REGULATION OF CANADIAN MARKETS FOR LIFE INSURANCE

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PREFACE

While Chapter 1 is due primarily to Winter, Chapter 2 is due primarily to Mathewson, the Executive Summary and Chapter 3 are jointly written, we have discussed, read and corrected each others work until we are jointly and severally liable for the material. We wish to thank Sam Kellner for competent research assistance, Rita Mollica for typing this manuscript and Gail Morrison for enlightening regulatory and institutional discussion on the industry.

EXECUTIVE SUMMARY

This report consists of three parts. In Chapter 1, we examine the impact of conservative valuation regulation and nominal solvency constraints imposed by government regulation in Canadian life insurance firms. In Chapter 2, we examine the evidence in support of a rational equilibrium price distribution for life insurance. In both chapters, we evaluate the relevant aspects of market failure in markets for life insurance and assess the policy options available to government. Finally, in Chapter 3, we discuss three other studies of insurance regulation to appraise their policy conclusions.

The concept of informational asymmetries that favour life insurance firms against consumers is central to our analysis of life insurance markets. If consumers could sort life insurance firms by the riskiness of the decisions of managers of these firms now and in the future, to maintain reserves to meet future liabilities, then valuation regulation would be unnecessary. If consumers could sort life insurance policies and firms by their true valuation of policy options and riders, savings elements, and qualities of the management of firms so that price variation would reflect only the differing characteristics of products that reflect, in turn, the differing needs of consumers, i.e. known differences in quality, then any government information program would be unnecessary. Unfortunately, there is no reason to believe this is the case and every reason to believe that exactly the opposite holds.

In Chapter 1, we investigate two effects of valuation procedures in the Canadian market for life insurance: (1) has the rise in nominal interest rates since the early 1960's been adequately reflected in life insurance premiums paid by Canadian consumers? (2) can a lack of response of the life insurance market to this rise in interest rates be attributed to conservatism in mandatory valuation standards, and if so what has been the effect of the 1977 deregulation which eliminated mandatory conservative valuation? We analyze these questions by comparing the actual trend in market rates with the simulated trend of rates in a hypothetical, competitive or responsive market. Our conclusions in this chapter are (1) that the industry has not passed the full savings resulting from higher interest rates on to consumers. Between 1965 and 1980, the average mark-up of premiums over annualized benefit costs tripled, for the sample of policies examined here. Had rates fully reflected the rise in interest rates the mark-up would have approximately doubled. Based on the sample examined here, buyers of 1980 nonparticipating policies receive an average of only thirty-four cents for every dollar paid (in present value terms). (2) that the valuation regulation which was in effect until 1977 was sufficient to prevent an adequate response on the part of the industry to the rise in interest rates. Because of inertia and a lack of competitive pressure in the industry, however, the 1977 deregulation has had little apparent effect on market performance.

We briefly evaluate five government policy options:

1. disclosure of costs
2. mandatory valuation standards
3. regulatory limits on surplus/liability ratios
4. guaranty laws
5. non-subsidized federal life insurance funds

In Chapter 2, we investigate the nature of price and quality variability in life insurance and pose a number of questions about life insurance markets. Does price variability reflect costly search by some consumers for a homogeneous product or consumer ignorance about product qualities across substitute life insurance contracts and underwriting insurance firms? What role is played by life insurance agents in the marketing of life insurance products? Are consumer interests served more effectively by independent or exclusive agents? In a free (unregulated) market which firms would use independent agents and which firms would use exclusive agents and why? Should public policy encourage one or the other agency system? Is there a role for public policy in the provision of information in this industry? What is that role?

We argue that existing observed price distributions for life insurance products cannot be explained consistently by a model of pure price shopping, i.e. firms sell homogeneous products and charge different prices as consumers have varying costs to searching out the cheapest supplier. Rather, we argue that life insurance products are heterogeneous goods with quality variation where life insurance agents price discriminate against consumers according to the knowledge on product alternative held by each consumer. Such price discrimination is feasible as consumers reveal sufficient personal and financial information to an agent for risk rating and policy recommendation that agents are fully-informed about each consumer's willingness to search. Further, each sale is a negotiated bilateral exchange where further resale is not possible. This explanation for price variability finds empirical support in a reduced form price equation where variability in relative life insurance prices, corrected for savings and dividend elements, relative to variability in the costs of consumer search, is explained by household and product variables. Consistent with traditional notions of entry, more firms increase rather than decrease equilibrium price variability, i.e. more firms increase the pay-off from search. Prices for women exhibit larger relative price variability than prices for men. Consumers undervalue participating relative to non-participating insurance but do not appear to undervalue term relative to permanent insurance.

While we forecast that the pattern of consumer perceptions on the relative merits of alternative types of life insurance will remain identical whether agents are independent or exclusive, we forecast that independent agents will lead to a greater efficiency in consumer search across competing life insurance firms for any contract type. A comparison of prices for Canadian (exclusive agency) and Pennsylvania (some independent agencies) firms indicates that the presence of independent agents improves consumer search. However, agents still price discriminate under both institutional arrangements. Indeed, we argue that all successful life insurance firms must price discriminate for survival. Those that fail to do so will themselves ultimately fail. Those that do so successfully will make only competitive rates of return in the long-run. In other words, entry serves to constrain rates of return and discipline in favour of price discrimination.

We predict that smaller life insurance firms with smaller brand names would choose to use independent agents if permitted, while larger firms attempting to capture a return on their large brand names will use exclusive agency agreements. Furthermore, we demonstrate why sales commissions per contract sold may be smaller for larger insurance firms.

We argue in favour of free choice for firms in the design of their agency system. Both agents and consumers are potential gainers from such a change from the historical exclusive agency system in Canada. We are against any barriers to entry into the agency business including longer training programs or higher entrance qualifications.

We feel that there is the potential for a public informational policy in this industry. In particular, we argue in favour of subsidies to information to improve the knowledge of consumers and therefore, their ability to negotiate more successful with life insurance agents and against regulatory restrictions on agents commissions or their activity. However, firms should be legally liable for the statements of their agents and we recommend six month "cooling-off" periods in which consumers may cancel policies. Consumers bargaining positions would be improved by the availability of insurance experts at government expense on phone-in lines and government information on the relative merits of alternative policies. The key to any such program is to present simple understandable statements. It is better to stimulate further consumer research than to confuse consumers by excessive information. For example, to facilitate comparison across companies, we recommend publication of only retention indices by policy by company. This would facilitate further research by consumers into differences in service across competing firms.

Finally, we integrate our findings in this industry with those of others. While we together with others advocate policies that lead to a greater flow of consumer information, we emphasize the limited abilities of consumers to process even simple information, let alone complex technical features of products. Therefore, in contrast to the recommendations of the Ontario Select Committee, we advocate a modified information package where the guiding principle is that a few simple easily understood facts are better than complex information "overkill" where consumers decisions are unimproved due to confusion.

CHAPTER 1

RESPONSE OF THE CANADIAN WHOLE LIFE INSURANCE MARKET TO RISING INTEREST RATES

1.1 Introduction

This chapter presents an analysis of the evolution of the Canadian life insurance industry rate structure over the past twenty years. The economic environment within which the industry has operated has changed dramatically over this period, especially since the mid-1960's. Long term interest rates have more than doubled since 1965, resulting in an enormous decrease in the costs of provision of whole life insurance, which is the single most important product of the industry. The main purpose of this chapter is to investigate the response of the Canadian life insurance market to this change in costs. The central empirical question is this: Has the secular rise in interest rates in Canada been adequately reflected in life insurance premiums?

Professor P. Boyle, in the report "Consumer Problems in Life Insurance", concludes that the conservative standards that until 1977 were mandatory for life insurance reserve valuation in Canada had the potential effect of depressing the yields that could be offered in the whole life insurance market. Most important among these standards was a very conservative discount rate assumption. Winter (1980) analyzes the impact of an identical regulation in the American life insurance market and concludes that it has led to a significant excess in premiums in that market. The hypothesis that the conservative valuation standards have resulted in excessive premiums in the Canadian life insurance market is investigated here, as is the effect of the 1977 deregulation.

The methodology adopted to assess the market's response to rising interest rates is to compare the actual trend in market rates with the simulated trend in competitive or responsive prices for a sample of whole life policies. From two alternative assumptions on the structure of administrative costs incurred by writers of the whole life policies, we estimate upper and lower bounds for the response premiums in each year after 1965. The "responsive" premium is, specifically, the premium necessary to cover expected present value of benefits and administrative costs as estimated using the current term structure of interest rates.

The conclusion reached in this chapter is that premiums in the Canadian whole life insurance market have not fully responded to the recent increase in nominal interest rates. In 1965 an estimated one-third of each premium was retained by the insurer to cover administrative costs, in the sample of nonparticipating policies examined here. If premiums had fully responded to the interest rate rise, this figure would have risen to approximately one-half in 1980. In present value terms, 1980 purchasers of nonparticipating policies are actually being paid back only an estimated thirty-four cents on each dollar paid in to a nonparticipating policy. Nonparticipating premiums were at least forty percent in excess of the estimated competitive premiums on the sample of policies examined here. While the long term interest rate rose from 5.2 percent in 1965 to 11.4 percent in 1980, the average rate of return paid to nonpar policyholders remained virtually constant at about two percent.

The response of the more important participating whole life rates - as based on projected dividend scales - has also been less than that predicted for a competitive market. In 1965 approximately twenty percent of the premium paid went towards covering administrative costs and profit in the sample examined here. By 1980 this figure had more than doubled to forty-four percent, whereas the estimated responsive proportion was about thirty-three percent. The average premium on the sample of participating policies examined here was more than twenty percent higher than the responsive premium, assuming no change between 1965 and 1980 in the degree of conservatism in projected dividend scales. The average estimated rate of return on the sample of participating policies from the five largest Canadian insurers rose from 2.2 percent in 1965 to 3.2 percent in 1980. The estimated mark-up of premiums over annualized benefit payments (including projected dividends) tripled over this period from its mid-1960's value of approximately twenty-five percent. All estimates of the increase in the mark-up of premiums over costs reported in this study are conservative insofar as no attempt is made to account for the effect, on insurance company costs, of the improvement in mortality since the late 1950's.

A qualification to the conclusion that participating policy costs haven't adequately responded to the increase in rates of return on other securities is the possibility that current dividend projections may be very conservative. However, even if realized dividends are twenty-five percent greater (in present value terms) than projected, the realized rate of return on the sample of participating policies will still be only 4.2 percent and the net average premium still about fourteen percent greater than the responsive level.

Moreover, a comparative analysis of historical dividends and projections does not suggest a trend to an increase in the difference between projected and realized dividends. While the realized discounted value of ten year dividends on 1959 policies sampled was twenty-seven percent greater than projected, the difference between projected and realized ten year dividend scales in 1969 policies was less than one percent. On the other hand, some mutual companies have recently increased dividend payments and even the nominal face values of outstanding policies.

While it is impossible to determine the extent to which the life insurance market would have responded to the rise in interest rates in the absence of regulation, we conclude here that valuation regulation which was in effect until 1977 was sufficient to prevent an adequate response. Following the 1977 relaxation of the regulation, there was the beginning of a decline in the average participating premium, although the premium remained well above the estimated responsive premium over the 1977-1980 period. (The estimate of responsive premium incorporates changes in projected dividends.) Precise identification of the effect of the 1977 elimination of the mandatory Conservative valuation standards upon market rates is confounded by the large increase in interest rates between 1977 and 1980. However, the results do show that the elimination of the mandatory standards did not lead to a sudden decrease in premiums.

The presentation of the empirical results of this study is preceded in the next section by an economic explanation of the potential impact of valuation regulation in the market for whole life insurance and in the third section by a discussion of the methodology and assumptions of the analysis. In the final section of this report, we present a number of government policy options, of varying significance and potential impact, which would mitigate the documented shortcomings in market performance.

1.2 The Predicted Impact of a Conservative Valuation Regulation

In this section, we set the stage for the empirical analysis by briefly reviewing and extending Professor Boyle's explanation of the effect of the conservative valuation regulation on market premium levels. The effect of the 1977 amendment relaxing the regulation upon valuation standards used is also investigated in this section.

The Impact of Non-Participating Policy Premiums

Life insurance companies are required to submit financial statements annually to the Superintendent of Insurance as evidence of financial solvency. The principal liability which is expressed in this annual statement is the obligation to pay future benefits to policyholders and beneficiaries. This liability is calculated as the reserve, which is the present value of future benefits minus premium payments to be received, and accounts for more than seventy percent of the total liabilities of Canadian life insurance companies.

Until the 1977 amendments, the Canadian and British Insurance Companies Acts and the Foreign Insurance Companies Act placed statutory restrictions on the valuation bases which companies used in the calculation of reserves. In particular, the Acts required that companies use a discount rate of not more than three and one half percent - four and one half percent after 1973 in calculating future benefit payments.

The purpose of the standardization of such conservative valuation limits was to facilitate the conservative assessment, by the insurance commissioner, of the financial solvency of the insurer. If an insurance company was insolvent, in the judgment of the commissioner, he had (and has) the legal authority to place the company in receivership at a stage where the policyholders will not suffer a loss. Thus, the conservative valuation law was intended to serve as protection for the consumer against loss due to insurer insolvency.

The regulation effectively set a minimum premium that an insurer could charge for a non-participating policy of given face value and cash values. A simplistic explanation follows: When an insurance company sells a policy to a (large) group of policyholders, the changes in its economic assets and liabilities are as follows:

Assets	Liabilities
Expected present value of future premium payments from new sales	Expected present value of future benefit payments and administrative costs from new sales.

In a hypothetical competitive market with free entry and with no regulatory constraints, the expected present value (EPV) of future premium payments would equal the EPV of future payments plus administrative costs, where present values are obtained by discounting at the economy's term structure of riskless interest rates and where administrative costs include a normal rate of return in capital.

If a regulation were imposed on this competitive market that required firms to use a discount rate lower than the economy's interest rates, then the changes in assets and liabilities would be overstated. Since benefit payments occur on average at a time in the more distant future than premium payments, the bias in the change in liabilities would be greater than the bias in the change in assets. At the competitive (or normal profit) level of premiums, the change in the accounting net worth of the company (the nominal or book profit), equal to the change in assets minus the change in liabilities, would be negative. Therefore, if the initial net worth of the insurance company were not large relative to the volume of new business, the company would - in an accounting sense - be bankrupt. The Department of Insurance monitors the financial conditions of companies very closely - indeed, that is its most important duty - and if the accounts indicated that a company is bankrupt it would be forced into receivership.

To avoid this situation of nominal bankrupty under a conservative valuation regulation, firms would be forced to charge premiums higher than the unconstrained equilibrium value. Thus, by making the nominal solvency constraint stronger, the predicted effect of the imposition of valuation law is an increase in the equilibrium premiums of non-participating policies.[1]

Naturally, there is some flexibility in the constraint implied by the regulation and in its application, and the regulation should be regarded as a source of price rigidity rather than a strict minimum price constraint. During times of high investment return, for instance, the Superintendent of Insurance would likely be more liberal in his assessment of insurance companies' condition.

The explanation of the regulation's immediate, or short-run, impact on the market outlined above is incomplete in that it ignores the dynamic behaviour of the market under the constraint. For example, if industry demand were not growing, then profits would result from the excess of premiums above the unconstrained equilibrium level. If accounting profits were not entirely distributed to shareholders, the net worth of companies in the market would increase, weakening the solvency constraint and bringing premiums closer to the unconstrained level, until the constraint is no longer binding. In this case, the valuation regulation would not affect the "steady-state" or long run equilibrium level of premiums. However, Winter (1980a) has shown in a formal model that for market conditions such as growth in demand, rate of entry of new capital and interest rates representative of the Canadian and American experience, the steady-state impact of a valuation regulation is severe.

One might argue that insurance companies could eliminate the constraint imposed by the nominal solvency condition by issuing equity. However, if a firm attempted to circumvent the constraint by issuing new stock, it would, in the steady state, be issuing increasing amounts of equity while its books showed increasing losses. This simply would not be feasible in the presence of real world complications.

The requirement of a conservative valuation discount rate forces insurers to use a low discount rate in the determination of premiums, (although the premium rate need not be so low as the prescribed valuation rate). Professor Boyle, in Table 16 of his report, demonstrates the effect of different discount rate assumptions on premium levels for non-participating, whole life policies. If an insurer is forced to use a discount rate of four percent in the calculation of premiums, for example, the annual premium on a Male Age 35 policy would be $13.90; at a rate of six percent, this premium would be $10.35

The Impact on Participating Policies

In contrast to its predicted impact on non-participating policy premiums, a conservative valuation regulation has only an indirect impact on the net premiums of participating policies. The regulation does not constrain an individual insurance company to offer high premiums on participating policies as it does in the case of non-participating policies but may mitigate various pressures to lower premiums in the market.

