand dollars of coverage when $25,000 is purchased. The same man would pay only $2.16 per thousand for $100,000 in coverage or $216 per year. Thus four times as much coverage costs only 2.8 times as much in annual premium payments. The "pure rate" in this amount range is $1.96 or about 16% lower than $25,000 pure rate. The policy fee is $19.72 (see Table IV-11), about the same as that on the lower amount policy. Inclusion of the fee only adds about 20 cents per thousand, compared to 73 cents on the smaller policy. Thus, of the 91 cent difference in the per thousand rates between the two policy sizes, 38 cents is due to a lower pure rate and 53 cents to the spreading of an almost fixed policy fee over a larger amount of insurance.

Why are the pure rates lower on a $100,000 policy than on a $25,000? Possible reasons are systematically (1) lower mortality rates, (2) lower lapse rates, (3) lower commission rates, (4) smaller contribution to overhead costs. and (5) lower margins due to more competition for more knowledgible buyers. Higher income individuals buy larger amounts of insurance coverage, and generally have lower mortality rates. Thus some of the 16% difference may reflect an income related difference in mortality rates. In the past, commissions were a constant percentage of the premium, regardless of their total amount (see FTC 1979, Appendix IVI), but it is not clear that this was still true in 1983. It was not the case for universal life policies (see Chapter VI). We do not have any information on (2), (4) and (5).

Table IV-5

FTC-83 ART Rates
Face Amount: $25,000
Smoker

Age	Standard Deviation	Average	Low	High	Coefficient of Variation
25	.54	3.07	2.53	3.60	17.56%
26	.54	3.10	2.56	3.64	17.54
27	.55	3.11	2.56	3.66	17.64
28	.55	3.14	2.59	3.70	17.66
29	.56	3.17	2.61	3.74	17.65
30	.57	3.20	2.63	3.76	17.71
31	.57	3.24	2.67	3.81	17.50
32	.57	3.28	2.71	3.85	17.33
33	.57	3.32	2.75	3.89	17.17
34	.57	3.38	2.81	3.95	16.89
35	.57	3.46	2.89	4.03	16.54
36	.58	3.57	2.99	4.15	16.25
37	.59	3.73	3.14	4.32	15.81
38	.60	3.92	3.32	4.51	15.27
39	.61	4.13	3.53	4.74	14.67
40	.61	4.38	3.76	4.99	14.05
41	.64	4.67	4.02	5.31	13.79
42	.67	4.97	4.29	5.64	13.52
43	.70	5.29	4.59	5.99	13.21
44	.72	5.64	4.92	6.37	12.83
45	.75	6.05	5.30	6.80	12.38
46	.79	6.49	5.70	7.28	12.23
47	.84	6.97	6.14	7.81	11.99
48	.88	7.51	6.63	8.39	11.67
49	.92	8.08	7.16	8.99	11.33
50	.95	8.74	7.78	9.69	10.90
51	1.04	9.45	8.42	10.49	10.97
52	1.12	10.23	9.11	11.34	10.91
53	1.19	11.05	9.87	12.24	10.76
54	1.26	11.96	10.70	13.22	10.52
55	1.32	12.97	11.65	14.29	10.21
56	1.47	14.07	12.61	15.54	10.42
57	1.60	15.30	13.70	16.89	10.43
58	1.72	16.62	14.90	18.33	10.32
59	1.83	18.09	16.26	19.91	10.10
60	1.93	19.69	17.75	21.62	9.82
61	2.16	21.52	19.36	23.69	10.04
62	2.37	23.39	21.02	25.76	10.13
63	2.56	25.46	22.90	28.02	10.06
64	2.74	27.83	25.09	30.57	9.84
65	2.90	30.45	27.55	33.36	9.54

Table IV-6

FTC-83 ART Rates
Face Amount: $25,000
Non-Smoker

Age	Standard Deviation	Average	Low	High	Coefficient of Variation
25	.48	3.04	2.56	3.51	15.67%
26	.48	3.05	2.57	3.52	15.63
27	.48	3.06	2.58	3.53	15.60
28	.48	3.09	2.61	3.56	15.46
29	.48	3.10	2.62	3.58	15.42
30	.48	3.13	2.65	3.61	15.28
31	.47	3.14	2.67	3.62	15.04
32	.47	3.16	2.70	3.63	14.79
33	.46	3.20	2.74	3.67	14.45
34	.46	3.23	2.78	3.69	14.15
35	.45	3.30	2.85	3.75	13.72
36	.49	3.41	2.92	3.90	14.35
37	.52	3.53	3.01	4.06	14.85
38	.56	3.70	3.14	4.26	15.07
39	.59	3.89	3.30	4.48	15.14
40	.62	4.10	3.48	4.72	15.08
41	.70	4.34	3.64	5.04	16.13
42	.77	4.60	3.83	5.38	16.81
43	.84	4.88	4.04	5.72	17.22
44	.90	5.19	4.29	6.09	17.40
45	.96	5.56	4.60	6.52	17.30
46	1.08	5.92	4.84	7.00	18.22
47	1.18	6.33	5.15	7.52	18.69
48	1.28	6.81	5.53	8.09	18.80
49	1.37	7.35	5.98	8.72	18.66
50	1.46	7.92	6.47	9.38	18.37
51	1.65	8.57	6.92	10.22	19.28
52	1.83	9.25	7.42	11.07	19.77
53	1.99	9.99	8.00	11.98	19.90
54	2.14	10.81	8.67	12.95	19.77
55	2.28	11.71	9.43	13.98	19.44
56	2.60	12.74	10.14	15.34	20.38
57	2.88	13.85	10.97	16.73	20.80
58	3.14	15.10	11.96	18.24	20.80
59	3.38	16.46	13.08	19.84	20.53
60	3.60	17.97	14.37	21.58	20.05
61	4.19	19.77	15.58	23.96	21.18
62	4.70	21.60	16.90	26.29	21.76
63	5.16	23.62	18.46	28.78	21.84
64	5.58	25.85	20.27	31.43	21.60
65	5.98	28.52	22.54	34.49	20.95

TABLE IV-7

FTC-83 ART Rates
Face Amount: $100,000
Smoker

Age	Standard Deviation	Average	Low	High	Coefficient of Variation
25	.33	2.16	1.83	2.49	15.11%
26	.33	2.17	1.85	2.50	15.00
27	.33	2.19	1.87	2.52	14.87
28	.33	2.21	1.89	2.54	14.72
29	.33	2.23	1.91	2.56	14.59
30	.33	2.26	1.93	2.58	14.43
31	.34	2.28	1.94	2.62	14.89
32	.35	2.31	1.95	2.66	15.32
33	.37	2.34	1.97	2.71	15.69
34	.38	2.39	2.01	2.78	15.92
35	.40	2.47	2.07	2.86	16.03
36	.45	2.58	2.13	3.03	17.59
37	.51	2.73	2.21	3.24	18.81
38	.57	2.89	2.32	3.46	19.75
39	.63	3.09	2.46	3.72	20.40
40	.69	3.32	2.63	4.00	20.77
41	.75	3.56	2.81	4.31	21.05
42	.81	3.83	3.02	4.65	21.18
43	.87	4.13	3.26	5.00	21.15
44	.94	4.45	3.52	5.39	21.00
45	1.00	4.81	3.81	5.80	20.74
46	1.03	5.24	4.20	6.27	19.73
47	1.07	5.67	4.60	6.75	18.86
48	1.11	6.15	5.04	7.25	18.00
49	1.14	6.67	5.52	7.81	17.15
50	1.18	7.25	6.07	8.43	16.27
51	1.21	7.89	6.68	9.10	15.35
52	1.24	8.56	7.32	9.80	14.52
53	1.27	9.29	8.02	10.57	13.72
54	1.31	10.09	8.78	11.39	12.95
55	1.34	10.97	9.64	12.31	12.19
56	1.41	12.00	10.59	13.42	11.76
57	1.49	13.09	11.61	14.58	11.35
58	1.56	14.22	12.66	15.78	10.96
59	1.63	15.58	13.94	17.21	10.48
60	1.71	17.03	15.32	18.74	10.02
61	1.83	18.84	17.02	20.67	9.69
62	1.94	20.60	18.66	22.55	9.43
63	2.06	22.54	20.48	24.60	9.15
64	2.18	24.60	22.42	26.78	8.86
65	2.30	27.27	24.98	29.57	8.42

TABLE IV-8

FTC-83 ART Rates
Face Amount: $100,000
Non-Smoker

Age	Standard Deviation	Average	Low	High	Coefficient of Variation
25	.29	1.81	1.52	2.10	16.00%
26	.29	1.82	1.53	2.10	15.92
27	.29	1.83	1.54	2.12	15.81
28	.29	1.84	1.55	2.13	15.70
29	.29	1.85	1.56	2.14	15.58
30	.29	1.87	1.58	2.15	15.45
31	.29	1.88	1.59	2.17	15.40
32	.29	1.90	1.61	2.19	15.34
33	.29	1.92	1.63	2.21	15.27
34	.29	1.94	1.65	2.24	15.17
35	.30	1.99	1.69	2.28	14.89
36	.32	2.06	1.73	2.38	15.71
37	.35	2.14	1.78	2.49	16.40
38	.38	2.24	1.86	2.61	16.88
39	.40	2.36	1.96	2.77	17.11
40	.43	2.49	2.06	2.92	17.33
41	.48	2.65	2.17	3.14	18.26
42	.54	2.84	2.30	3.38	18.97
43	.59	3.05	2.46	3.64	19.39
44	.65	3.29	2.64	3.94	19.61
45	.70	3.56	2.86	4.26	19.63
46	.79	3.88	3.09	4.66	20.30
47	.87	4.21	3.34	5.09	20.76
48	.96	4.59	3.62	5.55	21.00
49	1.05	4.99	3.94	6.04	21.07
50	1.14	5.44	4.30	6.58	20.96
51	1.28	5.91	4.64	7.19	21.60
52	1.42	6.42	5.01	7.84	22.04
53	1.55	6.98	5.43	8.54	22.24
54	1.69	7.58	5.89	9.27	22.31
55	1.83	8.27	6.44	10.10	22.11
56	1.9[illegible]	9.11	7.19	11.03	21.09
57	2.01	9.98	7.96	11.99	20.18
58	2.11	10.94	8.83	13.05	19.25
59	2.20	11.99	9.80	14.19	18.33
60	2.29	13.26	10.97	15.55	17.28
61	2.42	14.85	12.43	17.27	16.30
62	2.55	16.31	13.76	18.86	15.63
63	2.68	17.91	15.23	20.59	14.95
64	2.81	19.70	16.89	22.50	14.24
65	2.93	21.69	18.75	24.62	13.53

Tables IV-5 through 12 also contain information on variability in ART rates. The last columns of Tables 5 through 8 show the coefficient of variation at each issue age between 25 and 65. These are generally in the 20% range at younger ages and decrease to the 10-15% range by age 65. These rates are similar to those found by Jung (1983) on mortgage insurance policies, but larger than those on many products with comparable annual expenditures.

Causes of Variation In ART Rates

We have seen that ART rates for the same age and sex vary substantially. There are many possible reasons for such variation. One important source of difference could be in underwriting standards. One company's "standard risk" might be another's "preferred" risk. We have no usable data on mortality experienced by individual companies on individual lines. Thus we cannot say how much, if any variation is attributable to different underwriting standards.

Some of the policies pay dividends. While the illustrated dividends were subtracted from premiums, this clearly doesn't make either two dividend paying policies, or a dividend paying policy and a non-divdend paying perfectly comparable. Also renewal periods differed, some being renewable through age 100, one as low as age 64. A few automatically included waiver of premium protection in the basic rate etc. Are these differences compensating?

Basically, without information on underwriting standards, without information on dividend histories etc., we simply do not have enough information to investigate whether the observed differences are or are not compensating. Overall, however, there seems to be little reason to be concerned about pricing in the ART market. We have seen, on the average, that premiums are often below the ideal prices we calculated. Premium rates have fallen with falling mortality rates and rising interest rates, just as we would expect they would in an ideal market, in fact, they seem to have fallen considerably more than one would expect on the basis of mortality and interest rate changes alone.

Rather than attempting to explain the variation in the ART market, we will instead ask the question as to whether variation in the savings intensive markets seems to be similar to or greater than variation in the ART market.

Table IV-9

Variability in Term Rates and Policy Fees: Smokers' Rates Applicable to Amounts $25,000-$99,999

Policy Fee	
Average	Variance
$18.20	$70.03

Age	Pure Term Rates Average	Variance	Covariance	Age	Pure Term Rates Average	Variance	Covariance
25	2.34	.23	-.64	45	5.32	.51	-.82
26	2.37	.24	-.65	46	5.76	.58	-.78
27	2.39	.24	-.66	47	6.25	.65	-.75
28	2.41	.25	-.67	48	6.78	.71	-.71
29	2.45	.26	-.68	49	7.35	.78	-.67
30	2.47	.26	-.69	50	8.01	.85	-.63
31	2.51	.26	-.69	51	8.72	1.02	-.70
32	2.55	.27	-.70	52	9.50	1.19	-.76
33	2.59	.27	-.70	53	10.33	1.37	-.82
34	2.65	.27	-.71	54	11.23	1.54	-.89
35	2.73	.27	-.72	55	12.24	1.72	-.95
36	2.85	.29	-.77	56	13.34	2.12	-1.06
37	3.00	.30	-.83	57	14.57	2.53	-1.17
38	3.19	.32	-.89	58	15.89	2.93	-1.29
39	3.41	.33	-.94	59	17.36	3.34	-1.40
40	3.65	.35	-1.00	60	18.96	3.74	-1.51
41	3.94	.38	-.96	61	20.80	4.72	-1.95
42	4.24	.41	-.93	62	22.66	5.69	-2.40
43	4.56	.45	-.89	63	24.73	6.67	-2.84
44	4.92	.48	-.86	64	27.10	7.65	-3.28

Note: To calculate the standard deviation of term rates in this amount range for any given amount, use the following formula:

> The variance of the term rate per $1000 for a policy of amount $A is equal to the variance of term rate (columns 3 & 7) plus the variance of the policy fee (column 2 at top left side) divided by the amount squared plus twice the covariance between the pure term rates and the policy fees (columns 4 & 8) divided by the amount.

Table IV-10

Variability in Term Rates and Policy Fees: Non-Smokers' Rates Applicable to Amounts $25,000-$99,999

Policy Fee	
Average	Variance
$19.09	$104.09

	Pure Term Rates				Pure Term Rates		
Age	Average	Variance	Covariance	Age	Average	Variance	Covariance
25	2.27	.19	-1.59	45	4.79	.78	-.23
26	2.28	.19	-1.57	46	5.16	1.00	-.08
27	2.29	.18	-1.54	47	5.57	1.23	.08
28	2.32	.18	-1.52	48	6.05	1.46	.23
29	2.33	.18	-1.49	49	6.59	1.68	.39
30	2.37	.18	-1.47	50	7.16	1.91	.54
31	2.38	.18	-1.51	51	7.81	2.50	.85
32	2.40	.18	-1.56	52	8.48	3.08	1.15
33	2.44	.18	-1.60	53	9.23	3.67	1.46
34	2.47	.17	-1.65	54	10.05	4.26	1.77
35	2.53	.17	-1.69	55	10.94	4.85	2.07
36	2.65	.21	-1.69	56	11.98	6.34	2.87
37	2.77	.24	-1.69	57	13.09	7.84	3.67
38	2.94	.28	-1.69	58	14.34	9.34	4.46
39	3.12	.31	-1.68	59	15.70	10.84	5.26
40	3.33	.35	-1.68	60	17.21	12.34	6.06
41	3.58	.44	-1.39	61	19.00	16.82	6.85
42	3.84	.52	-1.10	62	20.83	21.30	7.65
43	4.12	.61	-.81	63	22.86	25.78	8.44
44	4.43	.69	-.52	64	25.09	30.26	9.24

Note: To calculate the standard deviation of term rates in this amount range for any given amount, use the following formula:

The variance of the term rate per $1000 for a policy of amount $A is equal to the variance of term rate (columns 3 & 7) plus the variance of the policy fee (column 2 at top left side) divided by the amount squared plus twice the covariance between the pure term rates and the policy fees (columns 4 & 8) divided by the amount.

Table IV-11

Variability in Term Rates and Policy Fees: Smokers' Rates Applicable to Amounts $100,000-249,999

Policy Fee	
Average	Variance
$19.72	$77.86

	Pure Term Rates				Pure Term Rates		
Age	Average	Variance	Covariance	Age	Average	Variance	Covariance
25	1.96	.12	-.84	46	5.04	1.12	-2.38
26	1.98	.12	-.84	47	5.48	1.19	-2.39
27	2.00	.12	-.85	48	5.95	1.27	-2.41
28	2.02	.12	-.85	49	6.47	1.35	-2.42
29	2.04	.12	-.86	50	7.06	1.44	-2.44
30	2.06	.12	-.86	51	7.69	1.52	-2.56
31	2.08	.13	-.90	52	8.36	1.60	-2.68
32	2.11	.14	-.94	53	9.10	1.68	-2.80
33	2.15	.15	-.97	54	9.89	1.76	-2.92
34	2.20	.16	-1.01	55	10.78	1.85	-3.04
35	2.27	.18	-1.05	56	11.81	2.05	-2.88
36	2.38	.23	-1.14	57	12.90	2.26	-2.73
37	2.53	.29	-1.24	58	14.03	2.48	-2.57
38	2.70	.35	-1.33	59	15.38	2.72	-2.42
39	2.89	.43	-1.43	60	16.83	2.96	-2.26
40	3.12	.50	-1.52	61	18.65	3.37	-1.95
41	3.37	.60	-1.69	62	20.41	3.81	-1.64
42	3.64	.70	-1.86	63	22.34	4.28	-1.34
43	3.93	.80	-2.02	64	24.40	4.77	-1.03
44	4.26	.92	-2.19	65	27.08	5.29	-.72
45	4.61	1.04	-2.36				

Note: To calculate the standard deviation of term rates in this amount range for any given amount, use the following formula:

> The variance of the term rate per $1000 for a policy of amount $A is equal to the variance of term rate (columns 3 & 7) plus the variance of the policy fee (column 2 at top left side) divided by the amount squared plus twice the covariance between the pure term rates and the policy fees (columns 4 & 8) divided by the amount.

Table IV-12

Variability in Term Rates and Policy Fees: Non-Smokers' Rates Applicable to Amounts $100,000-249,999

Policy Fee	
Average	Variance
$22.78	$94.77

	Pure Term Rates				Pure Term Rates		
Age	Average	Variance	Covariance	Age	Average	Variance	Covariance
25	1.58	.10	-1.10	46	3.65	.62	-.34
26	1.59	.10	-1.10	47	3.99	.76	-.11
27	1.60	.10	-1.10	48	4.36	.92	.13
28	1.61	.10	-1.11	49	4.76	1.09	.36
29	1.62	.10	-1.11	50	5.21	1.28	.60
30	1.64	.10	-1.12	51	5.69	1.61	.73
31	1.66	.10	-1.14	52	6.19	1.98	.86
32	1.67	.10	-1.16	53	6.76	2.38	.98
33	1.69	.10	-1.17	54	7.35	2.83	1.11
34	1.71	.10	-1.19	55	8.04	3.31	1.24
35	1.76	.10	-1.21	56	8.89	3.65	1.84
36	1.83	.12	-1.23	57	9.75	4.00	2.45
37	1.91	.14	-1.25	58	10.71	4.37	3.05
38	2.01	.16	-1.26	59	11.77	4.75	3.66
39	2.13	.18	-1.28	60	13.03	5.15	4.26
40	2.26	.20	-1.30	61	14.62	5.76	4.15
41	2.43	.25	-1.16	62	16.08	6.40	4.03
42	2.61	.30	-1.01	63	17.68	7.08	3.92
43	2.82	.36	-.87	64	19.47	7.78	3.80
44	3.06	.42	-.72	65	21.46	8.53	3.69
45	3.33	.49	-.58				

Note: To calculate the standard deviation of term rates in this amount range for any given amount, use the following formula:

> The variance of the term rate per $1000 for a policy of amount $A is equal to the variance of term rate (columns 3 & 7) plus the variance of the policy fee (column 2 at top left side) divided by the amount squared plus twice the covariance between the pure term rates and the policy fees (columns 4 & 8) divided by the amount.

Summary

The market share of term insurance policies, both of new policies and of all policies in force, peaked in 1980. By 1983, the market share of term policies of all new policies was about the same as its share of all policies in force. Thus, the trend toward relatively more term insurance owned ended, at least temporarily, in 1983. Some, but not all, of the fall in the life insurance industry's share of the personal savings market, then, can be explained by a shift toward less savings intensive policies.

The level, structure of ART premiums were examined for policies offered in 1983. The average premium rates were closely related to census mortality rates, with non-smoker rates actually below average mortality rates. On an industry wide basis, these rates appear to be low relative to industry expenses. ART rates, since 1977, have fallen more than one would expected on the basis of the fall in mortality rates and the rise in interest rates. Several possible explanations were discussed, but the question remains a topic for further research. No evidence of adverse selection problems was found in the structure of ART rates. Rates per thousand dollars of coverage fall with an increasing amount of coverage, that is, there are substatial quantity discounts in the ART market. There is substantial variation in ART rates for policies issued for the same amount issued to persons of the same age and sex. There is insufficient information to ascertain how much of this variation is due to different underwriting standards, a "normal" amount of market friction, to different dividend policies and so forth. If we assume, however, that the ART market is operating efficiently, then we can ask the question as to whether the variation observed in the savings intensive markets is more or less than what one would expect on the basis of the ART market.

Chapter V

Pay In Advance Policies: Part I

Whole Life and Other Traditional Savings Intensive Policies

Since its introduction in England more than 200 years ago, the whole life policy, also known as "ordinary" or "straight" life, has been the most important single type of life insurance contract both in terms of generating premium dollars and in terms of generating the assets that make the industry a major financial institution. The main focus of this chapter is on the more traditional whole life contracts, but we begin by examining aggregate statistics on all pay in advance contracts. Although the most important contract of the pay in advance type, whole life is neither the only type, nor does it come in a single more or less uniform package. Whole life contracts differ in the number of premium payments that must be made (e.g. "life paid up at 85), in whether and how they pay dividends, in the options available if the coverage is canceled and in many other ways. It is not the most savings intensive pay in advance contract. The most savings intensive contracts are "endowment" contracts, that is, contracts that pay the face amount in a lump sum or an annuity if the insured survives to a certain age. A $1,000 endowment at 65 contract, for example, will pay $1,000 if the insured survives to age 65, otherwise nothing. An annuity form of such a contract might be called "life income at 65." Other new forms of pay in advance contracts include "universal life", "adjustable life", "variable life", and "flexible premium whole life." These new forms will be examined in the next chapter.

As shown in Table V-1, savings intensive "pay in advance" policies still account for more than half of the face amount of insurance in force.[1] Their share of total insurance in force has been declining since the mid-1960's or roughly since the onset of the inflation that began with the Vietnam war. Their share of insurance in force declined steadily from 1978 to 1980, increased by two percentage points in 1981, stayed at the same level in 1982 and declined slightly in 1983.

Table V-1

**Amounts of Pay In Advance Insurance
Issued and In Force,
And Market Shares:
1978-1983
(Amounts In Millions of Dollars)**

	Issued			In Force		
Year	Pay In Advance	Pay As You Go	PIA Share	Pay In Advance	Pay As You Go	PIA Share
1978	141,387	149,559	48.60%	923,722	611,923	60.15%
1979	153,827	182,718	45.71	1,004,345	716,441	58.37
1980	172,799	222,536	43.71	1,182,736	898,570	56.83
1981	247,492	248,692	49.88	1,472,157	1,093,891	57.37
1982	331,918	279,264	54.31	1,660,492	1,212,191	57.80
1983	434,833	335,838	56.42	1,844,070	1,410,700	56.66

Source: Annual Statement Data, as complied by A.M. Best Co.

Since the share of "pay in advance" policies has generally been declining, one would expect that their share of newly issued insurance would be lower than

[1] Though the column heading in the annual statement is labeled "whole life & endowment" insurance, the number is in fact obtained by subtracting the face amount of all term policies from the overall total. Hence the resulting number is actually the total face amount of non-term policies, including whole life, limited pay life, universal life, adjustable life, etc. As mentioned in Chapter IV the term category actually includes some small amount of pay in advance insurance, but by and large, the category can be most accurately described as "pay in advance", which we have done.

their share of all insurance on the books.[2] As expected, Table V-1 shows that the share of savings intensive newly issued insurance in each year is less than its share of total insurance in force. However, the Table also shows that its share of newly issued business reached a low of about 44% in 1980 and thereafter increased by more than twelve percentage points. By 1983, its share of new business was about equal to its share of insurance in force, suggesting that the decline in the share of savings intensive life insurance to all insurance in force might end or even reverse. The increase in the share of savings intensive policies seems to be due to the increased sales of such policies by stock companies and the increasing share of total sales accounted for by these companies as compared to the mutuals. Mutual companies, on the other hand, have been selling relatively more "pay as you go" policies than in the past, but this factor was more than offset by the behavior of the stock companies..

Tables V-2 and V-3 provide information on the total amounts of pay in advance insurance held and issued by the top 30 companies in 1982, as well as for some additional companies whose policies are analyzed in this chapter or the next. The amount held, or "in force", at the end of the year is a measure of the past and current importance of the company in selling this type of insurance; the amount issued is a measure of the current importance. The number in the second column in both Tables provides the rank of the company named in the first column as measured by total insurance in force (Table V-2)

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[2] It is not necessarily the case because the change in the "stock" of policies is equal to the newly issued minus the new reductions due to surrender, lapse, death etc. If pay in advance policies had lower surrender and lapse rates than pay as you go policies, for example, then their share of new business could decline, without necessarily causing a decline of their share of insurance in force.

or issued (V-3), whereas companies are ranked in these Tables by pay in advance in force or issued. The ranks for some companies are very different, indicating that some companies specialize in whole life while others mostly sell term insurance. For example, Lincoln National (see the 14th company row in Table V-2) is the 7th ranked company by total insurance in force, but is 14th in pay in advance in force. The third column shows the total amount of insurance in force at the end of 1982 and the fourth, the amount that was pay in advance. The last two columns show the share of whole life market held by the company in that year and the ratio the amount of pay in advance to term insurance for the company. For example, Lincoln National had about 1.1% of the pay in advance in force, but this business was only 42% as large as its term business.

Table V-2

Pay In Advance (PIA) Policies
Amount In Force In 1982
(Amounts In Millions of Dollars)

Company	Rank	Amount In Force Total	Amount In Force PIA	PIA Market Share	Ratio of PIA To Term
Total Industry		2,872,680	1,660,490	100%	136.98%
Prudential	1	183,679	113,245	6.82%	160.78%
Metropolitan	2	119,422	86,872	5.23	266.89
New York Life	3	118,813	76,077	4.58	178.02
N'western Mutual	4	79,027	61,432	3.70	349.14
Equitable Life	5	69,634	40,194	2.42	136.53
John Hancock	9	53,508	33,249	2.00	164.12
Occidental	6	68,079	31,366	1.89	85.44
Mass. Mutual	10	43,160	30,097	1.81	230.40
State Farm	8	60,937	24,664	1.49	67.99
Conn. Mutual	12	35,101	23,822	1.43	211.22
Fed Kemper IL.	17	25,914	21,973	1.32	557.45
M.O.N.Y.	13	31,007	20,534	1.24	196.07
New England Mutual	14	27,922	19,564	1.18	234.08
Lincoln National	7	61,030	18,186	1.10	42.45
Travelers CT.	20	23,064	17,606	1.06	322.56
Security Conn.	11	37,363	16,101	.97	75.72
Conn. General	16	27,201	15,553	.94	133.53
Phoenix Mutual	15	27,499	14,301	.86	108.35
Penn Mutual PA.	22	18,883	13,306	.80	238.61
Farmers New World	21	18,910	11,830	.71	167.07
Natl Life TN.	26	16,098	11,084	.67	221.02
North Amer Co IL.	29	14,317	10,996	.66	331.00
Westrn & Soutnrn OH	18	14,566	10,468	.63	255.46
Guardian Life	23	16,928	9,862	.59	139.57
Home Life NY.	33	12,753	8,622	.52	208.71
First Colony VA.	35	10,377	7,919	.48	322.09
Liberty Natl AL	36	9,836	7,678	.46	355.75
Exec Life CA.	41	8,433	7,586	.46	895.39
Aetna Life & Ann CT	37	9,147	7,447	.45	438.07
Allstate	19	23,430	7,258	.44	44.88
Franklin Life	24	16,679	6,612	.40	65.68
Jackson Natl MI.	40	8,468	5,081	.31	149.99
Philadelphia Life	30	13,419	4,800	.29	55.69
Nationwide Life	34	11,574	4,532	.27	64.36
E.F. Hutton CA.	47	5,525	4,394	.26	388.62
Businessmens	32	13,039	3,928	.24	43.11
Bankers Natl. TX.	44	8,017	3,195	.19	66.25

Table V-2, continued

Company	Rank	Amount In Force Total	Amount In Force PIA	PIA Share	Ratio of PIA To Term
Integon Life NC.	39	8,552	3,011	.18	54.35
Minn Mutual MN.	45	7,164	2,842	.17	65.78
Amer Genl Life TX.	50	4,423	2,746	.17	163.69
Firemans Fund CA.	46	6,532	2,390	.14	57.70
Alex Hamilton MI.	49	4,569	2,324	.14	103.56
Beneficial Nat'l	31	13,043	1,659	.10	14.57
Old Line Life	25	16,351	1,410	.08	9.44
North Amer L&C MN	48	5,485	1,179	.07	27.38
Security Life	18	25,399	1,138	.07	4.69
USAA Life	42	8,333	1,060	.06	14.58
United Investors	38	8,969	884	.05	10.93
Milico	27	15,573	85	.01	.55
Family Life	43	8,240	15	.0	.18

Source: Annual Statement Data as compiled by A.M. Best

Many of the large mutuals such as the Metropolitan and the Northwestern have sold and sell far more whole life than term, whereas for stock companies like Security Life, Old Line Life and USAA the opposite is true. Surprisingly, there has been a trend in the last 5 years for Stock companies to sell relatively more savings intensive policies than before and for the reverse to be true for mutual companies. Therefore, the ratio of pay in advance to term has been rising for the stock companies and falling for the mutuals (see Best's Composites-1983 at p.46). The overall trend in the ratio is in part produced by the growing share of the stock companies in the total. The reasons underlying these opposing trends for the two different types of companies are unclear.

One should also note that the market shares of pay in advance insurance held and issued are in general very small, with the largest share being less than 8% and only a few companies having shares over one percent. The top four have 20% of the amount of whole life in force and 16% of insurance issued. The life insurance industry on a national or a local level is one of low or moderate concentration almost regardless of the measure used. Entry and exit appear to be relatively easy.