Because the supplier of participating insurance has the flexibility of determining "net" prices or rates by setting dividend scales and not only the level premium, he can circumvent the constraint that a valuation regulation places on nonpar policy offers. Future dividend payments do not enter the reserve calculation and indeed are not considered a liability of the firm. (Rather they are viewed as a means of distributing surplus, in analogy to stock dividends of a corporation, and are not guaranteed.) Therefore, the supplier of par insurance can effectively lower the rate on this product without violating the nominal solvency constraint - i.e., without a detrimental impact on the state of his accounting or nominal solvency - by increasing dividends instead of lowering premiums. The regulation places no effective constraint on the contract offers in the market for participating policies.[2]

However, because the conservatism in valuation standards results in an overstatement in liabilities and hence an understatement in surplus, a high level of premiums appears actuarilly justifiable. Pressure from policyholders, the Department of Insurance and the general public or media to lower premiums is avoided or mitigated by the apparent need for artificially high premiums to cover the overstated liability of future benefit payments. To the extent that insurance firms are disciplined by these pressures rather than the pressure of active price competition in the market, the predicted result of regulation is an excess of premiums on participating policies. Expressed differently, the detrimental impact of a lack of price competition or efficient consumer search will be exacerbated by a regulation that rationalizes excessive premiums. Only if firms were forced by competition to keep rates low - and it is well-established that this may not be the case in the life insurance market - would the regulation have no predictable impact on the market.

Effect of New Legislation on Financial Reporting of Life Insurance Companies

In 1977, the Canadian and British Insurance Companies Act and the Foreign Insurance Companies Act were amended with the purpose of lessening the disparity between statutory life insurance accounting and generally accepted accounting principles. As reported by Professor Scheel, the amending act gave the company actuary more scope in the selection valuation assumptions to calculate policy reserves. The valuation assumptions may now be set appropriate to the situation of the individual company. Also, the expenses of acquiring new business may be deferred, rather then charged against the year of acquisition.

As a result of the amendment most Canadian life insurance companies now use a variety of valuation assumptions, the most liberal being applied to recent business. Table 1.1 below reports the highest valuation discount rate used in 1978 by each of the ten largest Canadian insurers. (The lowest discount rates are typically between two and four percent.)

Evidently, the amendment allowing the adoption of less conservative valuations standards has had a significant effect on the financial reporting of Canadian Life Insurance Companies, although the valuation rates used in 1978 (the most recent year for which these data were available) were well below the current nominal interest rates. The extent to which more realistic valuation rates have allowed improved rates of return to policyholders in the market will be investigated in the empirical analysis of 1.4.

1.3 The Methodology and Assumptions of the Empirical Analysis

This section presents the basic methodology of the estimation of the relative changes in whole life insurance rates and costs of provision over the period from the early 1960's to 1980. For a sample of policies sold by the largest Canadian suppliers of whole life insurance, the trends in the premium and in the

TABLE 1.1

Highest Discount Rates Used in Valuation of Ordinary Life Reserves by Ten Largest Canadian Life Insurance Companies in 1978

Company	Highest Valuation Rate
Sun Life	6.5%
Great West Life	4.75%
Manufacturers Life	4.5%
London Life	9.25% decreasing to 4.0% after 20 years
Canada Life	6.5%
Confederation Life	7.75%
Crown Life	6.89% decreasing to 4.36% in 1981
Mutual Life of Canada	4.5%
North American Life	3.5%
Imperial Life	7.0% to 1988, 5.5% then 4.0% thereafter

proportion of the premium retained by the insurer compared with those simulated for a competitive market. Additional cost indicators that are calculated are the internal rate of return of the expected premiums minus benefits stream, and the mark-up of the premium over the annualized cost of paying benefits. The former is the rate of return on the funds paid by policyholders in total. There is no formal basis for considering the rate of return as an indication of the relative cost position of a firm, but it is useful for a direct comparison to the rates of return offered on other securities. In a competitive market with zero transactions costs and a time-invariant interest rate, the internal rate of return would equal the economy's interest rates.

The mark-up and internal rate of return cost indices are calculated for the following contracts:

Time Period:	1959-1980
Companies:	Those companies holding the largest market shares subject to availability of data. For the participating policy this set of companies consisted of the five largest.[3] For the non-participating policy, a sample of ten to twelve of the twenty largest companies was used.
Policies:	Male, age 35, participating and non-participating whole life. $25,000 face value (without waiver of premium option). (35 is near the median age of life insurance purchasers.)

The calculation of indices for current participating policies requires an assumption as to the conservatism of illustrated dividend projection. The calculations are taken under the assumption - common to all previous empirical studies of the life insurance market - that projected dividends will be realized, as well as under an assumed degree of conservatism of the dividend projections.

Data Sources: Policy Data

The policy data for the empirical section were taken from Stone and Cox Life Insurance Tables. The cash values are listed in the compend to the nearest dollar and for every fifth year only, after the first five years; the intermediate values were obtained by interpolation. Because of this approximation and because it is likely that not all policy characteristics were included, the results of the calculations should be interpreted as within some small error. For the same reason, the companies are not identified.

Mortality Rates

The "1957-60 Ultimate Basic Mortality for Males" table (Transactions of the Society of Actuaries, 1962). adjusted to reflect selection and the decline in mortality to 1977, was used in this study. The table is listed in the Federal Trade Commission Report (1979).

The same mortality table is used to calculate the indices for each year (1959 to 1980). The lack of incorporation into the calculation of improvements in mortality over this period implies that any rise in the mark-up of premiums over costs is understated in our empirical results. Also, to the extent that there will be improvement in mortality rates in the future or that the mortality table used is conservative, the current level of the mark-up is understated in our results.

Withdrawal Rates

The withdrawal rates assumed are Moorhead's S Rates, a representative set of moderate lapse rates. Moorhead's S rates are listed in the Federal Trade Commission Report (1979).

Interest Rates

The appropriate interest rates for use in discounting in any year are given by the term structure of interest rates of that year. The term structure is approximated in this study by the rates on 3 to 5 year, 7 year and long term government bonds; the rates being applied to horizons of less than 5 years, 5 to 10 year and more than 10 year horizons, respectively. These rates were taken from various issues of the Bank of Canada Review.

The interest rates are not adjusted for taxation. Investment income of insurance companies is not taxable if it is matched by benefit-payment liability increases. In practice, taxes paid are less than six percent of total income.

Duration and Timing of Cash Flows

The duration chosen for non-participating policies is thirty years; that for participating policies was limited to twenty years because of the unavailability (or unreliability) of dividend projections over a longer horizon. The use of finite horizons involves an approximation in the calculation of cost indices; however, the error introduced is small if the cash value of the last year is close to the future net benefits discounted to that year.

It is assumed that premiums are paid at the beginning of the year, that dividends or cash values are received at the end of the year (when the next premium is due) and that mortality occurs, on average, in the middle of the year.

The expected cash outflow from the insurer to a policyholder in year t is equal to (probability of survival and persistance until year t)x [(withdrawal probability in year t)x (t-th cash value) + (mortality probability in year t)x (face value)]. The probability of survival and persistance is determined in the obvious way. The expected cash inflow is the product of this latter probability and the premium (net of projected dividend).

Simulation of Relative Changes in Costs and Competitive Prices: Methodology and Example

The assessment of the actual life insurance market's response to the rise in interest rates requires a prediction of what the response of a hypothetical, competitive market to the same rise would be. The response of the actual market may be considered "adequate" to the extent that it approximates the competitive response. An increase in a cost index (e.g., the mark-up) indicates inadequacy in the market response only if the increase is large relative to the competitive response.

The competitive responses of the mark-up index and the premium (for fixed additional contract parameters) depend on the maturity structure of administrative costs. If the administrative costs accrued equally in every year the policy were in force then the mark-up of the premium over annualized benefit costs would remain constant. However, if the incidence of costs in the first year were high, then the mark-up in a competitive market would rise with interest rates since a greater excess of premium over annual costs would be necessary to cover the initial expenses, in present value terms. In short, simulation of the relative changes in costs and hypothetical competitive premiums requires an assumption about the maturity structure of administrative costs.

The simulation determining which path the costs indices would have followed over the 1965-1980 period had contracts fully responded to the rise in nominal interest rates is based on the following assumptions:

Assumption 1: The cost of writing a new policy is ten times the cost of administering an existing one.

According to Stone and Cox (1980, p.6), this rule of thumb has "proven fairly satisfactory over a period of year, though not entirely so". The general results of this chapter are not sensitive to this assumption.

Assumption 2A: (Constant administrative costs) The real first year and annual administrative costs are constant over time.

The calculations are done under assumption 2A and an alternative assumption 2B:

Assumption 2B: (Proportional administrative costs) The first year and annual administrative costs are each proportional to the policy premium, with the constants of proportionality being constant over time.

The actual cost structure lies somewhere between assumptions 2A and 2B. The latter is surely the closer approximation: agents' commissions are proportional to premiums and investment costs are nearly so. One has no reason to suspect that when the premium is reduced, because of lower mortality costs and higher interest rates, the proportion of revenues devoted to selling and administrative expenses should greatly rise.

To view assumption 2B from a different angle, it is reasonable to assume that the real administrative costs are constant over time for a policy of a given "size" - but the face value is not so reasonable a measure of the "size" of the policy for this assumption as is (for example) the present value of funds transferred between the policyholder and insurer. The choice of the proportionate change in the premium as a measure of the change in the "size" of the policy results in a conservative bias in our results as compared to using the present value of premiums paid or benefits received.

We will first determine, by way of example, the "responsive" 1980 non-participating premiums under assumptions 1 and 2A and under assumptions 1 and 2B. For the sake of simplicity the effects of inflation will be ignored in the initial calculation, then adjusted for. In the next section of this chapter, the results of the calculations over the entire time period are tabulated and described.

Over the period 1959-1965, life insurance market conditions including interest rates were relatively stable: long term interest rates were between 4.9 and 5.2 percent over this period. In 1965, the long term rate began to rise relatively quickly, and it is the response to this rise that we are investigating. Accordingly, 1965 is chosen as the "base year" for the calculations, in the sense that the administrative costs (plus profits) that are revealed in the 1965 rates will be taken as estimates of the administrative costs plus "normal" profits, before inflation adjustments, that are incurred in years after 1965!

I. Calculation of 1980 responsive premium under assumptions 2 and 2A

The relevant 1965 data for the average non-participating policy were as follows:

Premium	15.71
Retention	50.44
Mark-up	.51
E.P.V. of premiums	149.34
E.P.V. of benefits	98.90
a65	9.51

where a_{65} is the expected present value (E.P.V.) of one dollar paid annually while the policy is in force. The retention is defined as the EPV of premiums minus the EPV of benefits, where benefits include both face value payments and cash value payments. Let C_1 be the costs (including a normal profit) incurred in the first year of the policy and let C_2 be the annual costs incurred. By assumption 1, $C_2 = .1\ C_1$. Assuming that the retention just covered the present value of these costs in the base year:

$$C_1 + aC_2 = \text{ retention} \qquad ; \text{ which implies}$$
$$C_1 + (9.51)(.1)C_1 = 50.44 \qquad ; \text{ solving for } C_1 :$$
$$C_1 = 25.85$$

We now determine the premium and proportion of the premium retained which would have been necessary in 1980 to cover the same costs, C_1 and C_2. The relevant 1980 data for the average policy were:

Premium	14.94
Retention	61.70
Mark-up	1.91
E.P.V. of premiums	94.17
E.P.V. of benefits	32.47
a_{80}	6.30

where a_{80} is again, the expected present value (at 1980 interest rates) of a one dollar annuity paid while the policy was in force. With P.V. of benefits = 32.47, $C_1 = 25.85$ and $C_2 = 2.59$, what would the zero profit premium, $\hat{P}$, be? $\hat{P}$ would satisfy:

$$\text{E.P.V.}(\hat{P}) = \text{E.P.V. of benefits} + C_1 + \text{E.P.V.}(C_2)$$
$$a_{80}\,\hat{P} = 32.47 + 25.85 + a_{80}\,.259 \quad ; \text{ with } a_{80} = 6.3,$$

this yields $\hat{P} = \$11.85$

Thus, ignoring inflation, \$11.85 is the premium which would have been necessary in 1980 to cover the same costs and profits as were covered by the 1965 premium. As we will now show, this figure is altered only slightly by the incorporation of the inflation effect!

Effect of Inflation on Estimate of Responsive Premium

A first reaction to the problem of incorporating inflation into the estimate of responsive premiums might be that the costs C_1 and C_2, should be adjusted upwards by the increase in a price index before the calculation of the zero profit 1980 premium. This reaction would be wrong insofar as it ignores the fact that the real size of the \$25,000 policy is declining over time and therefore less resources are being devoted to its administration.

To clarify the impact of inflation, consider the effect of a ten percent increase in the economy's price level, with no change in relative prices. The nominal administrative costs of selling an \$11,000 policy after prices rose would be ten percent higher than the cost of selling a \$10,000 policy before the change in prices, the same quantity of inputs being used in each case. The administrative cost per thousand dollars of face value would be constant over time for a policy of constant face value measured in real dollars. A corollary is that if administrative costs are proportion to face value, inflation has no effect on costs per \$1000 of face value.

The measured increase in the average premium of a policy of a fixed nominal \$25,000 face value can be estimated by the difference in premium per 1000 between the 25,000 policy and a policy of a face value equal to 25,000 times the increase in the price level between 1960 and 1980. This latter face value equals 25,000 x 2.87 = 71,778.

The premiums on \$71,778 face value policies (Male age 35) were approximately 8.2% less than in 1980, ceteris paribus.[4] The estimated premium, adjusted for inflation, therefore, equals 11.85 ÷ (1 - .082) = \$12.91.

In sum, under assumptions 1 and 2A, the 1980 responsive premium was \$12.91, and the responsive mark-up was [a_{80} \$12.91 - EPV(benefits)/EPV(benefits) = 1.50. These compare with the actual premium of \$14.94 and mark-up of 1.91.

II: Calculation of 1980 Responsive Premiums Under Assumption 2B

Under this assumption, C_1 and C_2 differ between 1965 and 1980, but

(1) $C_i = c_i$ Premium, $i = 1,2$, with constants c_1 and c_2 remaining unchanged.

From I above, $C_1 = 28.85$ and $C_2 = 2.58$ in 1965. From equation (1), with Premium = 15.71, $c_1 = 1.65$ and $c_2 = .16$, the responsive 1980 premium is now defined by

(2) $\mathrm{EPV}(\hat{P}_{1980})]\ C_{1,1980} + \mathrm{EPV}(C_{2,1980}) +$ EPV(Benefits); or

(2') $a_{1980}\ \hat{P}_{1980} = c_1\ \hat{P}_{1980} + a_{1980}\ C_2\ \hat{P}_{1980} + 32.47$

Deleting subscripts,

(3) $$\hat{P} = \frac{32.47}{a-C_1-C_2a} = \frac{32.47}{6.3-1.65-.16(6.3)} = \$8.91$$

Adjusting P for inflation, as in I above, yields a responsive premium of 8.91 ÷ (1 - .082) = \$9.71 . The responsive mark-up under assumption 2B was thus a(9.72)/EPV(Benefits) - 1 = .88.

In sum, the actual premium, and mark-up in 1980 were 14.94 and 1.91. The estimated and corresponding responsive figures under assumptions 2A and 2B were (12.91, 1.50) and (9.71, .88), the second set of figures derived, we believe, from the more realistic assumption.

1.4 Empirical Results and Interpretation

This section presents and discusses the results of the cost calculations and discusses the hypothesis that the life insurance market has not responded adequately to changes in the rates of return on other securities. Evidence that premiums have failed to fully respond to falling costs is documented. Important qualifications to the conclusion that the market's performance is inadequate are discussed, as are sources of conservatism in the empirical results.

The results of the calculations of the actual and the hypothetical responsive premiums and the responsive premium proportions retained are presented in Tables 1.2 through 1.5 and depicted in Figure 1.1 through 1.8. Again, these figures are the averages over our sample of Male, Age 35 policies. The responsive premium on non-participating policies is estimated to have been between 9.67 and 12.86 in 1980, with the former figure being the closer estimate. While cash value benefits in each year increased somewhat between 1965 and 1980 - an increase which is incorporated in the estimates of responsive premiums - the present value of total benefits declined by 1980 to less than one-third its 1965 value; the average premium, however, declined only about five percent over this period. If one accepts $10.50 as a close estimate of the responsive premium (averaging the bounds of 9.67 and 12.86, with more weight on the lower bond) then the actual 1980 premium of 14.94 is more than forty percent higher than the estimated responsive premium. The increases in the mark-up of the premium over the annualized cost of benefits from .51 on 1965 to 1.91 in 1980 (Figure 2) and the proportion of premium retained from .33 in 1965 to .66 in 1980 are well in excess of those justified by the amounts of administrative costs and profits that were revealed in 1965 rates. The non-participating whole life and endowment market is declining in size in Canada, which is not surprising given the estimates reported here; however, over ten billion dollars of business is currently outstanding in this market.

The difference between the trends in actual and in responsive premiums is less pronounced but still substantial in the participating market. If one accept $16.10 as an estimate of the responsive premium, between the bound of 15.58 and 17.22, then the actual premium of 19.45 is twenty-two percent in excess of the responsive premium. The proportion of premium retained rose from twenty percent in 1965 to forty-four percent in 1980, substantially more than the increase in about thirty-four percent that would have been experienced in a responsive market. These latter estimates are based on the assumption that the projections of dividends in 1980 policies are as conservative as were the projections on 1965 policies, an assumption which is discussed below. We note here that if the present value of realized dividends exceeds that of projected dividends by twenty-five percent plus the percentage by which 1965 dividends were conservative, then the actual premium will effectively be reduced to 18.33. Since early dividends are not likely to greatly exceed projected dividends, this twenty-five percent difference in present values would require later dividends to be substantially more than twenty five percent greater than projected. In order that the ex post effective premium be reduced from 19.45 to the responsive

Table 1.2

Responsive Non-participating Premiums Versus Actual Premiums 1965 - 1980

Year	Sample Size	a_t[1]	Average EPV[2] Admin. Costs	Average EPV Benefits	Responsive[3] Premium, Unadjusted	CPI	Responsive[4] Premium	Actual Premium	Responsive Proportion Retained	Actual Proportion Retained
Under Assumption 2A:										
1965	11	9.51	50.44	98.90	15.71	80.5	15.71	15.71	.33	.33
1967	12	8.95	48.94	85.39	15.00	86.5	15.06	15.44	.36	.38
1969	12	7.90	48.37	62.14	13.99	94.1	14.11	15.34	.44	.48
1971	12	8.46	47.68	71.34	14.07	100.0	14.24	15.34	.40	.45
1973	13	8.00	46.49	62.94	13.68	112.7	13.96	15.42	.43	.49
1975	12	7.38	44.89	47.05	12.73	138.5	13.21	14.96	.48	.56
1976	8	7.21	44.45	46.15	12.57	148.5	13.12	14.98	.49	.57
1978	12	7.12	44.22	44.94	12.52	175.2	13.30	14.89	.49	.58
1980	10	6.30	42.10	32.47	11.80	213.3	12.86	14.94	.50	.66
Under Assumption 2B:										
1965							15.71	15.71	.33	.33
1967					14.55		14.61	15.44	.35	.38
1969					12.46		12.56	15.34	.38	.48
1971	As	As		As	13.07		13.23	15.34	.36	.45
1973			-		12.41		12.66	15.42	.38	.49
1975	Above	Above		Above	10.78		11.19	14.96	.40	.56
1976					10.47		10.93	14.98	.42	.57
1978					10.38		10.03	14.89	.37	.58
1980					8.87		9.67	14.94	.47	.66

Notes: 1. a_t is the expected present value of one dollar paid annually while the policy is in force.

Table 1.2 (Cont'd)

Responsive Non-participating Premiums Versus Actual Premiums 1965 - 1980

2. Under the assumption of constant administrative costs, the EPV of administrative costs in year t is estimated at $25.85 + a_t(2.59)$ as explained in the text (see example). Under the assumption of proportionate administrative costs, calculation of the responsive premium does not require direct calculation of EPV of administrative costs.

3. The "responsive premium unadjusted", $\hat{P}$ is estimated as a_t^{-1} (EPV Benefits + EPV Admin. costs) under the constant administration cost assumption. Under the assumption of proportional administrative costs $\hat{P}$ is estimated as

$$\hat{P}_t = \frac{\text{EPV (Benefits)}}{a_t - 1.65 - .16\, a_t}$$

as per equation (3) of the example in the text.

4. To obtain the responsive premium, the unadjusted responsive premium was increased by 2 percent for every ten thousand dollars that the current value of 25,000 1965 dollars exceeded 25,000. (See example in text.) Specifically, the responsive premium

$$= \frac{\hat{P}}{1-.05\left(\frac{CPT_t}{80.5} - 1\right)}$$

Table 1.3

Responsive Participating Premiums Versus Actual Premiums 1965 - 1980

Year	a_t[1]	Average EPV[2] Admin. Costs	Average EPV Benefits	Responsive[3] Premium, Unadjusted	CPI	Responsive[4] Premium	Actual Premium	Responsive Proportion Retained	Actual Proportion Retained
Under Assumption 2A:									
1965	8.39	34.29	137.18	20.43	80.5	20.43	20.43	.20	.20
1967	7.92	33.28	123.10	19.76	86.5	19.83	20.20	.22	.23
1969	7.24	32.12	100.86	18.36	94.1	18.51	20.20	.25	.31
1971	7.72	33.01	109.71	18.49	100.0	18.71	20.18	.24	.30
1973	7.53	32.66	100.08	17.63	112.7	17.99	20.28	.26	.33
1975	6.58	31.26	87.02	17.45	138.5	18.11	20.28	.29	.37
1976	6.89	31.47	87.36	17.25	168.5	18.25	20.15	.31	.37
1978	6.28	30.33	74.10	16.63	191.2	17.96	19.82	.34	.41
1980	5.97	29.75	64.55	15.80	213.32	17.22	19.45	.37	.44
Under Assumption 2B:									
1965	As Above	-	As Above	20.43	As Above	20.43	20.43	.20	.20
1967				19.58		19.65	20.20	.21	.23
1969				17.78		17.93	20.20	.22	.31
1971				17.97		18.18	20.18	.22	.30
1973				16.87		17.21	20.28	.22	.33
1975				16.58		17.21	20.28	.25	.37
1976				16.33		17.28	20.15	.26	.37
1978				15.45		16.59	19.82	.29	.41
1980				14.30		15.58	19.45	.31	.44

Notes: 1. a_t is the expected present value of one dollar paid annually while the policy is in force.

Table 1.3 (Cont'd)

Responsive Participating Premiums Versus Actual Premiums 1965 - 1980

2. Under the assumption of constant administrative costs, the EPV of administrative costs in year t is estimated at 18.65 + $a_t(1.87)$ as explained in the text (see example). Under the assumption of proportionate administrative costs, calculation of the responsive premium does not require direct calculation of EPV of administrative costs.

3. The "responsive premium unadjusted", $\hat{P}$ is estimated as a^{-1}_t (EPV Benefits + EPV Admin. costs) under the constant administrative cost assumption. Under the assumption of proportional administrative costs $\hat{P}$ is estimated as

$$\hat{P}_t = \frac{\text{EPV (Benefits)}}{a_t - .913 - .09\, a_t}$$

as per equation (3) of the example in the text.

4. To obtain the responsive premium, the unadjusted responsive premium was increased by 2 percent for every ten thousand dollars that the current value of 25,000 1965 dollars exceeded 25,000. (See example in text.) Specifically, the responsive premium

$$= \frac{\hat{P}}{1-.05\left(\frac{CPT_t}{80.5} - 1\right)}$$

Table 1.4

Average Rate of Return on Whole Life Insurance in Canada 1959-1980: Male, Age 35, $25,000 Policy

YEAR	LONG TERM INTEREST RATE	PARTICIPATING			NONPARTICIPATING		
		Sample Size	Mean	(Std. Deviation)	Sample Size	Mean	(Std. Deviation)
1959	4.87	5	1.38	(.23)	11	1.22	(.72)
1961	5.00	5	1.71	(.22)	12	1.46	(.57)
1963	5.10	5	2.02	(.25)	11	1.86	(.42)
1965	5.21	5	2.22	(.25)	11	1.91	(.38)
1967	5.93	5	2.38	(.22)	12	2.02	(.42)
1969	7.58	5	2.42	(.18)	12	2.05	(.42)
1971	6.95	5	2.17	(.11)	12	2.06	(.39)
1973	7.56	5	2.14	(.12)	12	2.02	(.44)
1975	9.04	5	2.58	(.59)	12	2.21	(.48)
1976	9.22	5			8	2.03	(.30)
1977	8.70	5	2.41	(.38)			
1978	9.23	5			12	2.01	(.25)
1979	10.21	5	2.92	(.28)			
1980	11.42	5	3.17	(.17)	10	2.06	(.25)

Table 1.5

Average Mark-up on Whole Life Insurance in Canada, 1959-1980: Male, Age 35, $25,000 Policy

	PARTICIPATING			NONPARTICIPATING		
YEAR	Sample Size	Mean	(Std. Deviation)	Sample Size	Mean	(Std. Deviation)
1959	5	.32	(.03)	11	.59	(.15)
1961	5	.29	(.03)	12	.56	(.12)
1963	5	.26	(.03)	11	.50	(.08)
1965	5	.25	(.03)	11	.51	(.07)
1967	5	.30	(.03)	12	.62	(.09)
1969	5	.45	(.03)	12	.95	(.10)
1971	5	.42	(.02)	12	.82	(.09)
1973	5	.49	(.02)	12	.96	(.11)
1975	5	.58	(.13)	12	1.25	(.13)
1976	5			8	1.34	(.09)
1977	5	.59	(.07)			
1978	5			12	1.36	(.08)
1979	5	.68	(.07)			
1980	5	.80	(.06)	10	1.91	(.11)

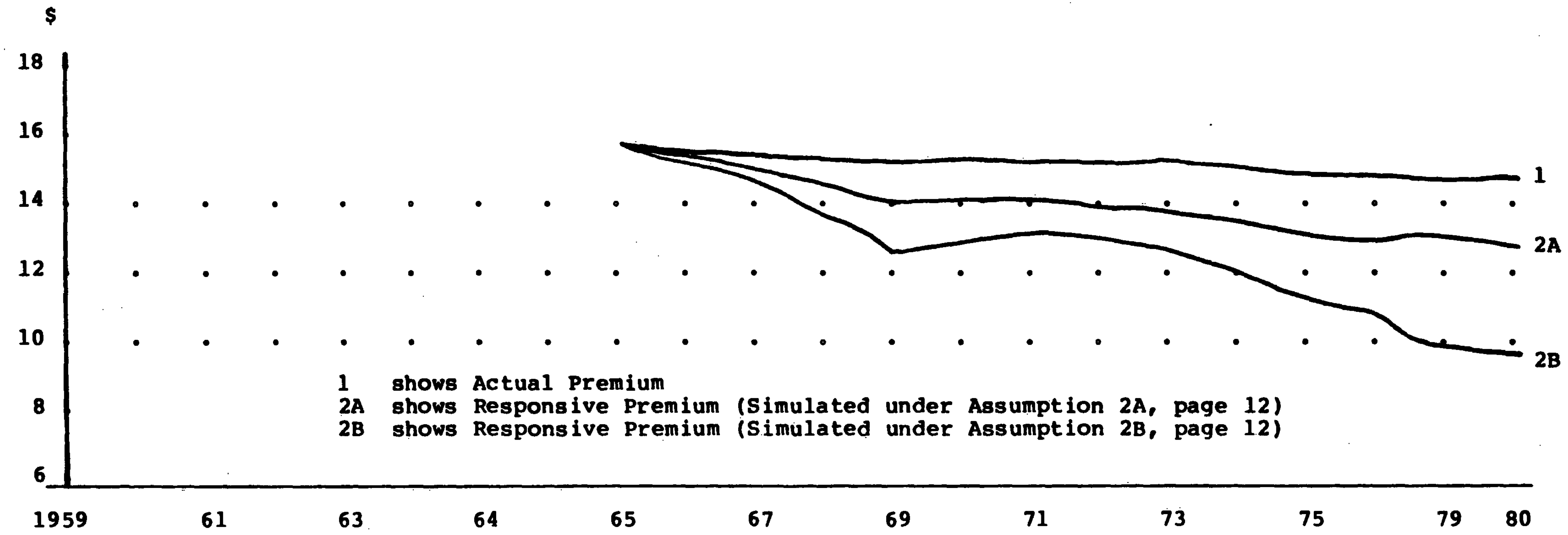
Table 1.6

Projected Dividends Versus Historical Dividends 10 Year Horizon, 1959 and 1969

	EPV OF 10 YEAR DIVIDENDS					
	1959			1969		
COMPANY	Projected	Realized	Ratio	Projected	Realized	Ratio
1	24.01	32.25	.34	25.21	26.03	1.03
2	19.99	23.09	1.15	21.41	22.47	1.05
3	17.11	23.06	1.34	21.41	23.83	1.11
4	16.83	21.78	1.29	19.90	18.61	.93
5	25.26	30.45	1.21	25.58	22.94	.90
AVERAGE			1.27			1.0

Figure 1.1

Responsive and Actual Premiums 1965 - 1980
Nonparticipating Policies[1]



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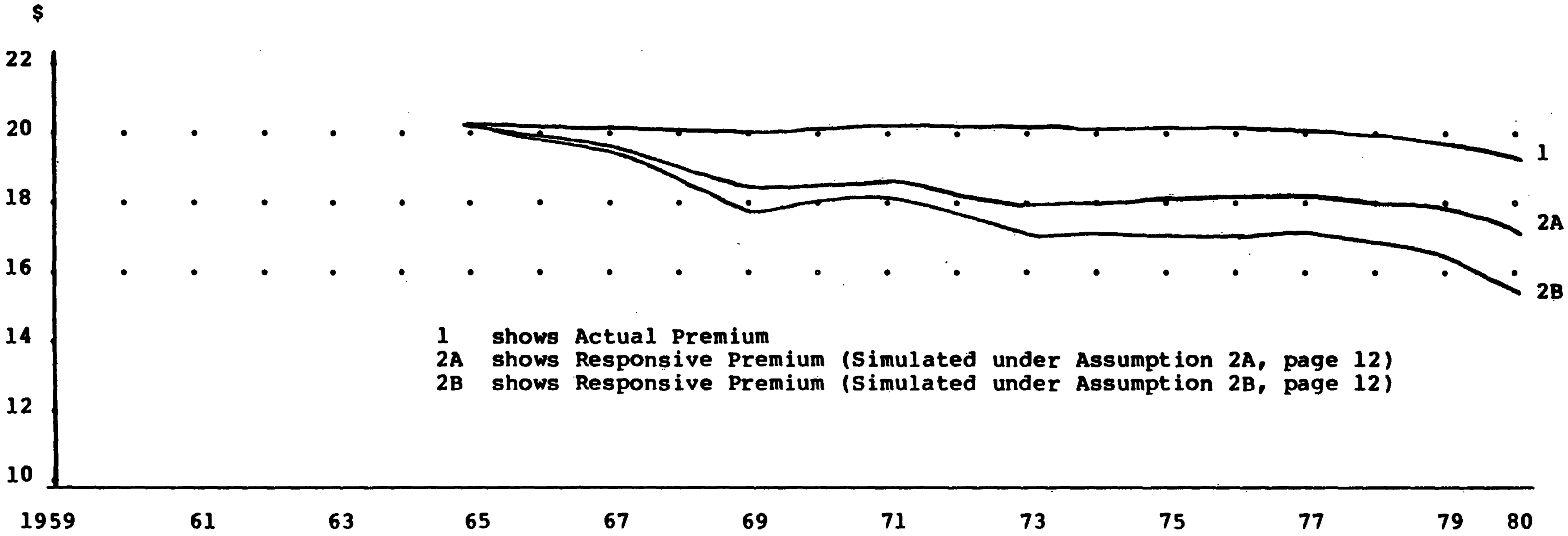
1. Average, from sample of Male, Age 35 Policies; horizon 30 years. The highest curve is the average actual premium; the middle and lowest curves are the average responsive premiums under the assumptions of constant cost and proportional cost, respectively.