Table V-3

Pay In Advance (PIA) Policies
Amount Issued In 1982
(Amounts in Millions of Dollars)

Company	Rank	Amount Issued Total	Amount Issued PIA	PIA Market Share
Total Industry		611,182	331,918	100%
Prudential	1	29,061	15,844	4.77%
Occidental	5	15,017	13,660	4.12
Fed Kemper IL.	8	13,369	13,010	3.92
Metropolitan	3	16,025	10,944	3.30
New York Life	2	27,563	10,674	3.22
North Amer Co IL.	13	8,338	7,521	2.27
N'western Mutual	6	14,213	7,361	2.22
Exec Life CA.	20	6,092	5,994	1.81
Equitable Life	4	15,637	5,826	1.76
Aetna Life & Ann CT	17	6,365	5,365	1.62
Farmers New World	16	6,655	5,239	1.58
John Hancock	14	8,197	4,562	1.37
First Colony VA.	25	4,408	4,099	1.24
State Farm	7	13,773	3,935	1.19
Traveler CT.	23	4,642	3,793	1.14
Mass. Mutual	15	7,467	3,642	1.10
Jackson Natl MI.	27	4,199	3,217	.97
Conn. Mutual	11	9,465	3,104	.94
Conn. General	18	6,360	3,004	.91
M.O.N.Y.	22	5,351	2,957	.89
Liberty Natl AL.	32	3,167	2,419	.73
E.F. Hutton CA.	36	2,645	2,412	.73
New England Mutual	24	4,622	2,286	.69
Natl Life TN.	31	3,450	2,245	.68
Phoenix Mutual	39	2,463	2,099	.63
Penn Mutual PA.	29	3,510	1,671	.50
Integon Life NC.	34	2,974	1,621	.49
Westrn & Soutnrn OH	37	2,553	1,550	.47
Lincoln National	33	2,981	1,516	.46
Allstate	19	6,201	1,473	.44
Guardian Life	44	1,895	1,106	.33
Security Conn.	9	10,868	1,045	.31
Alex Hamilton MI.	43	1,993	1,036	.31
Philadelphia Life	28	4,056	1,026	.31
Home Life NY.	40	2,367	1,000	.30
Amer Genl Life TX.	49	1,042	882	.27
Businessmens	30	3,506	882	.27

Table V-3, continued

Company	Rank	Amount Issued Total	PIA	PIA Market Share
Firemans Fund CA.	38	2,517	870	.26
Beneficial Nat'l	12	9,302	855	.26
Bankers Natl. TX.	47	1,618	821	.25
Franklin Life	26	4,247	757	.23
Nationwide Life	45	1,890	653	.20
Security Life	50	749	384	.12
North Amer L&C MN.	48	1,155	305	.09
Old Line Life	21	5,785	270	.08
Minn Mutual MN.	42	2,172	184	.06
USAA Life	46	1,716	154	.05
United Investors	35	2,715	66	.02
Family Life	41	2,225	1	.00
Milico	10	10,247	1	.00

The major differences in company rankings between Tables V-2 and V-3, indicate the growing importance of such nontraditional companies as Federal Kemper, Executive Life and Transamerica Occidental. Market shares, both for savings and non-savings policies, have changed substantially in the last 6 years, one more indication of the rapid pace of change over this period.

Having looked at the aggregate pay in advance market, we now turn to a consideration of the most important traditional policy type in this market: the whole life policy. We will first illustrate the technique of buying term and investing the difference (BTID) and then use it to compute prospective rates of return for a representative sample of whole policies offered in 1983.

Buying ART and Investing the Difference: An Example

Table V-4 provides an example of buying term and investing the difference versus buying a whole life policy from large company, AA. The example refers to a 35 old male, non-smoker who survives and holds the policy for 10 years. The cash value at the end of the individual's 44th year is specified in the whole life policy to be $15,768. The question posed and answered by the Table is "suppose this individual bought annual renewable term insurance and invested the difference in a side fund - instead of buying the AA whole life policy. What rate of return on the side fund would he need to earn in order to have a savings accumulation in the side fund, at the end of ten years, equal to the cash value in the AA policy?" To make the comparison meaningful, we must hold "other things constant". What other things? Ideally, we would like to construct the two alternatives so that the individual was in exactly the same condition in either. The relevant features of the individual's condition are (1) the total cash outlay under the two alternatives (the term insurance premium plus the deposit in the side fund for the second alternative), (2) the size of the estate he will leave to his beneficiaries if he dies at any time within the ten year period, (3) the accumulated savings if he cancels the contract, i.e., decides he no longer wants life insurance and (4) his options if he both wants to continue the insurance coverage and to use some or all of the savings accumulation for some other purpose.

The comparison shown in Table V-4, using the "Linton yield" technique, (1) makes the cash outlay for the two alternatives the same in each year, (2) holds the death estate constant between the two alternatives as of the beginning of each year, (3) solves for that interest rate on the side fund that makes the side fund accumulation just equal to the cash value at the end of the tenth year.

The Linton technique ensures that the first two conditions are satisfied in every year, but the third condition is only satisfied at the end of the holding period. Because of the front end loading on most whole life policies, the side fund, when buying term, will be larger than the corresponding cash value for the whole life policy at the end of years earlier than the year in which the policy is assumed to be canceled. Thus, for the example displayed, the individual would actually be better off buying term and investing the difference at 3.88% because the savings accumulation at the end of year 5, for example, is $7,882 compared to a cash value of $4,100.

The fourth desired condition referred to above, namely, that the individual be in the same financial position should he want both to continue to have insurance coverage but also to use some of his savings for some other purpose is more complicated. In essense, if the policyowner wants the extra money either from his savings account or from his cash values to purchase something, then he will be slightly better off under the BTID strategy. On the other hand, if the purpose of borrowing against his cash value is to take advantage of an arbitrage opportunity, that is, where the market rate of interest is higher than the policy loan interest rate (see Chapter IV) then the advantage is completely with the whole life alternative since no such option is normally available on savings accounts. Regardless of strategy, the effect of withdrawing saving or borrowing against cash value is to reduce the death estate by the amount of the withdrawal. The fact that one has to pay interest on a policy loan but not if one borrow's one's own money is, in itself, irrelevant. Since the insurance company is crediting inside interest to the cash value account even when the assets have been borrowed by the policyholder, the only relevant cost to him is the difference between the policy loan interest rate and the rate at which cash values are guaranteed to build up. Since there usually is a differential of one or two percentage points, the policyholder will be slightly worse if borrows against his cash value than if he had made a savings withdrawal.

Table V-4

Prospective Rate of Return
On a Whole Life Policy
1983 - 1992

Face Amount	Cash Outlay	Term Pol. Fee	Age at Issue	Add'l 1st Yr Dep	Term Policy Name
$100,000	$1,701	$23	35	$0	ART83-NS

Cash Value Pol Name	End Yr Compare	EOY Cash Value	Interest Rate
Company AA WL-1983	10	$16,368	3.88

					Fund at	
Age	Term Rate	Amount of Insurance	Term Charge	Deposit	Beginning of Year	End of Year
35	1.76	$98,495	$196	$1,505	$1,505	$1,563
36	1.83	$96,936	$200	$1,501	$3,064	$3,183
37	1.91	$95,467	$205	$1,350	$4,533	$4,709
38	2.01	$93,957	$211	$1,334	$6,043	$6,277
39	2.13	$92,413	$220	$1,310	$7,587	$7,882
40	2.26	$90,833	$228	$1,285	$9,167	$9,523
41	2.43	$89,226	$239	$1,251	$10,774	$11,192
42	2.61	$87,592	$251	$1,216	$12,408	$12,890
43	2.82	$85,931	$265	$1,179	$14,069	$14,615
44	3.06	$84,244	$281	$1,141	$15,756	$16,368

Sources: AA Executive Whole Life from 1983 *Best's Flitcraft Compend*. This policy automatically includes a waiver of premium provision. Since the ART rates do not, the rate of return on AA is slightly understated. 1983 ART nonsmoker rates from Chapter IV.

Let us trace through the first few lines in Table V-4. The first task is to figure out how much term insurance a non-smoking man needs to buy so that if he dies, his death estate will be $100,000. Cleary this amount is less than $100,000. Why? To buy $100,000 worth of ART will cost $199 (100 times $1.76 per thousand plus a $23 annual policy fee). But the cash outlay for the AA policy would be $1701. So the "deposit" made to the side fund account would be $1502. If the man died on the first day of the contract his death estate would be $101,502 under the term alternative rather than $100,000. Simple algebra gives the required amount of term insurance coverage, namely, $98,495 as shown in the fourth column in the Table. Note that in each year the "beginning year fund" (column 7) plus the "amount of term insurance" (column 4) equals $100,-000. The second year is similar, except that the accumulation in the side fund is now over $3000 and so less term insurance is needed. Now consider the third year. The AA policy pays a dividend of $1.46 for each $1000 of coverage at the end of the second policy year. In our calculations (with one exception), we assume that the dividend is used to reduce the cash outlay or the premium payment on the whole life policy. Thus the net premium paid at the beginning of the third year for the AA policy is $1,555 ($1,701 less $146). Therefore the cash outlay for the term-invest the difference strategy is also lowered. The third year deposit is therefore $1,555 less the "charge" for the term insurance coverage of $205, or $1,350, as shown in column (6) of the Table.

Following these calculations through to the tenth year shows that the final accumulation in the side fund will be equal to the AA's tenth year cash value at a rate of return on the side fund of about 3.88%. If the man canceled the AA policy at this point and took the cash value, would he be liable for federal taxes on the interest buildup? The answer here is yes, but the amount of taxable income is small (about $1300 on the more than $16,000 realized). Hence the 3.88% required on the side fund is essentially an after tax rate of return.

As a further example, we show in Table V-5 exactly the same policy, but in a case where the policy is surrendered after the twentieth year.

Table V-5

Prospective Rate of Return On a AA Whole Life Policy 1983-2002

Face Amount	Cash Outlay	Term Pol. Fee	Age at Issue	Add'l 1st Yr Dep	Term Policy Name
$100,000	$1,701	$23	35	$0	ART83-NS

Cash Value Pol Name	End Yr Compare	EOY Cash Value	Interest Rate
Company AA WL-1983	20.00	$39,254	6.01

Age	Term Rate	Amount of Insurance	Term Charge	Deposit	Fund at Beginning of Year	Fund at End of Year
35	1.76	$98,495	$196	$1,505	$1,505	$1,595
36	1.83	$96,904	$200	$1,501	$3,096	$3,282
37	1.91	$95,368	$205	$1,350	$4,632	$4,911
38	2.01	$93,755	$211	$1,334	$6,245	$6,620
39	2.13	$92,070	$219	$1,311	$7,930	$8,407
40	2.26	$90,307	$227	$1,286	$9,693	$10,275
41	2.43	$88,473	$237	$1,253	$11,527	$12,220
42	2.61	$86,562	$249	$1,219	$13,438	$14,245
43	2.82	$84,572	$262	$1,183	$15,428	$16,355
44	3.06	$82,499	$275	$1,146	$17,501	$18,552
45	3.33	$80,339	$290	$1,109	$19,661	$20,842
46	3.65	$78,214	$308	$944	$21,786	$23,094
47	3.99	$76,126	$326	$780	$23,874	$25,308
48	4.36	$74,078	$346	$614	$25,922	$27,479
49	4.76	$72,074	$366	$447	$27,926	$29,603
50	5.21	$70,118	$388	$279	$29,882	$31,677
51	5.69	$68,224	$411	$99	$31,776	$33,684
52	6.19	$66,398	$434	$-82	$33,602	$35,620
53	6.76	$64,645	$459	$-265	$35,355	$37,479
54	7.35	$62,970	$486	$-448	$37,030	$39,254

Sources: See Table V-4. If surrendered or canceled at the end of 20 years, the cash value plus the terminal dividend will be in excess of $39,000. Trial and error shows that a before tax rate of about 6% would be required for a BTID strategy to accumulate a similar amount. Note that since the required rate of return is now 6.01% that each end of year side fund balance differs from the preceding example.

Federal Taxes

Now, however, federal income taxes are significant. The excess of the cash value plus all dividends paid over all premiums paid is considered to be taxable income.[3] In this case the cash value plus terminal dividend is $39,254 and the dividends over 20 years amount to another $13,180. Premiums paid amount to $34,020 over the 20 years, so taxable income is $18,414. If our man is in a 30% bracket, his tax bill will be $5,524 and so his after tax accumulation will be $33,730. A further calculation reveals that a 4.99% after tax rate of return would be required for a BTID strategy to yield the same after tax accumulation.

Prospective Rates of Return On Whole Life Policies

Tables V-6 through V-8 show the results of many calculations of the type just described. Rates of return were calculated for for three different issue ages (25, 35 and 45), using both the average nonsmoker and smoker ART rates calculated in Chapter IV, assuming the policyholder survives and then "cashes in" at the ends of the fifth, tenth and twentieth policy years. While the number of companies in each category varies slightly, an attempt was made to choose about 15 companies out the top 20 in PIA issued in 1982 (see Table V-3), plus 5 other companies selected at random from the next 130 companies. Due to data limitations, the actual number in each category is somewhat lower.

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3. For simplicity, we have assumed that no taxes are due on the dividends unntil the policy is surrendered. In fact, if the dividends are taken in cash each year, taxes would be due each year. Thus, the actual after tax rate of return would be somewhat lower than the one calculated here, if the man stayed in the same 30% bracket over all 20 years.

Table V-6

Prospective Rates of Return
Whole Life Policies
1983 - 1987
Face Amount: $100,000

Policy	Issue Age 25 Non-Smoker	25 Smoker	35 Non-Smoker	35 Smoker	45 Non-Smoker	45 Smoker
Dividend Paying - 1983 Current Rate						
BB	1.4%	.9%	.3%	-.7%	.0	-1.3%
CC (c)	-3.5	-6.0	-1.5	-4.0	-1.2	-3.8
DD (d)	-3.6		-.8		.3	
AA (b)	-5.0		-6.0		-5.5	
EE	-6.4	-8.4	-3.0	-5.5	-.9	-3.6
FF	-11.6	-11.9	-7.1	-8.2	-5.1	-6.1
GG (b)	-15.1		-11.8		-11.1	
HH	-18.9	-19.1	-12.6	-12.5	-9.1	-8.4
II	-20.6		-13.5		-10.5	
JJ	-24.8		-15.3		-12.5	
KK(a)						
LL		-13.5		-9.6		-7.8
MM		-6.8				
NN1		-22.3		-13.6		-8.3
Average	-10.8%	-11.9%	-7.1%	-7.9%	-5.6%	-5.8%
Range	26.2	23.2	15.6	12.9	12.8	7.1
Standard Dev	8.7	7.4	5.8	4.3	5.0	2.60
Coeff. of Var.	-80.6	-62.2	-81.9	-54.7	-88.7	-46.4
Non-Dividend Paying Policies-1983 Guaranteed Rates						
OO	-.7%	-.3%	-1.9%	-4.8%	-1.7%	-4.6%
PP	-16.0		-7.5		-5.6	
QQ	-30.8	-32.2	-16.1	-17.8	-12.8	-13.9
RR	-48.9	-49.2	-21.0	-21.7	-14.9	-15.5
SS	-50.5	-50.7	-20.4	-21.8	-13.4	-14.8
TT	5.6		1.3		-1.2	
UU	-17.7		-13.4		-8.2	
NN2		-23.9		-13.4		-8.2
Average	-29.4%	-24.1%	-13.4%	-13.1%	-9.7%	-9.5%
Range	49.8	56.3	19.1	23.1	13.2	14.3
Standard Dev	21.4	22.0	8.4	13.1	5.7	5.5
Coeff. of Var.	-72.8	-91.2	-62.7	-100.0	-59.2	-57.7

Table V-6, continued

Notes to Table V-6

a: We did not compute a five year ror for this policy because the dividends were all used to buy paid up additions, rather than to offset premiums.
b: Waiver of premium is included.
c: Policy has first year cash values of $1 per thousand at age 45 for both smokers and non-smokers. First year ROR about -95%.
d: Policy has first year cash values at all three issue ages. First year ROR's are -23%, -11% and -9% at ages 25, 35, and 45 respectively.

Table V-7

Prospective Rates of Return
Whole Life Policies
1983 - 1992
Face Amount: $100,000

	Issue Age					
	25		35		45	
Policy	Non-Smoker	Smoker	Non-Smoker	Smoker	Non-Smoker	Smoker
			Dividend Paying - 1983 Current Rate			
KK	7.6%	6.1%	6.9%	6.6%	7.8%	7.7%
EE	7.0	5.8	6.6	5.3	6.9	5.4
BB	6.7	6.5	5.9	5.6	5.9	5.3
AA (b)	4.7		3.9	—	2.7	
FF	4.6	4.4	5.0	4.6	6.0	5.6
HH	4.5	4.3	4.3	4.4	4.4	4.8
CC	4.3	2.8	4.9	3.4	5.4	3.9
GG (b)	2.9		2.9		2.5	
DD	2.6		3.5		4.1	
II	1.9		2.3		2.4	
JJ	.9		1.4		1.3	
LL		.9		1.5		2.0
NN1	1.9		2.4		3.8	
MM		1.2		2.4		2.7
Average	4.3%	3.7%	4.3%	4.0%	4.5%	4.6%
Range	6.7	5.6	5.5	5.0	6.5	5.8
Standard Dev	2.2	2.1	1.7	1.7	2.1	1.7
Coeff. of Var.	49.7	57.4	40.5	42.6	46.5	37.3
			Non-Dividend Paying Policies-1983 Guaranteed Rates			
OO	5.9%	4.5%	5.0%	3.6%	5.1%	3.7%
PP	5.5		4.8		4.3	
QQ	1.2	.3	1.2	.5	.7	.3
SS	-3.3	-3.4	-.6	-1.2	.2	-.4
RR	-4.7	-4.9	-1.3	-1.4	-.7	-.8
UU		.3		-.2		.6
TT		6.5		4.4		2.8
NN		-.4		1.0		2.0
Average	.9%	.4%	1.8%	.9%	1.9%	1.2%
Range	10.6	11.4	6.4	5.8	5.8	4.5
Standard Dev	4.9	4.0	3.0	3.0	2.6	1.7
Coeff. of Var.	544.6	981.7	161.9	313.6	135.0	143.7

b: Waiver of premium is included.

Table V-8

Prospective Rates of Return
Whole Life Policies
1983 - 2002
Face Amount: $100,000

	Issue Age					
	25		35		45	
Policy	Non-Smoker	Smoker	Non-Smoker	Smoker	Non-Smoker	Smoker
			Dividend Paying - 1983 Current Rate			
KK	9.3%	8.9%	9.0%	8.7%	9.2%	9.0%
EE	9.0%	8.4%	8.6%	8.0%	8.8%	8.0%
FF	8.8%	8.7%	8.8%	8.8%	9.5%	9.4%
HH	8.7%	8.6%	8.4%	8.4%	8.3%	8.4%
BB	8.5%	8.5%	8.0%	8.0%	8.1%	7.9%
GG (b)	7.5%		7.1%		6.7%	
II	6.9%		6.5%		6.5%	
CC	6.5%	5.8%	6.9%	6.0%	7.2%	6.4%
DD	6.5%		6.6%		6.9%	
JJ	6.5%		5.9%		5.5%	
AA (b)	6.4%		6.0%		5.6%	
NN1	6.1%		6.0%		6.5%	
LL		5.3%		5.2%		5.1%
MM		5.3%		5.5%		5.4%
Average	7.7%	7.3%	7.4%	7.2%	7.5%	7.3%
Range	2.9%	3.6%	3.1%	3.5%	4.0%	4.3%
Standard Dev	1.2%	1.6%	1.2%	1.5%	1.4%	1.6%
Coeff. of Var.	15.3%	22.0%	15.5%	20.5%	18.6%	21.1%
			Non-Dividend Paying Policies-1983 Guaranteed Rates			
PP	7.9%		6.8%		6.1%	
OO	6.8%	6.2%	6.3%	5.7%	6.3%	5.6%
QQ	4.9%	4.7%	4.2%	4.0%	3.5%	3.5%
SS	3.5%	3.7%	3.5%	3.5%	3.4%	3.4%
RR	2.6%	2.7%	3.1%	3.3%	2.8%	3.1%
TT		5.7%		4.6%		3.7%
NN2		3.6%		3.6%		3.8%
UU		3.6%		3.0%		2.4%
Average	4.5%	4.3%	4.8%	4.0%	4.4%	3.6%
Range	[illegible].3%	3.5%	3.7%	2.7%	3.5%	3.2%
Standard Dev	2.2%	1.3%	1.7%	.9%	1.6%	1.0%
Coeff. of Var.	49.7%	29.4%	35.0%	23.4%	37.3%	26.9%

b: Waiver of premium is included.

Rates of return for policies that pay dividends and those that do not are given separately in each of the tables. As explained previously, the rates of return on policies that pay no dividends, but have premiums and cash values fixed in the contract, are completely fixed or guaranteed by the contract. Dividend paying policies may differ among themselves in the way dividends are computed for certain classes of policyholders. Traditionally, companies used the "portfolio" approach, wherein the average rate of return on assets was used in the dividend formula. In times of rising interest rates, however, the "portfolio" rate will be below current market rates, possibly causing some competitive disadvantage in facing companies using an "investment year" method, which credits new funds at current interest rates and older assets at their current yield. Companies using a portfolio approach, will pay more than the current rate in a market where interest rates are falling. It is to be remembered that for dividend paying policies, these prospective rates only reflect current dividend policy. The rates shown for the year 2002, for example, reflect how dividends would grow in the unlikely event that the dividend formula remained unchanged for all years from 1983 to 2002. Thus actual rates of return will in all liklihood be different from those shown.[4] In addition, dividend paying policies also have guaranteed rates, those which could be calculated by assuming that dividends are zero.

Before turning to a discussion of these rates of return as compared to a BTID strategy, we check to see how sensitive the rates are to variations in the ART rates used. Tables V-9 and V-10, show the changes in the computed rates of return when ART rates one standard deviation below and above the average are

[4] For some limited evidence on actual rates of return between 1950 and 1977, see Chapter IX.

used. Naturally, the higher the ART rates used the higher the implicit prospective rate of return. As one can see from the tables, ART rates one standard deviation below the average will reduce the calculated rate by about 60 to 100 basis points (.6% to 1.0%) and using rates one standard deviation above the average will raise the implicit rate by a similar amount.

Table V-9

Sensitivity of Prospective Rates of Return
To Changes In ART Rates:
Whole Life Policies,
1983 - 1992
Face Amount: $100,000
Issue Age:35

	ART Rates					
	Non-Smoker			Smoker		
Company	Low	Average	High	Low	Average	High
EE	6.1	6.69	7.29	4.7	5.51	6.34
FF	4.3	5.01	5.73	3.57	4.58	5.62
HH	3.6	4.21	4.87	3.39	4.36	5.35
II	1.6	2.27	2.97	----	----	----
BB	5.2	5.86	6.57	4.55	5.53	6.55
PP	4.0	4.78	5.63	----	----	----
VV	4.7	5.68	6.7	3.38	4.74	6.19
GG	2.4	3.01	3.64	----	----	----
OO	4.4	4.99	5.6	2.75	3.56	4.41
CC	4.2	4.89	5.62	2.43	3.4	4.42
JJ	.7	1.36	2.03	----	----	----
DD	2.9	3.46	4.07	----	----	----
AA	3.4	3.86	4.37	----	----	----
QQ	.5	1.2	1.99	-.62	.45	1.56
SS	-1.5	-.62	.25	-2.43	-1.22	.049
RR	-2.2	-1.36	-.53	-2.62	-1.44	-.22
UU	----	----	----	-.92	-.18	.57
LL	----	----	----	.79	1.5	2.23
TT	----	----	----	3.56	4.35	5.16
NN2	----	----	----	-.04	.94	1.96
NN1	----	----	----	1.47	2.45	3.47
MM	----	----	----	1.49	2.34	3.23
Average	2.8%	3.5%	4.2%	1.6%	2.6%	3.6%
Range	8.4%	8.1%	7.8%	5.6%	7.0%	6.6%
Standard Deviation	2.4%	2.3%	2.3%	2.4%	2.3%	2.3%
Coeff. of Var.	86%	67%	55%	146%	91%	64%

Table V-10

Sensitivity of Prospective Rates of Return
To Changes In ART Rates:
Whole Life Policies,
1983 - 2002
Face Amount: $100,000
Issue Age:35

	ART Rates					
		Non-Smoker			Smoker	
Company	Low	Average	High	Low	Average	High
EE	8.06	8.60	9.13	7.36	8.00	8.64
FF	8.28	8.80	9.36	8.06	8.73	9.42
HH	7.85	8.35	8.86	7.77	8.40	9.07
II	6.03	6.50	6.99	----	----	----
BB	7.43	7.94	8.47	7.29	7.93	8.6
PP	6.20	6.75	7.32	----	----	----
VV	6.13	6.83	7.54	5.79	6.62	7.51
GG	6.66	7.13	7.61	----	----	----
OO	5.90	6.29	6.68	5.25	5.70	6.18
CC	6.31	6.86	7.42	5.38	6.02	6.69
JJ	5.36	5.86	6.36	----	----	----
DD	6.13	6.59	7.07	----	----	----
AA	5.62	5.98	6.35	----	----	----
QQ	3.61	4.16	4.73	3.35	3.99	4.68
SS	2.86	3.5	4.16	2.72	3.46	4.25
RR	2.47	3.07	3.69	2.57	3.29	4.05
UU	----	----	----	2.51	2.94	3.39
LL	----	----	----	4.66	5.13	5.6
TT	----	----	----	4.08	4.55	5.03
NN2	----	----	----	2.99	3.60	4.23
NN1	----	----	----	5.28	5.92	6.58
MM	----	----	----	4.94	5.48	6.04
Average	5.9%	6.5%	7.0%	5.0%	5.6%	6.2%
Range	5.8%	5.7%	5.4%	5.6%	5.8%	5.3%
Standard Deviation	1.7%	1.7%	1.7%	1.9%	1.9%	1.9%
Coeff. of Var.	29%	26%	24%	38%	34%	31%

Advantages & Disadvantages of Whole Life

Relative to BTID

As explained in detail in Chapter II, whole life and BTID are very closely related as a logical matter, and as we pointed out under ideal conditions they are identical. Clearly, however, under actual conditions, the advantages of whole life versus BTID depend very much on what the "difference" is invested in. In general, it will not be practicable to find a non-insurance investment alternative that has precisely all the conditions of a given whole life policy. To keep the discussion manageable, we assume that the alternative funds are always invested in a highly liquid money market fund, that is, that the alternative fund earns the current short term rate of interest, either on a fully taxable basis or as in a municipal bond fund, where most of the interest earnings are free of Federal tax. Before concentrating on the detailed results, we first mention some general pro's and con's.

Whole life plans are required by law to provide some guaranteed benefits, and often companies guarantee more than the minimum required by law. These translate into guaranteed mimimum rates of return (that vary by holding period and can be and are negative at some durations), whereas a money market rate's only guarantee is that it will never be negative. Some whole life plans also have fixed policy loan interest rates which create what can be an attractive option, not generally available in non-insurance savings media.

On the other hand, some of the options in a typical ART policy may be more valuable than those in the typical whole life policy. An ART policy provides more valuable renewability options than a whole life policy of the same amount for any given duration, since the amount "at risk" in a conventional whole life policy decreases as the cash value increases. For example, the whole life policy shown in Table V-5 provides for a cash value of almost $40,000 at the end of 20 years. One can renew simply by paying the next year's premium, but the true amount of insurance one is entitled to buy at the standard contractual rate is about $60,000. In contrast, a $100,000 ART policy is all insurance, so the renewability option entitles one to buy $100,000 of coverage in every year of coverage. Hence, if the renewability option is valuable, the ART rates should be higher than the implicit mortality costs in the WL policy.[5] If the ART rates are used to calculate the implicit rate of return a conventional WL policy, it could therefore produce an apparent rate higher than the market. As indicated in Chapter VI, however, there does not seem to be any detectable effect of renewability on the ART rates.

Limiting the comparison to WL versus BTID and assuming the cash outlay and the final accumlation to be the same for both, the results in Tables V-6 through V-8 show the following:

1. Over a term one to five years, none of the WL policies studied are competitive with BTID.

All but one of the WL policies had one year ror's of minus 95% or less. First year penalties for early withdrawal could hardly be more severe. The one exception also had negative rates of return. Obviously the fact that these rates are "guaranteed" does not make them attractive compared to a money market fund with a guarantee against negative rates. Rates of return on a holding period of five years are also generally negative, both for dividend and

[5] Some WL policies contain special options that allow additional insurance to be purchased without evidence of good health. It could, therefore, be the case that a WL policy has more valuable renewability options than an ART policy of the same face amount. The argument given in the text clearly would not apply in such a case.

non-dividend paying policies. For the former, average rates ranged from minus 6% to minus 12% and for the latter from minus 10% to minus 30%. Only one policy had consistently positive rates, but those were about 1% or less.

In the 1983 bond markets, the yield on 3 month T-bills ranged from about 8% to 9%; one and five year Treasury bond yields were in the 10% range and tax-free municipals were surprisingly generally above the bill rate at over 9%. None of the whole life policies could be considered even remotely competitive with any of these market alternatives.

Of course, the shape of the yield curve for the first five years would matter little if surrender during that period was a rare event. We do not have current detailed information on lapse and surrender by policy year. We do have data on the lapse rate for the first two policy years. In 1983, one out of every four ordinary policyholders dropped their policies within the first two years. This rate was up from about one out of every five in 1978. These numbers would include holders of pay as you go policies as well as those with pay in advance. We do not know the exact proportion of dropped savings intensive policies in 1983, but evidence from earlier years indicates that lapse rates on whole life and other savings intensive policies is very significant.[6] Thus it seems likely that the negative early rates do matter.

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[6] Detailed statistics on lapse rates can be found in LIMRA's 1971-1972 Expected Lapse Tables (TSA, XXVII[1975]) and the important additional work by Brezinski, "Patterns in Persistency",(TSA, XXXIV[1983], 203-220) and in **The Life Insurance Industry**, Part 4, Hearings Before the Subcommittee on Antitrust and Monopoly, U.S. Senate, July, 1974, 2886-2891. The last mentioned provides lapse data for whole life policies only, whereas LIMRA statistics provide separate statistics on term and permanent business. According to the Senate Survey, in 1972, the cumulative percentage of the number of whole life policies lapsed in the first two years ranged from a low of 9% for the Massechussetts Mutual to a high of 50% for Fidelity Union. The average two year lapse rate for the 62 companies responding to the question was over 25% with a standard deviation of 8.9%. The frequency of articles in trade press in the early 1980's expressing grave concern over the high rates of lapse and replacement

2. Longer term (10 to 20 years) rates are, on the average, below the BTID alternative, but some individual policies are quite competitive.

Average WL rates of return at the ten year holding period were about 4% for the dividend paying policies and between 1% and 2% for the fixed rate policies. Three dividend paying policies were in the 6% to 8% range, which in view of possible tax advantages and the guarantees provided might well be competitive with alternative savings media.

Average WL rates at the end of 20 years were in the 7% range for the dividend paying policies and the 3.5% to 5% for the non-dividend policies. Twenty year Treasury bonds paid an average of 11.34%, but, of course, would involve the risk of capital loss if future rates rose. In so far as life insurance companies invest in long term government and corporate bonds, dividends are also subject to considerable risk of capital loss. Again, in view of the tax advantages and the various guarantees offered, one could argue that the the 20 year average rates of return were competitive with alternative media. Some individual dividend paying policies yield between 8% and 9% and which was in the same range as certificates of deposit being offered in that year. One can conclude that, on average, WL 20 year rates of return were lower than those being offered by alternative savings media, but one cannot rule out the possibility that tax advantages and the various guarantees were sufficient to make them competitive.

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on traditional whole life policies suggests that it is unlikely that lapse rates on savings policies dropped from their 1972 rates.

3. The differences in rates of return among WL policies are "large" relative to those found in other savings media.

Coefficients of variation (CV's) found in 1983 are similar in magnitude to those observed for WL policies issued in 1973 and 1977. For five and ten year holding periods they are generally well above 50% with the lowest at 37% and some over 100%. For a 20 year holding period, CV's from about 15% to 50%.

By contrast, Table V-11 shows CV's observed on IRA accounts (4% to 8%), car loans (5% to 6%) and on savings account earnings (7%) are in general much lower.

Table V-11

Variation In Interest Rates and Earnings In The Washington, D.C. Area, 1982-1983

I. Effective IRA Yield (Date surveyed 1/9/83-1/24/83):

	Duration	
	> 18 months	> 30 months
A. Fixed Rate		
Average Yield	11.22%	11.38%
Standard Deviation	.91	.77
Coefficient of Variation	8.14%	6.77%
B. Variable rate		
Average Yield	11.04%	10.57%
Standard Deviation	.74	.41
Coefficient of Variation	6.67%	3.85%

II. Car Loans (Date surveyed 11/8-11/12/82):

	3 Years	4 Years
Average Rate	15.30%	15.69%
Standard Deviation	.81	.98
Coefficient of Variation	5.27%	6.28%

III. Account Earnings (Date surveyed 11/1/81):

Average Earnings	$181.79
Standard Deviation	12.76%
Coefficient of Variation	7.02%

Source: Washington Consumers' Checkbook, savings accounts-Vol.III, no.4, IRA's-Vol.4, no. 2, auto loans-Pricefighter, no. 7.