Figure 1.2

Responsive and Actual Premiums 1965 - 1980
Participating Policies[1]



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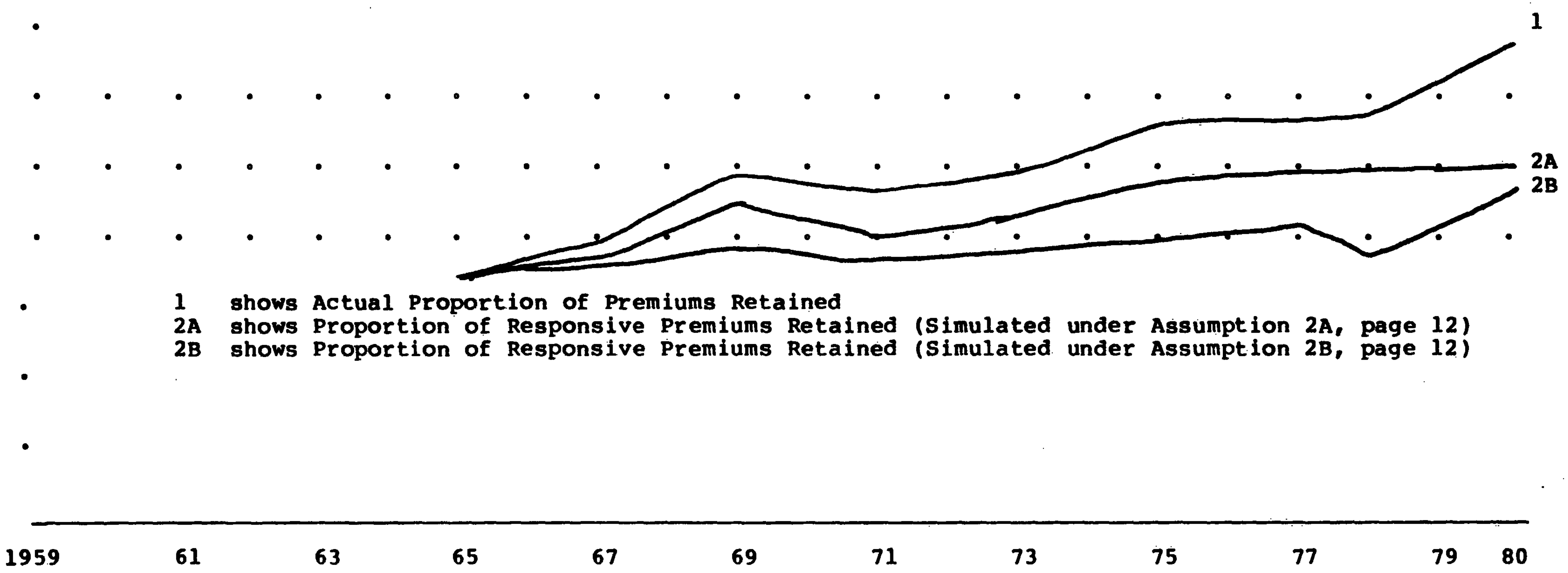
1. Average, from sample of Male, Age 35 Policies; horizon 20 years. The highest curve is the average actual premium; the middle and lowest curves are the average responsive premiums under the assumptions of constant cost and proportional cost, respectively.

Figure 1.3

Responsive and Actual Proportions of Premiums Retained 1965 - 1980
Nonparticipating Policies[1]



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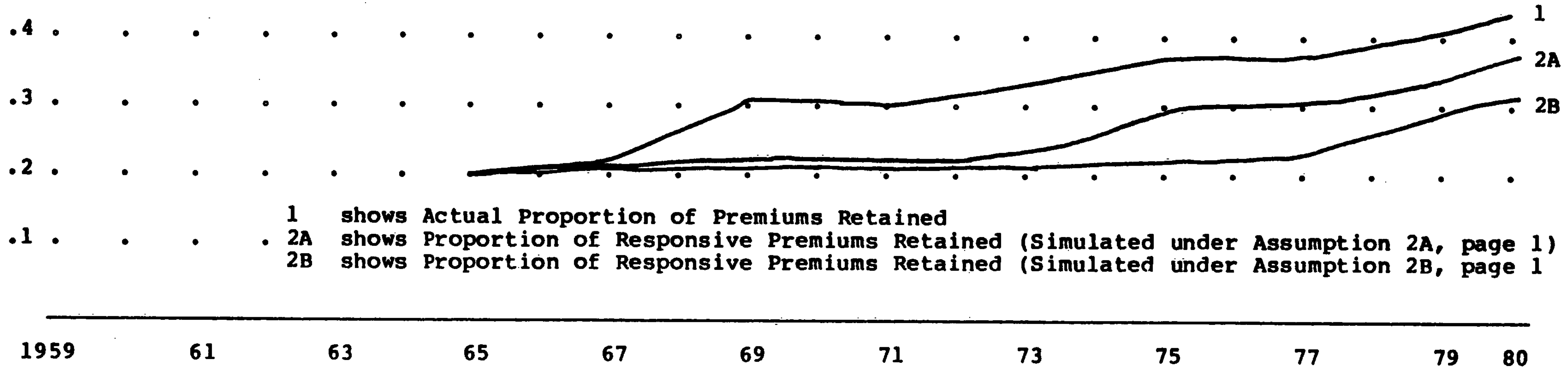
1. Average, from sample of Male, Age 35 Policies; horizon 30 years. The highest curve is the average actual proportion of the premium retained; the middle and lowest curves are the average responsive proportions retained under the assumptions of constant cost and proportional cost, respectively.

Figure 1.4

Responsive and Actual Proportions of Premiums Retained 1965 - 1980
Participating Policies[1]



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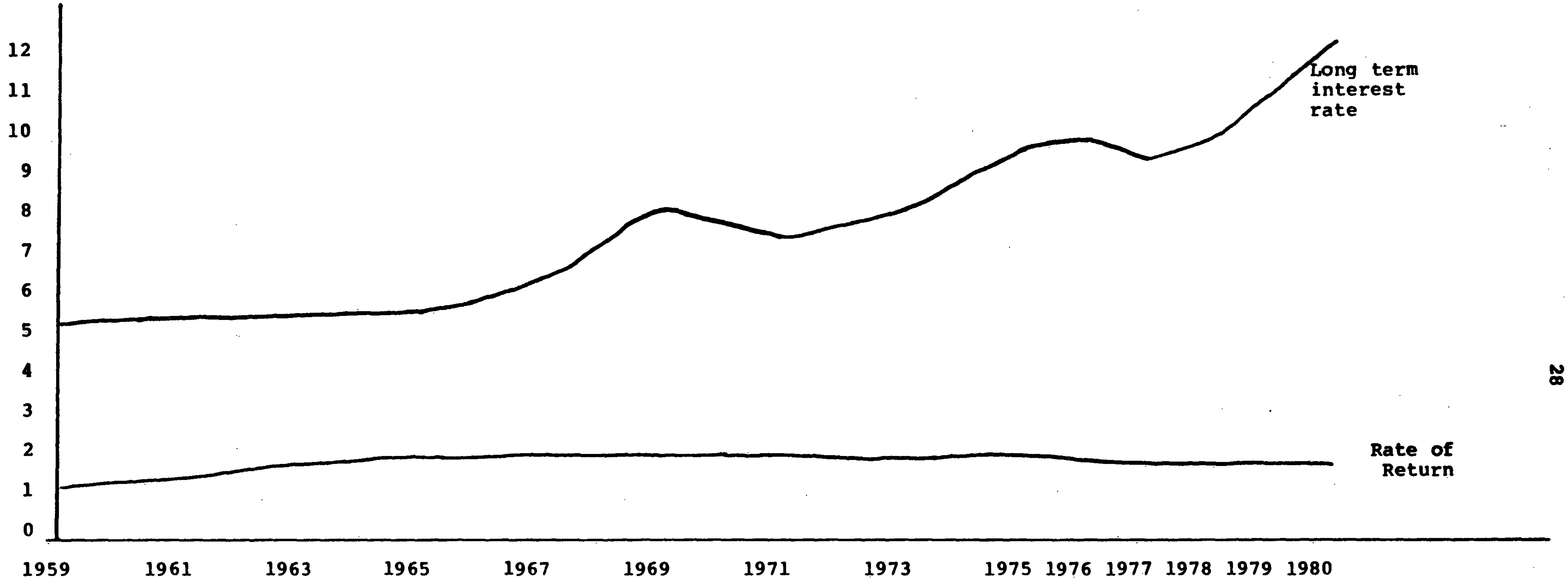
[1] Average, from sample of Male, Age 35 Policies; horizon 20 years. The highest curve is the average actual proportion of the premium retained; the middle and lowest curves are the average responsive proportions retained under the assumptions of constant cost and proportional cost, respectively.

Figure 1.5

Average Rate of Return 1959 - 1980
Nonparticipating Policies[1]



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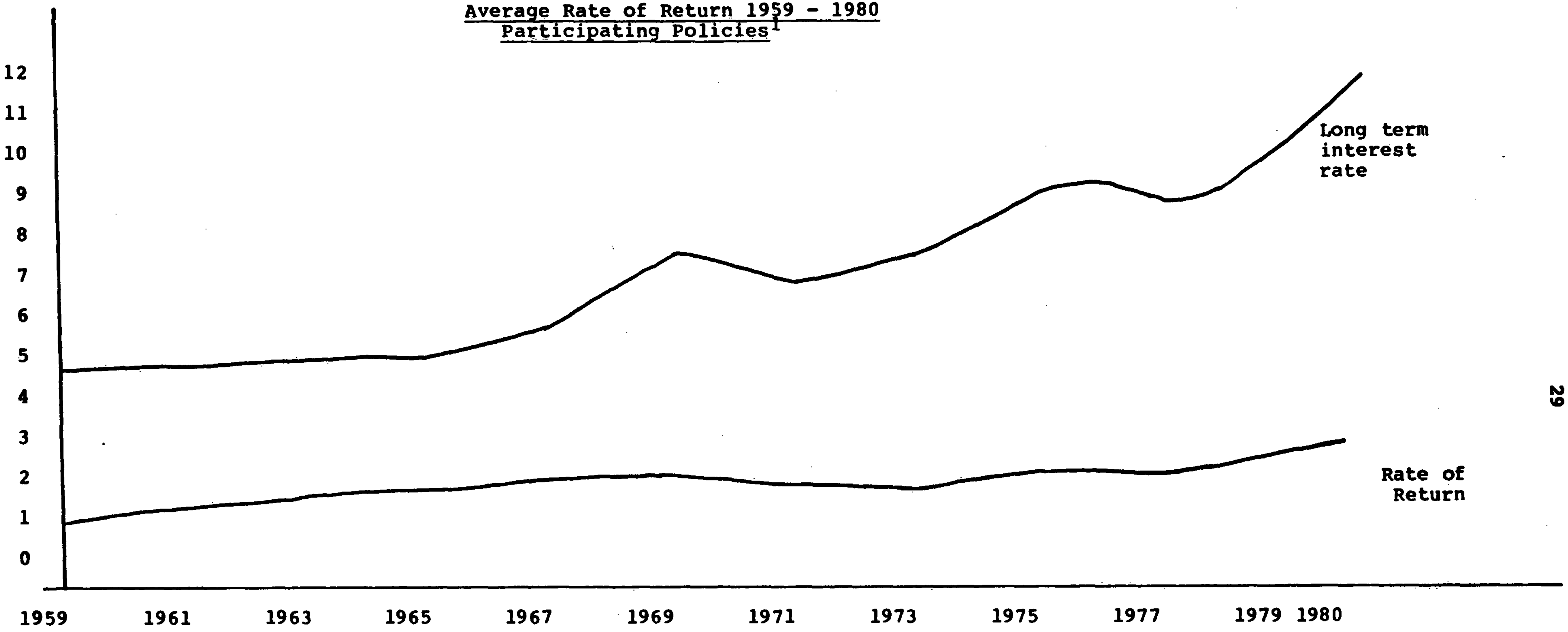
[1] Male, Age 35, $25,000 Policy; thirty year horizon.

Figure 1.6

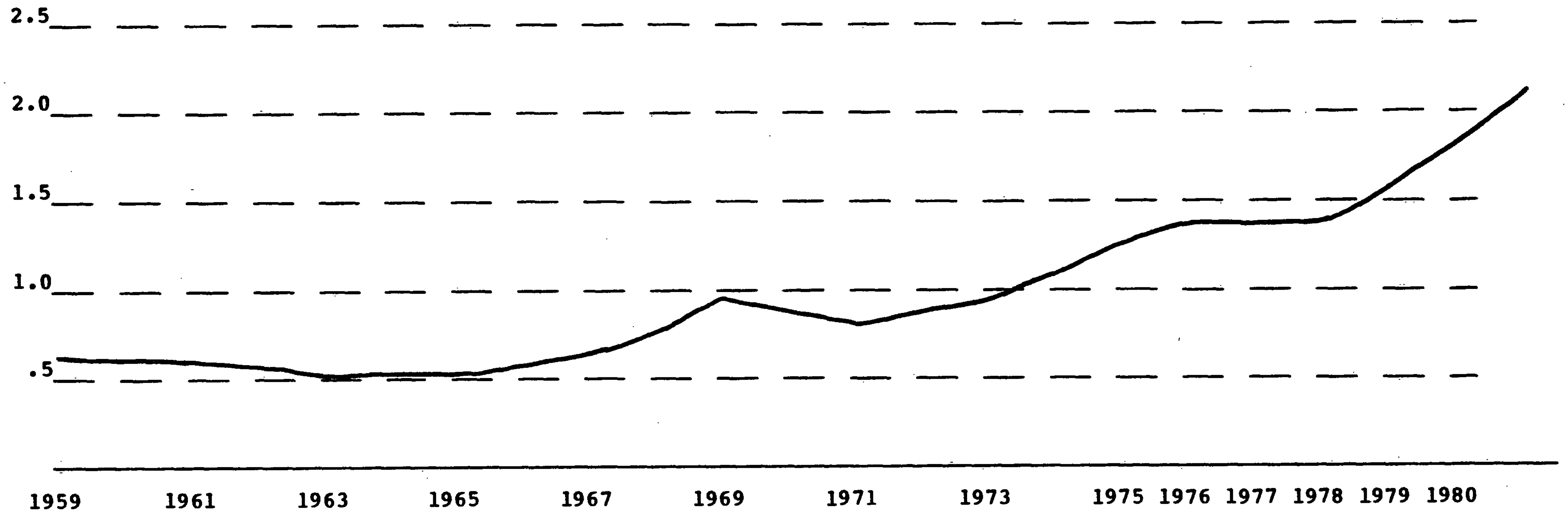
Average Rate of Return 1959 - 1980
Participating Policies[1]



1. Male, Age 35, $25,000 Policy; twenty year horizon.

Figure 1.7

Average Mark-Up 1959 - 1980
Non-Participating Policies[1]



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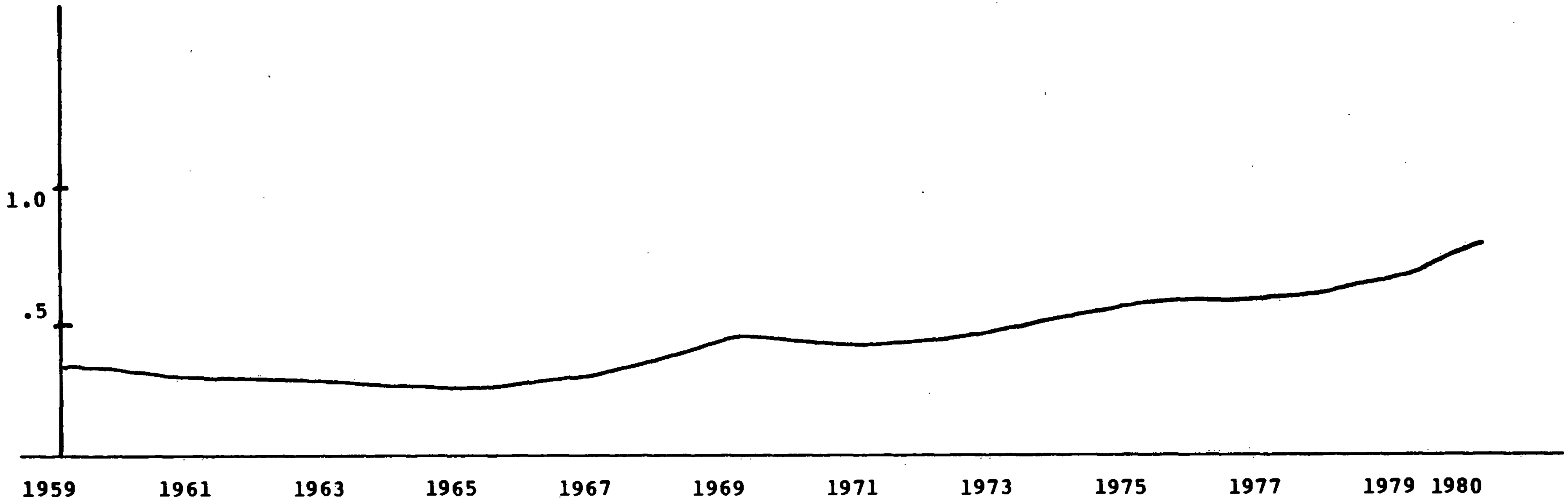
1. Male, Age 35, $25,000 Policy; thirty years horizon.