As discussed in Chapter III, the CV's alone tell one very little about the potential savings available through further shopping. We can roughly calculate potential shopping savings for the IRA's, car loans and S & L savings accounts shown in Table V-11. For example the variation in yearly earnings for a high income individual who deposits a bi-weekly check of about $1000 in the various Savings and Loan Associations in the Washington, D.C. area ranged from $158 to $217, with an average of $200. The standard deviation was about $15. Thus if one could save about 56% of the standard deviation by examining the offers of two institutions instead of one, the expected annual saving would be a little more than $8 a year. For someone earning more than $12 per hour, such additional search would only be worthwhile if it took very little time. Potential savings for people who deposit smaller paychecks are correspondingly smaller.

Potential savings through further shopping on IRA accounts also seem fairly modest. On a $2,000 investment for 36 months, for example, the accumlated difference at the end of three years between the average rate of 11.38% and a rate that is one half of a standard deviation lower is about $40.[7] The variation on the car loans was also modest. The monthly payment on a $5,625 loan (assumes a 25% downpayment on the car) to be repaid in 48 equal monthly installments would be about $157 at the average annual interest rate of 15.3%. The monthly payment on a loan of the same amount at 14.8% (56% of one standard deviation lower) would be about $1 a month lower.

Potential savings on whole life insurance policies are much larger. We will use the policy and circumstances detailed in Tables V-4 and V-5 to illustrate the magnitude of the potential savings corresponding to the vari-

[7] The present value of $40 received three years in the future is $32, using a discount rate of 8%.

ations in WL rates of return. If the policyholder had chosen a policy with the average rate of return for par policies issued to male non-smokers at age 35 of 4.3%, the accumulated cash available at the end of ten years would have been $16,775. With one additional canvass, he could have found a policy yielding 5.25% (.56 times 1.7% plus 4.3%) and at the end of ten years the accumulation would have been $967 higher.[8] A similar calculation for the difference in accumulations at the end of twenty years produces an accumulation $5,805 higher.[9] An economic man making $10 an hour would be willing to spend many hours to capture such potential savings.

To the extent that the variation observed in whole life policies is due to differences in underwriting criteria, customer service and so forth, the potential savings are only apparent not real. We know that CV's for ART rates were found to be in the 10% to 20% range. Since the smallest whole life average CV for durations of ten years or less is 37%, even if we attributed say 15% of the whole life CV's to differences in underwriting criteria and so forth, the amount of variation unaccounted for is still substantial.[10] At

[8] The present value of $967 received 10 years in the future is $448, using an 8% discount rate.

[9] The present value of $5,805 received 20 in the future is $1,245.

[10] If we assume that all the variation in ART rates is a simple and efficient reflection of variation in mortality pools and so forth, then we can ask the question: will we observe the same amount of variation in whole life premiums or in rates of return as in ART rates? Does a 20% CV in ART rates imply a 20% CV in WL premiums and rates of return? The answer to the question is "no"; a 20% CV in mortality costs will induce a smaller variation in whole life premiums. The precise calculation in any given case is quite complicated and we have been unable to make calculations for the policies analyzed in this report. It does appear that the higher the interest used, the smaller the induced CV from any given mortality variation. An intuitive argument for the proposition is that since mortality costs account for less than 20% of the premium on a typical whole life policy, a 20% CV in these mortality costs will result in far less than a 20% CV in whole life premiums, if mortality costs are assumed to be the only source of vartiation.

longer durations, the whole life CV's on dividend paying policies fall into the same range as the ART variation. At longer durations, however, the same yield difference implies larger differences in accumulations. For the example given in the previous paragraph, a .8% difference in the twenty year rates of return implies a difference of over $5800 in the twentieth year cash accumulation. The CV's on the non-dividend paying policies range from 25% to 50%, so again substantial variation and potential savings would remain even if 15% of the variation were attributed to mortality differentials.

The question of whether consumers appear to have sufficient understanding of and information on savings intensive life insurance policies in order for price competition to be effective will be discussed in Chapters VIII and IX.

Summary

For the sample of traditional savings intensive policies analyzed here we found that penalties for early withdrawal of savings were very severe for withdrawals in the first five years of ownership; despite the penalties, early withdrawal was common; average rates of return for ten or twenty year holding periods were generally below other market rates available at the time, though some particular policies offered rates similar to, or for those in high tax brackets, better than market alternatives; variation in rates of return and potential savings from additional shopping appeared to be much higher for these life insurance policies than for IRA's, car loans or effective rates of return being offered on savings accounts by S & L's.

Chapter VI

Pay In Advance Policies: Part II
Universal Life

New types of contracts or sales strategies were introduced during 1978 -1983 by companies who were relatively recent entrants in the life insurance business.[1] This chapter is devoted to an analysis of one of the most important of these innovations, the "universal life" (UL) policy. We compute rates of return being offered on a sample of UL policies in 1983 and discuss the advantages and disadvantages of such policies relative to a buy term and invest the difference strategy and to the traditional whole life policies analyzed in the preceding chapter.

Universal life was not the only innovation in life insurance policy contracts to appear in the decade of the seventies. Other important innovations included companies that stressed "buy term and invest the difference" and also sold the products in which they suggested the difference be invested and companies which sold "variable" life, a product akin to term insurance plus investing in a stock market mutual fund. Older companies, especially those who mainly sold non-dividend paying whole life policies, introduced and often switched to selling "indeterminate premium" whole life products. The current (non-guaranteed) premium on these products can be calculated using current market rates of interest. Thus, if market interest rates go up, the current

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[1] In so far as the new policy types were "revolutionary", it is interesting to note that revolution was begun by firms new to the business with a new way of doing business. This is consistent with Schumpeter's (1928 and 1942) stress on the importance of dynamic competition, the "gale of creative destruction."

premium rate will fall.[2] These other innovations are also important, but we did not have the time or resources to study them thoroughly. We believe this would be a worthwhile topic for future research. We turn now to the main subject of this chapter.

Universal Life

The first "universal life" (UL) policy was introduced by the company now known as E. F. Hutton Life in December, 1978. This new policy form has recieved a great deal of attention. A leading industry trade journal (Best's **Life and Health Edition**) referred to it as "the most successful new product the industry has seen in decades". Earlier, **Money** magazine published an article on UL with the title: "At Last- An Almost Ideal Policy". According to **Business Week** (see their recent cover story on the life insurance industry, June 25, 1984), the industry after bitterly opposing the universal life policies "promoted by upstart insurers" is now "capitulating". They write that "nearly every one of the two dozen giant companies that dominate life insurance have unveiled their own versions of universal life, variable life, or other "new wave" products. One new universal life policy introduced in mid-1983 by the Metropolitan Life Insurance Co. "is pulling in an astounding 47% of new premiums." In this chapter we will examine what is known of the importance of this policy type relative to all ordinary life insurance, analyze it's structure, present rates of return and cash accumulations at different durations for 19 such policies being sold in 1983. We will also present some informatiom and analysis of the sales commission structure of these policies, a structure that appears to differ in some important ways from that on more traditional

[2] See Chapter II for an explanation of why and how premiums would decrease as the interest rate assumed increases.

ordinary life policies.

The only direct evidence we have on the sales of this new policy type comes from surveys done for the years 1982 (see Table VI-1 below) and 1983.[3] For earlier years, we can obtain indirect evidence from the annual statements of E.F. Hutton. Premiums from UL accounted for about 90% of all E.F. Hutton direct premium income in 1982 and for over 94% of the amount of coverage issued in that year (Hutton also sells graded premium whole life and split life). Thus, by 1982, E.F. Hutton was essentially selling only UL insurance. It seems reasonable to assume that much of their growth in the years 1979-1982 was due to sales of the new UL policies. While direct premium income and amount of new insurance issued grew rapidly between 1978 and 1979 (33% and 41% increase) and between 1979 and 1980 (30% and 11%), growth became much more rapid after 1980. Direct premium income increased 130% and amount issued by 213% from 1980 to 1981. It was at this time that the first stories concerning UL began to appear in mass magazines and newspapers. (**Fortune**, July 14, 1980, mentioned Hutton's UL as a new product "rooted in rationality", but was not optimistic about its success). Premiums increased by 63% and amount issued by 98% in the following year. The year 1981 brought a spate of favorable stories about UL. **The Wall Street Journal** (May 10,1981), **The New York Time's** and **Time** magazine (both on May 25, 1981) all ran favorable stories on UL products. In July, **Money** magazine published it's article - "At Last- An Almost Ideal Policy". It seems clear that sales of UL policies grew very rapidly after 1980, though the rate of increase slowed in 1983 (premiums up 53%, amount issued 36%).

We do know that by 1982, 137 companies were selling such policies and that

[3] The 1982 results will be found in the June, 1983 issue of **Best's** and the 1983 results in the August, 1984 issue.

they accounted for over 11% of all new whole life and endowment insurance coverage sold in that year. Thus, in just three years this new policy type constituted more than one dollar out of every ten dollars of new coverage on savings intensive life insurance policies. Table VI-1 shows total premium volume, amounts issued and in-force of the leading 20 companies in 1982. As the table shows, E.F. Hutton was still the leading company, although companies belonging to the Lincoln National group have the largest premium volume if companies belonging to the same group are treated as a unit. The groups in the top 20 are indicated at the bottom of Table VI-1. If a policy from a top twenty company is analyzed in this chapter, it is named in parenthesis below the name of the company.

TABLE VI-1

Universal Life Insurance
Sales, Amount Issued and Amount in Force, 1982
(In Millions of Dollars)

Company & Plan	Premiums	Amounts Issued	In Force
1. E. F. Hutton (Complete Life)	$ 82.6	$2499	$3660
2. Penn Mutual Life (a) (Independence Builder)	49.6	1985	3099
3. First Penn-Pacific	49.2	1969	2172
4. Acacia National (Flex-Account)	41.3	1204	1258
5. Lincoln National (b) (Advantage)	27.8	4645	4883
6. Life of Virginia (The Challenger)	27	1202	1630
7. Great Southern (c) (Lifetime Life)	24.2	1507	2591
8. Alexander Hamilton (Irresistable Life)	23.2	915	937
9. Western-Southern (Universal Life)	20.2	1285	1266
10. Transamerica Assur. (T Plan Life)	17.1	1925	2077
11. Inter-State Assur. (Flexlife II)	16.7	388	686
12. Security Conn. Life (Designer Life)	16.6	634	701
13. Jackson National	13.4	895	937
14. Travelers Insurance (Universal Life)	13.1	526	526
15. Hartford Life & Accident (The Solution)	13.0	494	538
16. Integon Life (Universal Life)	13.0	1484	1692
17. First Colony Life	11.4	539	634
18. Bankers Nat'l. Life (Adapta Life)	10.8	813	913
19. United Presidential (All-in-One)	10.2	645	666
20. Jefferson National (Universal Life)	8.6	330	566
Totals for 137 Companies	$700.3	$38,000	$44,300
Total for the Top Ten	$362.2 Million	or 52% of total	
Total for Top Twenty	$489.0 "	or 70% "	
Total Premiums	$700.3		

TABLE VI-1

Notes to Table VI-1

Companies in the Same Group:

a. Penn Mutual Life, Penn Insurance & Annuity.

b. Lincoln National, Security-Connecticut Life, First Penn-Pacific American States Life, Dominion Life.

c. American General Group: California Western States Life, Hawaiian Life & Casualty, Lincoln American Life, American General Life of Delaware & Texas and Great Southern Life.

Source; Best's Review (Life/Health ed.), June 1983; 11-12.

While the numbers in Table VI-1 are large in absolute terms and exhibit the phenomenal growth of this product in three years, one should still realize that the total premium volume and the amount in force were both less than 2% of the total for all ordinary life insurance, and the amount issued was only about 6.5% of all ordinary issued in 1982. Growth of UL in 1983 continued to be rapid, with premiums rising to $1.8 billion or about 4.7% of all ordinary premiums. UL's share of new insurance issued grew from about 11% to 19% and UL insurance in force more than tripled from $42 billion to $138 billion or to 4.8% of all ordinary insurance in force in 1983.[4] In spite of the rapid growth of this new product, it should be remembered that, as of 1983, more than 95 cents out of every premium dollar flowing into the industry came from a non-UL policy and that more than 95 cents out of every dollar of life insurance coverage was provided through a non-UL policy.

Below we analyze policies issued by seven out of the top ten companies shown in Table VI-1 and those issued by five out of the bottom ten companies (see Tables VI-4 throught V-12). The others were either not listed in our main source (**Best's Flitcraft Compend**) at all or the data given there was insufficient for our purposes. While we obtained additional information directly from some of these companies, neither time nor resources permitted us to obtain sufficient data to analyze the policies of all of these companies.

What Is Universal Life?

A concise definition of a universal life policy might be "a flexible

[4] Figures from an A.M. Best survey published in the August, 1984 issue of **Best's Review**, p.90.

whole life policy that is sold explicitly as a combination of pure insurance and a savings plan". [5] In structure the UL policy is very like the BTID examples we have used. However, most UL policies are more flexible than the examples we have used because the policyholder can vary the amount he wishes to save (i.e. can vary the premium or cash outlay within limits) and sometimes the face amount as a contractual right. UL resembles a whole life policy in that it combines a pure insurance feature with a savings plan. Indeed, one version of universal life (known as type A), where the death benefit remains equal to the face value of the policy, would be virtually identical to a whole life policy[6] if the premium or contribution is fixed. The other version (Type B) is equivalent to a policy where the death benefit is equal to the face amount plus the cash value.[7]

Unlike traditional pay in advance policies such as whole life, the rate of return being offered on the savings portion is heavily emphasized in print advertising for UL policies. If there is merit to the "framing" hypothesis (see Chapter V), that the failure of policyholders to frame the question properly (what rate of return will I earn on that portion of my cash outlay

[5] The definition in the proposed NAIC Universal Life Insurance Model Regulation focuses only on "separately identified interest credits and mortality and expense charges are made to the policy". The model regulation makes a futher distinction between "fixed" and "flexible premium" UL policies depending on whether the policyholder "can vary the amount or timing of one or more of the premium payments or the amount of the insurance". Thus a policy can satisfy the Model definition of "universal" simply by explicitly crediting interest payments. Any whole life policy can be transformed into a universal life policy by the simple procedure of spelling out the interest assumptions that went into it's construction.

[6] UL policies do not have fixed policy loan interest rate provisions, but do have the equivalent of guaranteed minimum cash surrender values. Thus a UL policy could be completely identical only to a WL policy with a variable loan interest rate.

[7] See Jordan at 123-124.

that is savings?), then the emphasis on rate of return could be a very important difference between UL and more traditional products.

We will need to go more explicitly into the mechanics of these policies. From the premium, cash outlay or the "contribution" that you make to a universal life plan, the company deducts the "cost of insurance" or a "mortality charge" for that month or year and a sum for other expenses and profits. The remainder is treated as a "deposit" to a side fund. The amount in the side fund earns interest at a rate either determined by the company at its own discretion, or at a rate that is tied to some market interest rate, e.g. the rate on 30 day "T-bills", the rate which the U.S. government is paying to borrow money on a short term basis.

As an example, Table VI-2 shows the structure for company AA's successful UL policy issued to a male, non-smoker, age 45 and who has decided on $100,000 initial coverage and a contribution or premium of $2000 per year.[8] The death benefit paid in any year will be the sum of the initial face amount ($100,000) and the side fund (type B).

[8] An outlay of $2,000 annually is the standard figure used in the UL ledger statements shown in the Flitcraft Compend. We do not have reliable figures on premium outlay per policy, because of the problems created by the spread of "modco " mentioned in Chapter I. The scale of the outlay is an important determinant of the net or effective rate of return on a UL policy.

TABLE VI-2

Universal Life Ledger

Company: AA Policy: 1

Face Amount	Annual Premium	Current Int Rate	Guar Int Rate	Age at Issue	Sex
$100,000	$2,000	11.00%	4.00%	45	Male

First Year Expense			Renewal Expense		
Premium Load	Mthly Per M	Mthly Per Policy	Premium Load	Mthly Per M	Mthly Per Policy
7.50%	9 cents	$21.00	$0	$0	$0

Mthly Curr Rte	Mthly Guar Rte	Excess Int Above	Surrend Charge	Smoker?
			Yes	No

Age	Mthly Term Rate	Annual Expense	Mthly Expense	Begin Balance	End Balance	Cash Value
45.1[a]	$.24	$150	$54	$1,796	$1,806	$1,806
45.2[a]	.24		54	1,752	1,762	1,762
45.3[a]	.24		54	1,708	1,718	1,718
45.4[a]	.24		54	1,664	1,673	1,673
45.5[a]	.24		54	1,619	1,627	1,627
45.6[a]	.24		54	1,573	1,582	1,582
45.7[a]	.24		54	1,528	1,535	1,535
45.8[a]	.24		54	1,481	1,489	1,489
45.9[a]	.24		54	1,435	1,442	1,442
45.10[a]	.24		54	1,388	1,395	1,395
45.11[a]	.24		54	1,341	1,347	1,347
45.12[a]	.24		54	1,293	1,299	1,299
46	.26	150	26	3,149	3,096	3,096
47	.28	150	28	4,946	5,066	5,066
48	.30	150	30	6,916	7,226	7,226
49	.33	150	33	9,076	9,587	9,587
50	.36	150	36	11,437	12,169	12,169
51	.39	150	39	14,019	14,997	14,997
52	.42	150	42	16,847	18,098	18,098
53	.45	150	45	19,948	21,501	21,501
54	.48	150	48	23,351	25,241	25,241
55	.52	150	52	27,091	29,342	29,342
56	.56	150	56	31,192	33,843	33,843
57	.61	150	61	35,693	38,776	38,776
58	.67	150	67	40,626	44,174	44,174
59	.74	150	74	46,024	50,078	50,078

[a] Monthly

TABLE VI-2, continued

Age	Mthly Term Rate	Annual Expense	Mthly Expense	Begin Balance	End Balance	Cash Value
60	.81	150	81	51,928	56,543	56,543
61	.89	150	89	58,393	63,617	63,617
62	.98	150	98	65,467	71,354	71,354
63	1.07	150	107	73,204	79,828	79,828
64	1.17	150	117	81,678	89,108	89,108

Table VI-2 "works" as follows: the one year term cost at age 45 is 24 cents per $1000 per month ($2.88 per year), so the cost of $100,000 coverage for one month is $24; the annual expense charge is 7.5% of the $2000 premium or $150, which is subtracted when coverage begins; there is a monthly expense charge of 9 cents per $1000 of face amount or $9 per month plus a flat monthly fee of $21. Hence the total expenses subtracted from the $2000 contribution in the first month amount to $204 (24 + 150 + 9 + 21), leaving a "deposit" of $1796 at the beginning of the first month. This deposit earns one month's interest, but the calculation is little more complicated than it might, at first, appear. The phrase "no excess interest paid on the first $1000" means that the lower guaranteed rate (4%) is paid on the first $1000 of the deposit and the higher current rate (11%) is paid only on the amount above $1000, or in this case on $796. Using the monthly equivalents of these annual rates, the interest earning for the month is about $10, leaving an end of month balance in the side fund of $1806. In the second month, only $54 is subtracted, leaving a beginning balance of $1752. This balance earns about another $10 in interest, leaving $1762 at the end of the second month, etc.

From the second year on, expenses are much lower. There is the annual fee of $150 paid at the beginning of the year. The only other deduction from the premium is a monthly "mortality charge", which goes from $26 in the second year to $117 in the twentieth policy year. As is true of many UL policies, expenses tend to be "front loaded" or "front ended" and are usually highest in the first year. In this way they ressemble term policies that have an additional first year premium charge. Although the expense structure shown in the table is fairly typical for UL policies, not only do expense charges vary from policy to policy, but even the way expenses are charged varies greatly.

In addition, or sometimes instead of, to "front-end" expenses, some policies have "back-end" charges or "loads". These come from "surrender charges" imposed if the policyholder wants to withdraw some or all of the cash value accumulation. Such charges are similar to those made on conventional whole life policies.

The rate paid on the side fund, above some initial amount (e.g. $1000), is generally the rate that is advertised by the insurance company, but clearly is a rate that is "gross" of the expenses that are deducted. To compare the economic attractiveness of buying term and investing the difference versus a universal life policy, we need to "net" out all expenses, other than those already built into the ART rates. The resulting effective rate of return on the side fund should be compared with an effective rate of return on alternative savings media, that is, with rates that are net of the costs of operating the savings media. If the expenses in the ART rates precisely matched those in the UL policy and if the current rate were paid on the entire side fund, then the rate of return we would calculate would be the same as the advertised "gross" current rate. In so far as the UL expenses plus mortality charges are greater than the term insurance charges (which have expenses built in), the calculated "net" rate will be lower than the current rate. We make the net calculation in exactly the same way as we have done for whole life policies; we fix a premium or a contribution that we would make to the UL policy, and compare the results to buying term insurance at our benchmark ART rates and investing the difference at a certain rate of interest. We then find that rate of interest that leads to equal amounts in the UL and BTID side funds.

Table VI-3 provides an example of the rate of return calculation for the

AA policy just discussed, this time using a 35 year old male smoker, with all other features the same. The calculation assumes the policy is canceled or surrendered at the end of the tenth year.

TABLE VI-3

Universal Life - Rate Of Return
(Type B)
(Death Benefit Equals Face Amount + Cash Value)

Face Amount	Cash Outlay	Term Pol. Fee	Age at Issue	Add'l 1st Yr Dep	Term Policy Name
$100,000	$2,000	$19.72	35	$0	FTC-S

Combined Pol Name	End Yr Compare	EOY Cash Value	Interest Rate On Fund
Company AA	10	$26,337	8.00%

Age	Term Rate	Amount of Insurance	Term Charge	Deposit	Fund at End of Year
35	2.27	$100,000	$247	$1,753	$1,894
36	2.38	100,000	258	1,742	3,927
37	2.53	100,000	273	1,727	6,106
38	2.70	100,000	289	1,711	8,443
39	2.89	100,000	309	1,691	10,945
40	3.12	100,000	332	1,668	13,622
41	3.37	100,000	356	1,644	16,488
42	3.64	100,000	383	1,617	19,553
43	3.93	100,000	413	1,587	22,831
44	4.26	100,000	445	1,555	26,337

Table VI-3 shows that if 11% were to remain the "current rate" for 10 years, the same cash accumulation would have accrued if the individual had bought term at the ART rates indicated, and invested the difference at a "net" rate of 8%. Why is the "Linton" rate lower than the advertised rate? Two reasons: First, the expenses in the UL policy, especially in the first year, are higher than in the ART policy. The "mortality charge" in the UL policy is $2.41 versus $2.27 for the ART, not much of a difference. The policy fee for the ART policy is less than $20, as compared to a $510 expense loading in the first year. After the first year, the main difference is between the $150 UL annual policy fee and the $20 ART policy fee. The second, and far less significant reason, is that the first $1000 earns at a rate of 4%, not 11%.

UL As ART: The Importance Of Cash Outlay to Return

With a UL policy, one can vary the mix of protection to savings by changing the ratio of cash outlay to amount of insurance. In the examples we have just discussed, the cash outlay of $2,000 annually was large relative to the cost of the insurance protection, so much of the annual outlay went as a deposit to the side fund. To get a clearer idea of how the expense structure in a typical UL policy can be strongly affected by this ratio, we consider a case where virtually all the cash outlay goes to cover the cost of the insurance. In this polar case, the UL policy is similar to an ART policy.

Return to the situation summarized in Table VI-2, with this difference; that the cash outlay be the minimum necessary to maintain $100,000 of coverage. A rough way to calculate the first year minimum cash outlay is as follows: the "term cost" for a 45 year old non-smoker is $2.88 per thousand per year and the first year monthly expense charge is an additional $.09 per thousand per month or $1.08 per thousand per year. Thus there will be a charge of $3.96 per thousand per year or a total of $396 for one hundred thousand. To this must be added the fixed first year policy fee of $252 and seven and half percent of whatever the first year premium happens to be. A little algebra will show that a minmum total first year premium of about $700 will be necessary to buy $100,000 worth of coverage.[9] Since the minimum required premium for a 45 year old non-smoker is $383, it is feasible to buy pure protection with this UL policy.

Compared to the average ART rates, pure UL term coverage is expensive,

[9] The algebra shows that the required premium is $648 divided by (1 - .075) or about $700. This calculation ignore interest and the monthly structure of payments. A more detailed calculation taking these into account will show that the minimum premium required is somewhat smaller, about $688.

especially in the first year. One hundred thousand dollars of coverage could be bought through an ART policy for $356 at age 45, compared to $700 for UL term. In the second year, the UL pure protection cost will be much lower; the mortality cost of $2.60 per thousand plus seven and half percent of the premium. Thus at age 46, given coverage at age 45, UL term insurance will cost $4.10 per thousand compared to $3.65. While the differential is smaller, UL is still higher priced (of course the UL policy has options not found in the ART policy).

The important thing to note is the effect on the implicit rate of return. The BTID alternative will show positive deposits in almost all ten years, yet the cash accumulation in the UL policy will remain at zero. Hence the 10 year rate of return on this policy will be negative, in spite of the fact that when the cash outlay was a constant $2,000 a year the rate of return was a healthy plus eight percent. As we will see in Chapter IX, increasing the scale of outlay (perhaps by making a one time large transfer of the cash value in an existing policy) relative to the cost of the insurance, increases the net rate of return toward the gross rate of return. The reason is intuitively clear; a greater and greater percentage of the dollar outlay is treated as a deposit entitled to the full gross rate of return.

Type "B" Vs. Type "A"

There is a significant difference between the WL Linton yield claculations made in Chapter V and the type "B" UL calculations. In the latter, the death benefit is equal to the face amount of the policy plus the amount in the side fund. This is equivalent to a WL policy where the death benefit is equal to the initial face amount plus the cash value. Instead of holding the death estate constant as in the Linton yield method, the death protection increases throughout.

Tables VI-4 through VI-7 show net rates of return for 19 UL policies. As mentioned above, 14 of these were selected because the companies were in the top 20 in 1982, two were included because they appeared to have exceptionally high rates of return (companies BB and CC) and the remainder were chosen randomly from **Best's Flitcraft Compend.**

TABLE VI-4

Rates of Return on 19 Uni-Life Policies
(Type B)
End of Year One
FTC Term Rates

	Issue Age					
	25		35		45	
Policy	Non-Smoker	Smoker	Non-Smoker	Smoker	Non-Smoker	Smoker
BB	10.0%	8.6%	8.7%	6.1%	7.4%	-1.7%
CC	8.9	2.9	7.1	1.6	9.3	-6.9
DD	-5.9	-13.1	-20.1	-33.6	-53.3	-86.7
EE	-14.8	-15.2	-25.1	-27.4	-55.1	-76.4
FF1	-15.2	-14.3	-35.6	-34.9	-71.9	-72.4
FF2	-16.1	-13.7	-34.4	-34.0	-71.6	-70.3
HH	-18.6	-20.6	-40.8	-45.0	-75.5	-86.0
AA	-20.3	-21.5	-20.9	-23.7	-21.1	-29.5
II	-20.6	-19.7	-20.1	-20.5	-25.3	-27.4
JJ	-24.4	-28.4	-43.9	-51.7	-96.0	-100.0
KK	-25.0	-26.3	-24.3	-28.7	-27.1	-37.9
LL	-33.4	-33.4	-33.8	-35.2	-39.8	-44.3
MM	-35.2	-34.2	-34.6	-36.3	-39.0	-45.8
NN	-37.2	-42.5	-38.8	-42.1	-42.9	-50.6
OO	-42.7	-45.9	-43.5	-47.5	-45.6	-56.5
PP	-48.2	-48.8	-74.6	-77.6	-99.9	-100.0
QQ	-48.6	-50.5	-50.1	-52.9	-58.6	-61.2
RR	-57.5	-58.9	-59.9	-60.3	-64.4	-75.3
SS	-100.0	-100.0	-100.0	-100.0	-100.0	-100.0
Average	-28.7%	-30.3%	-36.0%	-39.1%	-51.1%	-59.4%
Range	110.0	108.6	108.7	106.1	109.3	98.3
Standard Dev.	25.0	24.5	25.1	24.4	31.7	30.0
Coef. of Var.	-87.2	-81.0	-69.7	-62.4	-62.0	-50.5

TABLE VI-5

Table of Rates of Return
End Of Year Five
FTC Term Rates

	Issue Age					
	25		35		45	
Policy	Non-Smoker	Smoker	Non-Smoker	Smoker	Non-Smoker	Smoker
CC	11.1%	9.2%	10.9%	8.5%	11.3%	5.2%
BB	11.1	10.8	11.0	9.9	10.8	7.1
DD	10.8	10.3	10.0	9.0	8.8	5.7
JJ	8.1	7.6	7.1	6.0	3.8	-1.2
FF2	7.2	6.8	5.5	5.3	-3.0	3.2
HH	7.1	6.7	6.3	5.9	-3.3	1.6
EE	7.0	7.3	5.8	6.1	2.5	.6
FF1	6.9	5.4	5.0	2.8	1.9	-4.4
II	6.1	6.4	6.5	6.4	5.2	4.9
KK	6.0	5.5	6.3	4.7	6.1	1.9
AA	5.9	5.4	5.8	4.7	6.5	3.6
PP	5.6	5.7	4.6	4.1	-.2	-3.0
MM	5.0	5.4	4.8	4.9	4.4	2.1
LL	4.9	5.1	4.7	4.4	3.2	1.9
OO	3.6	2.6	3.3	1.8	4.1	.6
NN	3.4	1.8	2.9	2.0	2.0	.2
RR	2.4	2.2	2.5	1.6	1.5	-1.9
QQ	2.3	1.7	1.6	1.0	-.9	-.3
SS	-.9	-.5	-.5	.1	-.9	-.1
Average	6.0%	5.6%	5.5%	4.7%	3.4%	1.5%
Range	12.1	11.3	11.5	9.7	14.6	11.5
Standard Dev.	3.1	3.0	3.0	2.7	4.2	3.0
Coef. of Var.	52.1	53.7	54.2	57.8	124.1	207.6

TABLE VI-6

Table of Rates of Return
End Of Year Ten
FTC Term Rates

	Issue Age					
	25		35		45	
Policy	Non-Smoker	Smoker	Non-Smoker	Smoker	Non-Smoker	Smoker
CC	11.6%	10.7%	11.6%	10.1%	12.1%	8.3%
DD	11.3	11.1	11.2	10.9	11.4	10.4
BB	11.1	10.9	11.0	10.4	10.9	8.8
JJ	10.6	10.3	10.5	10.2	9.8	7.7
HH	9.7	9.5	9.5	9.3	8.8	8.3
KK	9.6	9.3	9.8	8.8	9.5	7.3
PP	9.6	9.6	9.7	9.4	9.3	8.2
EE	9.2	9.4	8.8	8.9	7.4	6.9
LL	8.9	8.9	8.7	8.6	8.0	7.1
MM	8.9	9.0	8.9	8.8	8.6	7.0
AA	8.7	8.5	8.7	8.0	9.3	7.6
II	8.4	8.5	8.6	8.6	8.1	8.0
OO	8.1	7.8	8.0	7.2	8.9	7.1
RR	7.8	7.8	7.8	7.3	7.7	5.9
NN	7.6	6.9	7.4	6.9	7.0	6.2
SS	7.1	7.3	7.3	7.7	6.9	7.4
QQ	7.1	6.8	6.6	6.5	5.2	5.9
FF2			7.8	7.7	9.3	9.5
FF1			7.5	6.6	8.5	5.2
Average	9.1%	9.0%	8.9%	8.5%	8.8%	7.5%
Range	4.6	4.4	5.0	4.4	6.9	5.2
Standard Dev.	1.3	1.3	1.4	1.3	1.6	1.3
Coef. of Var.	14.5	14.2	16.0	15.5	18.7	17.1

TABLE VI-7

Universal Life
Table of Rates of Return
Amount $100,000 - Type B
End of Year Twenty
FTC Rates

	Issue Age					
	25		35		45	
Policy	Non-Smoker	Smoker	Non-Smoker	Smoker	Non-Smoker	Smoker
CC	11.9%	11.4%	11.9%	11.1%	12.1%	10.0%
JJ	11.3	11.2	11.2	11.1	10.9	9.3
KK	11.3	11.1	11.3	10.8	11.7	10.1
DD	11.2	11.1	11.2	11.1	11.5	11.0
BB	11.0	10.9	11.0	10.6	11.0	9.9
LL	10.7	10.7	10.6	10.4	10.4	9.5
PP	10.7	10.7	11.0	10.5	10.4	9.8
HH	10.5	10.5	10.4	10.3	10.0	9.6
MM	10.5	10.6	10.5	10.5	10.4	9.1
EE	10.2	10.3	10.0	10.1	9.6	9.6
OO	10.0	9.8	10.1	9.7	11.0	10.3
RR	10.0	10.0	9.1	8.8	10.2	9.1
AA	10.0	9.9	10.1	9.7	10.7	9.8
SS	9.8	10.0	9.9	10.1	9.6	9.9
NN	9.5	9.3	9.4	9.2	9.4	9.2
II	9.4	9.4	9.4	9.5	9.3	9.3
QQ	9.0	8.9	8.7	8.8	8.0	8.6
FF2			9.7	9.8	11.8	12.2
FF1			9.6	9.2	11.4	10.0
Average	10.41%	10.33%	10.27%	10.05%	10.50%	9.81%
Range	2.93	2.50	3.19	2.29	4.16	3.55
Standard Dev.	.73	.69	.86	.74	1.03	.78
Coef. of Var.	7.04	6.67	8.33	7.38	9.83	7.94

Advantages and Disadvantages of Universal Life

Compared to ART,BTID and WL

On the basis of the rates shown in the four tables above, we can answer a series of questions concerning the advantages and disadvantages of UL policies relative to ART, BTID and WL.

1. As pure protection policies, most UL policies appear to be higher priced than average ART policies. This does not necssarily mean they are bad buys, since they contain options not found with ART policies. We did not investigate this question thoroughly.

2. One year rates of returns are generally negative, but higher than WL rates.

Table VI-4 shows that the average one year ror's range from minus 30% to minus 60%. While far from negligible, these early withdrawal penalties are much lower than the corresponding ones associated with WL, which generally involve the loss of the entire principal. The absolute losses involved may also be smaller because UL buyers can vary the premium or cash outlay within limits. There usually is some minmum allowed premium (MAP) and so the first year loss could be limited by paying only this amount in the first year. Thus the UL policies appear to dominate WL policies over the first year. We should also note that two of the UL policies pay generally positive rates of return in the first year. Except for these two, BTID dominates UL in the first year.

2. By the fifth year all rates are generally positive, with only one company (SS) showing generally negative rates.

Average five year UL rates ranged from a low of 1.5% for 45 year old smokers to a high of 6% for non-smokers. These rates of return are much higher than those for WL policies. While below both short term and five market interest rates, UL (like WL) has a significant tax advantage relative to T-bonds, requires less cash to get into, and involves no risk of capital losses. These would compensate, to some degree, for the lower average rates of return. We note that at ages 25 and 35, three companies (BB, CC and DD) had rates of return close to, or even in excess of, the five year Treasury bond yield.

3. Longer term rates of return (between 10 and 20 years) on the average compare compare favorably with both BTID and WL.

Average UL rates of return's at year ten are in the 7.5-9% range. Ten year Treasury bonds sold in 1983 averaged 11.1%. However, UL has significant tax advantage relative to T-bonds. High grade federal tax free muncipal bond yields averaged 9.47%. UL rates of return's at year 20 were in the 10-10.5% range. Twenty year Treasury bond yields averaged 11.34% (July, 1984 Fed. Bul. at A24). In view of tax advantages and smaller minimum investment sizes, the UL long term rates seem at least competitive, and perhaps dominate both BTID and WL.

4. There is less variation in rates of return's on UL policies than on WL policies, especially at longer durations.

. CV's for years one and five range from 50% to 200%. While high relative to ART and other savings media, these figures are lower than comparable figures for 1983 WL policies. Because the premium can also be varied, the variation is less significant for UL than WL. The variation, however, is very high relative to variations found at other times for other products. These CV's are larger than any found in the studies we previously quoted (FTC 1979, p.58), larger than all but 3 out of 39 items surveyed by Pratt, Wise and Zeckhauser (QJE, May, 1979, 189-211), and larger than those found by Jung in his recent survey of annuity rates. The potential shopping savings are large.

For years 10 and 20, the CV's fall to about 14% and 7% respectively. These figures are below those for WL and below the sum of the CV's for ART and alternative savings media. The low variation in these long duration rates reflects the low variation in the current advertised gross rates. The longer the duration the smaller the difference between advertised and effective rates, because like WL expenses tend to be front loaded.

5. The advertised "current rates" rates are not a good guide to the underlying net rates.

Most companies advertise similar rates at the same point in time, yet there are significant differences in effective yields, especially for holding periods of up to ten years. The average advertised gross rate of return for the 19 policies analyzed was 11.4%, with a range of 2.5% and a standard deviation of .7%. Thus the coefficient of variation on the advertised rate was only 6.4%, similar to the CV's observed on IRA's discussed in the preceding chapter. As we have seen, the variation is much higher on the net or "effective" rates. The gross rate is a poor guide to the net rates for a given policy. In Table VI-9, the first column shows the rank of the advertised "current" rate or gross rate for each of the 19 UL policies analyzed. The next four columns show each policies rank as measured by the net or effective rates of return at durations of one, five, ten and twenty years.

Table VI-9

Relative Rankings of Universal Life Policies
By Gross and Net Rates of Return
At Various Durations: Age 35, Non-Smoker

Company	G.R. Rank	Yr.1 Rank	Yr.5 Rank	Yr.10 Rank	Yr.20 Rank
KK	2.0	6.0	6.5	5.0	2.0
FF2	2.0	9.0	10.0	14.5	14.0
FF1	2.0	11.0	11.0	16.0	15.0
CC	4.0	2.0	2.0	1.0	1.0
JJ	5.5	15.0	4.0	4.0	3.5
LL	5.5	8.0	13.0	10.5	7.0
MM	7.0	10.0	12.0	8.0	8.0
PP	9.0	18.0	14.0	6.0	5.5
SS	9.0	19.0	19.0	18.0	13.0
RR	9.0	17.0	17.0	14.5	18.0
OO	11.0	14.0	15.0	13.0	10.5
HH	12.0	13.0	6.5	7.0	9.0
DD	14.5	3.5	3.0	2.0	3.5
BB	14.5	1.0	1.0	3.0	5.5
AA	14.5	5.0	8.5	10.5	10.5
EE	14.5	7.0	8.5	9.0	12.0
NN	17.0	12.0	16.0	17.0	16.5
II	18.5	3.5	5.0	12.0	16.5
QQ	18.5	16.0	18.0	19.0	19.0

Spearman Rank Correlation Coefficients
Between the Gross Rate and the Net Rate

Yr.1	Yr.5	Yr.10	Yr.20
-.07	.07	.18	.40*

*Significant at the 5% level, using a one-tailed test.
Note: When tied scores occur, each is assigned the average of the ranks that would have been assigned, had no ties occurred. See Sidney Siegel, *Nonparametric Statistics*, 1956, 202-213.

There is no significant correlation between the current advertised rate and the net effective rates at durations of one, five and ten years. The correlation between the current rate and the net rate after twenty year is positive and significant at 5%. Even as a guide to long term rates of return, current rates may mislead. Company FF, for example, offered the highest current rates, but its net rates were among the lowest after ten and twenty years.

We might also note that there is little long term significance to either the current rate or to the net rates shown in Tables VI-6 through VI-8. Most current rates will change monthly or quarterly. Therefore calulations that presuppose the same current rate for 20 years are highly unlikely to produce the actual rates of return that will be earned in the future. As is now obvious, no one can consistently predict future interest rates. It is the difference between the current rate and the net rates that is significant. The difference reflects the various expenses that are not reflected in the current rate, but are in the net rate. At any current rate, for example, company FF will have a larger differential between its current and net rates than will BB or AA because it's expenses are larger than their's.

6. The differences observed in UL rates of return's entail large differences in the cash accumulations.

As we have already discussed, the economically relevant measure of price or rate of return dispersion is the potential savings to further shopping, not the absolute size of a coefficient of variation. Presumably what matters is the absolute number of dollars that could be gained if an individual searched successfully and found a savings vehicle offering a higher rate of return, relative to the time and trouble and money it takes to find one. Tables VI-10 through VI-13 show the cash accumulations that would accrue through making a

$2000 annual contribution in each policy, assuming the current rate of interest were paid in all years. One half a standard deviation above the mean tranlates to over $200 more in the "fund" at the end of the first year, $1,500 at the end of the fifth year, $1,000 at the end of the tenth and around $5,000 at the end of the twentieth. The magnitudes involved appear to provide ample incentive to search.

TABLE VI-10

Cash Accumulations with 20 Uni-Life Policies (Type B) End Of Year One

	Issue Age					
	25		35		45	
Policy	Non-Smoker	Smoker	Non-Smoker	Smoker	Non-Smoker	Smoker
BB	$1,986	$1,937	$1,959	$1,858	$1,768	$1,492
CC	1,983	1,835	1,931	1,779	1,799	1,413
DD	1,712	1,550	1,441	1,164	769	203
EE	1,551	1,513	1,348	1,272	739	359
FF1	1,543	1,528	1,161	1,141	462	419
FF2	1,526	1,539	1,164	1,156	467	452
HH	1,482	1,416	1,067	964	402	214
AA	1,451	1,400	1,426	1,337	1,299	1,070
II	1,445	1,433	1,441	1,393	1,230	1,102
JJ	1,376	1,277	1,011	847	82	0
KK	1,365	1,314	1,365	1,250	1,199	943
LL	1,211	1,189	1,194	1,136	990	845
MM	1,178	1,174	1,178	1,116	1,003	823
NN	1,142	1,027	1,103	1,015	939	750
OO	1,042	965	1,019	920	895	661
PP	941	915	458	394	0	0
QQ	935	883	899	826	681	589
RR	772	735	722	697	586	375
SS	0	0	0	0	0	0
Average	$1,297	$1,244	$1,152	$1,067	$806	$616
Range	1,986	1,937	1,959	1,858	1,799	1,492
Standard Dev.	454	437	453	427	521	455
Coef. of Var.	35%	35%	39%	40%	64%	74%

TABLE VI-11

Cash Accumulations on Universal Life Policies
End of Year Five

	Issue Age					
	25		35		45	
Policy	Non-Smoker	Smoker	Non-Smoker	Smoker	Non-Smoker	Smoker
CC	$12,610	$11,674	$12,302	$11,113	$11,039	$8,367
BB	12,585	12,256	12,360	11,558	10,864	8,866
DD	12,478	12,060	12,002	11,264	10,259	8,486
JJ	11,535	11,141	11,022	10,331	8,838	6,880
FF2	11,242	10,897	10,520	10,110	8,665	7,866
HH	11,227	10,854	10,764	10,275	7,116	7,512
EE	11,195	11,049	10,618	10,335	8,499	7,272
FF1	11,133	10,458	10,346	9,375	8,334	6,246
II	10,876	10,770	10,823	10,439	9,207	8,285
KK	10,866	10,488	10,777	9,917	9,458	7,580
AA	10,810	10,467	10,611	9,915	9,587	7,972
PP	10,736	10,548	10,239	9,743	7,841	6,511
MM	10,532	10,458	10,306	9,983	9,002	7,623
LL	10,511	10,321	10,266	9,826	8,686	7,561
OO	10,102	9,615	9,834	9,111	8,920	7,281
NN	10,048	9,397	9,725	9,152	8,369	7,186
RR	9,745	9,507	9,625	9,052	8,253	6,735
QQ	9,726	9,379	9,362	8,892	7,678	7,074
SS	8,835	8,774	8,798	8,661	7,657	7,131
Average	$10,884	$10,532	$10,542	$9,950	$8,856	$7,497
Range	3,775	3,482	3,562	2,897	3,923	2,620
Standard Dev.	991					
Coef. of Var.	9.1%					

TABLE VI-12

Cash Accumulations on Universal Life Policies
End of Year Ten

	Issue Age					
	25		35		45	
Policy	Non-Smoker	Smoker	Non-Smoker	Smoker	Non-Smoker	Smoker
CC	$34,929	$32,258	$33,860	$29,745	$29,153	$21,051
DD	34,165	33,224	33,016	31,115	28,471	23,797
BB	33,813	32,775	32,756	30,211	27,701	21,604
JJ	32,835	31,752	31,661	29,925	25,951	20,227
HH	31,279	30,285	29,914	28,455	24,445	20,938
KK	31,147	29,905	30,417	27,559	25,565	19,774
PP	31,042	30,425	30,326	28,597	25,280	20,902
EE	30,458	30,056	28,763	27,782	22,567	19,331
LL	29,927	29,289	28,683	27,194	23,400	19,525
MM	29,866	29,459	28,881	27,636	24,182	19,410
AA	29,528	28,503	28,668	26,337	25,241	20,101
II	29,040	28,629	28,523	27,281	23,455	20,585
OO	28,579	27,420	27,498	25,100	24,619	19,561
RR	28,132	27,401	27,259	25,291	22,987	18,186
NN	27,810	26,163	26,543	24,768	21,997	18,463
SS	26,939	26,753	26,420	25,824	21,883	19,910
QQ	26,906	25,926	25,412	24,080	19,814	18,151
FF2			27,211	25,888	25,250	22,611
FF1			26,659	24,485	23,997	17,414
Mean	$30,376	$29,425	$29,077	$27,225	$24,524	$20,081
Range	8,023	7,298	8,448	7,035	9,339	6,383
Standard Dev.	2,456	2,251	2,421	2,080	2,314	1,562
Coef. of Var.	8.08%	7.65%	8.32%	7.64%	9.44%	7.78%

TABLE VI-13

Cash Accumulations on Universal Life Policies
End of Year Twenty

	Issue Age					
	25		35		45	
Policy	Non-Smoker	Smoker	Non-Smoker	Smoker	Non-Smoker	Smoker
CC	$144,120	$131,283	$135,770	$114,613	$109,576	$67,525
JJ	133,592	128,109	124,131	114,550	92,670	61,226
KK	132,826	125,933	126,006	110,629	100,478	68,959
DD	130,979	126,726	123,902	114,409	100,702	78,044
BB	128,843	123,408	120,843	107,521	93,894	66,506
LL	123,260	119,778	114,123	105,612	85,886	62,655
PP	123,060	119,499	120,934	106,377	86,937	65,788
HH	121,023	116,635	111,760	104,063	82,358	63,939
MM	120,756	118,159	114,073	105,999	85,887	59,480
EE	116,514	114,521	106,699	101,295	77,852	63,873
OO	113,650	107,337	107,525	95,481	93,881	70,344
RR	113,550	109,409	94,523	85,329	84,125	59,862
AA	113,485	108,284	107,603	95,970	89,108	66,080
SS	111,387	110,207	104,843	100,921	77,867	66,614
NN	107,058	100,613	98,918	90,344	75,135	60,200
II	104,767	102,264	99,195	93,280	74,700	60,786
QQ	100,316	96,332	90,668	85,396	62,106	55,590
FF2	103,007	97,274	104,613	92,430		
FF1	100,595	89,882	98,940	67,069		
Average	$119,952	$115,206	$110,796	$100,997	$88,248	$66,156
Range	43,804	34,951	45,102	29,284	47,470	36,840
Standard Dev.	11,589	10,295	12,052	9,499	11,890	8,052
Coef. of Var.	9.7%	8.9%	10.88%	9.40%	13.47%	12.17%

7. Like WL policies, but unlike many other savings alternatives, UL policies provide guaranteed minimum rates of interest.

UL policies quote both a current rate and a minimum guaranteed interest rate. In 1983, the gross rate guarantees were in the 3 to 4% range. WL policies also provide guaranteed cash values, with nominal interest rates in the same range. UL policies, however, also typically contain guaranteed maximum term premium rates, whereas the implicit mortality charges in a WL policy are fixed. Hence it may be the case that the guarantees in the WL policies are worth more than those in the UL policies. The significance of this possibly compensating difference is presently unknown.

Universal Life Company Expense Rates

Compared to ordinary ordinary life companies as a group, UL companies that pay competitive rates of return have significantly lower first year agent expenses both as a percentage of premium and in terms of dollars per thousand. The commission structure is also different from the traditional flat percentage of premium structure that has been the rule for more than one hundred years. Commission rates are variable and the percentage declines with increasing premium. Commissions are usually a large (35-85%) percentage of the "target" or "Minimum Allowable Premium" (MAP), but are much smaller on premium dollars generated in excess of the target premium. With a flat commission structure, a doubling of the premium or cash outlay means a doubling of the agent's commission. This may account, in part, for the findings that rates of return on WL policies generally decline with policy size and cash outlay. UL rates of return increase toward the gross rate of return as cash outlay increases relative to insurance coverage. The reason, in part, may be that many UL companies have adopted a sliding commission schedule whose percentage declines with increasing cash outlay or premium. UL companies companies also appear to sell larger policies.

Summary: Universal Life Policies

The new policies, although they have early withdrawal penalties, on the average offer higher rates of return than WL and other Traditional types. Early withdrawal penalties, although not as steep as most on WL, are high enough to make UL rates of return negative in the early years. Variation though large in dollar terms, is low compared to observed variation for WL. Variation is sufficient to make generalization risky. Two of the UL policies had virtually no early withdrawal penalty at all. Some of the WL policies we analyzed compare reasonably well with UL, whereas one of the UL policies had lower rates of return than most WL policies at durations 5 and 10. Comparing UL policies is more complex than comparing WL policies, yet the evidence on variability suggests that the extra complexity may be more than offset by some other factor. It is possible that the explicit emphasis placed on the rate of return in the selling of these products provides an opportunity for policyholders to check more easily on how well their savings dollars are faring.

Chapter VII

Existing Policies Compared With New Policies
The Decision To Replace

While between 14 and 18 million new policies were sold in each of the years 1978 to 1983, there were 8 to 10 times that number of policies in force.[1] As discussed in Chapters IV-VI, many policies offered in 1983 appear to be better buys relative to current interest and mortality rates than policies sold five to twenty years earlier. For many millions of policyholders the question then arises as to whether an existing policyholder would be better off if he or she canceled an existing old policy and replaced it (perhaps even with the same company)[2] with one of the new offerings? This chapter will discuss the advantages and disadvantages of replacing an existing policy with a policy being offered in 1983. The issue is not just of potential importance. It seems very likely that a large number of new sales were actually replacements.

In this chapter we consider the replacement decision: given that an individual has owned a policy for some years, what factors should he or she take into account in deciding whether to continue the old coverage or to

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[1] See the **1984 Life Insurance Factbook**, p. 10 and p. 23. Figures refer to ordinary life insurance purchased and in force in the United States.

[2] Harold Skipper, Jr. concluded that many holders of older non-dividend paying policies would be financially better off if they replaced their older policies with new policies of exactly the same type from the same insurer. See his "Replacement Vulnerability of Older Non-participating Ordinary Life Insurance Policies", **Journal of Risk & Insurance**, XLVII(2), June, 1980, 691-712. By his criteria, he found that all of the policies issued in 1958 were candidates for replacement by policies issued in 1978, so long as the new policies were held for at least 10 ten years. Results were similar for policies issued in 1963 compared to policies newly issued in 1978.

replace it with a new policy? What types of policies are most likely to be good candidates for replacement from an economic point of view? Can a rate of return analysis be used to assist in making a sound decision on whether or not to replace? Are current rates of return for specific durations on new policies, such as those given in Chapters VII and VIII for five and ten years, a good guide to the rate of return you would be giving up if you cancelled your existing policy? Does the timing of a replacement matter, that is, given that you've decided that your current policy is not as attractive as a new policy in the long run, should you replace right away or is there some advantage to "timing" the replacement? Are company's promising or guaranteeing a better deal to attract new policyholders than they are actually providing to existing policyholders?

Replacement May Be A Large Fraction of New Sales

It is very likely that a substantial number of the new purchases, were actually "replacements"; people who canceled or lapsed policies that they had purchased in earlier years and had used some or all the money they had accumulated or would have spent on premiums for the new policy. In 1982[3], for example, 15.6 million new policies were sold, but the number of policies in force at the end of that year, actually **fell** by 3 million. In contrast, between 2 and 4 million more policies were added to the books in every year of the 1970's. Of the 18.6 million policies terminated in 1982, only 1.2 million were terminated because the insured died. Some 14.7 million policies were voluntarily lapsed or cancelled and the remaining 2.7 million policies no longer in force at the end of 1982 must have been term policies whose term had

[3] All figures in this paragraph are taken from the source and pages indicated in footnote one.

expired and were not renewed and endowments that matured. Survey evidence from 1980[4] indicates that about 36% of those households who had dropped a policy in the preceding 12 months, replaced the dropped policy with a new one. If the same proportion of those dropping in 1982 also replaced, then almost 5 million new sales were "replacements." While we do not know the precise extent of replacement activity, it is clearly of substantial importance. In 1983, 17.7 million new policies were sold, but the net increase in policies in force was zero. In contrast with earlier decades, a greater fraction of current policyholders were canceling their coverage and replacing it with new coverage.

Before discussing possible advantages to replacement and the mechanics of computing them, we first briefly mention some general disadvantages to replacement. These apply regardless of the alternative insurance policy selected as a replacement.

Some General Disadvantages To Replacement

There are a number of disadvantages to replacing an existing policy. In the past these were deemed to be sufficiently serious, so as to establish a presumption that replacement was not likely to be in the best interest of the policyholder. Many state regulations regarding replacement activities, were in fact designed to discourage replacements. The basic argument was that replacement would rarely be in the financial interest of the policyholder, since the large "front end" expense, which had already been incurred once, would have to be paid again. If all policies offered about the same benefits for about the

[4] See "Consumer Experiences in the Marketplace", vol. 2, p. 8, a survey sponsored by the American Council on Life Insurance, the Million Dollar Roundtable and conducted by the Life Insurance Marketing and Research Association. In 1980, 14.7 million new policies were sold and the number in force had increased by about 2 million by the end of the year.

same price, then the switch would leave the policyholder worse off. While it now generally agreed that replacement is sometimes in the policyholders interest, the disadvantages are real and important. We list the general disadvantages, those that could apply regardless of the characteristics of the replacing policy, here. Disadvantages that may apply to replacement by a particular policy type will be discussed under that policy type.

1. The policyholder must go through the underwriting process again. Therefore it is unwise to drop an existing policy before you are sure that the new policy is actually available to you at the quoted rates.

2. The policyholder will incur another two year incontestibility period. If you die within the first two years of the new policy, the company can dispute the claim on the basis of false medical information supplied by you. After the first two years, the company cannot contest the claim, even if all the information supplied can be shown to be false.

3. The policyholder will also incur another two year suicide clause period. If your death during the first two years is ruled a suicide, the company does not have to pay. Thereafter it does.

4. Most policies are front end expense loaded, which generally means that benefits relative to premiums paid will be lower in the early policy years than in later years. We provide evidence on this point in this chapter.

5. Tax considerations are highly complex, but will usually be a disadvantage to the surrendering policyholder. Upon surrender, with some exceptions, one is liable for the "taxable gain" built up in the policy. "Taxable gain" is equal to the cash surrender value plus all dividends paid minus the sum of all premiums paid. A life insurance policy may be exchanged, on a tax free basis, for an annuity, endowment or another life insurance policy, provided no

cash or other property is received in connection with the exchange. If the policy were not surrendered, then taxes would be deferred until surrender or until annuity payments are actually made, or avoided completely if policy is held until death.

In view of these disadvantages, a "replacement" policy must be better than, not merely about equal to, the existing policy in order for the replacement to make the policyholder better off.

Enhancing, Not Replacing An Old Policy

One way of self-enhancing an older policy is to make use of the policy loan privilege. Many old policies give the policyholder an option to borrow against the cash value in the policy at an interest rate stipulated in the policy. The rate in many older policies was 5% or 6%. As we have discussed previously, this option can be of considerable value. For a non-par policy, it is a way of enhancing the policy without canceling it. On par policies, the option may have little or no value as an enhancement, if the company reduces dividends by exactly enough to reflect the difference between current market rates of interest and the policy loan rate. Suppose, for example, that a 15 year old non-par policy has an prospective rate of return of 2% annually and that the policyholder is a 30% percent marginal tax bracket. If one borrows against the cash value to the maximum extent, and reinvests the funds at a (taxable) market rate of 10%, one can increase the after tax return from 2% to to 5.5%. This is because the 2% is guaranteed even if you borrow against the policy, and you also receive the after tax difference between the market rate and the policy loan rate (.7 times (10%-5%)) of 3.5%. It should be remembered that your insurance coverage falls dollar for dollar with the policy loan. Clearly, the advantages of borrowing relative to canceling depend heavily on the implicit "inside" rate guaranteed in the contract, as well as the differential between market rates and the contractually fixed policy loan rate. For the sample of ten and twenty year old non-par contracts we analyzed, the inside implicit rate is only about 1%. With short term market rates in the 8% to 9% range during 1983, a policy with a 5% loan rate could only be enhanced by at most 3% to 4% less taxes. This might be insufficient to make retaining the policy financially more rewarding than canceling and investing all the funds at current market rates of interest. Thus, the only to improve one's rate of return may be to cancel and replace with another savings intensive life insurance policy or to buy term and save in institutions outside of the life insurance industry. To understand the potential pitfalls of replacement, as well as the mechanics of using rate of return analysis to help make that decision, one needs to understand how front end loads affect the rate of return on pay in advance policies. To that we now turn.

Front End Loads and Rates of Return

We will show in this chapter that the same technique that we have used in chapters V and VI to compute the rate of return on new policies can also be used to compute rates of return earned on existing policies. However, there is an important difference in the pattern of results that one obtains with policies that have been held for five or more years relative to new policies. Whereas new policies show extreme fluctuations in average rates of return by duration, policies that have been held for some years generally do not. In table VII-1, one year "marginal" rates of return are shown for dividend paying policies issued in 1950, 1960, 1970, using the actual dividends paid in each year between 1950 and 1976 to make the computation. The one year "marginal" rate of return is conceptually similar to a one year rate of return on an ordinary bank account. If one makes a deposit at the beginning of the year and makes no withdrawals during the year, then rate earned on the account is simply the ratio of the ending balance to the beginning balance plu the deposit minus one. The different part is to subtract from the deposit a sum to reflect the cost of the insurance coverage for that year. This is done by multiplying an appropriate term rate by the effective amount coverage in the policy, which is approximately the face amount less the cash value. The second column shows the average rate of return on high grade municipal bonds for each of the calender years 1950 through 1976.

TABLE VII-1

**One Year "Marginal" Rates of Return
Using Actual Dividends Paid
Policies Issued In 1950, 1960 and 1970**

Year	Municipal Bond Rate	1950 Mutual	1950 Stock	1960 Mutual	1960 Stock	1970 Mutual	1970 Stock
1950	2.0%	-85.9%	-84.8%				
1951	2.0%	-21.5%	-53.5%				
1952	2.2%	12.1%	-.3%				
1953	2.7%	7.8%	3.7%				
1954	2.4%	6.7%	3.3%				
1955	2.5%	5.9%	3.5%				
1956	2.9%	5.3%	3.4%				
1957	3.6%	5.2%	3.6%				
1958	3.6%	5.2%	3.6%				
1959	4.0%	5.9%	3.5%				
1960	3.7%	4.3%	3.7%	-84.6%	-94.6%		
1961	3.5%	4.5%	3.7%	-13.4%	-63.1%		
1962	3.2%	4.6%	3.9%	8.6%	10.9%		
1963	3.2%	4.5%	3.8%	6.8%	3.6%		
1964	3.2%	4.6%	3.9%	6.6%	3.5%		
1965	3.3%	4.6%	3.9%	5.4%	3.5%		
1966	3.8%	4.6%	4.0%	5.4%	3.8%		
1967	4.0%	4.6%	4.0%	5.0%	3.9%		
1968	4.5%	4.7%	4.2%	5.1%	3.9%		
1969	5.8%	4.8%	3.4%	5.3%	4.9%		
1970	6.5%	4.1%	3.9%	4.5%	3.9%	-86.7%	-92.9%
1971	5.7%	4.5%	3.9%	4.7%	4.0%	-18.2%	-46.3%
1972	5.3%	4.5%	3.9%	4.8%	4.0%	10.2%	6.6%
1973	5.2%	4.6%	3.9%	4.9%	4.2%	7.5%	5.1%
1974	6.1%	4.6%	3.9%	4.9%	4.3%	6.5%	4.3%
1975	6.9%	4.7%.	4.0%	5.2%	4.3%	6.0%	4.6%
1976	6.5%	4.7%	4.1%	5.0%	4.3%	6.0%	4.8%

Sources: Data from (previously unpublished) FTC survey done in 1977, answer to question 17. For the 1950 issue, 19 mutuals and 5 stocks supplied usable information; for 1960, 21 mutuals and 7 stocks and for 1970, 20 mutuals and 9 stocks. Marginal rates computed by FTC staff using the 1974 Actuaries Term Rates. The muncipal bond "rate" is an average of the yields to maturity of bonds of differing maturity dates and is taken from the 1985 *Economic Report of* **the President.**

The one year rate of return is generally close to **minus** 100%, that is to say, almost the entire deposit is lost as a penalty for early withdrawal.[5] In the second year from 20% to 60% of the deposit is forfeit for early withdrawal. These penalties reflect the company's front end expenses-the agent's commission and the cost of putting the business on the books. Both of these are large expenses which occur at the initiation of the policy. At the end of the third year, however, the marginal rate of return usually turns strongly positive (except for the 1950 stock issues, the range is from 7% to 12%). The rate then usually falls from the third year until around the fifth year it stabilizes at 4% to 6%. If in the long run the policy is designed to pay about 3%, but the early year rates are negative, then the one year rates of return in the middle years will have to be much higher than 3% in order to average out to 3%. Thus, for the average par policy issued by a mutual company in 1950, the marginal rate of return for the third policy year, given that the policy has already been held for two years, was over 12% ! in a year when the market rate on municipal bonds only averaged a little over 2%. For policies issued in 1960, the marginal rate in the third policy year (1962) was almost three times as high as the municipal bond yield to maturity for both the stock and the mutual companies. Thus timing of replacements can be important. It seems highly unlikely that any alternative policy would be as attractive, on a yearly basis, as the third year rate of return provided by a dividend paying policy issued by a mutual company.

Moreover, one can see why prospective 5, 10 or even 20 year average rates of return illustrated **at time of purchase** are likely to be misleading indi-

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[5] First year cash values are generally zero, but some of these policies paid dividends at the end of the first year.

cators of the desirability of replacement. The early negative marginal rates have a strong effect on the average rates for all durations. But given that one has already purchased a policy and held for a number of years, those early losses are irrelevant; they are spilt milk, or sunk costs. Only the future positive rates of return on the existing surrender value matter, and, as shown in Table VII-1, these can be and generally were above current market rates of interest. Thus average rates of return calculated for new policies should not be used to evaluate a potential replacement policy. The average rate of return on a policy that has been in force for a year or two will generally be significantly higher than the same policy's average rate of return at time of purchase.

The sharp fluctuations in one year rates of return also strongly suggests that an average one year rate of return for all existing policyholders, such as the estimates made for 1977 in the previous FTC Report will not be a good guide for "replacement" decisions. Because such an average is heavily influenced by the large negative returns of relatively new policyholders, it is not likely to be a good measure of the actual one year rate of return being earned by people who have held their policies for five years or more. As we shall see, marginal yearly rates of return depend not only on how long the policy has been held, but also on whether the policy pays dividends or not and on the interest rate used in the dividend calculation. The low overall average one year rate estimated for 1977 (between one and two percent) turns out to be representative of non-dividend paying policies issued in 1963 and 1973 that we sampled here, but far below the dividend paying policies.