Figure 1.8

Average Mark-Up 1959 - 1980
Participating Policies[1]



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1. Male, Age 35, $25,000 Policy; twenty year horizon.

level of 16.10, the present value of realized dividends will have to be seventy-five percent (plus the percentage by which 1965 dividends were conservative) in excess of the projected value.

Qualifications and Sources of Conservatism

Two important qualifications to our conclusion that the whole life insurance market has not fully responded to the recent increase in interest rates merit discussion, as do the sources of conservative bias in our estimates. A most important qualification in any empirical study of participating insurance is the unavoidable use of projected dividends rather than actual future dividends in the calculation of the price indices. Obviously, if future dividends are much higher than projected then, ex post, the rates paid by consumers will be much lower than calculated here. A rebuttal to this qualification, however, is evident in the trend in dividend conservation as indicated by the comparison of the first ten years of dividends on policies issued in 1959, with those of policies issued in 1969. Under the assumptions on mortality, lapsation and interest rates outlined in Section 1.3, the expected present values of these dividends were calculated. Table 1.5 compares the ratio of the present values of projected realized dividends in 1959 with those in 1969. Dividend projections in 1959 understated future dividends, in present value terms, by an average of 21% within our sample of the five largest companies. In 1969, this figure was less than 0.4%. (The cross sectional standard deviation was 8%.) While it would be premature to extrapolate (especially since the dividends are taken only over the first ten years) there is no indication that the trend to higher mark-ups is offset by a trend to increasing conservatism in dividend projections. If, as we argue, managers of mutual companies may not have strong incentives to distribute much more than projected dividends, then there is a hestitation to rely on the excess of future dividends over projected dividends as a means of improving the welfare of consumers in this market. As mentioned above, dividends would have to be an unprecedented seventy-five percent in excess of projections before the realized rates could be called responsive.

On the other hand, increased pressure on mutual companies to account for and rationalize their distribution of surplus may well result in the necessary dividend increases. Alternatively, one may see, with greater frequency, increases in the nominal face values of existing policies instead of increases in dividends. A closer monitoring of insurers' distribution of surplus is suggested as one policy option.

The second qualification is more theoretical. If insurers could perfectly match the maturity structure of their liabilities with the maturity of risk-free assets, then it would be reasonable to expect the market to respond fully to interest rates changes in the sense that, as in a competitive market, the expected present value (EPV) of premiums would equal the EPV of premiums would equal the EPV of benefit payments, administrative costs and a normal profit at each point in time. Present values would be determined by discounting at the term structure of interest rates. However, because the bond market is "incomplete", insurers cannot match the maturity structures of assets and liabilities and therefore, face interest rate risk - the uncertainty that arises when future interest rates, and hence rates of return on assets held, are unknown. The most important lack of bond markets is for those of maturities longer than thirty years: a substantial proportion of the liabilities of life insurance companies is of very long maturity.

The importance of this interest rate risk, however, is less than is commonly perceived. Because of the large lapsation rate (which, in fact, is ignored in most liability calculations), the proportion of individuals persisting and surviving more than thirty years is substantially less than half for a typical policy. Therefore, the proportion of liabilities that generates interest rate risk is not very large. More importantly, interest rates are so high that the discounted value of the loss that would be incurred by an insurer if interest rates thirty years in the future fell unexpectedly, by as much as five percentage points would be low. Moreover, if the lack of markets for extremely long-term bonds were important, one would expect insurance companies to create them by offering to lend to governments or established corporations.

The trend to higher mark-ups of premiums over costs is understated in our results insofar as no attempt is made to account for the improvement in mortality experience; rather, one set of rates is used. To the extent, also, that the table used is a conservative estimate of future mortality rates, the level of the average mark-up is understated and the rate of return overstated. A second source of conservatism is that the bond rates assumed represent a lower bound to the investment returns that can be earned by insurance companies.

Two final qualifications to the estimate of the responsiveness of industry rates to rising interest rates are as follows: First, at least four large life insurance companies have recently introduced "enhancement" programmes which increase the nominal face value policies of older nonparticipating policies. If this practice becomes more widespread in the future, then the cash flow to consumers will be greater than that which is contractually guaranteed. The contractually guaranteed cash flows to nonparticipating policy holders were used in this study. Second, the cash flows used in this study do not include the benefits of relatively low cost loans available on cash value policies. The valuation of the loan option would be too complex for the scope of this study. In any case, the interest rates on cash value loans for policies recently issued are variable, rather than at guaranteed low rates and are not so low that the results of this chapter would be significantly altered by the inclusion of the loan option.

1.5 Conclusion and Policy Options

Summary and Analysis of Findings

To summarize briefly the empirical findings of this study, we have found evidence supporting the hypothesis that life insurance rates in Canada have not fully responded to the rise in nominal interest rates since the early 1960's. While the long term interest rates have risen from about five percent to more than ten percent, the rate of return earned by purchasers of the policies examined here has remained at about two percent for non-participating policies and has risen to only 3.2 percent for participating policies. The average mark-up of premiums over the annualized cost of paying benefits has more than tripled since the mid-1960's for both types of policies. Comparison of the trend in actual premiums with the trend in hypothetical, responsive premiums demonstrates that non-participating premiums were in 1980 at least forty percent above what would be expected in a competitive market. The corresponding figure for participating policies, based on projected dividends was more than twenty percent. Evidence was presented against the reliance on conservatism in current divided projections as an explanation of the trend in participating mark-ups, although it was noted that some companies have recently increased the nominal face value of their policies. While it would be premature to extrapolate to the entire whole life insurance market from the small sample examined here, there is a strong suggestion that the life insurance market in Canada has failed to pass the entire cost saving resulting from higher interest rates on to consumers.

The findings of this study are not surprising in light of the results of the U.S. Federal Trade Commission Staff Report on the American life insurance industry and the similarity between the Canadian and American industries. The federal Trade Commission study, which is summarized in Section 3.2, reports that the average rate of return on savings through life insurance in the United States was "extraordinarily low".

Why have the cost savings in whole life insurance not been passed on to consumers? We provided, in Section 1.2, an explanation of price rigidity until 1977 when the conservative valuation laws were relaxed but have not offered a theory of why market premiums didn't fall immediately with the 1977 deregulation.

Since consumer search has been documented as weak in North American insurance markets,[5] the large number of sellers does not guarantee a competitive market; it is well established that in a market with imperfect consumer search, equilibrium price(s) may be as high as the monopoly price even when there is free entry into the market and numerous existing sellers.[6] It is therefore possible, a priori, that the market for whole life insurance has historically been disciplined not by market competition so much as by pressure from policyholders, the public generally and government insurance departments to actuarially justify current premium levels. Indeed, the failure of participating rates to respond to the decline in costs before 1977 is evidence supporting this hypothesis, as explained in Section 1.3. Since both mutual and stock companies have the freedom to continue to use low discount rates and conservative mortality rates they can continue to rationalize high prices. Thus, although the market structure of the industry hasn't substantially changed since 1965, the change in market conditions is such that the competitive or responsive premiums are now well below the premiums which can (and could) be actuarilly rationalized at the conservative valuation standards. The pressure upon companies to justify premium levels has evidently not yet included sufficient pressure to up-date these standards.

This explanation of the lack of market response since 1977 isn't entirely satisfactory and we believe that if current interest rates remain at their current level, the insurance market will eventually adjust. From a policy point of view, the finding that the current retention of forty to sixty cents of every dollar paid cannot be fully justified is the important conclusion of this chapter. The more academic issue of determining precisely why the 1977 deregulation hasn't been effective is still an open question.

Some Public Policy Options

In conclusion, we outline a number of public policy options which would improve the performance of the Canadian ordinary life insurance market. The options vary in their severity and political feasibility. No attempt to assess this latter is taken here.

1) Disclosure of Costs

The policy which has received by far the most attention in the life insurance forum is the improvement of price competition in the market through the dissemination of price information to consumers. With the elimination of the impeding valuation regulation, the stimulation of price competition now has among possible public policies the most favourable combination of potential effectiveness and political feasibility for improving the performance of the life insurance market.

Since the issue of price disclosure is relevant both to this study and the next section, discussion of the issue is delayed until Chapter 3. There, we discuss the design of a disclosure system, and review the main issues of cost disclosure.

While the increased availability of consumer information in the market is a very commendable goal, market prices are currently high enough relative to costs that it may be insufficient to improve market performance to an acceptable level. Further policy options merit discussion as programmes that may be undertaken either concurrently with disclosure or independently, if disclosure fails to sufficiently improve competition in the market. It is beyond the scope of this study to analyze all these options in detail; we simply indicate their main advantages and costs.

2) Mandatory Valuation Standards

The 1977 amendments to Canada's main insurance acts allowed company actuaries to set valuation assumptions "appropriate to the company's experience" but did not restrict the range of assumptions that could be adopted.

The environments faced by life insurers do not vary tremendously from company to company. In particular all insurance companies have access to the same capital markets. The discount rate for liabilities of a particular maturity that is appropriate for one company is not much different from that appropriate for another. The mandatory use of reasonably liberal valuation standards, would result in the transmission of more accurate information regarding firm's current and surplus situation to policyholders and the general public. Public and policyholder pressure to set premiums at levels which did not result in high surplus values would then help to discipline the market. This pressure is currently suppressed by the use of conservative valuation standards to rationalize excessive premiums.

The adoption of a common (with certain bounds) set of valuation standards would have an additional benefit; the assessment, by the departments of insurance, of the financial solvency of insurance companies would presumably be easier. Indeed, this was the original reason for the establishment of common valuation standards. Mandatory valuation standards would thus facilitate both the monitoring of the mutual companies' allocation of surplus (which would encourage a rationalization of current premiums and dividends) and the assessment of the financial solvency of insurance companies.

The discount rate(s) presented in these standards should be reviewed frequently since the interest rates have recently been relatively unstable. Alternatively, the rates could be tied to the term structure of interest rates. It is important that the rate be based on current (especially long term) interest rates and not, as has been suggested, on the recent rate of return on companys' investments; the current rates of interest are the best predictors of realized rate of return on investments.

3) Regulatory Limit on the Surplus/Liability Ratio and Mandatory Valuation Standards

In order to prevent the excessive accumulation of surplus at the expense of current policyholders a number of American states, including New York, have limited the surplus to liability ratio for companies writing participating policies. In most cases, this ratio is set at ten percent.

The implementation of such a regulatory limit on the surplus/liability ratio (at ten percent or lower) would limit net premiums which could be charged, and force the distribution of surplus. A prescribed set of valuation standards would, of course, be a necessary accompanying regulation.

4) Guaranty Laws

A significant number of American states have recently enacted insolvency guaranty laws which provide for idemnification of policyholder losses due to insolvency of insurance companies. Idemnification takes the form of payment of cash values or absorption of the outstanding policies of the insolvent company. This area of regulation is complex and has recently been under study by various agencies in the United States; a description of recent developments is provided by Heubner and Black (1976, p.582).

The benefit of guaranty laws per se in Canada would not be lower premiums. Rather, the laws would provide a means of policyholder protection against losses due to insolvency that is a less costly alternative to excessive conservatism in setting safety margins on premiums and in financial statements.

5) Establishment of a Non-Subsidized Federal Life Insurance Fund

A final policy which would undoubtedly improve competition in the industry would be the establishment of what has been called "yardstick competition" through a federally owned, non-subsidized life insurance fund. There is little doubt that such a fund could pay a rate of return of greater than two percent on non-participating insurance, without subsidy from taxpayers.

The state of Wisconsin established such a fund in 1911. It provides low-cost insurance to anyone physically present in the state at the time of purchase. However, the state insurance department has, as of recently, apparently done little to inform the public of the existence of this source of low-cost insurance.

Additional competition could be provided by the expansion of life insurance market to include other financial intermediaries as suppliers. The life insurance provided by savings banks in the United States has been low in cost compared to that sold by life insurance companies, (Belth, 1971).

The establishment of a socially-owned insurance fund is not likely given the current public sympathy towards a decrease in government regulation and involvement in the marketplace. However, the empirical results of this study indicate that measures to improve the performance of the Canadian life insurance market should seriously be considered.

FOOTNOTES TO CHAPTER 1

1. The foregoing is a very simplistic explanation which does not do justice to the incredible complexities of life insurance accounting. Surrender rates are not used in reserve calculation, for instance, and the "valuation premium" assumed in reserves calculation is higher than the "gross premium" or contractual premium. This latter mitigates the overstatement of reserves as a liability, but is in turn lessened by a requirement that if the valuation premium net of assumed administrative costs is less than the gross premium, the difference (in EPV terms) be established as a reserve liability. Also, the EPV of premiums is actually entered as a negative item on the liabilities side of the financial statement.

2. The foregoing explanation isn't quite correct in that if the insurance demand facing the company is growing at a sufficiently high rate, then the increase in the dividend at year t may not be feasible since the solvency constraint may be binding at that date. In this case, the paricipating policy supplier could raise premiums by $1 and end of-year dividends by where r is the interest rate and P the probability of survival and persistence through year t. This change would leave the policy with the same retention, and since consumers could be shown to be indifferent to the changes, demand would not change. The solvency condition would be relaxed (pre- miums being higher) and the company could now lower its pre- miums without violating the nominal solvency constraint.

3. The small size of this sample is not considered a strong limitation of the study since the results show that rates do not vary substantially across the sample. For example, the variation in premiums after adjustment for variation in other contract parameters is less than two percent. (See Winter (1981) for method of adjustment.)

4. Calculated by extrapolating the difference in premiums between the 10,000 and 50,000 face value policies listed in the Consumer Association of Canada's Shoppers Guide to Canadian Life Insurance Prices, W.M. McLeod, Editor. An alternative procedure would have been to simply keep the real face value constant over the 1965-1980 period. However, since price schedules are typically "kinked" at face values of $50,000, $75,000, etc., this procedure would have introduced artificial changes in the trends of rates.

5. Results in the 1974 Life Insurance Institute study on consumer attitudes report that 70% of consumers surveyed did not compare policies before purchasing life insurance.

6. Salop and Stiglitz (1976) describe a model of a market with a large number of firms in which if search costs are all positive and sufficiently homogenous across consumers, then the only (rational expectations) equilibrium possible is the one where all firms charge the monopoly price.

CHAPTER 2

CONSUMER INFORMATION AND THE DISPERSION OF LIFE INSURANCE PRICES

2.1 Introduction

In this chapter, we analyze the equilibrium nature of life insurance prices. Our purpose is to develop hypotheses to test the notions of consumer ignorance on life insurance suggested by Boyle (1981). Estimates indicate that the price variability of individual life insurance is substantial, so that the pay-off from additional consumer search is equally large. For example, term insurance contracts renewable to a specific age constitute a relatively simple and homogeneous class of product. Yet, a sample of 12 insurance firms issuing in 1979 to Canadian males aged 25, $100,000 term policies yearly renewable to age 70, indicates an annual price spread of $89 with an approximate 1979 present value price spread of $890 (using a 10% discount rate). A sample of 49 insurance firms issuing in 1977 to males in New York state aged 20, $50,000 term policies renewable every 5 years to age 70, indicates an annual price spread of $150 with an approximate 1979 present value price spread of $15000 (again using a 10% discount rate).

There is more than one explanation for retail price variability in any market. Pure price shopping models where products are homogeneous, buyers and sellers are many, buyers with identical search costs search for sellers and sellers with identical advertising costs advertise prices to locate buyers are sufficient to generate an equilibrium distribution of prices. However, such models do not appear to offer a consistent empirical explanation for the observed price variability in individual life insurance contracts. The question is why not?

There are several institutional features that differentiate the market for individual life insurance contracts from the markets that prevail in pure price shopping models. First, life insurance contracts are not homogeneous products. There are important differences across contract types. Contracts are typically either term insurance (insurance of some specified amount renewable over a relatively short horizon (yearly or every five years)), or permanent insurance (insurance of some specified amount where there is an annual premium but the horizon for the contract is longer and the contract has savings and/or business investment (participating) components to it). Optional riders such as double indemnity, waiver of premium benefits, and guaranteed insurability are other possible contract features but, are usually restricted to permanent insurance.

Second, there are differences amongst underwriting insurance firms for any given contract type. For example, firms may have different medical criteria for additional benefits that are included in guaranteed insurability options, different loan rates where a cash value policy is used as collateral, different ages of consumers at which renewable term policies terminate, different service on policies, different dividend records or differing abilities to screen accurately consumer insurance risk.

Third, there are differences across insurance consumers in either the marginal cost of search or equivalently, the productivity of their search efforts. Commentators on the life insurance industry (e.g. Consumers Union (1977), Federal Trade Commission (1979)) maintain that many (most?) consumers perceive only with error the real value of alternative contracts and, while consumers are aware of differences across underwriting firms, many (most?) can identify these firms only after extremely costly search. According to this view, this market is characterized by significant price distribution due to variability in consumer knowledge on the true value of various life insurance contracts underwritten by alternative life insurance firms.

Finally, individual insurance contracts involve a negotiated bilateral exhcange between the consumer and the life insurance agent where the agent identifies and "sells" the policy to the consumer and where the agent knows the educational, and financial characteristics of the household, revealed by the consumer to facilitate a risk rating and a policy recommendation by the agent. Such knowledge on consumer plus information on the true value of insurance contracts places the agent in a dominant informational position.

Ultimately, our objective is to estimate a reduced form equation that explains and interprets those factors affecting the prices of individual life insurance contracts. To do this, we need to sketch a model of buyer choice and life insurance sales which incorporates the institutional features of this market. Our explanation of price levels and variability turns on the ability of life insurance firms through their agents to price discriminate against consumers who hold varying price elasticities of demand with respect to coverage from each contract underwritten by each life insurance firm. Therefore, our demand story is cast at the brand level and focuses on consumer ignorance. Variation in consumer price elasticities on brands of life insurance reflects variation in marginal search costs for rational but not fully informed consumers who, consequently, hold varying stocks of knowledge on alternative life insurance contracts and underwriting firms. Price discrimination across consumers by firms is possible as each individual contract sales is a negotiated bilateral exchange between a consumer and life insurance agent, and agents know consumer price elasticities through personal and financial information revealed by potential consumers to agents. Therefore, individual life insurance sales are a strong example of markets examined by M. Porter (1979) where the institutional retail arrangements favour producers over consumers. Porter argues that similar explanations of price variability generalize to other markets characterized by retailer power due to asymmetric information between buyers and sellers, e.g. non-convenience goods such as automobiles.

In the sections that follow, we first sketch a model of negotiated bilateral exchange between the seller and buyer of an individual life insurance contract. This model is developed more completely elsewhere by Mathewson (1980). Our contribution here is empirical. First, the model is tested over an expanded data set. Second, the expanded data set includes regions with differing agency characteristics than those that prevail in life insurance sales in Canada. This permits tests on the relative efficiency of the alternative agency structures. Our empirical results together with a discussion of the data are presented and interpreted. The final section contains a discussion of the policy results that flow from this work.

2.2 A Model of Equilibrium Price Distribution

This model begins from the assumption that the market for life insurance is characterized by a fundamental asymmetry of information. Life insurance firms who design the attributes of the life insurance contract are fully informed about these characteristics i.e. the true value of (i) the whole life insurance (cash value of permanent insurance) relative to term insurance (ii) participating options where policyholders participate in company profits (iii) riders such as guaranteed insurability, and waiver of premium. Consumers are not initially informed about the true value of alternative life insurance options. However, consumers are capable of pre-purchase research on these alternative contracts and search across firms that supply life insurance. As well, competition in the market place may discipline life insurance firms to reveal to these consumers truthful information about product characteristics. The crucial question is whether or not the ability of consumers to self-protect through their own research and search efforts plus the competitive market pressures on life insurance firms leave consumers in any informationally disadvantaged state at the time they purchase the contract. Further, if errors or mistakes are made by consumers at the time of purchase are they costly and are they self-correcting?

Attention in recent papers on insurance in the economic literature focuses primarily on those informational asymmetries that arise when firms cannot differentiate consumers by risk. For example, in life insurance sales, it may be difficult for firms to ascertain the state of health of potential consumers. In this case, firms cannot prevent consumers with high medical risk from selecting policies designed for low risk consumers. If a competitive industry equilibrium is characterized by zero expected (economic) profit, then a competitive equilibrium can not exist in an industry where the revenues from some consumers (those with high medical risk) fall short of the expected (actuarial) costs. We assume away these adverse selection problems as empirically small (a judgement) and proceed from the assumption that the existing informational asymmetries are reversed. (Included in our specification of firm profits are the costs incurred by life insurance firms to screen consumers to determine the risk they represent).

In our model, consumers can engage in pre-purchase research on contract types and search across life insurance firms. Variability in the marginal opportunity cost of this activity yields variability in the stock of knowledge held by consumers at the time they purchase their insurance contracts. Positive marginal costs to search for some consumers means that these consumers are never fully informed. We expect life insurance firms to exploit the lack of complete consumers information in a rational profit maximizing fashion. To the extent that consumers are not fully informed about product attributes, they are not capable of sorting accurately competing life insurance contracts to discover the best deals. We do not expect any information brokers to be successful at correcting this situation. The reason is that consumers will have as much difficulty sorting potential brokers by quality as they have in sorting insurance firms by quality. Further, we do not expect consumers to be able to correct with ease any past mistakes in purchasing contracts. This is due either to protracted learning as many of the attributes of contracts that are difficult to evaluate occur typically after a lengthy period from the date of purchase or large transactions costs (agency fees) of switching to alternative life insurance products. The net result is that while consumers may engage in research and screening prior to purchase, they are not fully informed if search is costly. As post-purchase recontracting may be costly or as post-purchase learning is at best slow and at worst non-existent, errors made in the initial purchase decision may be expensive mistakes. Finally, experimental evidence on human behavior under uncertainty (Kahneman and Tversky, 1974) and evidence from marketing studies (Beales et al, 1980) indicates that, in general consumers' search productivity (marginal cost of search) is very low (high). Therefore, consumers may be seriously underinformed at the time of purchase.

In this study, the available data permit comparative static tests on search variability across consumers. We cannot measure directly the efficiency of consumer search and evaluation procedures. We will evaluate later the quantitative arguments on consumer search.

The data available to test any model of price dispersion are interest adjusted net cost (IANC) life insurance price data. In these calculations, whole life insurance is 'corrected' for any cash value and participating elements by calculating the present value of premiums, cash surrender values, and forecasted dividends. The protection costs of the insurance are the present values of premiums minus the present values of cash surrender values and dividends. These calculations are made in our data base over a 20 year horizon. Given the arbitrary nature of the horizon plus the utilization of 4% discount rates (rates that seem unduly low given current inflationary experience), the data should be used only to compare prices across firms for any given policy.

The technical details of the model are available elsewhere (Mathewson 1980). We provide a heuristic explanation of the model here. The benefits accruing to each consumer from a policy consists of death benefits and quality attributes per dollar of death benefits. These quality attributes may be policy specific e.g., does the policy afford an opportunity to increase coverage without a medical (guaranteed insurability) or does the policy guarantee payment of the premium in the face of illness that reduces income (waiver of premium benefit), or firm specific, e.g. does the firm screen risks more or less astutely than other firms or is there variability across firms in the amounts of additional benefits associated with guaranteed insurability. We measure these quality components per dollar of death benefits by variables that assume real positive monotonically increasing values to reflect increasing utility associated with increases in these quality items.

The model is driven by differences in the opportunity cost of research by consumers. In our world, consumers make three decisions that maximize their expected utility. One decision specifies the death benefits they wish to purchase given price and product quality. In the second, they choose their preferred type of policy. Finally, they choose the minimal acceptable reservation level of quality they seek to locate by searching across life insurance firms given their choice of policy type. Simultaneous satisfaction of these optimizing decisions yields for each consumers (i) a reaction path between the minimal acceptable level of quality and price (ii) an individual demand relationship. The consumer's price-quality path is downward sloping (higher prices are associated with lower coverage which means that rational consumers scrutinize firm policy offers less carefully). In Figure 2.1, the consumer reaction path is shown as:

$$\text{reservation quality} = \phi(\text{premium prices}) \qquad (1)$$

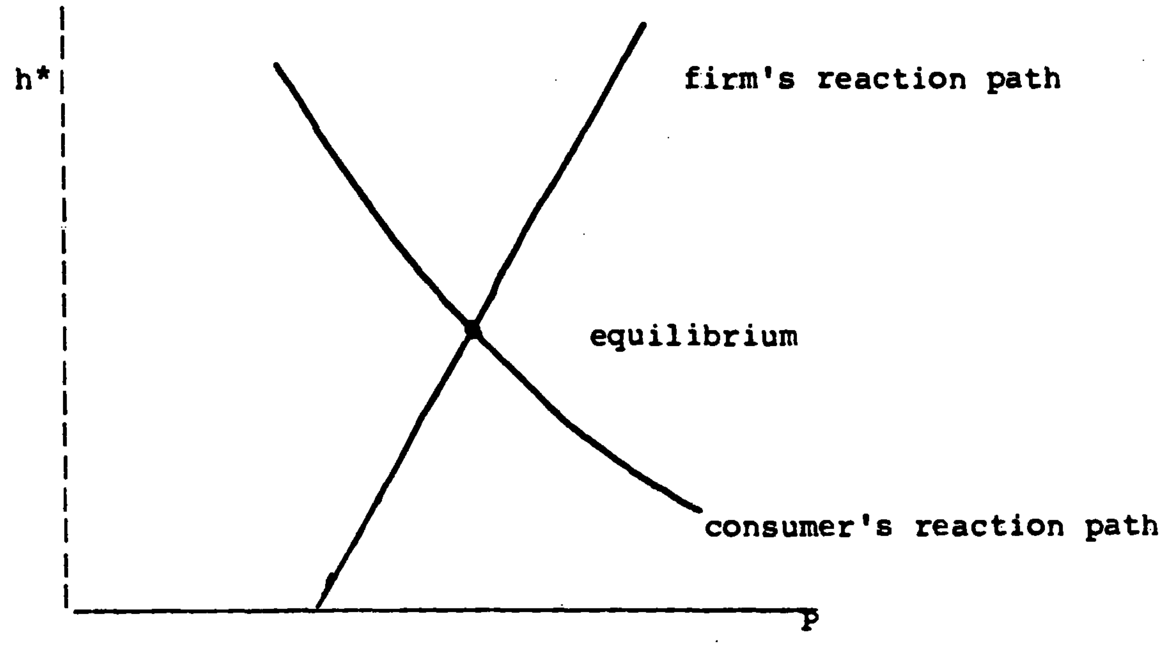
As consumers have different marginal opportunity costs of search, they have different reaction paths. Predictions are that for each price level of death benefits, consumers who have lower marginal opportunity costs to search or higher probabilities of death search more and hold higher reservation levels of product quality. In terms of Figure 2.1, lower marginal search costs or higher probabilities of death cause the consumer's price-quality reaction path to shift upwards.

Life insurance firms in this model seek to maximize expected profits. We impute two very important powers to firms. First, they have the ability to set prices in their negotiations with individual consumers. Each contract sale is a bilateral exchange where firms know that consumers buy larger contracts only if the premium price falls (i.e. firms know they face downward sloping individual consumer demand curves). As well, we argue that the extensive personal and financial information given by consumers to agents to facilitate risk rating and policy recommendation by the agent facilitate price discrimination by each firm. In particular, life insurance firms through their agents, read perfectly the reservation level of acceptable quality held by consumers which is a revelation of the consumer's willingness to search. Further, we assume that firms seek to service only one segment of the retail market where segments are defined according to the knowledge on policy alternatives held by consumers. This means that consumers in each segment of the market have common price elasticities of demand. Costs to the firm include the actuarial value of payout costs (expected death benefits), the cost of quality element, and the costs of policy underwriting and servicing.

We assume that capital markets are perfect and in equilibrium. In this case, expected returns on investments for life insurance firms just equal the opportunity cost of investment where investment costs reflect the non-diversifiable risk of any portfolio and any risk in the capital structure of the company.

Figure 2.1

A Consumer-Firm Negotiated Bilateral Exchange Equilibrium For a Life Insurance Contract


h*
firm's reaction path
equilibrium
consumer's reaction path
P

P = premium price per thousands of dollars of coverage
h* = consumer's reservation firm specific quality

Therefore, life insurance firms neither outperform nor underperform other financial intermediaries and we may ignore investment as an activity of a life insurance firm. Further, we assume that life insurance firms can diversify away underwriting risk either internally through the volume of contracts they underwrite or externally through a re-insurance market. Given the size of most life insurance firms and an active re-insurance market, this is a reasonable assumption. In this case, variability in the probability of bankruptcy across life insurance firms plays no role in the determination of life insurance prices.

Firms choose to enter that segment of the market which is most profitable. In each segment, firms are assumed to be Nash-Cournot competitors and to select contract size and number to maximize expected profits. The simultaneous satisfaction of these optimizing decisions yields for each firm and for each policy type, a reaction path between the minimal acceptable level of quality and price. This relationship is upward sloping to the right (as quality improves due to greater consumer search, profit maximizing price levels increase). In Figure 2.1, the firm reaction path is shown as:

$$\text{reservation quality} = \mathcal{E}(\text{premium prices}) \qquad (2)$$

For the firm's reaction path, for each price level of death benefits, increases in the medical risks of consumers' buying policies lower the reservation quality level. (The firm's reaction path is independent of the marginal opportunity cost of search for each consumer).

If (1) and (2) hold simultaneously, then there is the completion of the sale by insurance firms. The equilibrium price (price*) may be written as:

$$\text{price}^* = f(\text{consumer and product attributes}) \qquad (3)$$

or by assuming that for each class of insurance policies (each class of policies is defined by a vector of characteristics - contract type, death benefit size, age at which policy is issued, sex of consumer (where data are collected for males and females)) there is an equal variability to consumer search costs, we may write (3) as:

$$\text{variance (logarithm of prices)} = g(\text{consumer and product attributes}) \times \text{variance (marginal search costs)} \qquad (4)$$

(4) tells us that if the variance of marginal search costs is constant across consumer groups, then any relative variability in

the final prices of protection results from variability in consumer and product attributes. A linearization of (4), together with a specification of consumer and product attributes, yields:

> variance (logarithm of price) = [constant + a_1 (age of consumer when policy issued) + a_2 (number of companies in particular market) + a_3 (sex variable: 1 = female, 0 = male) + a_4 (permanent insurance variable: 1 = permanent insurance, 0 otherwise) + a_5 (participating variable: 1 = Participating insurance, 0 otherwise) + a_6 (permanent participating insurance variable: 1 participating permanent insurance, 0 otherwise) + a_7 (variance in loan rates for policy holder)) x variance (marginal search costs)

2.3 Empirical Results and Their Interpretation

(5) is estimated over six cross-sectional sets of data. All samples, with the exception of New York, report interest adjusted net cost data with a horizon of 20 years. For New York, data are interest adjusted net cost data with a horizon of 10 years. Samples 1 and 2 are taken from the Canadian Consumer's Association of Canada, Shopper's Guide to Canadian Life Insurance, 1978 and 1979 (respectively). Sample 3 is from the New York State Department of Insurance, Consumers Shopping Guide for Life Insurance, 1977. Sample 4 is from the State of Pennsylvania, Department of Insurance, Shoppers Guide for Life Insurance, pooled over 1972 and 1973. Sample 5 is from J. Belth, Life Insurance, a Consumer's Handbook, 1973. Sample 6 is a sample of U.S. life insurance firms assembled by the U.S. Federal Trade Commission. The results from Samples 1, 2 and 3 are reproduced from Mathewson (1980). Samples 4, 5 and 6 represent newly acquired data.

The theoretical model together with conventional wisdom about life insurance yield the following set of predictions:

$a_1 > 0$; a_2 has an uncertain sign; a_3 has an uncertain sign; $a_4 < 0$; $a_5 > 0$; $a_6 = a_4 + a_5$ and has an uncertain sign; $a_7 > 0$.

For those coefficients where there is an uncertain sign, it is possible to identify the economic forces at work. The intuitive explanation behind each of the predictions is as follows:

(1) a_1 should be negative. The older the consumer, the greater is the probability of death and illness and the more likely the policy or its options will be exercised. Therefore, more search is undertaken by each consumer in these older groups at the time of purchase. This additional search activity reduces the relative variability of prices within the group.

(2) a_2 has an uncertain sign. If more life insurance firms enter a particular segment of the retail market for individual life insurance contracts, we cannot predict whether consumers will be induced to engage in additional or reduced search efforts. If the new firm produces with higher (lower) levels of quality than those found currently to be minimally acceptable by the consumer, then consumers are induced to search more (less) as their chances of securing a better deal are increased (decreased). Additional (reduced) search by consumers decreases (increases) relative price variability.

(3) a_3 has an uncertain sign. If women are less (more) experienced than men at insurance search, then $a_3 < (>) 0$. However, $a_3 < 0$ has an alternative explanation. At the same age, women, on average, have a lower probability of death than men. Therefore, relative to men, women may search less due to a lower expected pay-off from insuarance.