Keep Existing Policy or Buy ART and Invest the Difference?

We start with an example. Consider the case of a male who bought a whole life policy from a large life insurance company in 1963, when he had just turned 25 years old. Twenty years later, he is considering whether to renew that policy, or whether he should instead buy enough term insurance to maintain his death estate at the current level, and invest the difference between the new premiums plus the cash surrender value in some non-insurance savings media. His projected future situation, as he turns age 45, is shown in Tables VII-2 and VII-3.

TABLE VII-2

An Illustration Showing the Financial Consequences of Replacing a Whole Life Policy Issued in 1963 with Term Insurance Bought at 1983 Rates and Investing the Difference at 6.41% (Taxes Ignored)

Characteristics of Replaced Policy

Age at Issue: 25 Age at Replacement: 45 Sex: Male
Face Amount: $100,000 Annual Premium: $1809
Cash Available at Termination (End of 20th Policy Year):$30,100
Cash Available at End of 40th Policy Year (If Kept): $67,190
Policy Name: Company X: Whole Life

Alternative Policy

Annual Renewable Term to at least age 70: FTC 1983 average Non-smoker Premium Rates Used.

Age	Term Rate	Amount of Insurance	Term Charge	Deposit	Fund at Beginning of Year	Fund at End of Year
45	3.56	$68,334	$243	$31,666	$31,666	$33,696
46	3.88	$66,623	$258	$-319	$33,377	$35,517
47	4.21	$64,921	$274	$-438	$35,079	$37,328
48	4.59	$63,231	$290	$-559	$36,769	$39,127
49	4.99	$61,552	$307	$-679	$38,448	$40,913
50	5.44	$59,889	$326	$-802	$40,111	$42,683
51	5.91	$58,217	$344	$-899	$41,783	$44,462
52	6.42	$56,537	$363	$-999	$43,463	$46,250
53	6.98	$54,855	$383	$-1,105	$45,145	$48,039
54	7.58	$53,174	$403	$-1,213	$46,826	$49,828
55	8.27	$51,493	$426	$-1,321	$48,507	$51,617
56	9.11	$49,814	$454	$-1,432	$50,186	$53,403
57	9.98	$48,137	$480	$-1,540	$51,863	$55,188
58	10.94	$46,463	$508	$-1,651	$53,537	$56,969
59	11.99	$44,798	$537	$-1,767	$55,202	$58,741
60	13.26	$43,151	$572	$-1,892	$56,849	$60,494
61	14.85	$41,538	$617	$-2,032	$58,462	$62,210
62	16.31	$39,950	$651	$-2,160	$60,050	$63,900
63	17.91	$38,390	$688	$-2,290	$61,610	$65,560
64	19.70	$36,859	$726	$-2,419	$63,141	$67,190

Source: Cash values, ordinary and terminal dividends (at 1983 scale) obtained directly from the company that issued the policy.

Notes: Annual premium of the whole life policy includes waiver of premium-hence the rate of return on keeping the policy is slightly understated. Typical waiver of premium rates at the given issue age on a WL policy range from 12 to 20 cents per thousand, so its exclusion would have no material effect on the calculated rate of return.

Suppose, rather than paying the annual premium of $1809 as he turns 45, our man cancels the company X policy and buys term insurance instead. As before, we assume he keeps his annual cash outlay and his death estate the same (as of the beginning of the year). If he cancels, the cash surrender value plus a terminal dividend will be $30,100. The "deposit" into the alternative savings fund will be this amount plus the old premium of $1809, less the premium due for enough term insurance to keep the death estate at $100,000. If he buys $68,334 worth of term insurance, it will cost $243 ($3.56 times 68.334). The deposit will then be $31,666 ($30,100 + $1,809 - $243). Thus, should he die on the first day of the new policy, his death estate would be $68,334 from the insurance company plus the $31,666 in the alternative savings fund, or $100,000. Thus the amount left to his beneficiaries will be the same under either alternative.

At the beginning of the next year, the amount in the alternative savings fund will have grown to $33,696 since it grows at a rate of 6.41%. What "deposit" must be made in this second year in order to keep the annual cash outlay the same as it would have been had the company X policy been kept? If the old policy had been kept, a dividend of $1870 (see Table VII-3, column (3) for dividends paid over the second 20 policy years, according to the 1983 dividend scale) would have been paid at the end of what would have been the 21st policy year. Assuming this dividend would have been used to offset the premium and any remainder taken in cash, our man would have had a cash <u>inflow</u> of $61 instead of an outflow of $1809. (Note: there was also a dividend paid at the end of the 20th policy year, but this would have been recieved regardless of whether the policy was continued or cancelled. Hence the 20th year dividend is irrelevant to the replacement calculation.) It will cost $258 to buy enough term insurance to maintain the death estate at $100,000. Hence the second year "deposit" is actually a withdrawal of $319 ($258+$61). After the withdrawal, the balance in the alternative savings fund is $33,377, so the amount of term insurance required is $66,623.

A similar calculation on the same policy issued ten years later (in 1973) to a man 35 years old is shown in Table VII-4.

Although the method of calculation is exactly the same as used earlier in chapters V and VI, there are some striking differences when this technique is applied to old policies. The first year deposit is very large since it includes the entire cash surrender value of the replaced policy, while with dividend paying policies the later "deposits" will often be negative. The major difference, however, is in the stability of the calculated rate of return. Table VII-5 shows that the prospective rate of return for holding periods from between one and twenty years vary by only one tenth of one percent. Thus on this particular policy, the one year rate turns out to be a good guide to the rate of return over longer durations. The reason for this is indicated in Table VII-3.

TABLE VII-3

**Rates of Return
to Keeping the Whole Life Policy
for One Additional Year**

Characteristics of Existing Policy

Age at Issue: 25 Age at First Calculation: 45 Sex: Male
Face Amount: $100,000 Annual Premium: $1809
Cash Available at Termination (End of 20th Policy Year):$30,100
Cash Available at End of 40th Policy Year (If Kept): $67,190
Policy Name: Company X: Whole Life

Alternative Policy

Annual Renewable Term to at least age 70:_FTC 1983 average
Non-smoker Premium Rates Used.

Age	Cash Value	Divi-dend	CV + Div'd	Term Amount	Term Charge	Term Rate	Marginal ROR
45	$31,800	$18.70	$33,670	$68,334	$243	3.56	6.33%
46	$33,500	$19.73	$35,473	$66,649	$258	3.88	6.36%
47	$35,100	$20.78	$37,178	$64,965	$274	4.21	6.12%
48	$36,800	$21.81	$38,981	$63,382	$291	4.59	6.45%
49	$38,400	$22.85	$40,685	$61,699	$308	4.99	6.22%
50	$40,200	$23.64	$42,564	$60,118	$327	5.44	6.72%
51	$41,900	$24.45	$44,345	$58,336	$345	5.91	6.43%
52	$43,600	$25.31	$46,131	$56,655	$364	6.42	6.43%
53	$45,200	$26.19	$47,819	$54,975	$384	6.98	6.21%
54	$47,000	$27.04	$49,704	$53,396	$405	7.58	6.65%
55	$48,700	$27.87	$51,487	$51,618	$427	8.27	6.42%
56	$50,400	$28.69	$53,269	$49,946	$455	9.11	6.42%
57	$52,000	$29.52	$54,952	$48,273	$482	9.98	6.23%
58	$53,800	$30.39	$56,839	$46,702	$511	10.94	6.64%
59	$55,500	$31.29	$58,629	$44,930	$539	11.99	6.46%
60	$57,100	$32.24	$60,324	$43,265	$574	13.26	6.33%
61	$58,700	$33.18	$62,018	$41,710	$619	14.85	6.40%
62	$60,400	$34.11	$63,811	$40,146	$655	16.31	6.61%
63	$62,000	$35.02	$65,502	$38,480	$689	17.91	6.47%
64	$63,600	$35.90	$67,190	$36,918	$727	19.70	6.51%

Sources and Notes: See TABLE VII-2.

TABLE VII-4

An Illustration Showing the Financial Consequences of Replacing a Whole Life Policy Issued in 1973 with Term Insurance Bought at 1983 Rates and Investing the Difference at 6.49% (Taxes Ignored)

Characteristics Of Replaced Policy

Age at Issue: 35 Age at Replacement: 45 Sex: Male
Face Amount: $25,000 Annual Premium: $580
Cash Available at Termination (End of 10th Policy Year):$4,475
Cash Available at End of 30th Policy Year (If Kept): $15,276
Policy Name: Company X: Whole Life

Alternative Policy

Annual Renewable Term to at least age 70: FTC 1983 average Non-Smoker Premium Rates Used.

Dividend	Age	Term Rate	Amount of Insurance	Term Charge	Deposit	Begin Yr Fund
$9.67	45	5.56	$20,056	$111	$4,944	$4,944
$10.65	46	5.92	$19,512	$115	$223	$5,488
$11.67	47	6.33	$18,962	$120	$194	$6,038
$12.67	48	6.81	$18,408	$125	$163	$6,592
$13.68	49	7.35	$17,847	$131	$132	$7,153
$15.43	50	7.92	$17,282	$137	$101	$7,718
$17.20	51	8.57	$16,730	$143	$51	$8,270
$19.04	52	9.25	$16,193	$150	$1	$8,807
$20.88	53	9.99	$15,674	$157	$-52	$9,326
$22.71	54	10.81	$15,174	$164	$-106	$9,826
$23.70	55	11.71	$14,696	$172	$-160	$10,304
$24.67	56	12.74	$14,221	$181	$-193	$10,779
$25.65	57	13.85	$13,749	$190	$-227	$11,251
$26.68	58	15.10	$13,280	$201	$-262	$11,720
$27.75	59	16.46	$12,817	$211	$-298	$12,183
$28.84	60	17.97	$12,363	$222	$-336	$12,637
$29.91	61	19.77	$11,919	$236	$-376	$13,081
$30.97	62	21.60	$11,486	$248	$-416	$13,514
$32.01	63	23.62	$11,064	$261	$-455	$13,936
$33.02	64	25.85	$10,655	$275	$-495	$14,345

TABLE VII-4, Continued

	Att'd Age 45		Term Pol Name ns-25	Preceding Cash Value $4,475		
Begin Yr Fund	**End Year Fund**	**CV Per Thous.**	**Cash Value**	**CV + Div'd**	**Term Amount**	**Term Charge**
$4,944	$5,265	$200	$5,000	$5,242	$20,056	$111
$5,488	$5,844	$220	$5,500	$5,766	$19,535	$116
$6,038	$6,429	$241	$6,025	$6,317	$19,040	$121
$6,592	$7,020	$261	$6,525	$6,842	$18,521	$126
$7,153	$7,617	$282	$7,050	$7,392	$18,027	$132
$7,718	$8,219	$303	$7,575	$7,961	$17,508	$139
$8,270	$8,807	$324	$8,100	$8,530	$16,990	$146
$8,807	$9,379	$345	$8,625	$9,101	$16,472	$152
$9,326	$9,931	$366	$9,150	$9,672	$15,954	$159
$9,826	$10,463	$388	$9,700	$10,268	$15,437	$167
$10,304	$10,972	$408	$10,200	$10,793	$14,894	$174
$10,779	$11,478	$427	$10,675	$11,292	$14,403	$183
$11,251	$11,981	$446	$11,150	$11,791	$13,938	$193
$11,720	$12,480	$466	$11,650	$12,317	$13,473	$203
$12,183	$12,973	$485	$12,125	$12,819	$12,983	$214
$12,637	$13,457	$504	$12,600	$13,321	$12,520	$225
$13,081	$13,930	$522	$13,050	$13,798	$12,058	$238
$13,514	$14,391	$542	$13,550	$14,324	$11,621	$251
$13,936	$14,840	$560	$14,000	$14,800	$11,133	$263
$14,345	$15,276	$578	$14,450	$15,276	$10,696	$276

In Table VII-3 we show the rate of return on holding or keeping the policy one more year. Following James Hunt (1984), we call these "marginal rates of return" to distinguish them from the longer duration (e.g. the average annual rate of return earned on holding this policy for another 20 years of 6.41% as shown in Table VII-2) rates of return. To compute these one year "marginal" rates of return we proceed exactly as we have above and in preceding chapters. The one year marginal rate and the average rate of return for duration "n" are the same for duration "1". If the policy is kept for one more year, starting at age 45, and then cancelled at the end of the year, the cash surrender value plus ordinary and terminal dividends will amount to $33,670. Thus, my "deposit" of $31,666 (which is the same calculation as in Table VII-2) must grow to this amount by the end of the year or by ($33,670/$31,666 - 1) 6.3%. The calculation at age 46 is similar. If I canceled just prior to attaining age 46, the cash value plus terminal dividend would be $31,800. (Remember that I receive the $1870 annual dividend whether or not I keep the policy for another year so it doesn't count against the cash outlay.) If I pay $258 for $66,649 worth of term coverage, then my deposit will be $33,351 ($31,800 + $1,809 - $258). If I cancel at the end of 22nd policy year, the cash value plus all dividends will be $35,473. Hence my deposit in an alternative savings fund would have to grow by 6.36% to generate the same fund by the end of the year. The same calculations are made for each of the policy years 21 through 40 and the results shown in column (8). The reason for the stability in these annual rates is that the implicit annual expense charge is a fairly uniform percentage of the annual deposit. This is in marked contrast to the first few years of the normal whole life policy, where the annual expenses begin at 100% of the deposit and then decline fairly rapidly, once the "front end expenses" have been paid. The stability of the marginal rates shown in Tables VII-3 and VII-4 applies to one policy at two different issue ages. The results given in Tables VII-5, VII-6 and VII-7, however, show that the rates of return on all policies examined exhibited little variation between the one year marginal rates and the average annual rates computed over 5, 10 and 20 years.

TABLE VII-5

Average Rates of Return On Dividend Paying Whole Life Policies Issued In 1963

Company/Policy	Age at Issue: 25 — If cancel at age 45 the rate of return after:	Age at Issue: 45 — If cancel at age 55, the rate of return after:
X Whole Life $100,000		
One year will be	6.3%	6.7%
Five years will be	6.3	6.4
Ten years will be	6.4	6.4
Twenty years will be	6.4	---
Y Whole Life Paid up at 90 $10,000		
One year will be	6.0%	6.4%
Five years will be	6.1	6.4
Ten years will be	6.2	6.3
Twenty years will be	6.2	---
XX Whole Life $25,000		
One year will be	6.6%	6.3%
Five years will be	6.3	6.5
Ten years will be	6.3	6.5
Twenty years will be	6.2	---
YY Whole Life $25,000		
One year will be	9.7%	10.0%
Five years will be	9.7	10.0
Ten years will be	9.8	10.0
Twenty years will be	9.8	---

TABLE VII-6

Average Rates of Return On Dividend Paying Whole Life Policies Issued In 1973

	Age at Issue		
	25	35	45
Company/Policy	If cancel at age 35,the rate of return after:	If cancel at age 45, the rate of return after:	If cancel at age 55, the rate of return after:
X WL $25,000			
One year will be..	5.4%	6.0%	6.5
Five years will be	6.1%	5.8%	6.9
Ten years will be	6.4%	6.3%	7.1
Twenty years will be	6.5%	6.5%	---
Y WL Paid-Up @90 $25,000			
One year will be..	7.3%	7.2%	8.0
Five years will be	7.0%	7.0%	7.7
Ten years will be	6.8%	6.8%	7.5
Twenty years will be	6.6%	6.7%	---
XX WL $25,000			
One year will be..	5.0%	5.5%	5.9
Five years will be	5.5%	5.7%	6.7
Ten years will be	6.3%	6.5%	7.0
Twenty years will be	6.4%	6.6%	---
YY Whole Life $25,000			
One year will be..	8.9%	9.8%	10.0
Five years will be	9.2%	9.9%	10.3
Ten years will be.	9.3%	10.0%	10.3
Twenty years will be	9.4%	10.0%	---
Extraordinary Life $25,000			
One year will be..	10.2%	10.2%	10.3
Five years will be	10.2%	10.2%	10.4
Ten years will be	10.1%	10.2%	10.4
Twenty years will be	10.1%	10.2%	---

TABLE VII-7

One Year 1983 "Marginal" Rates Of Return On Nondividend Or Guaranteed Cost Whole Life Policies Issued In 1963 And 1973

	Year Issued			
	1963		1973	
	Face Amount		Face Amount	
Company/Policy	$25,000	$100,000	$25,000	$100,000
AAA				
WL				
Issue Age-25	1.03%	1.06%	1.02%	1.03
Issue Age-35	1.02%	1.02%	1.03%	1.03%
Issue Age-45	------	------	1.03%	1.03%
BBB				
WL				
Issue Age-25	1.02%	1.02%	1.02%	1.03
Issue Age-35	1.02%	1.02%	1.03%	1.03%
Issue Age-45	------	------	1.03%	1.03%
CCC				
WL				
Issue Age-25	1.01%	1.01%	0.98%	0.97
Issue Age-35	1.01%	1.01%	0.99%	0.99%
Issue Age-45	------	------	1.00%	1.00%
DDD				
WL				
Issue Age-25	1.02%	------	0.97%	0.96
Issue Age-35	1.02%	------	0.99%	0.98%
Issue Age-45	------	------	1.00%	0.99%

Source: **Best's Flitcraft Compend** for appropriate years. We do not if some or all of these policies were unilaterally enhanced by the issuing company.

TABLE VII-8

Replace 1963 Company X Whole Life
With AA's Universal Life

Company:- AA   Policy: UL

Face Amount	Annual Premium	Current Int Rate	Guar Int Rate	Age at Issue	Sex Guar Fac
$100,000	$1809.00	11.00%	4.00%	45	Male

First Year Expense			Renewal Expense		
Premium Load	Mthly Per M	Mthly Per Policy	Premium Load	Mthly Per M	Mthly Per Policy
7.50%	9 cents	$21.00	$0	$0	$0

Mthly Curr Rte	Mthly Guar Rte	Annual Factor	Annual Diff	Smoker?	Add'l 1st Deposit
.873%	.327%	12.70	.541%	No	$30,100

Age Attned	Mthly Term Rate	Annual Expense	Mthly Expense	Begin Balance	End Balance
45	.24	$2529	$54	$31,736	$32,008
46	.26	$136	$26	$33,681	$36,991
47	.28	$136	$28	$38,664	$42,493
48	.31	$136	$31	$44,166	$48,566
49	.33	$136	$33	$50,240	$55,272
50	.36	$136	$36	$56,945	$62,683
51	.38	$136	$38	$64,356	$70,885
52	.41	$136	$41	$72,558	$79,944
53	.45	$136	$45	$81,617	$89,950
54	.50	$136	$50	$91,624	$101,004
55	.52	$136	$52	$102,678	$113,243
56	.57	$136	$57	$114,916	$126,768
57	.62	$136	$62	$128,441	$141,713
58	.68	$136	$68	$143,386	$158,228
59	.74	$136	$74	$159,901	$176,479
60	.81	$136	$81	$178,152	$196,651
61	.89	$136	$89	$198,325	$218,946
62	.97	$136	$97	$220,620	$243,589
63	1.06	$136	$106	$245,263	$270,829
64	1.16	$136	$116	$272,502	$300,939

The Effect of Federal Taxes

Thus far, taxes of all types have been ignored. For the case we have been considering, we can compute the "taxable gain" to the surrendering policyholder, that is, the basis on which federal taxes will be computed. The actual amount of tax due will, of course, depend on the marginal tax bracket appropriate to the individual in question. The "taxable gain" is defined to be the cash surrender value plus the sum of all dividends paid (including the terminal dividend, if any), minus the sum of all premiums paid. For the example detailed in Table VII-3, the taxable gain at the end of the first 20 years is equal to the difference between the sum of the cash surrender value[6] ($30,100) and all dividends paid ($14,377), and the sum of all premiums paid ($36,180), or a taxable gain of $8,297. If the policy were held to retirement and then canceled, not only would the taxes be deferred, but they would also likely be at a lower rate to reflect one's lower retirement income. It is even possible that taxes could be avoided altogether by converting the surrender value into a life annuity. In any case, since taxes can at be deferred, tax considerations will generally be disadvantageous to replacement.

Having explored one policy in detail, we now examine the results for several policies issued by very large companies.

Whole Life Policies Issued In 1963 and In 1973

Tables VII-5 through VII-7 present the rates of return one would have to earn on an alternative investment to do just as well as by canceling the older policies in 1983 as by keeping them. The tables ignore tax considerations. Rates are presented separately for dividend and non-dividend paying policies.

The results for policies that pay dividends are very different for those

[6] Including the terminal dividend.

that don't. The par policies for both issue years paid average rates of return of 5% or better, regardless of holding period and one policy paid about 10%. The non-par policies, however, paid only about 1% per year. From a financial point of view, the YY policy was clearly not a good candidate for replacement, the other par policies were probably not and the non-par policies certainly were.

Keep or Replace With Universal Life

We now turn to consider some of the financial advantages and disadvantages of replacing a traditional whole life policy with a universal life policy. We return once again to the company X policy issued in 1963, and ask what would happen if, at the end of twenty policy years, the man surrenders the company X policy and puts all his money into company AA's universal life policy (see Chapter VIII, tables 2 and 3). There are a great many possibilites as to how much insurance he buys in each year and how much cash he chooses to put out each year. Table VII-8 shows the results if the man (a) always buys $100,000 of insurance coverage and (b) maintains an annual cash outlay of $1809 and (c) puts all of his cash surrender value into the universal life policy. While a reasonable alternative, it should be noted that this strategy involves a larger death estate at every age than the man's beneficiaries would receive if he kept the Company X policy. Thus, if he died at the end of the first year, his beneficiary would receive $132,008 from AA rather than the $100,000[7]. By the end of the second (AA) policy year, the cash surrender value of the AA policy

[7] A better comparison is to the case where if he keeps the company X policy, he accumulates the dividends at the 8% this company was paying in 1983. Then the death estate would be the face amount plus the accumulated dividends. At the end of the first year, these would add $1,870; by the end of the 15th year (age 59), $65,088 etc.

exceeds that of the Company X policy and thereafter the difference continues to grow. The reason is clear; once the front end expense is overcome, the AA accumulation is growing at about 10% compared to 6% for the Company X policy. Thus by the 15th year, the surrender value of the AA policy is $176,497 compared to $58,629 (or to $165, 088 if dividends are accumulated at 8%) if the Company X policy is kept. Thus, while the replacement is not financially advantageous in the first year (where the rate of return is 1.44%), thereafter it is (the average rate of return is almost 9% after 5 years, 10% after 10 years and close to 11% after 20 years. This outcome could have been predicted from the results of Chapter VIII since the the 20 year rate of return on policy AA was shown to be about 10%. The 20 year rate on the replacement is higher than the rate shown in Chapter VIII because the first year cash outlay in this example is very high relative to that years cost of insurance. This means that more of the accumulated dollars in any given year are earning interest at the gross rate of 11%.

Thus if one ignores the disadvantages of replacement and considers holding periods of ten years or longer, then all but company YY's policys are candidates for replacement. The non-par policies were candidates for replacement for any holding period longer than one year. For holding periods of five years or less, all of the dividend paying policies have rates of return greater than the average rate for UL policies (see Table VIII-5), but here one must be careful. The rate of returns shown in the last chapter were premised on a constant annual outlay of $2,000. As we have already discussed, the implicit rate will approach the gross rate as the ratio of cash outlay to the cost of insurance increases. Thus replacing with UL will be more economically attractive than it might appear from the five year UL rates shown in Chapter VIII.

While rate of return figures based on particular cash outlays, face amounts, etc. can be helpful in deciding whether one's policy is a candidate for replacement by another policy with a higher rate, precise answers will still require the explicit matching of one policy directly against another.

All the elaborate calculations shown above are premised on the current rate of interest remaining the same over long periods of time. Perhaps the safest statement we can make about the future course of interest rates is that future rates will be different from present rates. So once again, what really matters in the replacement decision is how the implicit rate of return on either the old or a new policy will change when market rates change. If money market rates fall faster than dividend rates (because company dividend philosophy dictates portfolio averaging), then maintaining an existing policy may be better than replacing and receiving only the current money market rate. Unfortunately, very little is known about either past or present dividend practices of life insurance companies, so, at present, one cannot make an informed judgement on this question.

Summary

We have shown how rate of return analysis can be useful for deciding whether to replace existing coverage and what to replace it with. It is important to understand, however, that rates of return on existing policies are likely to be higher than the prospective rate of return on the same policy before purchase. This is a consequence of the front end expenses incorporated in most pay in advance policies. Rates of return of return to keeping policies issued 10 and 20 years ago by eight of the largest life insurance companies were calculated. The results were very different for dividend and non-dividend paying policies. For the latter, rates were close to one percent per year, for the former, three out of four companies were providing rates of return at around 6% and one at about 10%. Current rates of return offered on some new policies, especially UL policies, suggest that all but the last are candidates for replacement.

Chapter VIII

Extensions of the Basic Economics of Life Insurance: Implications for the Pricing of Policies[1]

Under certain idealized conditions, the performance of a whole life policy, which combines insurance protection and savings into a single bundle, can be replicated by purchasing its individual components separately--by buying annual renewable term (ART) insurance and investing the difference in premiums in a side fund earning the marketrates of interest. Under these conditions, a perfectly competitive life insurance market would set the price of the bundle equal to the sum of the prices of the individual components.[2] Specifically, if one were to impute the cost of an equivalent amount of ART insurance to the pure insurance component of the whole life policy, then the implicit rate of return paid on the savings component of the whole life policy would equal the market rate of interest. In other words, the Linton yield calculated for any holding period would equal the market rate of interest. This requires that the pattern of cash value build-up in a whole life policy be identical to the

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[2] A "perfectly competitive" industry would be characterized by free entry and exit of firms. Consumers would choose the contract they most preferred from the set of all contract offers; each firm would offer the set of contracts that maximized its profits given the contract offers of other firms; and each firm would make zero expected economic profit. See Winter (1981) and Mayers and Smith (1982) for further discussion of the nature of competitive equilibrium in insurance markets.

pattern of accumulation in the replicating side fund.[3] In this idealized competitive market, all whole life policies would be priced so that their Linton yields were identical and this common Linton yield, in turn, would equal the yield on equivalent savings instruments available in the marketplace.

The present study has attempted to empirically assess the workings of actual life insurance markets in the United States by drawing on the theoretical equivalence between a strategy of buying whole life insurance (or, more generally, savings-intensive life insurance policies) and a strategy of buying ART insurance and investing the difference in premiums in a side fund. The average cost of ART insurance observed in the marketplace has been used to impute the cost of the pure insurance component of savings-intensive policies. And, then, the implicit rate of return paid on a sample of whole life and universal life policies has been calculated. The calculated rates of return or Linton yields were compared to the yields observed on numerous savings instruments also available in the marketplace. The empirical evidence on the actual pricing of savings-intensive life insurance policies presented in the previous chapters is apparently at odds with the theoretical picture that has been

[3] This result follows since, as Winter (1981; 94) points out, a whole life policy can be viewed as a combination of "pure" life insurance and insurance against the event of withdrawal from the policy (i.e., surrender). With purely probabilistic surrender, insurance companies that provided cash values less (greater) than the net level premium reserves would be driven by competition to lower (raise) their premium. At the competitively implied trade-off between cash values and premiums, however, risk-averse consumers would prefer to fully insure against the possibility of surrender. They would prefer, in other words, that cash values be set equal to the net level premium reserves and they would then be willing to pay the net level premium for the policy. The net level premium must be calculated on the basis of the current interest rate and the actual mortality rates. The assumption of purely probabilistic surrender means that the likelihood of a policyowner surrender is independent of contract terms and, in particular, market interest rates. Under the assumed circumstances, moreover, this stream of cash values would not expose the insurance company to any additional risk since interest rates are assumed to be known for certain and there are no selling or administrative costs.

painted of the workings of a competitive life insurance market.[4] For example, the average Linton yield calculated for a sample of non-participating and participating whole life policies appears to be much less than the yield that could be obtained on alternative savings instruments (e.g., Treasury bills, Treasury bonds, or money market instruments). In addition, the Linton yields calculated for samples of whole life and universal life policies show significant variation for any particular holding period (e.g., 1, 5, 10, or even 20 years), as well as variation from one holding period to the next.

If taken at face value--as representing true variation in an underlying price analogous to observing significant price variability for a homogenous product in any other market--then the empirical evidence presented in earlier chapters would suggest:

(1) a lack of price competition within the life insurance industry, both across policy types and across companies for the same policy type; and,

(2) a lack of price competition between life insurance products with a savings component and comparable savings instruments offered by other industries.

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[4] Prior to the presnt study, the most comprehensive and well-documented study of rates of return on savings-intensive policies was the Federal Trade Commission (FTC) 1979 Staff study entitled Life Insurance Cost Disclosure. Consumers Union (1980) also presents data on the distribution of Linton yields for a large sample of whole life policies. Other empirical studies have attempted to measure the extent of variability in different indices of "cost" or "price" for alternative life insurance products and have found significant dispersion (i.e., more dispersion than the authors of the studies believe would exist in a competitive market). Early studies of price dispersion include Belth (1961, 1966, 1968). However, not all authors find excessive "price" dispersion. See Winter (1981) who finds empirically that the variation in adjusted premium is quite small. Also, see Walden (1985) who finds that much of the variation in the "price" of whole life policies can be explained statistically by policy and company characteristics.

If accurate, these findings would have important implications for public policy.[5]

Acceptance of these conclusions, however, depends critically upon the adequacy of the Linton yield technique for assessing the effectiveness of price competition. Two potential problems arise. The first problem one encounters in using this approach to assess the market pricing of savings-intensive life insurance policies is that it requires that the Linton yeilds be compared to the rates of return on equivalent savings instruments. However, finding an equivalent instrument and making a proper comparison is likely to be difficult since savings-intensive life insurance policies contain various attributes, options, and guarantees that not only are valuable to the policyowner but also are costly for insurers to provide, which cannot be easily repliated by available alternative savings instruments. For example, non-participating whole life policies carry guarantees with respect to the rate of return that will be paid on the policy and couple these guarantees with an option allowing the policy owners to surrender the policy for its cash value. The minimum rate of return guarantee provides important protection in environments of falling interest rates while the surrender option provides a valuable option in environments of rising interest rates. Such guarantees and options are not available on alternative savings instruments, such as Treasury bills or

[5] At one level these would be surprising conclusions since structurally, at least, the case for effective price competition in the life insurance industry would seem to be quite strong. There is a large number of firms offering life insurance policies; concentration ratios are low to moderate; there is evidence of low barriers to entry; and there is a lack of evidence of marginal firms earning economic rents. In 1983, for example, there were over 2000 firms licensed to sell insurance in the United States. Also, over the last 30 years new entrants have ranged between 50 and 216 per year while exiting firms have ranged between 11 and 104 per year. See Mayers and Smith (1985, pg. 12). Information problems rather than structural problems would be the more likely source of difficulty.

Treasury bonds. In addition, many whole life policies offer a loan option whereby the policyowner can borrow against the accumulated cash value at a maximum loan rate which is guaranteed in the contract. With rising interest rates, this option enables the policyowner to leverage the rate of return earned on the savings element of the policy above the rate being paid directly on the policy. Again, this option is not available on alternative savings instruments.

Under the idealized conditions of Chapter II, including certainty about future rates of interest, these options and guarantees would have no value to the policyowner and/or would be costless for the insurer to provide. As a result, savings-intensive life insurance policies would be conceptually equivalent to term insurance plus generic savings. Under realistic conditions, however, these options are valuable and costly to provide. To illustrate, a non-participating whole life policy with a guaranteed maximum loan rate of 5 percent is more valuable, all other things the same, than one guaranteeing a maximum loan rate of 8 percent. It is also more costly for the insurer to provide since he only earns the loan option on funds that are borrowed under the loan options. Under competitive conditions these policies would be priced so as to reflect the relative values of their respective loan options. When appropriately priced, their implicit rates of return also would be less than the rate of return available on a savings instrument that did not contain equivalent options.

In the absence of alternative savings instruments that are equivalent to the savings element in the life insurance policies being analyzed, rates of return cannot be meaningfully compared as a measure of the effectiveness of price competition unless the particular package or bundle of options contained in the policy has been properly valued. Since the Linton yields have <u>not</u> been adjusted to account for the value and cost of the various options and guarantees provided, caution must be exercised when comparing the distribution of measured Linton yield with various proxies for "the" market rate of interest. Along the same lines, it must be recognized that variation in the distribution of measured Linton yields could simply reflect spurious variation since the relative value and cost of alternative option packages have not been accounted for.

The second problem one encounters in using this approach to assess the effectiveness of price competition is that it relies on measures of average or standard experience drawn from the term insurance market to impute the mortality cost and the selling and administrative expense component of the savings-intensive policy. This imputation of <u>average</u> experieince to all policies will be inappropriate if insurers specialize in different segments of the overall market and the actual mortality and expense experiences--the cost of providing life insurance to these segments of the market--differ significanntly from industry averages. In this case, measuring implicit rates of return using average experienced to price othr components of the savings-intenstive policy can introduce spurious variation into the distribution of measured Linton yields.

To the extent these flaws in the assessment technique are significant, the empirical evidence simply may reflect the extent to which actual conditions in competitive life insurance markets deviate from the idealized conditions, signifiying little, if anything, about the extent of effective price competition.[6] In this case, the empirical evidence would suggest:

(1) the presence of differences in product design--differences in policy attributes, options, and guarantees--that effectively differentiate the polices from one another and from alternative savings instruments; and

(2) the presence of underlying cost differences in market segments and, hence, company experiences (e.g., mortality or selling and administrtive expenses) that are reflected, even under competitive conditions, in policy prices and contract terms.[7]

These findings, of course, would call for a different set of public policy responses than the findings of market failure due to ineffective price competition.

In order to examine the possibility that the empirical evidence is consistent with the workings of a competitive life insurance market, it is necessary to relax the extreme assumptions of the idealized model under which saving-intensive life insurance policies are equivalent to buying ART insurance and

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[6] Winter (1981) has pointed out that certain indicies of "price," such as the interest adjusted net cost, would show variation under competitive conditions except under extreme mortality and surrender assumptions.

[7] It is important to keep in mind that there are two empirical issues involved here--variation in Linton yields across polices and a low average Linton yield. Some factors, such as differential mortality selection, may help to explain the variability in yields but not the low average yield. Other factors, such as valuable policy options that do not vary from, say, one whole life policy to another, may help explain the low average yield relative to other savings instruments without the option but not the variability in yields.

investing the difference in premiums in a side fund.[8] The remainder of this chapter is devoted to this task.[9] It examines the implications of a more realistic and complex view of life insurance products for the workings of competitive life insurance markets, especially with regard to the competitive pricing of alternative policies. Both product design differences and company experience differences are considered.[10]

Differences in Product Design

Life insurance policies may not be homogeneous because of differences in policy features, especially differences in the explicit and implicit options and guarantees provided by the policies. The presence of options and guarantees in savings-intensive life insurance products that are valuable to the

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[8] Recall that the assumptions used to establish the simple equivalence relation presented in Chapter II are: 1) age-specific mortality rates are known and, aside from age, there is no other basis for selection; 2) surrender rates are purely probabilistic, independent across policyowners, and unrelated to policy terms; 3) there are no costs other than claims costs; 4) future interest rates are known for certain and are equal to the current rate of intrest; and 5) individuals and companies have access to the financial markets on the same terms.

[9] The discussion that follows draws on and extends the work of Hite (1980), Winter (1981), Smith (1982), Mayers and Smith (1982), and Mackay (1984).

[10] Early recogniztion of the potential of these factors is contained in the "Report to the National Association of Insruance Commisioners Life Insurance Cost Comparisons (C3) Task Force: Research Project Number 5," prepared by The American Life Insurance Association, 1974. To the extent that the low average Linton yield and the variation in these yields can be explained by these considerations, other pieces of empirical evidence regarding the apparent lack of price competition are also called into qustion. For example, it has been alleged that life insurance consumers do little search despite apparently large differences in policy costs (or rates of return). It has also been alleged that high cost (or low rate of return) policies compete successfully with low cost (or high rate of return) policies. Both these allegations, however, start from the same premise--the measured variation in Linton yields reflects a true and meaningful variation. As a result, these are not independent pieces of empirical evidence; instead, they are linked directly to the underlying and key issue of how one assesses the adequacy of price competition in this market.

policyowner and costly for the insurer to provide could explain, at least in part, why Linton yields appear to be low relative to other savings instruments. The conventional Linton yield calculation considers only three features of the life insurance contract -- premiums, dividends, and terminal cash value. As a result, it ignores valuable and costly options and guarantees contained in the life insurance contract. By ignoring the value of options and guarantees, the Linton yield calculation overstates the implicit amount of savings each period and, hence, understates the rate of return paid on the savings element. To the extent other savings instruments do not contain the same set of options and guarantees, a comparison of Linton yields to rates of return on these instruments would be biased against the life insurance-product. Similarly, variation in the package of options and guarantees offered by different life insurance policies potentially could explain the measured variation in Linton yields across alternative policies and policy types.

Some of the relevant options and guarantees that must be considered in evaluating the pricing of whole life or endowment contracts in the U.S. would include:[11]

a. Interest rate guarantees a surrender option whereby the policy can be surrendered for its cash value;

b. A loan option whereby nearly all the cash surrender value can be borrowed at a rate of interest that may be subject to a contractual maximum;

[11] This list is meant to be suggestive rather than exhaustive. For example, many policies contain a provision for the waiver of premium in the event of disability. This feature is automatically included in some policies and available as an optional rider in others. The waiver of premium option is also not standardized. Both of these factors create difficulties for the interpretation of rate of return calculations. See Society of Actuaries (1974) for further discussion of this point.

c. For participating policies, different implicit guarantees regarding the rate of return that will be paid on the policy as implied by the level of dividends illustrated in the contract and the companies' dividend practices;

d. A nonforfeiture or conversion option whereby the policy can be surrendered for paid-up insurance, extended term insurance, or an annuity with the annuity rates guaranteed in the original contract;[12]

e. A renewal guarantee;

f. Guaranteed renewal premiums;

g. A guaranteed insurability option conveying the right to buy additional coverage at guaranteed rates at specified dates;

h. Optional modes of receiving a death claim; and

i. For participating policies, optional modes for receiving dividends with guarantees built into the options.

The importance of these options and guarantees in contributing to the value of a life insurance contract has been clearly articulated by Michael Smith (1982):

> "(A) life insurance contract is a package of options that is not precisely duplicated by any other combination of commonly available financial contracts."[13]

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[12] In some cases the annuity option may simply specify that the policyowner may convert to an annuity at the net rates in effect by the insurer at the time of conversion as consumers should be first. As Consumers Union (1980) noted, the annuity rates guaranteed also may vary significantly from policy to policy.

[13] Smith (1982; 583).

"Each of these options will contribute to the market value of the contract although the value of a particular option will depend on circumstances faced by the policyowner or beneficiary. The options provide an opportunity to select against the insurer, and policyowners should be expected to exercise the options in their own best interest."[14]

* * *

"Options in a life insurance contract form an important part of the package of benefits provided by the policy. Recognizing the value of the options rather than ignoring them provides a better estimate of the return on the contract to policyowners and the risks assumed by the insurer."[15]

The analysis that follows addresses three of the more important options and guarantees in some detail, pointing out their likely implications for the pricing of policies in a competitive life insurance markets.[16]

The Surrender Option and Interest Rate Guarantees

Under the idealized conditions assumed in Chapter II, certain unique features of the life insurance contract--surrender options and interest rate guarantees--either would have no value to the policyowner or else would be costless for the insurer to provide. To see this point, recall that with no costs other than claims costs (i.e., no selling and administrative expense), with known interest rates, with probabilistic surrender, and with risk averse consumers, competition would set premiums equal to the net level premiums and

[14] Ibid., p. 585.

[15] Ibid., p. 598.

[16] The remaining sections draw on Smith (1982) and Mackay (1984). The renewal option and guaranteed renewal rates are discussed by Smith (1982; 584). To date, the only attempt to empirically test the options view of the pricing of life insurance policies has been conducted by Walden (1985). He finds empirical support for the options view in the sense that product characteristics and company characteristics statistically explain much of the variation in product "price" (i.e., the present value of premiums) for the sample of whole life policies studied.

cash values equal to the net level premium reserves.[17] Competition, in other words, would cause the policy to be priced so that its implicit rate of return, or Linton yield, equaled, at every duration, the market rate of interest. This contract would not only provide the desired death benefit, it would also fully insure the (risk-averse) policyowner against the risk of premature withdrawal from the policy (i.e., surrender). And, in the event of surrender, there would be no cost imposed on the company, since the cash values precisely equal the difference between the expectd future benefits and the expected future premiums, evaluated at the attained age or age of surrender. Insurance companies issuing such policies would have zero expected economic profits.[18]

With positive efficient levels of selling and administrative expenses, lapsation would not necessarily impose losses on the insurer, so long as cash values were calculated to take account of the incidence of these expenses. Taking account of the incidence of the efficient level of selling and administrative expenses would require, in particular, that the cash surrender value of the policy at the end of the first policy year be reduced below the net level premium reserves to reflect the front-end nature of selling and administrative expenses. The economic value reflected in the cost of selling and setting up the policy could be paid for by the consumer with a lump-sum charge at the time

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[17] The net level premium and net level premium reserves must be calculated, of course, on the basis of the current interest rates and current mortality rates. See footnote 3 for further discussion.

[18] With known interest rates there is also no risk that the surrendering policyowner will impose capital losses on the company by surrendering at a time when interest rates have increased unexpectedly and depressed the market value of the insurer's portfolio. This possibility is ruled out by assumption. With interest rate uncertainty, however, this could be a serious risk as the discussion below indicates.

of purchase. Given the long-term nature of the insurance contract, however, it also is possible (and customary) to spread this charge over the life of the contract. This method of covering these expenses, though, requires surrender penalties in the event of early lapsation. Otherwise, persisting policyowners, the insurer, or the selling agent would bear the cost of the services provided to the lapsing policyowner.[19] Linton yield calculations that ignore the value and cost of these services will lead to estimates of the implicit rate of return that are low and probably negative for short holding periods such as one or two years.

Probabilistic surrender, however, can cause problems for insurers -- in the sense of exposing them to risk -- if interest rates are uncertain, even if selling and administrative expenses are zero. An insurer who accepts a policyowner's funds and makes them available on short notice in the event of surrender is, in effect, "borrowing short" from the policyowner. To the extent the insurer "lends long" by investing a portion of its portfolio in long term mortgages or bonds, so as to cover any long-term interest rate guarantees it has written into its contracts, the insurer is exposed to capital value risk from uncertain interest rates. Policyowners who wish to surrender at par when interest rates have risen unexpectedly and depressed the market value of the insurer's portfolio expose the company to the risk of capital losses since it must liquidate part of its portfolio at depressed prices to meet these demands. However, if surrender is purely probabilistic and independent across

[19] Under current practices it appears that both the lapsing policyowner and the insurer suffer losses with early lapsation. These losses, however, provide the insurer with some financial incentive to reduce excessive lapsation by monitoring agent performance and by structuring commission and compensation schemes to provide agents with incentives to control lapsation.

policyowners, then this interest rate risk could be hedged by an interest rate immunization strategy that matches the duration of the insurer's expected liabilities, including expected surrender and indemnifications, with the duration of the insurer's expected assets.[20] Since it could be hedged in this fashion, this risk should not affect the pricing of life insurance policies.

If surrender were probabilistic but not independent across policyowners, then the pricing of policies would be affected in competitive markets. For example, if surrenders are positively correlated with the unemployment rate, then the surrender option would be costly to provide and the immunization strategy would not eliminate all the risk from surrenders. When unemployment is high the probability of surrender would be high for all policyowners. This exposes the insurer to a systematic or non-diversifiable risk for which the insurer would have to be compensated in a competitive market.[21] Since providing cash values would now be costly, even risk averse consumers would be willing to <u>accept</u> a reduction in lower cash values in exchange for a premium -- to share some of the risk of surrender.[22]

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[20] The key assumption here is that surrenders do not respond systematically to changes in market rates of interest. Unfortunately, this is not likely to be the case since rational exercise of the surrender option will depend upon market rates of interest. Surrenders would then impose a non-diversifiable risk on the insurer. This point is discussed in detail below in the section dealing with the surrender option and interest rate guarantees.

[21] This could be hedged with this risk options on the unemployment rates.

[22] Under these circumstances the competitive equilibrium would be characterized by variations in cash values and premiums reflecting differences in the probability of lapse and risk preferences across consumers. These policies with a relative high cash value <u>and</u> high premium would tend to have a relatively high measured Linton yield at that duration. This follows since the competitively determined trade-off between cash values and premiums would depend on the probability of surrender which is less than one. Under these particular circumstances, then, variation in Linton yields in a competitive life insurance market would simply reflect variations in consumer preferences. See Winter (1981; 94-95) for additional discussion of this point.

This discussion of the surrender option and interest rate guarantees, however, is seriously incomplete. The major shortcoming is the treatment of surrender as purely probabilistic -- independent of the contract terms-offered. When surrender is influenced by the interaction between market rates of interest and contract terms, such as the level of cash values, interest rate guarantees, or guaranteed policy loan rates, then there are greater risks imposed on an insurer who provides an option to surrender, potentially greater benefits to the policyowner from the option to surrender, and major implications for the competitive pricing of life insurance policies.

When the future course of interest rates is uncertain and the policyowner exercises the surrender option in a rational fashion, the fixed rate guarantee and the surrender option that characterize the whole life policy provide especially valuable protections and options to the policyowner.[23] The significance and potential value of these features can be seen by comparing the strategy of saving through a non-participating whole life policy to two alternative saving strategies in which the difference in premiums is invested in a side fund devoted to either: or (1) short-term riskless securities (e.g.,

[23] It is helpful to note that the investment element of a non-participating whole life or endowment policy can be viewed as a fixed income security, with a given maturity, that may be redeemed prior to maturity thorough surrender of the policy for a predtermined redemption price--its cash value. The redemption price or cash value increases over the life of the policy. The decision to redeem or to surrender the policy is made at the discretion of the policyowner. Alternatively, the investment element can be viewed as a sequence of payable-on-demand loans of a predetermined amount with a predetermined interest rate schedule. The amount of the loan at each stage in the sequence equals the end of the period cash value from the previous period, plus the premium less the cost of protection for the present period. This, of course, ignores administrative costs and other loadings. The loan is callable by the policyowner at the end of the period for the end-of-the-period cash value.

Treasury bills) or (2) straight bonds with a specified coupon schedule and maturity value (e.g., Treasury bonds).

In order to make this comparison, however, it is necessary to continue being explicit about the nature and pricing of the whole life product.[24] Although future interest rates are assumed to be uncertain suppose, for simplicity, that the term structure of interest rates is flat. In other words, interest rates are the same regardless of term to maturity. Moreover, suppose that companies use the current interest rate to price whole life policies and determine cash surrender values, just as they were assumed to do when future rates were certain.[25] The implicit rate of return on the whole life policy, then, would equal the current short-term and the long-term market rate of interest. Finally, suppose that the whole life policy is a guaranteed cost or non-participating policy. In this case, the implicit rate of return is a guaranteed or fixed rate and the surrender option allows the policyholder, at his discretion, to liquidate his investment in the policy for the current surrender or cash value.[26] This hypothetical whole life policy would dominate both of

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[24] The earlier assumptions regarding mortality selection and administrative and selling expenses are retained to simplify the analysis. Surrender, rather than being treated as probabilistic, now will be viewed as the outcome of rational decisionmaking by the policyowner.

[25] Certainly, this is not meant to be descriptive of the way whole life policies are actually priced. In fact, as discussed below, there are good reasons why they would not be priced in this fashion under competitive conditions.

[26] For a non-participating policy, the implicit rate of return at a duration, say, of 20 years would be the actual or realized rate of return earned on the policy. This would not be true, of course, for a 20-year Tresury bond with a "yield to maturity" <u>or</u> "promised yield" of, say, 8 percent. The calucation of the so-called promised yield to maturity assumes that all the interim coupon payments can be reinvested at 8 percent per annum to maturity. With interest rate uncertainty, there is no guarantee that the reinvestment rates will be 8 percent and, hence, no guarantee that the actual or realized <u>return</u> will equal the yield to maturity. This would only be true for a zero coupon bond.

the alternative investment strategies as long term savings plans. To see why this is so, the relative advantages and disadvantages of each strategy are considered below.

Investing the Side Fund in Short-Term Bills

The strategy of saving through a whole life policy can be compared with a strategy of buying ART insurance and investing the side fund in a short-term riskless asset, such as Treasury bills. Both strategies eliminate the possibility of capital losses resulting from an increase in interest rates. However, if the whole life policy were priced so that its implicit rate of return equaled the current short-term rate of interest, the owner of the whole life policy would possess an advantage over the owner of the ART policy. The whole life policy would offer a predetermined minimum yield over any holding period up to the maturity of the policy -- the interest rate used to determine the premium and cash values would be guaranteed for the life of the policy. The rate of interest paid on the side fund to the owner of the ART policy would not be guaranteed. If interest rates should fall, the owner of the non-participating whole life policy would continue to earn the previously guaranteed rate of interest, whereas the owner of the ART policy would receive a lower rate of interest. The policyowner would, as a result, accumulate smaller amounts in the side fund so that it would take longer to accumulate a fund equal to the face value of the whole life policy.

The interest rate guarantee in the whole life policy takes on an added dimension when coupled with the surrender option. Without the surrender option, the owner of the whole life policy would be stuck with the lower rate guaranteed in the policy if interest rates should rise. With the surrender option, however, the old policy could be surrendered and a new policy could be purchased which would be priced on the basis of the now higher interest rate.[27] The owner of the whole life policy would be clearly better off than the owner of the ART policy since he or she would have now locked in the higher interest rate as a guaranteed minimum rate.[28] From this perspective, then, the whole life policy can be viewed as equivalent to buying ART, investing the side fund in a riskless short-term security and purchasing an option to invest specified sums in the future (i.e., the difference in premiums) at the now current rate of interest.

Investing the Side Fund in Long-term Bonds

The strategy of saving through a whole life policy can also be compared with a strategy of buying ART insurance and investing the side fund in a long-term risky asseet such as Treasury bonds. Because of the surrender option, the owner of the whole life policy posseses an advantage over the ownr of the ART policy who is investing in a side fund devoted to straight bonds (e.g., long-term Treasury bonds) in that he or she is completely protected from the capital losses associated with an unexpected increase in interest rates. That is, the cash values in the whole life policy are guaranteed while the market value of

[27] This presumes that the policyowner is still insurable and that there are no surrender charges on the old policy. Both of these issues are discussed further below.

[28] This discussion should also make clear that policy surrender is an economic decision and should not be treated as purely probabilistic--independent of policy design or economic events--as is freuently done, for example, when calculating cost indices (e.g., company retentions) using a standard set of lapse rates. Moreover, the valuation of the surrender option and the determination of the optimal redemption or surrender strategy are intimately linked.

the bond portfolio is subject to fluctuations.[29] As a result, the owner of the whole life policy could surrender his or her policy for its cash value, buy an ART policy, and, if he desired, invest the proceeds in a side fund of long-term bonds now payinga higher yield without suffering a capital loss. The owner of the original ART policy, on the other hand, would suffer a capital loss in the side fund as the market price of his or her security holdings decline.

In fact, if newly issued whole life policies are being priced so as to reflect the now higher interest rate, it would pay the policyowner to surrender the policy--redeem it for its cash value--and use the proceeds to buy a new, partially paid-up whole life policy. Because of the higher interest rate now prevailing, the premium on this new policy would be lower than the premium on the old policy. The cost savings brought about by the lower premium could now be invested at the higher rate of interest so that the policyowner would eventually end up with greater wealth than originally anticipated.

It is useful to note that the owner of the ART policy also could have been protected from the risk of interest rate increases by purchasing a put option on the bonds in the side fund. The put option would provide the policyowner the right to sell a certain quantity of the bonds at a prespecified exercise price on or before a stipulated date.[30] In this case, then, the purchase of

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[29] Remember that the cash value accumulations in the whole life policy and the accumulations in the side fund would be identical up to the point in time when the interest rate changes. This follows from the way the cash values in the policy were assumed to be determined.

[30] See Levy and Sarnat (1984) for an excellent discussion of options and options pricing. More generally, a put option is the right to sell a certain quantity of a security at a fixed price on or before a stipulated date. The purchase of the put option then protects its owner against declines in the price of the security.

the put option would have allowed the owner of the ART policy to avoid the capital loss by exercising the option and selling the securities to the writer of the put at the exercise price. The writer of the put option would then bear the capital loss. Purchasing the put, though, would mean that the amount invested in the side fund each period would be less than the difference between the premium on the whole life policy and the term insurance premium. As a result, the side fund would accumulate to a smaller amount than the cash value in the whole life policy.

In short, when interest rates are uncertain and the non-participating whole life policy is priced so as to yield the market rate of interest, it clearly dominates the alternative strategy of investing the side fund in long-term bonds as a long-term savings strategy since the surrender option automatically provides similar protection to that afforded by a put option.[31]

Additional insight into these issues can be gained by looking at the whole life policy from the perspective of the insurance company issuing the policy. The increase in interest rates <u>and</u> the surrender of the original policy leaves the company worse off if the policy reserves are backed by investments in long-term securities. The market value of their bond portfolio declines as interest rates increase; yet, they have agreed in the whole life contract to pay out

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[31] The surrender option on a whole life policy differs from the standard put option in two important respects: (1) it is always owned by the policyowner and cannot be exercised without surrendering the policy; and (2) if the policy owner becomes uninsurable, the value of the surrender option will be affected since he or she would no longer be able to purchase life insurance. In terms of the previous example, a policy owner who became uninsurable would be better off pur-hasing an ART fund and investing in a side fund protected by a put option than investing in the whole life policy. In the former case, the put option could be exercised without giving up his insurance coverage. In the latter case, the put option implicit in the whole life policy cannot be exercised without surrendering the policy and, hence, foregoing life insurance protection.

cash values based on the lower interest rate used to price the old policy.[32] The surrender option with guaranteed cash values can pose a significant threat to the solvency of insurance companies since the risks of losses under different life insurance contracts are not independent but instead are jointly related to the overall performance of the bond market. That is, the investment risk the insurance company faces is a non-diversifiable risk in that a bond market collapse will render the company simultaneously liable under the guarantees of all its whole life policies.[33]

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[32] In response to this problem, one insurance company has recently proposed issuing a non-participating policy in which cash values would be guaranteed if the policy were held for a specified period; whereas they would be based on a market value adjustment formula if held for shorter periods. This type of policy maintains the interest rate guarantees, so long as the policy is held for a specified period, but reduces the value of the surrender option by requiring that surrender take place at market value rather than at par value. Alternatively put, this adjustment in contract terms makes the surrender option in the policy analogous to a European put, rather than an American put. American options can be exercised at any time up to the expiration date of the option, while European options can be exercised only at maturity. Clearly an American option has the benefits of a European option but not the other way around. This new contract, then, reduces the value of the surrender option. This change in the terms of the surrender option may be more than compensated for, however, if the new contract design allows the insurer to pay and guarantee a higher rate of return when the policy is held for longer durations.

[33] The option implicit in the whole life product when joined with significant volatility in interest rates exposes life insurance companies to severe risk of financial loss through disintermediation should interest rates rise unexpectedly. Moreover, standard immunization strategies based on static maturity or duration management will not suffice to protect the company from the risk of unanticipated interest rate increases. The purchase of put options would provide the required protection while allowing the insurance company to meet its liabilities in stable or falling interest rate settings through the purchase of long-term securities such as bonds and mortgages. This follows since the timing of policy surrender is not known for certain, nor is it simply probabilistic as was assumed in the previous analysis of persistency; instead, it is endogenous and depends upon the evolution of interest rates. It is interesting to note that the problems faced by insurers in issuing whole life products with interest rate guarantees and surrender options are analogous to the problems they face in annuity markets when selling guaranteed investment contracts. See Stieffel (1983) for an excellent discussion of these problems.

The insurance company, however, could have protected itself from the risk of interest rate increases by purchasing put options on its bond portfolio.[34] In effect, the purchase of put options can be viewed as purchasing insurance against the possibility of a rise in interest rates. Unfortunately, pricing the whole life product so that its implicit rate of return equals the current market rate of interest makes no allowance for the cost of put options. In other words, pricing the policy in this fashion and then guaranteeing the cash values provides the policyowner with a valuable option but makes no provision for covering the costs the company bears in eliminating this risk from its portfolio. Insurance companies, of course, would not (and, in a competitive market, could not) bear this greater risk unless they were compensated for it -- unless they were able to charge the policyowner for the cost of providing the surrender option. Likewise policy owners who recognize its value should be willing to pay for this feature.

Competitive pricing of the investment element of a whole life policy vis-a-vis other fixed-rate securities, therefore, requires that the cost of the whole life policy reflect the cost of the option conveyed to the policyowner. One way for this to occur would be for the policyowner to pay for the surrender option through a lump sum fee at the time the policy is initially issued. Note that it is only in this case that the contract rate or implicit rate of return on the policy could be set equal to the equivalent current rate of interest,

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[34] State insurance laws and regulations in some cases prohibit life insurance companies from purchasing put options. There is an alternative though to exchange or over-the-counter traded options. Synthetic options that provide downside protection can be created through a dynamic strategy of trading between short and long duration bonds as interest rates change. See Rubinstein and Leland (1981) for an analysis of how this strategy can be used to create "portfolio insurance."

which would be the rate paid on other fixed rate securities with the same nominal duration but without a redemption or surrender option. Alternatively, since the whole life policy and the surrender option are inseparable, the insurance company could receive compensation for the implicit put option by paying a lower than market rate of return on the savings element in the whole life policy -- by assuming a lower than market rate of interest in pricing the whole life product.

In competitive life insurance markets, then, low average rates of return paid on non-participating whole life policies relative to the rates paid on other savings instruments could simply reflect the value of the interest rate guarantees and surrender options implicit in these policies. Similarly, variation in these implicit rates of return could reflect variation in the value of these options across policies due to, say, differences in the level of guaranteed cash values.

This result suggests immediately a modification of the Linton yield technique. In order to determine the rate of return paid on a whole life policy, one must deduct not only a charge for mortality expenses, but also a charge for the cost of the put option implicit in the surrender option.[35] [36] The remainder is then the amount added to the side fund each period. By lowering the amount "saved" each period, this adjustment will raise the implicit rate of return or Linton yield. With interest rate uncertainty, in other words, the whole life policy must be compared to a strategy of buying ART, investing the side fund in a portfolio of long-term bonds <u>and</u> protecting this investment from the risk of capital loss through the purchase of put options.

Analogies with Other Financial Instruments

Several analogies with more familiar financial instruments can be drawn on to provide additional insight into the nature and proper pricing of the life insurance product when interest rates are uncertain. The first analogy to be examined is that between the whole life product and fixed rate bank deposits with early withdrawal options. The second analogy is that between the whole life product and fixed rate mortgages with prepayment options. The final

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[35] Calculating the cost of the surrender option poses a difficult analytical task since it depends on: 1) the time to maturity of the policy (i.e., the exercise date of the option; 2) the particular pattern of cash values (i.e., exercise prices for the option) specified in the policy; 3) mortality rates; 4) beliefs about the stochastic process determining interest rates (i.e., expected drift and variance in future interest rates); and 5) risk preferences. The modern theory of options pricing holds out hope, however, that the task can be accomplished. For example, Rendleman and Bartter (1980) attempt to price put and call options on bonds. More directly, Brennan and Schwartz (1977, 1979) attempt to value the redemption option on savings bonds as a put option. Pozdena and Iben (1983) value the early withdrawal option on money market certificates. Finally, Pozdena and Iben (1984) and Hall (1984) value the prepayment option on fixed-rate mortgages.

[36] Conceptually, as the previous discussion makes clear, a separate charge should be deducted to rfeflect the value or cost of the entire package of options implicit in the whole life contract (i.e., the surrender option, the loan option, etc.). This assumes, of course, that the options have not been paid for through an initial lump sum charge.

analogy is that between universal life insurance products and adjustable rate mortgages with interest rate caps.

Like a non-participating whole life policy, many fixed rate bank deposits offer a fixed return over the term of the deposit and include an early withdrawal option that allows the depositor to liquidate the account and obtain the par value of the account less some pre-specified withdrawal penalty.[37] The withdrawal option on a deposit account is effectively a put option on a "bond" paying coupons determined by the contract rate when the deposit account is opened. The deposit holder owns the option to *put* this "bond" on the depository institution for an exercise price equal to the principal value of the account less any penalty. The value of the withdrawal option derives from the possibility of a larger than expected rise in interest rates. Because of this, the option to liquidate and reinvest in response to changing economic circumstances becomes more valuable the more uncertain are forecasts of future interest rates and the longer the investment must be in place.[38]

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[37] The whole life policy can also be viewed as containing early withdrawal or surrender penalties if the cash values in the early years of the policy's life are less than what would be called for based on the implicit contract rate. The surrender penalties could reflect term structure considerations which have been ignored to this point. With no surrender charges the policyowner would be provided with an option on the yield curve to the extent the whole life policy, as a long-term contract, is priced off the long end of the yield curve. If short-term rates should rise unexpectedly above long-term rates, the policyowner could surrender his policy and invest the proceeds in short-term securities paying the higher rate. In effect, the highest point on the yield curve could be earned without exposure to the risk of capital loss that would normally accompany investments earning the long-term rate.

[38] The principles and techniques involved in valuing the withdrawal option on deposit-type instruments should also apply to the valuation of the joining of an interest rate guarantee with a surrender option in the whole life policy. For example, Brennan and Schwartz (1977, 1979) and Pozdena and Iben (1983) have used modern option pricing theory to determine the equilibrium value of the early withdrawal or redemption option on savings bonds and other deposit-type instruments such as money market certificates. Pozdena and Iben (1984; 28) estimate that, at the historic dispersion for interest rates, a 2-1/2-year money market

Like a non-participating whole life policy, fixed rate mortgages offer a contract rate that is fixed for the term of the mortgage while the borrower often has the option to pre-pay the remaining principal on the loan subject to pre-specified penalties. The pre-payment option, in effect, allows the borrower to call the mortgage from the lending institution for an exercise price equal to the remaining principal plus any penalties. Competitive pricing of a mortgage vis-a-vis other fixed rate securities requires that the cost of the pre-payment option be incorporated into the cost of mortgage borrowing.[39]

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certificate contains an option worth approximately $1.25 per $100 of face value while the option on a 4-year certificate is worth $4.75 per $100 of face value. In making their estimates, they use the historic penalty structure of 6 months simple interest on instruments greater than one year in maturity. Both studies demonstrate that the eary withdrawal type options can have significant value so long as withdrawal penalties are not prohibitive. The values determined by these analysts are equilibrium values in the sense that if depository institutions, operating in competitive securities markets, sold these deposits at these prices and managed their investment strategy so as to minimize risk exposure, they would make no abnormal profits or losses. Under the assumptions of their models the equilibrium values correspond, in other words, to the competitive equilibrium prices of the options.