(4) $a_4 < 0$, $a_5 > 0$ but a_6 has an uncertain sign. Insurance policies may be term or permanent (whole life or cash value), participating or non-participating. (Typically, term policies are non-participating but the U.S. samples contain some participating term policies). Each of these variables captures a relative evaluation of the respective policy attributes. If consumers undervalue term insurance relative to permanent insurance, as conventional wisdom suggests, then as a greater relative evaluation causes consumers to search more so that relative price variability is reduced. a_4 should be negative. If consumers overvalue non-participating insurance relative to participating insurance, then greater search across all consumers takes place with non-participating insurance, then a_5 should be positive. a_6 indicates whether permanent participating insurance is overvalued or undervalued relative to term insurance.

(5) $a_7 > 0$. Life insurance policies with higher interest rates on loans to policy holders against the policies should command a lower price in the market place. We expect greater variability in these loan rates to be associated with larger relative price variability.

Table 2.1 reports the regression coefficients across all 6 available samples. Table 2.2 reports corresponding elasticities evaluated at the mean of each respective variable.

Table 2.1

Estimated Model of Consumer Research and Misperception for Individual Life Insurance Contracts

Sample #	Constant	Age	No. of Companies	Sex Variable	Permanent Insurance Variable	Partici- parting Variable	Permanent Participating Variable	Variance Loan Rates	R^2
1.	3.06E-02 (10.66)*	-0.04E-02 (-6.75)	0.30E-02 (3.60)	-0.85E-02 (-6.33)	-0.74E-02 (-3.95)	2.32E-02 (11.77)	1.58E-02 (8.40)	--	0.63
2.	4.49E-02 (8.56)	-0.06E-02 (-5.32)	0.03E-02 (2.07)	-1.19E-02 (-4.83)	-0.24E-02 (-0.68)	3.03E-02 (7.99)	3.01E-02 (8.46)	--	0.52
3.	-4.36E-02 (-3.26)	-0.05E-02 (-4.83)	0.20E-02 (6.61)	-1.44E-02 (-5.21)	-0.52E-02 (-0.90)	1.78E-02 (6.44)	1.26E-02 (1.68)	--	0.73
4.	-1.30E-02 (1.21)	-0.05E-02 (-5.83)	0.03E-02 (3.02)	--	-1.13E-02 (1.62)	1.86E-02 (5.49)	0.73E-02 (1.52)	--	0.82
5.	0.97E-02 (2.70)	-0.03E-02 (-2.90)	0.04E-02 (3.59)	--	-0.05E-02 (-0.25)	-0.65E-02 (-3.09)	-0.70E-02 (2.29)	--	0.67
6.	-0.19 (-1.00)	-0.32E-02 (-3.51)	0.08E-02 (1.09)	--	-0.10 (-1.31)	--	--	0.48 (2.60)	0.72

* t-statistics are reported in parentheses under each coefficient estimate.

The results are consistent across the samples save for one peculiarity for the Belth sample. Our search hypothesis on age is confirmed. More companies increase rather than decrease price variability. Prices for women exhibit larger relative price variability than prices for men. If there is any relative over or undervaluation, consumers undervalue term relative to permanent insurance, and with the exception of the Belth data (Sample 5), undervalue participating relative to non-participating insurance. These last results are sensitive to forecasts of dividends in constructing each sample. Finally, the last sample indicates that relative price variability varies positively with variances in the loan rates for policy holders.

Table 2.2 reports relative price variance elasticities evaluated at the mean of each respective sample. Most elasticities, as point estimates, are less than one. Notice that the elasticities on the effect of increased life insurance firms in the U.S. where the elasticities are significant (Samples 3, 4 and 5) are larger than Canada (Samples 1 and 2). An explanation may be found in the historical difference in the agency relation between the two countries. In the U.S., life insurance agents may be general agents that represent several firms unless a firm restricts its own agents to work exclusively for that firm. In Canada, agents have been restricted historically to work for only one insurance firm. The recent report of the Ontario Select Committee (1980) has recommended a move towards general life insurance agencies in Ontario. Is such a change desirable or undesirable?

2.4 Economics of Insurance Agencies

To answer this question, we examine the economic issues of insurance agencies from the perspective of the three economic actors involved in the production and sale of life insurance - the underwriting life insurance firm, the consumers purchasing the insurance and the marketing agents themselves.

In the U.S. where there is an option to restrict agents to sell exclusively, we observe that this restriction is typically imposed by the larger life insurance firm. Why is this? The firms that are larger in terms of assets and sales volume are larger in terms of advertising budgets and sales force. Therefore, these firms have acquired through past investments the larger brand names and reputations. If consumers are attracted to the products because of the reputation of these firms, then these larger firms seek a return on their investment in goodwill. Should these firms market products through independent agents they face a possible erosion of their market.

Table 2.2

Estimates of Elasticities of the Variance of the Logarithm of Prices of Individual Contracts, Evaluated at the Mean of Respective Variables

Sample	EL_1**	EL_2	EL_3	EL_4	EL_5	EL_{4+5}	EL_6
1.	-0.93*	0.33*	-0.25*	-0.18*	0.29*	0.30*	---
2.	-0.87*	0.19*	-0.22*	-0.04	0.24*	0.36*	---
3.	-0.49*	2.19*	-0.20*	-0.07	0.25*	0.17	---
4.	-1.43*	3.48*	---	-0.69	0.54*	0.23	---
5.	-1.26*	1.36*	---	0.03	0.40*	0.22*	---
6.	-1.16*	0.53	---	0.50	---	---	3.93*

* Elasticities based on coefficients significantly different from zero are marked with an asterisk.

** 1 = Age;
2 = Number of Companies;
3 = Sex Variable; 1 = female, 0 otherwise;
4 = Permanent Insurance; 1 = Permanent Insurance, 0 otherwise;
5 = Participating Insurance; 1 = Participating Insurance, 0 otherwise;
6 = Variance of Loan Rates.

The reason is that the advertising and sales efforts of these larger firms may inform potential consumers of the existence of life insurance and annuity products as well as identify independent agencies where these products are available. However, these independent agents could supply to those potential customers substitute products at a lower price from firms that choose to spend fewer resources on informative brand name investments. These latter firms "free ride" on the informational activities of the larger firms. In fact, if consumers have problems distinguishing quality variation in substitute insurance and annuity products, the firms that did not advertise could supply inferior products, through higher commission rates bribe independent agents to push their products and still enjoy an advantage over the larger firms. Therefore, our argument is that the greater the size of the firm and correspondingly its expenditures on advertising and sales effort that attract consumers to the products of the industry, the more likely it will seek to enforce exclusive agency agreements.

What happens to the commission rates of agents and the direct sales efforts per customer across these firm size and alternative agency agreements? We have argued that larger firms will tend to use exclusive agency so that firm size and the type of agency arrangement used by any firm are related. In equilibrium, with open entry into the agency business, we would expect agents to earn the same income from working exclusively for a larger firm or independently selling for several smaller firms. As commission rates are typically a percentage of gross premium revenues, this equilibrium condition states that per policy sold, commissions should equal the opportunity cost of the agent's time involved in the selling effort.

As we move from smaller firms with smaller advertising budgets and less sales effort per policy using independent agents to larger firms with larger advertising budgets and more sales effort per policy using exclusive agents, we should observe variability in the commission rates. However, the direction of the change in commission rates is conditional on the relationship between variation in the advertising budget and the productivity of direct sales effort in each sale. If larger firms service market segments where the productivity of advertising is increased, for example due to potential consumers either initially misinformed of the existence of insurance and annuity alternatives or more susceptible to persuasive advertising claims, then the advertising expenditures of these large firms will be larger. If increases in advertising increase the productivity of direct selling effort, then direct selling efforts per contract and consequently total commissions demanded by agents per contract are larger.

However, the impact on commission rates is uncertain. Larger advertising expenditures with direct sales effort held constant would increase premium revenues and reduce commission rates. Larger direct sales efforts per contract with advertising held constant would increase premium revenues by more than salesman's commissions (as commission rates are less than one), and therefore would reduce commission rates. (The technical details of this analysis appears as a life insurance industry equilibrium model in Appendix A). In the absence of empirical evidence on the relative magnitudes of these two effects, it is impossible to predict the direction of change in commission rates. There is some indirect institutional evidence from the U.S.

In the U.S. where agency arrangements are more flexible than the historical system in Canada, the general tendency is that the larger life insurance firms tend to employ exclusive agency. This also holds for the property-liability insurance industry as well. As well, the general tendency in both industries is for commission rates to be higher for the independent agent. In terms of our previous analysis, these institutional facts suggest that the increased ease of sale that accrues to the exclusive agents for those firms with strong brand names and reputations dominates any effect from increased profit-maximizing sales effort per contract required to complete sales in that segment of the market serviced by these large firms. This analysis assumes identical costs to the firm of monitoring independent and exclusive agents.

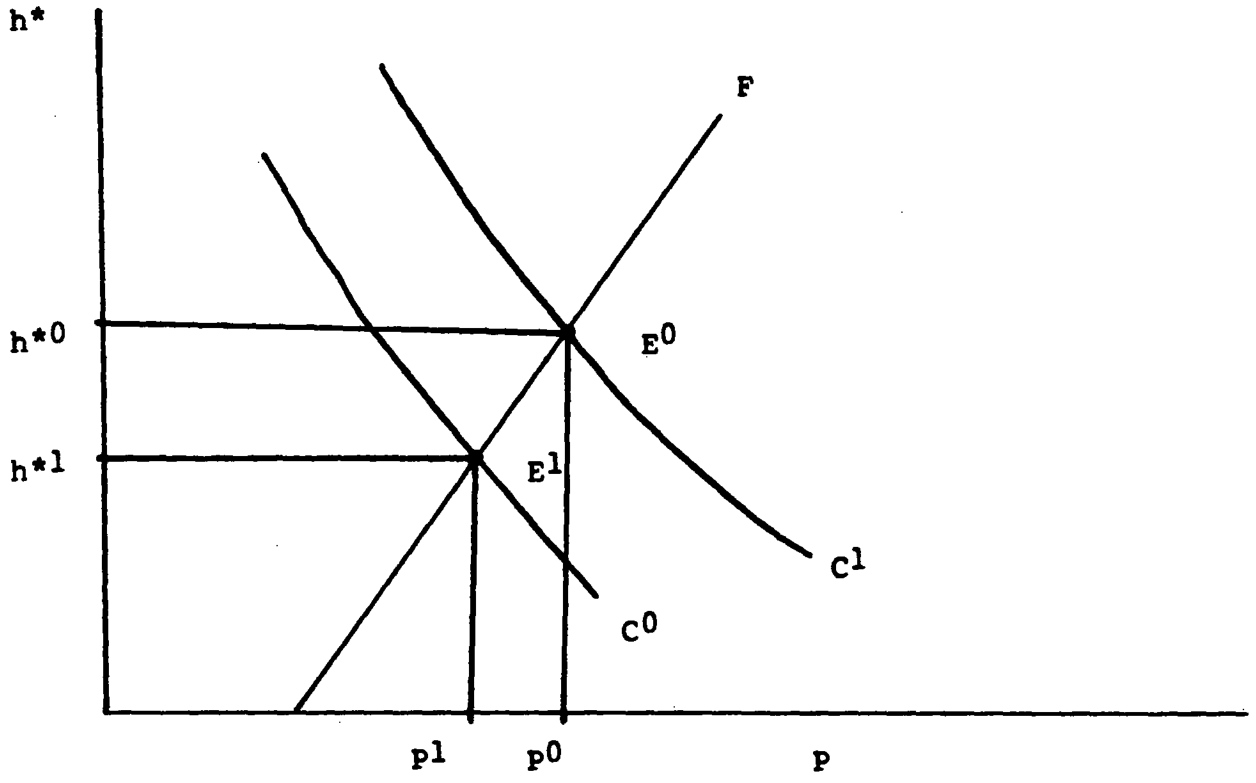
Would agents be better off with the right to form independent agencies? The answer is yes and the rationale rests with the existence of agent-specific rents. Clearly, life insurance agents have differential abilities to perform their job. We expect those with superior selling skills to earn rents on their differential human capital. However, if agents entering the business either are unable to signal their differential skills to the firm or do not know their skills ex ante then we would expect all agents to receive initially identical labour contracts. In this case, relative skills are revealed only in terms of actual job performance. A competitive secondary market for agents is sufficient to permit those with differential skills to collect any rents due to these skills. Exclusive agency plus the forfeiture of residual commissions on past policies should the agent move to represent a different company reduce mobility and permit the life insurance firms to collect the rents specific to agent human capital. One method of circumventing this trap is for the agent to incorporate and offer the services of the incorporated firm exclusively to the underwriting life insurance firm. Subsequent mobility is facilitated by offering exclusively the services of a second incorporated agency staffed by the same agent to another life insurance firm while the initial agency which ceases to place new business continues to exist exclusively for the first life insurance firm and to collect residual commissions. However, at the outset of their careers, agents still may have neither the knowledge nor the bargaining power to establish such a corporate arrangement with the underwriting life insurance firms. Thus, agent mobility is still reduced and life insurance firms share in agent rents. As a result, it is no surprise to learn that better life insurance agents in Canada are in favour of a change in the law to permit more flexible independent agencies.

Would consumers benefit from a move towards independent agencies? The first factor to note is that if independent agents are permitted but not required, we have previously argued that only smaller companies would find independent agents an attractive marketing device. In any retail system mixed between exclusive and independent agents, to the extent that consumers searching across life insurance firms for a given insurance policy include independent agents in their search, then the efficiency of consumer search would be improved as each search of an independent agent would yield information on several alternative underwriting firms. This holds even in the face of the powers of price discrimination imputed to agents in our model of negotiated bilateral exchange. While the details of including independent agents in our model of negotiated bilateral exchange are relegated to Appendix B, we provide a heuristic explanation using a diagram similar to Figure 1.

The effect of a more efficient consumer search routine is to lower the marginal cost of each search. As a result, consumers engage in additional search. For each price level of insurance, consumers now demand a higher reservation level of quality i.e. they are prepared to engage in additional search across firms to locate firms with higher quality. In terms of our negotiated bilateral exchange model, the consumers' reaction path (labelled C^0 in Figure 2) shifts upwards (to C^1 in Figure 2). The final equilibrium is characterized by higher prices and higher quality for each class of consumers affected by this change. However, in the context of our consumer model, consumer welfare is unaffected by this change. The price change and the quality change are exactly offsetting. The reason for this is that while consumers may suffer from misperception on the relative values of policies that may cause them to overvalue or undervalue the relative merits of any policy, they do not misperceive firm-specific quality. Rather, they do not know the location of each firm and therefore, they search to locate firms of varying quality. Further, life insurance firms offer consumers their minimally acceptable levels of firm quality which is fully realized and reflected in price.

Figure 2.2

The Impact of Technical Change in Consumer Search On the Consumer-Firm Equilibrium



F = firm's reaction path

C^0 = consumer's reaction path before technical change

C^1 = consumer's reaction path after technical change

E^0 = initial equilibrium

E^1 = final equilibrium

P = premium price per thousands of dollars of coverage

h^* = consumer's reservation firm specific quality

The 1979 Canadian and 1971-72 Pennsylvania samples afford a test of the effect of agency relations on price. First, there appear to be no differences in either regulatory solvency rules or the risk characteristics of populations between the two areas. Furthermore, neither region has rules restricting life insurance firm expenditures on agents. (For example, New York, Illinois and Wisconsin have expense limitations laws that restrict life insurance firm expenditures on agents). The one difference between these two regions is the presence of independent life insurance agents in Pennsylvania and their virtual absence in Canada. Therefore, we propose to test our prediction on agency structure with these two samples. As the price variable to be explained in equation (5) is relative price variability, inflation is not a problem in combining samples from the two regions over two different time periods.

As the Pennsylvania data contain only life insurance policies issued to males, we proceed by similarly restricting the Canadian sample. We augment the estimated reduced form equation (5) to include an agency variable capturing the differences between the two regions. That variable is defined as equal to 1 if the life insurance policy is sold in Pennsylvania and zero otherwise. We identify the agency variable's regression coefficient as a_8. The null hypothesis is that the Canadian and Pennsylvania samples are homogenous save for the difference in the nature of the agency system. The hypothesis that independent agents improve the efficiency of consumer search implies that $a_8 < 0$, i.e. increased consumer search should reduce relative price variability. Table 3 reports the estimated coefficients together with the relevant F statistics to test the null hypothesis on homogeneity of the samples.

First, the null hypothesis on the homogeneity of the Canadian and Pennsylvania samples with respect to consumer and product characteristics cannot be rejected, i.e. estimated $F_{5,90}$ critical $F_{5,90}$. Secondly, the null hypothesis on the improved search efficiency ($a_8 < 0$) cannot be rejected. The corresponding elasticity for this variable is -.55. Provided our dummy variable captures the difference in agency arrangements between the two regions (we could find no other differences), we may conclude that the presence of independent agents increases the efficiency of consumer search.