[39] Pozdena and Iben (1984) and Hall (1984) have used option pricing theory to estimate the value of the pre-payment option. For example, Pozdena and Iben (1984; 46) estimate that the yield differential between a 30-year mortgage <u>without</u> a pre-payment option and one <u>with</u> a pre-payment for which there are no penalties for exercising the option is nearly 400 basis points. Their estimates of the spread increases to over 600 basis points when they raise their estimate of interest rate dispersion by 50% over its historical level. If lenders charge the conventional penalty of six months interest for the first five years of the loan, the differential reduces to a spread of approximately 250 basis points. Arden Hall (1984; 14) estimates the lump-sum value of the pre-payment option on a 30-year mortgage with $100,000 in principal that carries the same interest rate as a comparable non-callable security as between $2,774 and $6,665. These figures are for estimates of interest rate dispersion that bracket the historicial level. He also estimates that if zero drift in interest rates is expected and the dispersion of interest rates is .3 (instead of its historical level of .22 to .26) then the lump sum value of the pre-payment option would be $12,779. These papers indicate the <u>potential</u> for the interest rate guarantee and surrender option implicit in the whole life policy to also take on significant value.

The pricing of fixed rate mortgages with pre-payment options vis-a-vis adjustable rate mortgages provides a useful analogy for understanding the present comparison between the hypothetical whole life policy -- a fixed rate instrument with early surrender or withdrawal options -- and a strategy of investing the side fund in short-term securities -- variable rate instruments. The fixed interest rate coupled with the pre-payment option provides significant value to the mortgage borrower and, in competitive equilibrium, this value must be reflected in differences in borrowing rates between fixed rate mortgages and variable rate mortgages.[40] Similar results would hold for the competitive pricing of the savings element in a whole life policy relative to variable rate securities such as Treasury bills. That is, whole life policies would be priced in competitive equilibrium so as to yield a lower rate of return than currently available on short-term securities.[41] This discussion should illuminate the theoretical relationship between the traditional non-participating whole life policy and the newer universal life policies. The latter bear a strong resemblence to buying term and investing the difference in premiums in short-term riskless securities.[42] In fact, some universal life

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[40] Pozdena and Iben (1984; 49), for example, estimate the equilibrium spread between a "pure" adjustable rate mortgage and the contract rate on a 30-year fixed rate mortgage with typical pre-payment terms (i.e., 6 months interest during the first five years of the term of the mortgage) as approximately 350 basis points. In making their estimates, the authors assume that the contract rate on the "pure" adjustable rate mortgage is adjusted continuously with no ceiling or floor and use historical estimates of interest rate dispersion. In addition, they estimate the equilibrium spread between a pure adjustable rate mortgage and a fixed rate mortgage with no pre-payment penalty as approximately 600 basis points.

[41] It should be possible, although difficult, to estimate the competitive equilibrium spread between these rates of return using the general principles and techniques underlying the recent work valuing financial options. This assumes, of course, that the surrender option is not paid for in a lump-sum fashion at the time the policy is issued.

[42] Universal life policies were discussed in detail in an earlier chapter. As a result, the discussion at this point is deliberately brief.

policies explicitly link the rate paid on the savings element of the policy to current rates on Treasury bills. The previous discussion, then, would apply to the comparison between a non-participating whole life policy and a "pure" universal life policy (i.e., one with a continuously adjusted rate of interest and no minimum rate guarantees). In general, however, universal life policies contain various minimum rate guarantees.[43] In this case, the comparison between the hypothetical whole life policy analyzed here and a universal life policy with a minimum interest rate guarantee is analogous to that between a fixed rate mortgage with a pre-payment option and an impure adjustable rate mortgage in which the upward range of adjustments is capped so that the rate may rise only some maximum amount over the life of the instrument.[44]

Universal life products also contain other interesting features and

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[43] Mortality charges in universal life policies are subject to change and can be increased up to a maximum amount specified in the policy. These charges could be increased to lower the effective minimum rate guarantee. As pointed out above, the participating whole life policy can also be viewed as a variable rate instrument with minimum interest rate guarantees (i.e., those implicit in setting dividends equal to zero). Rates paid on participating whole life policies are not directly linked to an external index: instead, they are determined through dividend payments that reflect the investment performance and allocation method of the insurance company.

[44] The cap, in effect, makes the adjustable rate mortgage more nearly a fixed mortgage rate. Pozdena and Iben (1984; 50), in addressing this comparison, estimate the equilibrium spread between an uncapped or "pure" adjustable rate mortgage and an adjustable rate mortgage with a rate increase cap of 2% as approximately 300 basis points. See Pozdena and Iben (1984), Buser, Hendershott, and Sanders (1984), Hendershott and Shelling (1984), and Cox, Ingersoll and Ross (1980) for attempts to price fixed rate instruments relative to variable rate instruments.

options.[45] For example, a few universal life policies use a dual rate index for determining the current rate that will be paid on accumulated deposits. The current rate may be set equal to the greater of the 3-month Treasury Bill rate or the 20 year Treasury Bond rate. This feature, in effect, provides an option on the yield curve since the policyowner earns the highest point on the yield curve each period without exposure to the risk of capital loss that would normally accompany an investment earning the long-tem rate of interest. Moreover, the time period for which the current rate is guaranteed varies considerably from policy to policy, ranging from continuously adjustable (i.e., no guarantee) up to three years guarantees. Finally, many universal life policies are flexible premium policies in that the policy owner can vary the amount or timing of premium payments. When coupled with guaranteed current rates, the flexible premium feature can provide a valuable option to the policyowner. For example, if the policy sets a minimum interest rate for the balance of some

period such as the calendar year, the policyowner may find it worthwhile to

[45] The previous examples illustrate an important point about the use of adjustable rate mortgages by mortgage lenders and the introduction of indeterminate premium and universal life policies by insurance companies. The financial institutions involved, of course, hope to limit the consequences of interest rate risk. In fact, pure forms of these instruments offer the borrower or policy owner no protection against interest rate changes. As Pozdena and Iben (1984) point out,the financial institution is no longer performing an interest rate intermediation function and the price of these pure variable rate instruments should contain no implicit compensation for this service. The conversion of an institution's portfolio to adjustable rate instruments is equivalent to abandoning the interest rate intermediation function.

increase the premium payments if market rates should fall during the period.[46]

Two basic conclusions follow from the above analysis. First, life insurance products with a savings element are potentially unique financial instruments whose pattern of payoffs cannot be replicated by a strategy of buying ART insurance and investing the side fund in fixed combinations of long- and short-term securities. Second, and as a result, an adequate evaluation of the advantages and disadvantages of these products -- relative to one another and to alternative saving strategies -- must take account of those contractual features that make them unique financial instruments, in particular, interest rate guarantees and surrender options.[47]

The Policy Loan Option and Guaranteed Maximum Loan Rates

Non-participating Policies[48]

Whole life policies generally contain a policy loan option whereby a large fraction of the cash value that has accrued under the policy can be borrowed by the policyowner at a policy loan rate that is subject to a guaranteed maximum.

[46] This option for the policyowner, of course, exposes the insurance company to reinvestment risk as more funds than expected are contributed by policyowners at a time when the interest rate that can be earned on those funds has fallen relative to the rate the insurance company guaranteed to pay. This risk is now a familiar one to those companies selling guaranteed investment contracts (GICs) to fund pension plans. See Stieffel (1983).

[47] Brennan and Schwartz (1976) provide an interesting attempt to determine the cost of the asset value guarantees in equity-linked or variable life insurance products issued in Canada. Unfortunately, the policies they examine do not join a surrender option with the asset value guarantee. The options they examine can only be exercised upon death of the policy owner or maturity of the policy.

[48] This section draws on and extends Smith's (1982) analysis of the policy loan option and the policy loan problem. The major extension explored here concerns the analysis of the policy loan option for participating policies.

In effect, the policy loan option grants the policyowner a line of credit that grows over the life of the policy with the increase in cash values and sets a maximum interest rate that can be charged for borrowing against that line of credit.[49] The guaranteed maximum loan rate makes the loan option a potentially valuable option. A policyowner who exercised the loan option could invest the proceeds in securities earning the market rate of interest. These earnings, of course, would be taxable while the interest payments under the loan would be tax deductible. The policyowner, thus, would earn an after-tax return on the loan transaction of one minus his or her marginal tax rate times the difference (or spread) between the market rate and the policy loan rate of interest. Meanwhile, the cash value of the policy would accumulate as untaxed inside-interest buildup at the rate of interest paid on the policy.

If market rates of interest rise above the policy loan rate, the loan option allows the policyowner to leverage the rate of return earned on the savings component above the rate being paid on the policy. If market rates of interest should fall below the policy loan rate, the policyowner could sell off his securities and repay the loan. These features of the loan option have been aptly summed up by M. Smith (1982; 589):

"The policy-loan clause is in effect a combined put and call

[49] Today, some policies are issued with variable policy loan rates that are not subject to a guaranteed maximum. On other policies, dividends or more generally, the rate of return paid on the policy may be adjusted to reflect the extent of borrowing against the cash value. Both of these developments are addressed below.

option which allows the policyowner to 'sell' the policy for its cash value when interest rates are above the policy loan rate and buy it back at a guaranteed price when interest rates are below the loan rate. Exercising the put option does not deprive the owner of future exercise rights, however. . . . . The options may be exercised at any time prior to the death of the insured."

The ex-post value of the loan option (i.e., the value for a given realization of the market rate of interest) can be illustrated with a simple numerical example.[50] Consider two policyowners, one with a marginal tax rate (i.e., t_1) of 30 percent and the other with a marginal tax rate (i.e., t_2) of 50 percent, both of whom have $50,000 in cash value in a non-participating whole life policy. Suppose the rate of return paid on the policy (i.e., r_p) is 5 percent; the guaranteed policy loan rate (i.e., r_l) is 8 percent; and the market rate of interest (i.e., r_m) has turned out to be 12 percent. Table VIII-1 shows the payoffs to the two policyowners from the three courses of action open to them: retain the policy while exercising the loan option; retain the policy while not exercising the loan option; surrender the policy to invest at the market rate of interest.[51]

[50] The ex-post versus ex-ante distinction is important in discussing the value of the loan option. Studies of the value of the loan option such as Babel and Staking (1982) or Kamath (1985) are ex-post studies that value the loan option for one particular interest rate path -- the path actually observed over some historical period. The results of these studies may overvalue or undervalue the loan option from an ex-ante perspective -- from the perspective of all possible interest rate paths that might occur, considered at the time of purchase. The ex-ante perspective, of course, is the relevant one for the pricing of the policy at the time of issue.

[51] This example is based on the analysis of M. Smith (1982; 587).

TABLE VIII-1

PAYOFF FROM THE POLICY LOAN OPTION

	Exercise the Loan Option		Do not Exercise the Loan Option
	(t_1=30%)	(t_2=50%)	
Interest Earnings (r_m=12%)	$6,000	$6,000	0
Policy Loan Interest (r_l=8%)	4,000	4,000	0
Taxable Income	2,000	2,000	
Tax	600	1,000	
After-tax Income	1,400	1,000	
Earnings on Cash Values (r_p=5%)	2,500	2,500	2,500
Total After-tax Income	$3,900	$3,500	$2,500
Total After-tax Rate of Return	(7.8%)	(7%)	(5%)
After Tax Income from Surrender	$4,200	$3,000	
After Tax Rate of Return from Surrender	(8.4%)	(6%)	

The leverage provided by the loan option is clearly illustrated by this example. Under this scenario both policyowners would be better off exercising the loan option than not exercising it. The total after-tax rate of return from exercising the loan option (i.e., $(1-t)(r_m-r_l)+r_p$) is 7.8 percent for the policyowner in the 30 percent tax bracket and 7 percent for the one in the 50 percent tax bracket. If the loan option is not exercised and the policy is retained, the rate of return (i.e., r_p) is 5 percent for both. The policyowner in the low tax bracket, however, would be still better off by surrendering the policy and earning the after-tax return from investing the proceeds at the market rate of interest (i.e., $(1-t)r_m$) which is 8.4 percent in this case.[52] The policyowner in the high tax bracket, on the other hand, is better off retaining the policy and exercising the loan option than by surrendering the policy. The policy loan option, as this example makes clear, may provide value above and beyond that provided by the surrender option.[53]

The flip side of the value created for the policyowner by the guaranteed loan rate is the cost or risk created for the insurer issuing policies containing this option and guarantee. To see the problems created by this option, consider a non-participating whole life policy priced so that the implicit rate of return paid on the policy (i.e., the Linton yield) equals the current market rate of interest which, in turn, equals the guaranteed maximum loan rate. With

[52] The tax due on surrender is assumed to be zero. Also, by surrendering, the policyowner would forego any other options implicit in the policy. The possibility of replacement with another whole life policy is ignored.

[53] This example illustrates how the surrender option and the loan option interact. Without the loan option or, alternatively, if the loan rate were variable and adjusted to the market rate, both policyowners would have found it advantageous to surrender and invest at the market rate or purchase another whole life policy priced to reflect the higher rates of interest.

costless and rational exercise of the loan option, a stock company issuing this policy would expect to make an economic loss! If the uncertain market rate of interest turned out to exceed the loan rate, policyowners would rationally exercise the loan option (or surrender). The company then would earn only the loan rate which, according to the contract, is equal to the rate paid on the policy, leaving no profit for the insurer. If market rates of interest turned out to be less than the loan rate, rational policyowners would not exercise the loan option nor would they surrender. The insurer, though, has promised to pay a rate of return on the policy that, as it turns out, exceeds the market rate of interest, leaving the insurer with a loss. In this case, the insurer is providing a valuable <u>and</u> costly option without being compensated for the risks involved.

Competitive pricing of non-participating whole life policies with policy loan options would require either that the rate of return paid on the policies be set <u>below</u> the current market rate of interest; or, that the guaranteed loan rate be set <u>above</u> the current market rate; or finally that some combination of the two adjustments be used. Moreover, with competitive pricing, two non-participating policies with different guaranteed maximum loan rates would be priced so as to reflect the relatively greater value of the loan option when coupled with the lower maximum loan rate, assuming other policy options were the same.

As with the surrender option, there is a second aspect to the risk faced by the insurer. If the insurer is "lending long" to cover long-term interest rate guarantees in the whole life product, then an increase in the market rate of interest that leads to an increase in loan requests may also have caused a decrease in the market value of the insurer's investment portfolio. In order to meet the loan requests, the insurer may have to liquidate part of its portfolio at depressed prices and, since the loan proceeds are provided at par, suffer capital losses. This risk will be non-diversifiable but could be protected against at a cost by purchasing put options -- purchasing insurance against the possibility of a rise in interest rates.

Participating Policies

When examined solely from the perspective of the incentives of the individual policyowner, the loan option in non-participating and participating policies would appear to be identical. This perspective, though, misses essential features of participating contracts and, hence, can be misleading. It is true, of course, that for a given rate of return being paid on a participating policy and a given loan rate, the analysis of when to exercise the loan option would be precisely the same as for a non-participating policy. With a participating policy, however, it generally will not be appropriate to take the rate of return paid on the policy as given and independent of the decisions by policyowners to exercise the loan option.

To see this point, consider the case of a pure mutual company issuing a participating whole life policy to its members. If the market rate of interest turned out to exceed the guaranteed maximum loan rate, then _each_ individual policyowner, acting rationally but independently of all other policyowners, would wish to exercise the loan option.[54] But if _all_ policyowners exercised the loan option, the mutual company would make _no_ investments at the market rate of interest; instead, it would simply earn the policy loan rate on the policy loans exercised. The policy loan rate, in turn, i- all the mutual would

[54] This assumes that exercising the loan option is costless.

be able to pay out to the policyowners as a rate of return on their policies. By exercising the loan option, policyowners would be able to leverage the rate of return they earn on their savings above the rate paid on the policy. Their after-tax return, however, would be less than the market rate of interest.[55] If all the policyowners, instead, refrain from exercising the loan option, then the mutual company could pay out the now higher market rate of interest as the rate of return on the policy. These earnings would accumulate entirely untaxed as inside interest buildup. As a result, the policyowners, both individually and as a group, would be better off.[56]

With a participating policy and individually rational exercise of the loan option, the guaranteed maximum loan rate restricts the ability of the mutual company to pass through market rates of interest untaxed to the policyowners. Under these circumstances, an increase in the guaranteed maximum rate could make all policyowners better off. The increase in the loan rate could eliminate the incentive of each policyowner to exercise the loan option and allow the company to earn and pay out the higher market rate of interest. In effect,

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[55] The total after-tax return from exercising the loan option would be $(1-t)\ (r_m - r_l) + r_p$; but, with r_p equal to r_l this simplifies to $r_m - t\ (r_m - r_l)$ which is less than r_m so long as r_m exceeds r_l.

[56] Of course, if all other policyowners refrain from exercising the loan option, then any single policyowner could be still better off exercising the loan option. This action would have a minimal impact on the company's earnings and would let the policyowner leverage his or her own rate of return above the rate paid on the policy and earned by all other policyowners. The strategic situation described is the classic "Tragedy of the Commons." The mutual's assets are, in effect, a common pool resource belonging to all the policyowners. Each individual policyowner's use of the common pool (i.e., exercise of the loan option) imposes an externality (i.e., reduces the earnings on the mutual's assets) on all other policyowners. Individual restraint is required for efficient utilization of the common resource. See Hardin (1968).

the higher loan rate makes it individually rational to do what is in the group's interest.[57]

This result has important implications for the competitive pricing of non-participating and participating policies with policy loan options. For non-participating policies, a lower guaranteed maximum loan rate increases the value and cost of the loan option and hence increases the value of the policy, holding other factors constant. For participating policies, however, a greater guaranteed maximum loan rate may, instead, increase the value of the contract by enabling the insurer to more effectively pass through market rates of

[57] This result helps to explain the movement by insurance companies and state insurance commissioners to raise statutory maximum loan rates, introduce variable loan rates, and directly recognize loan activity in determining dividends or rates of return paid on the policies. The net effect of gutting the loan provision could be an improvement in the welfare of most participating policyowners. These developments, no doubt, also were important to the introduction of the newer universal life products. The same type of problems would plague these financial instruments if they carried 5 percent or 8 percent guaranteed maximum loan rates and simultanously linked the rate paid on the policy to market rates of interest without adjustment for loan activity. This analysis also reveals one way in which regulation may have inhibited, at least temporarily, the ability of life insurance companies to effectively respond to the rapidly rising interest rates experienced in the mid- to late 1970s. Complete market adjustment would require the design of new contract provisions for the loan option (e.g., direct rcognition of loan activity in universal life and participating policies) and the revision of policy loan regulations (e.g., the adoption of higher and/or variable statutory maximum loan rates).

interest. This difference in the loan option reflects the deep, underlying differences in the nature of non-participating and participating contracts.[58]

Dividends and the Guarantees Implicit in Participating Policies

Under the assumptions of the ideal model--known future rates of interest and mortality rates--there would be no need for policy dividends or, for that matter, for participating policies. With uncertain interest rates, however, the dividend formulas and dividand practices adopted by insurance companies can play an important role in differentiating the basic products they offer.[59] More specifically, for a participating policy the level of illustrated dividends, cash values, and premiums determine in conjunction with the company's dividend pay out policy, the implicit rates of return guaranteed by the policy.

[58] There is significant variation in the key features and terms of the policy loan option. Some non-participating whole life policies guarantee a maximum 8 percent loan rate, others guarantee a maximum 6 percent rate, while others still guarantee a 5 percent rate. Some newer policies specify variable loan rates that adjust to changes in an index of market rates. Some participating policies, while guaranteeing a maximum loan rate, directly recognize loan activity in determining the dividends to be paid on the policy. Similarly, many universal life policies directly recognize loan activity in determining the amount of interest to credit under the policy. These differences in contract terms, of course, have important implications for the relative values of the loan options in the various policies. Finally, it is important to note, the value of loan option depends on the pattern of cash value buildup in the policy since this determines the size of the line of credit that is available to the policyowner. The value of the loan options in two policies with the same guaranteed loan rate may differ if the pattern of cash value buildup differs.

[59] For participating policies illustrated dividneds show the amounts the company would pay if it did not change the formula it uses for calculating dividends. The extent to which actual dividends have tended to differ from illustrated dividends--the degree of conservatism in dividends illustrations--varies across companies. Ex-ante measurements of Linton yields, based on illustrated dividends, would reflect the underlying variation in the degree of conservatism. To the extent consumers in a competitive market discount for the actual degree of conservatism, the measured variation in Linton yields may be more apparent than real. Moreover, if companies on average are conservative in making dividend projections, then the average Linton yield measured for a sample of participating policies will be understated.

Alternatively put, two participating policies with precisely the same Linton yield when measured on the basis of illustrated dividends may contain significantly different implicit guarantees with respect to the minimum and, even, the maximum rate of return payable under the two policies.

Actual dividends, of course, can differ from illustrated dividends when there are differences betwen the assumed and the actual return on the insurer's portfolio, mortality experience, or expenses. As a result, a participating policy from a company with high illustrated dividends and a high premium could result in a much lower rate of return on an ex-post basis (i.e., on the basis of actual dividends) than a policy with low illustrated dividends and a low premium if investment, mortality, and expense experience turn out poorly. The participating-policy with the lower illustrated dividends and low premium, in other words, is implicitly guaranteeing a higher minimum rate of return on the policy. In the extreme, if actual dividends were zero on both policies, then the rate of return earned on the high dividends/high premium policy could be much lower than that earned on the low dividend/low premium policy.

A company's dividend practices or pay out policy also could be used to set a maximum rate that would be paid on a policy. For example, if a company made a practice of paying out no more than the illustrated dividend, then this practice in conjunction with the policy's premium and illustrated dividends would determine the maximum rate of return payable under the policy. This maximum would be the Linton yield measured on the basis of the illustrated dividends. The premium and illustrated dividend, as pointed out above, also would determine the minimum rate of return payable.

Several implications follow from these considerations. First, although two participating policies exhibit precisely the same Linton yield on an illustrated dividend basis, they may represent quite different combinations of expected return nd risk. Second, a participating policy with a high Linton yield on an illustrated dividend basis may represent an inferior return distribution when compared to a participating policy with a lower Linton yield if the company offering the former uses its dividend pay out policy to make the higher illustrated return a maximum return. Finally, and more generally, a policy's premium and illustrated dividend stream combine with the company's dividend practices to determine how a distribution of uncertain market return will be translated into a distribution of actual rates of return paid on the policy.[60]

Of equal, if not greater, importance in differentiating participating policies is the method the issuing company uses for allocating investment earnings to policyowners. The choice of allocation method -- the portfolio method or the investment year method -- is a key link in establishing the relationship that will exist between the market rate of interest earned on the insurer's portfolio and the rate of return paid on its policy. The two different methods of allocating investment earnings present the potential policyowner with two distinctly different investment alternatives. Consider, for example, the case of two participating policies, each with the same premium

[60] Examining the historical record of dividends relative to illustrated dividends may provide a means of estimating the actual dividend practices of the company. Key to understanding the relationships among participating policies are the empricial questions of: 1) whether, in fact, there are such stable policy functions; and 2) if there are, to what extent do they vary from company to company. In response to this problem, the National Association of Insurance Commissioners is considering proposals for disclosure regulations with regard to dividend practices.

and streams of dividends and cash values, one of which is issued by a company using the portfolio method and the other of which is issued by a company using the investment year method. Moreover, assume that the two companies are currently earning the same rate of return and that their portfolios would sell at par if valued at market prices. With uncertain future rates of interest, these two policies, although having identical illustrated Linton yields, represent distinctly different distributions of potential payoffs.

To illustrate, consider two different scenarios for the evolution of interest rates -- an unexpected decline in market rates of interest following the purchase of the policy versus an unexpected increase in market rates of interest. If interest rates decline unexpectedly, the policyowner would be better off with the policy for which investment earnings are allocated according to the portfolio method instead of the investment year method. Under the portfolio method, the policyowner's savings under the policy would be credited with dividends based on the now relatively high average rate of return being earned on the insurer's portfolio. Alternatively put, with the insurer's portfolio priced at par prior to the decline in interest rates, the new policyowner is, effectively, being allowed to buy into the earnings of this portfolio at par instead of at a price reflecting the higher market value of the portfolio.[61]

Under the alternative scenario in which interest rates rise unexpectedly, the policyowner would be better off with the policy using the investment year method. Under this method, his savings would be credited with dividends based on the now relatively higher current rates of interest being earned in the

[61] Under a pure mutual, existing policyowners would find it disadvantageous to allow new members to join the mutual following the interest rate decline.

market. By contrast, under the portfolio method the new policyowner would in effect be buying into the insurer's portfolio at par when the market value of the portfolio had declined.[62] As pointed out above, the different methods of allocating investment earnings present the potential policyowner with a choice of two distinctly different investment alternatives.

The previous discussion illustrates the general problem of developing standards of comparability for evaluating the investment performance of alternative savings instruments. At a surface level this might have seemed like a straightforward task, involving little more than a direct comparison of illustrated Linton yields for life insurance products. Certainly, if illustrating the future could make it come to pass, then evaluating investment alternatives would be just this simple. Unfortunately, with uncertain future rates of interest, simply looking at illustrated rates of return or Linton yields is insufficient since it ignores the risks that lie behind the illustrations. This observation applies not only to participating policies, but also to indeterminate premium whole life policies and universal life policies. It also applies to a comparison between Linton yields and yields apparently being offered by other savings instruments.

Summary Remarks on Product Design Differences

This section on product design differences has analyzed several of the most important ways in which savings-intensive life insurance policies may fail to

[62] This result explains the competitive difficulties companies using the portfolio method for allocating investment earnings find themselves in during periods of unexpected increases in interest rates. It also explains why some older, established companies, using the portfolio method, found it necessary to establish subsidiaries to market newer products, such as universal life products. The new subsidiary, even if operating on the portfolio method, could offer rates more competitive with current market rates.

be simple, homogeneous products and, instead, may be distinguished on the basis of policy terms, especially differences in explicit and implicit options and guarantees. These key differences in policy terms also serve to differentiate savings-intensive life insurance policies from a strategy of buying ART insurance and investing the difference in premiums.

Two important implications for the interpretation of the empirical evidence presented in this study follow from these considerations. First, it is now clear that measures of Linton yields that ignore the cost and value of important policy options and guarantees will systmatically understate the implicit rate of return actually being paid on the savings element of life insurance policies. This conclusion follow since the conventional Linton yield calculation fails to deduct a charge for the expected cost of the package of policy options included in the life insurance contract and, hence, overstates the amount "saved" each period, and, as a direct consequence, understates the estimated rate of return. Second, it is also clear that measures of Linton yields that ignore the existence of variations in policy options and guarantees will introduce spurious variation into the estimates of the rates of return being paid on savings-intensive policies. This conclusion follows since variation across policies in the types of options and the terms of guarantees will create variation in their relative costs and values. The empirical evidence presented in this study must be considered in the light of these limitations and any conclusions drawn from this evidence must be appropriately qualified.

This section also makes it clear that the life insurance industry's products are riddled with options, some of which are explicit and knowingly granted while others are implicit in particular product features or combinations of features. As a result, the modern theory of options and options pricing provides an imporant perspective and set of tools for evaluating the design and pricing of both new products and the modification of existing products. On the one hand, the options perspective can aid insurance companies in controlling their exposure to interest rate risk and in pricing their products so as to be competitive and profitable without abandoning the interest rate intermediation function. On the other hand, this perspective should also be of assistance to regulators in addressing such issues as "cost" or rate of return disclosure, the determination of non-forfeiture values, the regulation of reserves, and the regulation of investment activities.

The factors discussed to this point have all dealt with variations in product design and how these variations would affect the pricing of life insurance products in competitive markets. Observed measures of Linton yields will reflect company experience differences--differences in cost resulting from companies specializing in different segments of the marketplace.

Differences in Company Experience

Not all companies sell to the representative actuarial pool so that there may be resulting differences in the mortality experieince of comanies as well as differences in the efficient level of selling and administrative expenses. Moreover, not all companies pursue the same investment strategy.[63] Under

[63] Insurance companies are also subject to different tax and regulatory policies, depending on the state in which they opperate and their organizational form (i.e., mutual or stock companies). Differences in tax or regulatory policies, such as differences in premium taxes or differences in staturory reserve valuation and non-forfeiture laws, may affect the relative prices of life insurance policies in competitive markets. For the most part, these factors are not considred here, although they hve been examined by others. See Winter (1981).

competitive conditions, each of these factors would be expected to affect the pricing of alternative life insurance policies. The likely effects are examined below.

Variation in Mortality Selection by Insurance Companies

The ideal model assumed that, aside from age, there was no other basis for selection. In fact, insurance companies may specialize in different sub-segments of the overall life insurance market, screening and sorting consumers into risk classes on the basis of criteria other than age. The variation in underwriting standards ranges from mail order, short-form applications with no medical examination to much more detailed underwriting based on extensive medical examinations.[64] Companies, in effect, have different definitions of standard and non-standard risks. Some companies also have explicit restrictions on the availability of their policies (e.g., teachers only, or Lutherans only).[65] In addition, some companies specialize in different socioeconomic and geographic markets with resulting variations in mortality experience.[66]

Variation in mortality experience is thus a potentially important source of apparent rather than true variation in measured Linton yields. That is, if all the assumptions of the ideal model were true except for the assumption that all companies experience the same mortality rates, then calculating Linton yields

[64] Winter (1981; 88) found, for example, that one company in the sample of firms studied rejected "about 15 percent of applications, whereas typically about 8 percent are rejected for application to the standard risk category."

[65] Consumers Union (1980) found that 30 of the 195 policies examined had explicit restrictions on availability.

[66] One company, for example, specializes in insurance sales to retired military officers.

using average ART rates would create spurious variation in the measured Linton yields.[67] All policies would, in fact, be priced so that the Linton yields, based on each company's own experience, were equal to the market rate of interest. Using the average ART rates would understate Linton yields for those companies whose actual mortality rates were greater than average, and vice versa. It is important to note though that so long as the average mortality experience of term insurance purchasers is the same as the average experience of purchasers of savings-intensive policies, there should be no bias in the estimate of the average Linton yield. If, however, a set of term rates lower (higher) than the average mortality experience were used to calculate Linton yields, then the average Linton yield would be biased downward (upward).

Variation in the Efficient Level of Selling and Administrative Expenses

In the idealized model of a perfectly competitive insurance market, consumers are assumed to be able to costlessly search the entire set of contract offers. Selling efforts and expenses play no role in that model. Under more realistic assumptions, where information about policy price, policy attributes, and company attributes is incomplete and costly for consumers to obtain and process, as well as for companies to provide, search efforts by consumers and selling efforts by insurers will have economic value. Such efforts would thus be expected to play an important role in the workings of the market and, in particular, in the pricing of policies.

When consumers are differentially informed and, hence, more or less costly to sell policies to and to service, companies may specialize in their marketing

[67] The evidence presented in Chapter IV on variability in term insurance rates suggests that mortality selection is potentially a significant factor in explaining the variability in Linton yields.

stratgies, choosing to sell only to certain niches or segments of the overall market. For example, some consumers may be well informed about their financial plans and insurance needs, about general types of life insurance coverage, and about specific policy alternatives currently on the market. These consumers require little servicing and, in turn, will only be attracted by policies for which the premium loading for selling expenses is small. They might best be served by a company that specialized in a targeted program of direct mail or telephone marketing.[68] Other consumers may require more assitance with financial planning, more information about general policy types, and more asisstance in product selection. These consumers will require greater servicing efforts and may be willing to pay for these efforts through the premium load for selling expenses. An appropriate analogy to the distinction suggested here might well be the difference between load and no-load mutual funds. More generally, insurance companies may provide differnt qualities of service (i.e., different types and quantitites of informtion and advice) and consumers may find it worthwhile to cover the expense of these services.[69]

To the extent, therefore, that there are variations in the efficient level of selling and administrative expenses for savings-intensive life insurance policies, the measured variations in Linton yields will be more apparent than real. The calculation of Linton yields using average ART rates, for example,

[68] This example, it should be noted, is not meant to imply that non-agency insurers always experience lower expenses than agency insurers.

[69] The effect of costly and imperfect information on insurance markets is also examined in Chapter IX. For interesting analyses of the selling function with costly search and selling, see Matthewson and Winter (1981) and Matthewson and Todd (1982). In their models, insurance companies are able to exploit their information advantages through price discrimination. For alternative views stressing market correctives for the informational asymmetry, see Mayers and Smith (1982).

only allows for the average level of selling and administrative expenses reflected in the set of ART rates. For this same reason, if the average efficient level of selling and administrative expenss in saving-intensive policies is greater than that in ART policies, as is likely to be the case because of the greater complexity of the saving-intensive policies, then the average Linton yield will be underestimated.

Variation in the Investment Strategies Pursued by Insurance Companies

With interest rate uncertainty (or, more generally, portfolio risk) insurance companies may pursue different strategies with respect to the investment of their portfolios. With efficient capital markets an insurer can earn a higher expected rate of return only by accepting a greater degree of risk. This trade-off is ignored in the ideal model which assumes that interest rates or investment returns are known with certainty. The implication of variations in investment strategies for the pricing of life insurance depends on the type of policy and insurance company being considered. For a non-participating policy purchased from a stock company, a policy owner may prefer to pay a slightly higher premium for a policy sold by a company pursuing a more conservative investment strategy since this strategy reduces the possibility of bankruptcy. Although the possibility of bankruptcy is remote, a stock company in financial difficulty may delay settlement or be stricter in the interpretation and enforcement of policy terms. For a participating policy, a more conservative investment strategy reduces somewhat the risk of a low dividend.[70] In a

[70] Dividend practices were discussed in detail in the previous section on product design differences. As an aside, it is interesting to note that the ideal model has no implications for the structure of the life insurance industry -- for the choice of ownership structure in terms of stock companies versus mutuals. For an insightful and important analysis of ownership structure in insurance markets, see Mayers and Smith (1982).

competitive market, then, variations in investment strategy may be reflected in variations in the prices of life insurance policies.

Concluding Remarks

This chapter has raised the possibility that much of the empirical evidence put forth as indicative of a lack of effective price competition may, instead, be consistent with the workings of a competitive market for life insurance once proper account is taken of the long-term complexity and nature of the life insurance product. In particular, once it is recognized that insurers specialize in different market segments and that the products being offered are not necessarily homogeneous, then the empirical evidence documenting a relatively low average Linton yield for various types of policies and variability in Linton yields for a given policy type must be interpreted cautiously. As this chapter has argued, it is conceivable that much of the difference in measured Linton yields for alternative types of policies (e.g., non-participating whole life, participating whole life,, or universal life) could be explained by differences in policy options and guarantees. Moreover, these same factors could explain the observed differences between the average Linton yield for different types of life insurance policies and the current yields being offered on alternative savings instruments. It is also conceivable that much of the variation in measured Linton yields across alternative policies could be explained as spurious variation induced by using assumptions as to standard or average experience with respect to mortality, persistency, and expenses when, in fact, the marketplace is highly specialized with insurers facing different costs in each market segment. Unfortunately, we do not have the evidence necessary to determine if these conjectures are true.

A definitive resolution of these issues will require additional theoretical and empirical work. As a first step, the recent work on valuing financial options should be extended and applied to the valuation of the unique and diverse packages of options implicit in life insurance policies. As a second step, the extent to which insurers specialize in different segments of the market and, as a result, experience different costs should be examined. Special attention should be devoted to examining variation in mortality and selling expenses. As a final step, a large data base with matched samples containing extensive information not only on policy and company characteristics but also on policyowner and benficiary characteristics should be compiled and analyzed. Without this theoretical and empirical effort, it will be impossible to determine whether the pricing of life insurance policies reflects the natural forces of a competitive markt or is symptomatic of underlying market failure.

Chapter IX

Consumer Information and Life Insurance

One of the tasks set by the Committee was to study the "adequacy" of information made available to consumers concerning life insurance policies. As we have seen (Chapter III), a stream of scholarly research running back over 150 years, both in England and the United States, has consistently suggested that price competition in life insurance is not as effective as it might be in supplying a variety of policies at low cost, perhaps both because buyers lack a basic understanding of the product and because the information required to evaluate products is costly to obtain and process. The evidence cited in support of this thesis, which we reviewed in Chapter III, includes average rates of return on life insurance savings that are low relative to market alternatives, severe penalties for early withdrawal which nevertheless fail to deter it and for which consumers who do not withdraw early receive no extra compensation for running the risk of incurring them, and the large variation in rates of return which may indicate that high priced firms can successfully compete with low priced firms. As detailed in the preceding chapter, it is possible that any or all of this evidence is consistent with an efficiently working, but highly complex options market. In this chapter, however, we explore the alternative possibility that the apparent inefficiencies are real.

Some of the evidence gathered for this report, subject to the caveats detailed in the preceding chapter, is similar to that reported in previous studies. Other evidence, however, particularly that relating to recent innovations suggests a reduction in the problems as previously perceived; the differentials between the rates of return on savings through life insurance and alternative media are smaller, withdrawal penalties are less severe (though early withdrawal rates were increasing) and there was a substantial, industry-wide, decline in the ratio of home office and selling expenses per thousand dollars of insurance coverage.

In this chapter we briefly review the evidence presented in Chapters IV - VII relating to the question of information adequacy. We then go on to discuss some research on the operation of markets where it is costly for buyers to evaluate the quality of their purchases even after the sale. The efficiency of such markets depends, in part, on how well buyers can use whatever partial information is available to check on the performance of companies or on their designated agents. We then briefly review survey evidence concerning consumer knowledge of life insurance contracts and the extent to which they shop or seek information on alternative policies. Lastly, we close with some suggestions toward building a testable theory based on an assumption of costly verification as an alternative to an efficient market hypothesis.

1983 Evidence Concerning the Adequacy of Information

We have analyzed samples of annual renewable term policies (Chapter IV), traditional whole life policies (Chapter V) and the newly introduced universal life policies (Chapter VI). We also provided some evidence on the behavior of people who purchased policies in earlier years concerning the extent to which they exercised the policy loan option and the extent to which they canceled older policies to replace them with new policies (Chapter VII).

Using the concept of "ideal" or "breakeven" prices, we found the average annual renewable term (ART) rates to be low, especially when account is taken of the average home offfice and selling expenses incurred by the industry as a whole. Early withdrawal penalties are not an issue with this type of insurance. Since ART premiums are not front-end loaded, there is little or no economic penalty for canceling or not renewing coverage. Variability in premium rates for persons in the same age, sex and underwriting class and for the same amount of coverage was substantial. Coefficients of variation were in the range of 10% to 20%. Based on this variation, a crude estimat of potential shopping savings availble for a non-smoking, 35 year old male, would be on the order of $15 in the first year of coverage. Since a policy which provides a lower than average first year rate, often also provides lower than average rates at later ages, such savings can be expected to continue for some years into the future, if the policy is renewed. Thus, the present expected value of the potential savings is greater than the $15 accruing in the first year, but we were unable to estimate how much greater. We were also unable to estimate how much of the variation was simply a reflection of differing underwriting standards and other intrinsic policy and company differences. Thus, there was no evidence in this market of inefficiencies due to lack of information.

Average prospective rates of return offered on whole life policies for holding periods of up to ten years were substantially below rates available through other savings media. The (guaranteed) rates on non-par policies were substantially lower than variable rates offered on par policies. Prospective rates for 20 year holding periods on dividend paying policies were around 7%, a rate that in view of tax advantages was perhaps competitive with market alternatives. Penalties for early withdrawal were extremely severe. Rates of return were generally negative for holding periods of five years or less. Lapse rates within the first two years were over 20% and increased over the period studied. Variability was high, whether measured within the class of par or non-par policies alone, or whether all whole life policies were treated as one class. Potential shopping savings from canvassing one additional seller were far larger than estimated shopping savings on IRA accounts, car loans and savings account earnings and amounted to a present expected value of hundreds of dollars. Thus, the evidence on whole life policies issued in 1983 is consistent with the findings in earlier studies, and suggests that this market may be subject to information based inefficiencies.

Prospective rates of return on universal life policies for holding periods of five years or less were generally higher than those being offered on whole life policies, but lower than those being offered by the non-life insurance savings media. For holding period of ten years or more, they compared favorably with other market alternatives and with whole life insurance policies. Penalties for early withhdrawal were severe, but less severe than those contained in whole life policies. Compared to whole life, penalties could also be reduced by choosing a low cash outlay in the first few policy years. Variability, though lower than that observed on whole policies, was substantial. The observed coefficient of variation of the advertised current rates was in the same range as those observed on IRA accounts and car loans. The advertised rates are, however, gross of expenses. The coefficients of variation on the net rates were substantially higher, especially for durations of less than ten years. There was no correlation between advertised and net rates of return for durations of one, five and ten years and only weak correlation at duration twenty. Potential shopping savings were substantial, amounting to expected present values of hundreds of dollars from one additional canvass. Thus, the evidence for the universal life market is mixed; if inefficiencies exist, they are smaller in magnitude than those observed in the whole life market, yet apparent shopping savings are substantial.

Markets Where Quality Verification Is Costly

There is a recent and rapidly growing literature in economics dealing with goods whose quality will not be revealed in the ordinary course of using them. Remarkably enough, the most general formulation of the problem and the earliest reference known to the author is in Babbage's book on the economics of machinery (1832).[1] In a chapter called "On the Influence of Verification On Price", he defines the cost of any item to the buyer to be the purchase price plus the cost of "verifying the fact of its having that degree of goodness for which he contracts." [2] He immediately applied this insight to explain the different degrees of price dispersion that he observed among London retailers and suggested that retail margins would be higher on items that had higher costs of verification. Babbage wrote that the price of loaf sugar, whose "goodness" could be "discerned almost at a glance," is "so uniform, and the profit upon it so small, that no grocer is anxious to sell it; whilst, on the other hand, tea, of which it is exceedingly difficult to judge, and which can be adulterated by mixture so as to deceive the skill even of a practiced eye, has a great variety of different prices, and is that article which every grocer is most anxious to sell to his customers." Later, in discussing the retail linen trade in London, he suggested that the "purchaser, if not himself a skilful judge (which rarely happens to be the case), must pay some person, in the shape of an additional money price, who has skill to distinguish and integrity to furnish,

[1] See Chapter III for a brief account of Babbage's book on life insurance. Philip Morrison, book review editor of the **Scientific American**, describes Babbage's book on machinery with as the first work in a discipline now known as "operations research."

[2] **The Economy of Machinery and Manufactures**, 4th edition, London, 1835. Quote is from page 134 of the 1971 reprint by Augustus M. Kelley. The first edition was published in London in 1832.

articles of the quality agreed on." [5]

The latter notion has recently been reintroduced into economics under the term "quality assuring price" by Klein and Leffler (1981) and Shapiro (1980 and 1982). Earlier Nelson (1971, 1974) had proposed a very interesting model concerning markets where information on quality was costly to obtain. He distinguished between "search" goods and "experience" goods. In the case of the former, quality can be ascertained on inspection and before purchase. The quality of a color TV picture is an example of a search characteristic. In the case of experience goods or characterisics, quality can be ascertained by using or "experiencing" the good through normal use. The time to first repair on a TV set is an example of an experience charcteristic. Clearly, some characteristics fit into neither category- those whose quality cannot be ascertained through normal use. Borden (1942) called these "hidden" characteristics and more they have been modeled under the name of "credence" characteristics. [4]

The theory of how markets operate, when quality is costly to verify, is quite difficult and little progress, even in the form of theoretical results, has been made. In the special case of experience goods, some theoretical models predict the emergence of a quality assuring price, which though higher than the ordinary full information cost of production, will give sellers an incentive to provide the efficient level of quality. When quality cannot be ascertained costlessly through normal use, one possible road to efficiency is through the institutional development of "agency." Buyers hire agents who have expert knowledge to make purchase decisions on their behalf. But then

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[5] ibid., p. 140.

[4] See Darby and Karni (1972).

monitoring the agent's performance will be costly since it will still be costly for buyers to evaluate the product after purchase. Some market experiments (Forsythe et al., 1984) have been run to investigate such markets under controlled conditions. In these experiments some sellers provided the optimal quality at a high price as the quality assuring price models would predict, but a substantial proportion of sellers provided low quality at a high price, gambling that their clients would not undertake the expense to check on their performance.

In so far as there are information based problems in some life insurance markets, it is likely that they are due to the difficulty of evaluating the quality of a life insurance policy, especially as a savings vehicle, even after owning the policy for some time.

Why Is Life Insurance Different?

Many will (properly) find evidence of informational market failure, such as outlined above, hard to credit since it is inconsistent with experience in so many other markets. How could a serious widespread problem based on lack of knowledge persist for over 150 years? Surely the answer is not just that life insurance policies are too "complex" for the public to understand. Many products are far more complex than life insurance policies: automobiles, personal computers, compact disk stereos etc. These markets work very well, even though most buyers understand very little about how the product works. The market for IRA accounts is complicated by different yields to maturity, different guarantees, and by different options allowing the buyer to add to his deposit at a later date at the rate specified in the original contract. Despite these complexities, as we have seen in Chapter V, rates offered closely reflect other market rates and potential shopping gains are small. Some financial market instruments are extremely complex: commodity or stock market futures contracts, for example. Financial strategies (e.g. "straddles") can be both complex and require delicate timing and constant monitoring. Complexity does not prevent these markets from performing well even for investors who do not have the time to understand their details or to follow their course minute by minute. In such cases one may hire an expert to act as one's "agent" or one may simply rely on a company's reputation for producing high quality products, even if one can't evaluate the quality without great difficulty. Hasn't the agency system in life insurance developed to meet this very need? Won't fear of losing reputation and future sales prevent companies from selling high cost policies?

An explanation that invokes more than just complexity and that explains why the agency system or reputation development fails to resolve the problem is needed. Mathewson - Todd offer two reasons why consumer misperceptions can persist in the long run.[5] First, the consumer may learn little about the quality of his life insurance policy even after many years of owning it, because purchases are infrequent, the contingencies covered are only likely to occur many years in the future and because of heavy front end loads, switching policies is costly. Second, expert informational shopping services offered by third parties will probably fail to completely eliminate the inefficiencies, not only because of the usual "public good" and "free-rider" problems associated with providing information, but also because consumers will have as much difficulty distinguishing between high and low quality agents as between high and low quality policies.

In some the ways the reasons given above are unsatisfactory because they

[5] Mathewson with Todd (1982), p.41.

apply to many products where there seems to very broad agreement that markets work well. The problem of appropriating the gains from supplying expert information applies to all markets, and so we would expect markets wherein complex products like personal computers or stereo systems to perform poorly. But they don't. Similarly, life insurance policies are probably bought as frequently as refrigerators or houses, yet those markets appear to perform well. The more basic notion running through both of the reasons given above, however, is that the consumer is unlikely, in the normal course of owning his policy to be able to evaluate his policy relative to alternatives. Thus it is difficult to distinguish between high and low quality policies or agents either before or after purchase. By using a computer, by listening to a stereo a consumer is able to evaluate the quality of his purchase for his own uses and tastes. With a life insurance policy, the death benefits can be evaluated by the beneficiary after the policyholder's death. The question is straightforward; did the company pay the contractually agreed upon amount in a timely manner? On this aspect of actual policy quality, the answer seems to equally straightforward. Companies virtually always pay the agreed upon amount and in a timely fashion. But what of the "living" benefits, which in pay in advance policies are a far larger portion of the premium dollar than the death benefits? Without sophisticated financial analysis and access to a computer how can a policyholder evaluate whether the dividends paid on his policy are "competitive" with other savings media or whether the cash surrender value after 7 years is satisfactory or not? This report itself, if it serves no other purpose and demonstrates no other point, should be ample testimony to the fact that even with access to a computer and the help of experts, it is not at all easy or cheap to evaluate alternative life insurance policies.

The "monitoring" problems are compounded if policyholders do not perceive their life insurance policy as a joint protection/savings plan, in which the various interest rate assumptions factored into the premium and benefit structure play a crucial role in determining the cost of the overall policy. There is little hope of the policyholders providing an effective competitive check on sellers if they are unaware that rates of return are important.

Survey evidence has consistently shown that buyers do not understand the dual nature of savings intensive life insurance policies, that they do not how to assess relative costs, that they do not think that dividends are important and that they do not try to compare policies even when they believe costs differ subtantially.

Consumer's Ability and Actions To Evaluate Life Insurance Contracts

A theme running throughout the early works cited and the history of regulation is that policyholders often do not seem able to evaluate and compare life insurance contracts either before or after purchase. Surveys (almost all of which were sponsored by the life insurance industry) consistently indicate that (1) policyholders exhibit little knowledge about or understanding of the basic components of their policies; (2) they do not know how to compare costs of different policies or to evaluate the performance of an existing one; (3) in spite of the financial importance of dividends, consumers generally do not know whether their policies pay dividends or not, nor do they consider dividends an important potential benefit to look for in a policy; (4) in spite of what appear to be large gains to search, most consumers do not search at all; (5) in spite of strong financial incentive to use the policy loan privilege to the fullest possible extent, most policyholders did not exercise this right.

Lack of Understanding

Almost twenty years ago, the Yankelovich organization, on the basis of an extensive survey, reported to the major life insurance company trade association that,[6]

> Due in part to the inherent characteristics of the product, the average person feels less self-confident as a buyer of life insurance than of any major purchase. Indeed, the entire act of purchasing life insurance is fraught with anxiety: people are not confident about their ability to comprehend the pros and cons of alternative plans...

Just one year ago, Professor Crosby, in summarizing the results of a recent survey sponsored the major trade association representing agents and an industry management research organization, wrote,[7]

> Examination of of policyholder beliefs regardin persistency showed that most lacked strong opinions about what their policies can or cannot do for them. While they may have few reasons for dropping the policy, they do not have strong arguments for keeping it...
>
> Lack of product knowledge may be one reason why consumers have few strong opinions about the benefits of whole life ownership (except that it provides insurance even if health worsens). Instructed to have the policy in front of them, 20% "didn't know" whether the policy had an Automatic Premium Loan provision or a Variable Loan Interest Rate. **Only two-thirds were aware of the Nonforfeiture Options. Forty percent "didn't know" the policy's present cash value and many others gave unrealistic estimates. Further evidence of a lack of differentiation was that none of the satisfaction components varied with the presence or absence of objective policy features.** (emphasis added)

Not only do policyowners show little awareness of the explicit benefits available under their own policies, but many do not understand the fundamental point that each whole life premium payment is in part a contribution to a

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[6] Institute of Life Insurance, Monitoring the Attitudes of the Public (MAP), 1969, at 23. Quoted in FTC (1979) at 75.

[7] Crosby (1984), p. 6. On p.45, Crosby, after presenting the average reported cash value and noting that 40% chose not to answer, says some of the estimates given by those who did choose to answer "are highly improbable considering the policy age and the coverage amounts involved."

systematic savings plan. When asked whether by keeping their whole life policy in-force, it was extremely probable, very probable...extremely improbable that they would "be consistently setting aside money for savings", on the average, policyholders answered that it was "neither probable nor improbable."[8] In spite of the fact that everyone of these policyholders was in fact systematically saving, on the average, they couldn't even say whether it was likely or unlikely that they were saving at all through their whole life policies.

Comparing Costs

Surveys have repeatedly found that many people appear to equate the "cost" of a policy to its premium, and say that they have considerable difficulty in determining whether they are getting their money's worth.[9] In a recent survey, only 18% of the respondents reported that they compared costs in their recent experience in the life insurance marketplace. Of these 18%, six out of ten "still think about cost as premium." They said they compared premiums or rates charged by different companies for similar kinds of policies. About 11% of those who compared costs, or about 2% overall, reported using cost indexes to compare costs. Thus, most buyers and nonbuyers do not attempt to compare costs at all and those that do compare premiums.

The Perceived Unimportance of Dividends

Despite the importance of dividends, policyholders are in general not aware of whether their own policy pays dividends, nor do they think dividends have any great importance. The importance of dividends can be shown in many ways. At the aggregate level, Table I-3 shows that dividends per thousand dollars in force amounted to about $3 per year on participating policies. In 1981, only

[8] Ibid.,p. 146, question 2 in section III.

[9] See FTC (1979), pp. 75-81 for a summary of survey evidence through 1977.

about half of the policy amount in force was participating, so dividends per thousand on par policies were on the order of $6 per thousand. Dividends per thousand were by far the largest single source of benefits; with death benefits ranging between $2.80 to $3.50, surrenders between $2.75 and $3.80 and the change in policy loans between $0.35 and $3.50. The powerful impact of dividends on rates of return can be seen from the tables in Chapters VII and IX. Yet the recent industry survey discussed above indicates that in only 27% of the households recently visited by a life insurance agent could recall any discussion of dividends and an additional 29% could not recall whether their had been any discussion.

Little Shopping Despite Large Potential Savings

In spite of what seem to be large potential gains from shopping, policyholders shop or "search" very little. A 1975 survey sponsored by a life insurance trade association[10] found that 58% of the respondents said they had **never** compared policy costs, in spite of the fact that 65% said that they believed that there were differences in policy costs. The vast majority of those who purchased a policy from an agent, dealt only with that agent. A more recent survey[11], reports similar findings. About 80% of the recent buyers said they had not compared costs and that they had dealt with only one agent. Of those who said they believed there were large cost differences between policies, only 29% said they had compared costs. More highly educated people are more likely to believe there are large cost differences and to compare costs;

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[10] Institute of Life Insurance, **Monitoring Attitudes of the Public**, 54-55. For further discussion see FTC (1979, 69-81).

[11] **Consumer Experiences in the Marketplace**, Vol. 1:Buyers and Nonbuyers in the Sales Process, A Joint Study by LIMRA and the ACLI, 1982, 20-21 and especially 32-36.

34% of those with a high school education or less believed that differences could be large and 14% said they had compared cost, whereas, 47% of those with some post-graduate education believed differences could be large and 26% had compared costs.

Failure to Exercise Policy Loan Privilege

Another observation that appears inconsistent with the notion of well-informed, financially sophisticated policyholders is the relatively small percentage of policyholders who have taken advantage of the fixed 5% loan rates in policies issued before 1981.[12] Especially for non-participating policies (where there is no question of being penalized by lower dividends), it is hard to conceive of any reason why knowledgable profit maximizers would forego an opportunity to probably more than double their after-tax interest yield on many tens of billions of dollars. The simplest explanation seems to be that they don't do it because they don't know about it and that no one has any incentive to tell them about it.

Economic Models of Life Insurance

The inability to evaluate policy performance in the normal course of owning the policy seems to be fundamental to any theory of informational market failure in this market. The survey evidence cited above suggests that policyholders do not understand how to evaluate the dual savings/protection pay in advance life insurance contract. They neither know nor realize the economic importance of cash values, dividends and the policy loan interest rate. None of the usual market institutions that help buyers cope with complexity, expert "agency" or firm reputation, will work unless buyers can and, with some frequency do, evaluate the product and the services supplied by sales agents.

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[12] See Warshawsky (1984) and Crosby (1984).

Differential ability to evaluate policies based on differences in knowledge has been used both by Mohring (1959) and by Mathewson-Todd to explain (not completely successfully) price variation in this market. They have stressed the incentives on the part of companies to price discriminate on the basis of consumer elasticity of demand. The latter is in part a function of knowledge, so that the better informed will be offered more quality per unit price than the less informed. Companies are able to discriminate because buyers don't shop and because company sales agents either target particular groups with a policy tailored for each group, or because agents can offer a variety of policies and will recommend one based on an individual assessment of the client.

Buyer difficulty or inability to evaluate the product even after purchase can have powerful effects on the role of the salesman. An analogy to a well known model of a "lemons" market may provide some insight into the situation. The essential notion is that because buyers do not "frame" the question as "am I receiving a good rate of return on the savings portion of the contract?", companies have little incentive to provide market rates of return. Unless increasing the rate of return makes a policy easier to sell, companies will instead offer higher commission rates to attract the more talented salesmen. High cost policies will tend to drive out low cost policies. The situation can persist because buyers neither seek nor receive any feedback on investment performance. The reason is either that they are unaware that life insurance policies contain significant investment features or because they do not know how to evaluate a policy's investment performance. The "agency" system fails to correct the problem, because buyers cannot effectively monitor the performance of the agents/salesmen[13]. The history of sales agents and their commission rates recounted in Chapter III is at least consistent with this alternative theory.

A "Lemons" Model of the Life Insurance Market

Most of those who believe the life insurance market works poorly from the consumers point of view have focused on buyers' inability to evaluate policies even after purchase as the main source of these problems. Complexity is hardly unique to the life insurance market, however. Many, many markets involve products that are far too complicated for the non-professional buyer to evaluate on his own (e.g. autos, microcomputers, stereos, most medical procedures etc.), yet by and large these markets work well. Institutions and strategies that have evolved to deal with problems of consumer ignorance include brand names as a signal of quality, third party providers of information such as **Consumers' Report** and relying on an expert to act as your "agent."[14] For any of these solutions to work, however, there must be some check on performance at least after the sale. In life insurance such checks seem weak. Life insurance policies may be good examples of the problems that can arise when goods have "hidden " or "credence" characteristics. The most important problem may be a variant of the "lemons" phenomenon. Bad (from the buyer's point of view) policies drive out good.

Akerlof appears to have been the first to provide an analytical model of

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[13] Life insurance agents are not "agents" of the buyer, in the legal sense of having a "fiducial" obligations to their clients. Rather they are salesmen receiving commissions and other considerations from the life insurance companies they are associated with.

[14] On the general problem see Beales, Craswell and Salop. On brand names and reputation, see Nelson, Schapiro and Klein and Leffler. On agency see Ross and Radner.

the "lemons" phenomenon and showed that it could arise from ignorance. In his model, the buyers' are unable to distinguish the quality of one automobile from another, and so they are only willing to pay for average quality. But potential sellers who own higher than average quality automobiles leave the market because the price based on average quality is below the value they place on keeping their cars. This process continues until only the lowest quality items are left trading. The market fails to transact all mutually beneficial trades. The information required to solve the market failure exists, but in the minds of the sellers. The failure comes about because buyers do not have access to this information. If buyers could have had access to the information in sellers' heads, then trades would have taken place which would have made both buyers and sellers better off than they were in the pure "lemons" market. The problem is not simply that sellers are not allowed to disclose the quality of their automobiles; it is that most would have little incentive to tell the truth and buyers would not believe their claims. By assumption, seller and buyer will have no further dealings, so sellers have no incentives to acquire a reputation for fair and honest dealing with any particular buyer. Thus the root cause of failure in Akerlof's model is the combination of a good whose quality can't be known prior to purchase with a zero repurchase rate in the future, regardless of customer satisfaction.

A variant of Akerlof's "lemons" model might provide at least the first steps toward an analytical model of buyer ignorance in the life insurance market. Suppose that buyers, either because they don't frame the question properly or because they are not expert enough, cannot distinguish between savings intensive policies with very different rates of return. If buyers cannot tell, within fairly wide limits, whether one product is better than another even after purchase, then offering the buyer a higher rate of return will not make the product any easier to sell. If buyers are aware of their ignorance, then they will be reluctant to buy the product. They must be persuaded. Rather than choosing only on the basis of objective product characteristics and their prices, they may now choose partly on the basis of their assessment of the agent or salesman.[15] The probability of a sale wll now depend on the ability of the salesman and not just on the objective quality of the policy. Since offering a higher rate of return may not make the policy any easier to sell, firms that offer effective agents higher commission rates than others will attract the better salesmen.- This may increase policy costs, but so long as buyers cannot detect them, high cost firms will be successful and may drive out low cost firms. This lemons-like phenomenon seems to be related to what some people have called "reverse competition" in some insurance markets, a situation where increased competition leads to higher consumer prices with no change in quality.

In a world of ignorant buyers the role of the salesman is very different from his role in the ideal world of the preceding chapter. Here the personal characteristics of the salesman are among the main determinants of sucess or failure. This latter view of the role of the agent seems much closer to the views held by people in the industry and by industry historians such as Stalson and Carlyle-Buley. The most common axiom in the industry is surely this; "Life insurance is sold-not bought!." The second most common axiom may be;

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[15] See the very interesting experiments by Chestnut (197") on this issue. Chestnut developed a very clever way to control the subject's "liking" of a computer-generated life insurance agent. He found that "liking" of a particular agent was far more important in choosing between whole life and term insurance policies than any objective policy characteristics or previously expressed beliefs about the relative desirability of the two products.

"There is competition in the life insurance industry- for the agent!." The second axiom follows if sales ability is scarce, which it clearly is. Companies will then have to compete for good salesmen by offering policies that are more remunative per sale than those of other companies. Higher sales commissions will be the route to higher sales, since lowering sales commissions does not make the policy easier to sell. With free entry and no scarcities elsewhwere (entreprenuerial talent etc.), excess profits above the ideal will in fact show up as "rents" to talented salesmen.

But What Puts a Cap on Cost?

The above argument, while it provides an explanation for some common observations in the industry, is far from a satisfactory economic theory of how such a market could evolve and persist. If buyers cannot discern true cost, what prevents prices from rising until buyers income are exhausted? Clearly, buyers must and do know something about the costs of a policy, but how can one analyse this partial ignorance? There are two important clues in the evidence. First it is clear that buyers are well aware of the premium they pay and that many will say that the premium is the measure of cost.[16] Hence it seems reasonable to assume that both the probability of any purchase and the amount purchased will be a decreasing function of the premium per $1,000. The second clue comes from the controversy over "cost disclosure" in the industry. While the proponents of cost disclosure disagreed on the best way of disclosing costs, all agreed that the "net cost" method is incorrect and potentially highly misleading. "Net cost" refers to the difference between the sum of all net premiums paid and the cash value at a particular duration. Anyone who followed the controversy knows that the debate over net cost was not a debate

[16] See FTC (1979), 70-74.

concerning actuarial exotica, but a debate over deceptive selling tactics. In fact, the debate over net cost goes back to De Morgan's comments on the "magic" being used in company advertisements almost 150 years ago. At issue was a a sales pitch creating an impression that it was possible to get a "free lunch" by buying a life insurance policy. The argument would run as follows: "For a mere $100 a month you can buy $25,000 worth of insurance to protect your loved ones. Suppose your needs change or you change your mind ten years from now. Then we will give you all your money back and more!" The illusion of a free lunch is based on the failure of the buyer to perceive the savings bank aspect to the policy. An offer from a savings bank to merely return all the money deposited over 10 years without interest is unlikely to be perceived as a wonderful incentive to patronize the bank.

If buyers consider both the premium and the net cost in making a purchase decision, then this may explain what puts a cap on costs and it may be helpful in generating testable predictions of the workings of a market based on partially ignorant buyers. For example, sellers would now have an incentive to raise premiums and late duration cash values from their ideal levels. If the seller increased the premium and the 10th year cash value by a dollar, for example, the net cost of the policy would be unchanged. But the seller would have the excess of the contingent present value of a dollar a year minus the contingent present value of one dollar in surrender values 10 years in the future for any use to which he chose to put it. By increasing the premium, the seller will decrease the demand for his product, even though the net cost remains unchanged. So long as the buyer does not fully discount for the additional premium, however, firms will have an incentive to raise premiums and late cash values relative to their ideal levels. The excess income would in the end result in higher rents for effective salesmen.

The above is a sketch, not a model. It provides some explanation for the importance of the selling function, but unlike the efficient market model, it does not yield a wealth of detailed testable predictions. Thus there is a bias in testing against the efficient market model. Its detailed and precise predictions offer many more opportunities for failure, than the vague inequalities of the lemons market. Pending further development of the latter, all we do is to note the bias and discount for it.

Summary

Severe penalties for early withdrawal that fail to deter and are unaccompanied by higher than market rates of return for those who do not withdraw, lower than alternative market rates of return and large potential shopping savings that go unexploited have been taken to be evidence of a consumer information problem in the life insurance market. The evidence presented in this report shows all of these indications to be strongly present on traditional life insurance policies being sold in 1983. The new universal life policies show some, but not all, of these indications, but in a lessor degree.

The preceding chapter developed the possibility that some of these indicators are not inconsistent with an efficient, sophisticated options market. Survey evidence strongly suggests that buyers are not sophisticated, that they know little about the most basic savings features of their policies such as cash surrender values and dividends actually paid. This suggests that there is a real information based problem in this market that inhibits effective price competition and can lead to "lemons"-like phenomena.

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