Would the presence of independent agents necessarily reduce the amount of consumer misperception on the relative qualities of policies? In our model of the life insurance market, we proceed from the assumption that consumers formulate opinions on the relative value of alternative (substitute) life insurance

Table 2.3

Estimated Model of Consumer Research and Misperception for Individual Life Insurance Contracts for Pooled Canadian and Pennsylvanian Samples

Constant	Age	No. of Companies	Permanent Insurance Variable	Partici- parting Variable	Permanent Participating Variable	Agency Variable	R^2
2.52E-02 (11.89)*	-4.0E-02 (-8.48)	.02E-02 (5.96)	.75E-02 (-4.41)	1.72E-02 (10.68)	.97E-02 (6.56)	-3.43E-02 (-7.03)	.69

$F_{5,90} = .15$ Critical F (.001% level of significance) = 4.42

*t-statistics are reported in parentheses under each coefficient estimate.

policies that may contain error. Consumers may undervalue or overvalue the policy they choose and as a consequence, buy too much or too little coverage. Consumers may also rank policies incorrectly so that they buy the wrong policy. For example, many industry commentators feel that consumers underinsure and purchase the wrong policies. Specifically, consumers would be better off by substituting renewable term insurance with larger death benefits for their smaller whole life insurance policies and investing any differences in premiums in their own investment portfolios.

Some argue that independent agents would have the knowledge and incentive to shop across competing life insurance firms thus screening out the better deals for their clients. However, unless consumers either learn about policies more effectively and/or switch easily and inexpensively from inferior products after purchase, independent agents would not have an incentive to scrutinize underwriting firms for better deals. Agents would simply appropriate any quasi-rents that formerly accrued to the life insurance firms from ill-informed consumers. Therefore, we see no reason to expect that independent agents will reduce consumer misperception aside from any positive effect that independent agents will have on the ability of consumers to self-protect.

It is important to note that rents that accrue to firms (or agents) disappear due to open entry into the life insurance industry. All firms that enter are disciplined by competition to price discriminate. This would not be the case if there were any signs of natural monopoly tendencies in this industry. However, there are none. The last twenty years in the Canadian life insurance industry have been characterized by significant growth in new firms and a decline in concentration. As well, estimates of cost function parameters indicate a lack of any natural monopoly tendencies.

Another argument in favour of exclusive agency is that the liability for any policy difficulties under exclusive agency rests clearly with the underwriting company. With independent agents, discontented consumers do not know whether the source of their discontent rests with the agency or the life insurance firm issuing the policy. In addition, life insurance firms may find it more costly to monitor independent agents than agents tied directly to the underwriting firm.

D. Mayers and C. Smith (1980) argue that they expect the firm-agent incentive conflict to be relatively greater with an independent than an exclusive agency system. Their analysis does not consider problems of consumer ignorance and search but focuses on the nature of optimal institutional arrangements in the presence of positive contracting costs and incentive incompatibility across contracting agents. For example, exclusive agency where agents are directly employed by the life insurance firm internalizes the firm-agency relationship. It is relatively easy for the firm to monitor the agent. Mayers and Smith argue that this is not the case for independent agents who offer higher service and higher priced policies to maximize their commissions. In contrast, they expect firms that employ exclusive agents to specialize in low service, low priced policies.

Our predictions from our model of consumer search are that those life insurance firms that would move to an independent agency system given the choice would find that their equilibrium levels of price and firm quality would rise relative to the equilibrium levels of the same firm with exclusive agents. Our Pennsylvania-Canadian test sought support for these effects. However, our equilibrium industry model (employed in our earlier discussion of variation in commission rates across agency arrangements and developed in Appendix A) predicts that given the choice, those life insurance firms choosing independent agencies are those that offer less agent related services, have lower advertising budgets and have smaller equilibrium sizes than those firms that choose to remain with an exclusive agency system.

The Mayer-Smith approach emphasizes the incentive for the behaviour of agents in the presence of contracting costs and the issues of incentive compatibility between the goals of agents and those of insurance firms. Our approach emphasizes potential consumer misperception, search across firms and the role of agents as inputs into the creation of brand names and as instruments to screen consumers by their knowledge of the product to facilitate price discrimination. While the conflict in predictions is potentially resolvable through empirical tests, the data are not available. For example, the accurate measurement of agency service and firm quality is not possible. One fact is clear. None of our empirical results suggest rejection of our null hypothesis developed from our specification. It is our judgment that firm-agent conflicts, contracting costs and the ensuing cost minimizing institutional structures play a more important role in the property-liability insurance industry. In this industry, issues of consumer ignorance are less important as typically contracts are more uniform, have a shorter life and there is greater consumer experience with the product, e.g. automobile insurance.

From the point of view of the policy issues we address, it is worth noting that (i) our predictions as well as those of Mayers and Smith, involve prices and quality or service moving in the same direction (ii) both analyses assume freedom of choice for both firm and consumer with respect to type of agency. In Ontario, the requirement that agents be sponsored by one and only one insurance firm is the major impediment to more flexible independent agency arrangements. In its recent report, the Select Committee of the Ontario Legislature (1980) recommends that this single representation requirement be dropped so that agents would be free to sell the policies of any company, subject only to their contract with the company sponsoring them. At the same time, it recommends that the agent sponsorship provision by a life insurance firm be retained and suggests that the sponsoring insurance firm be held responsible under law for the actions of these sponsored agents, thereby increasing the legal price of sponsorship.

It has been argued that information flows would be improved and consumers would be better off if life insurance agents were better qualified. However, this argument is faulty. As long as consumers have neither the incentive nor the information technology nor the available data to become better informed, more highly qualified agents will operate under exactly the same incentive structure as less qualified agents. The one difference would be that as the qualifications to be an agent become more severe, it would become increasingly difficult to enter the profession and those already certified would enjoy certain monopoly privileges. Society has chosen to accept this cost as worthwhile in the case of medical doctors in order to reduce the incidence of quacks in the profession. However, the complexity of life insurance contracts and the consumer costs of mistakes are still several orders of magnitude less than their corresponding measures for medicine.

2.5 Conclusions and Policy Options

The preceeding positive analysis of price variability offers insight for potential public sector informational issues. It is important to stress that this analysis does not provide complete guidelines on the optimal magnitude or mix of various policy alternatives. This can come only with additional experimental evidence, once policy options have been exercised.

Our model explains why we observe price variability in the market for life insurance products. First, price variability that occurs because products have different characteristics to suit the different tastes of consumers is not necessarily a bad thing. Further, in a world of consumer and product diversity, there are always resource costs associated with identifying and matching up consumers and products. However, if products have different characteristics and prices which render some of them inferior to others simply because some consumers cannot differentiate across product attributes, then there are negative welfare overtones. Put a different way, this says that some consumers may be better off with higher prices and higher quality but with reduced price elasticities.

At the heart of the model that explains both measured price distribution and life insurance firm and industry performance is the concept of price discrimination through a negotiated bilateral exchange between consumers and life insurance agents facilitated by asymmetrical product information favoring the firms and their agents over consumers. In this model, ex-post and ex-ante utility of consumers need not be identical due to the possibility of consumer misperception. Further, consumers take prices as given and consequently are unaware of the impact of their own research and search activities on the ability of the firm through its agent to price discriminate. Therefore, as consumers do not anticipate appropriation of any price effects, they underallocate resources to this activity.

In general, we expect that the allocation by consumers of resources to information on the qualities of goods and services, and life insurance in particular, will not be optimal due to the public good features of information i.e. use of this information by any consumers does not reduce its value to others so that the consumer generating the information may not appropriate fully its return. We expect this welfare consequences of this problem to be more acute with goods where post-purchase evaluation of the product is more difficult or at some time in the far future. Further, we argue that life insurance is such a product due to its complex features and the difficulties confronting the consumer at the time of buying the insurance contract of evaluating riders and options potentially operative only in some future and uncertain state of the world. However, the non-appropriability features of insurance information are internalized through group insurance. Group insurance is typically term insurance which also means that the product is easier to evaluate. As well, the insurance firms risk rating costs are reduced as groups do not present selection difficulties.

In terms of our search and misperception model, we predict that relative price variability for groups would be much less than for individuals. Unfortunately, we cannot test this hypothesis as group price data is not available. It is also worth noting that the availability of group insurance may not eliminate the informational problem. First, obviously not all consumers have access to groups. Second, consumers with group term policies desiring insurance with savings and/or dividend features may purchase outside individual insurance. Finally, as groups are formed for reasons other than insurance purchase e.g. by employment, there is no guarantee that the group size has fully internalized the informational appropriability. Table 6 in Boyle (1980) shows that in terms of sums insured, group and individual policies are approximately equal through the mid-1970's. Consequently, we argue that there is significant potential pay-off from improved and enlarged informational flows on life insurance products.

Based on our analysis of agency in the life insurance industry, we advocate a relaxation of the single company sponsorship rule to facilitate independent agents. It is our prediction that

1) not all firms will move to independent agents; the large firms will retain exclusive arrangements; the small firm will use independent agents

2) the presence of some independent agents will facilitate increased consumer search

3) better life insurance agents will retain a larger proportion of their skill-specific rents

4) consumer misperception on the merits of alternative life insurance policies will remain unchanged.

To reduce consumer misperception on alternative life insurance contracts, the public sector has two possible actions. It can seek to aid consumers either by stimulating consumer research on policy alternatives and search across competing firms or by regulating or taxing the actions of individual agents. The problem with regulating the actions of agents, for example by placing limitations on agent expenses (similar to New York, Illinois and Wisconsin), is that the agent's activity of screening and sorting consumers to facilitate price discrimination and the activity of informing or persuading consumers of the merits of alternative insurance schemes are joint products. While persuasive activities on the part of agents can lead to consumers buying either too much insurance or the wrong policy leading to negative welfare effects, the act of successfully sorting consumers according to their knowledge or their price elasticities has the potential for generating short-run rents and guaranteeing long-run survival for life insurance firms in the face of open entry. These have only distributional and not efficiency overtones. Less of both actions by restricting agents and expenses while it saves the resources represented by agents' commissions may lead to fewer life insurance firms and particular sectors of the retail life insurance market not being serviced, so that there is no guarantee that on balance such a policy would leave welfare improved.

Fewer life insurance firms can also have indirect effects on consumer welfare by altering the nature of the consumer search process. As a general proposition, it is not clear whether more or fewer firms alter consumer search activity so as to increase consumer welfare. (The details of this welfare analysis appear in Mathewson (1980)).

In our view, the more desirable public action is to subsidize consumer pre-purchase research on alternative life insurance products and search across competing suppliers. While our empirical work on price distribution indicates variability in consumer decisions that is consistent with rational consumer behavior, it provides no estimate of the productivity of consumer search. For example, (5) is predicted upon the assumption of a constant variance to the marginal cost (productivity) of consumer search across risk classes and policy purchases by consumers. However, we cannot estimate this variance from our empirical results as there is insufficient information in the available data i.e. the model is underidentified if we seek estimates of all of the parameters. If the marginal social welfare of subsidizing consumer search is strictly positive when we evaluate this marginal welfare at the levels of the decision variables on search, coverage, price and sales effort found to be optimal by all the economic agents (consumers and firms), then we know that there is a case for public subsidy. However, in the absence of specific information on the value of the marginal social welfare i.e. on the actual efficiency of consumer search, and on the improvements in consumer research at the margin and marginal costs of alternative public informational schemes, we can make only qualitative judgements.

First, we must recognize that there may be some limitations on the abilities of many consumers to process even the simplest information. In a recent publication of the U.S. Federal Trade Commission, Beales et al (1980) evaluate consumer search efficiency with a view to implementing public policy information programs. In general, their policy approach is to advocate the less restrictive policies of enhancing the free flow of information and requiring suppliers to disclose specific information rather than the more restrictive policies of limiting or banning products.

Beales et al argue that consumer experience and learning through use of a product works best for inexpensive frequently purchased goods with no hidden risks. We have already argued that life insurance contracts are not in this category. Further, they distinguish between active informational search by consumers considering explicitly the immediate purchase of a good and passive information acquisition by a consequence of the tied sale of advertising with entertainment. Consumers in the latter category are likely to accept the advertising message with less questioning of its information content. This difference could affect the ultimate purchase decision by the consumers.

This suggests that it is important to monitor the advertising messages of firms as this source of information is likely to have greater impact and be less costly than other sources. For life insurance firms, any public monitoring costs are likely to be large due to the difficulties of monitoring the informational content of messages from individual life insurance agents to individual consumers. Clearly, group life insurance purchasers are less susceptible as the purchasers of the product are more likely to be knowledgeable than individual purchasers, the insurance plans are likely to be more simple as they usually do not involve savings elements, and groups can afford to spend more on information than individual consumers given the public good nature of information.

For more susceptible individual consumers, any public policy should stress clear lines of liability for false or misleading statements by agents and the need for consumers to obtain signed statements of advice. To make public information competitive with seller information, it must be low cost. As the most important cost of information search for consumers is their own time cost, information must be easy to obtain e.g. government subsidized experts available on a phone-in basis and easy to understand. While it may be difficult to explain all the complexities of insurance contracts in a simple manner, a few broad truthful statements that warn consumers of dangers e.g. many whole life policies pay non-competitive returns on savings, all whole life policies have sales expenses deducted immediately (front-end loading), are better than information overkill that only adds more noise to the system e.g. some disclosure laws. (In 3.4, we discuss the merits of the Ontario Select Committee's disclosure laws).

For life insurance policies, there is a need to provide information on (a) the relative merits of different policies (b) the relative merits of any given policy from several firms. As we emphasized earlier, the interest adjusted net cost calculations contain arbitrary assumptions on the length of time the consumer will hold the policy, discount rates and forecasted company dividends. While the impact of these in distorting the relative rankings of life insurance firms may be relatively small, these indices do not provide any meaningful comparisons across policies. It is our opinion that the public sector should collect and publish either interest adjusted net cost figures (for at least two horizons e.g. 10 years and 20 years) or retention indices for all policy types by sex and by the age of the consumer at the time of purchase (e.g. 25, 35, 45, 55 year olds). While the Consumer's Association of Canada has published interest adjusted net cost figures in 1978 and 1979, they suffer from exclusion of information from some companies as participation is voluntary. At the same time, to facilitate consumer comparisons across policy types, we advocate government discussion booklets on insurance pitfalls for consumers which must be distributed by life insurance agents before each sale. Further, we advocate "cooling-off" periods of at least six months after each sale where life insurance contracts may be rendered null and void at the consumer's discretion subject to firms retaining revenues to cover policy set-up costs.

Some advocate the public provision of life insurance contracts that compete with private life insurance firms. A general analysis of the use of government enterprise to discipline private firms in an oligopoly appears in Harris and Wiens (1980). Our evidence is that the life insurance industry is a monopolistically competitive industry (i.e. zero (excess) firm profits in long-run equilibrium) with price discrimination and asymmetrical information rather than an oligopoly. As a device to guarantee marginal cost pricing and to regulate private firm profits, the use of public enterprise to regulate oligopolies is not without considerable controversy. At this time in this industry, in our view, it is not a realistic policy option.

Therefore, it is our view that there is scope for government information programs on life insurance options for consumers. Such programs while comprehensive should stress simple facts. The ability to "undo" contractual errors subject to resource costs should be available to consumers. In general, governments should not worry about the lack of competitive pressures on pricing performance but should worry about consumer product knowledge.

2.6 Appendix A

Changes in Commission Rates Across Market Segments in the Life Insurance Industry

Assume a single product life insurance firm producing a one-period contract with death benefits (μ) at a premium price (P) ;λ denotes the proportion of premium revenue available for investment with an expected rate of return r and an opportunity cost ρ; Γ denotes the probability of death in the period; m denotes the number of contracts produced at a total cost of $G(m,w)$ where w reminds us that total costs depend on factor prices, A represents dollars of advertising by the firm, N represents the number of hours of personal selling by agents per contract available at a wage rate of w. Goodwill for the firm is produced according to the production function $Z = Z(N,A;\beta)$ (where β denotes the 'type' of customer in this firm's market segment and market segments are ordered so that $\partial^2 Z/\partial A \partial\beta$, $\partial^2 Z/\partial N \partial\beta > 0$).

In this case, expected profits for a typical firm may be written as

$$E\pi = [P(\mu,Z)\mu - \Gamma\mu][1+\lambda(r-\rho)]m - G(m,w) - A - wNm$$

$$\text{with } Z = Z(N,A;\beta)$$

With capital markets in equilibrium (i.e. $r =$), the firm's profit maximizing problem may be written as:

$$\max_{N,A,m} \; E\pi = (\varepsilon(N,A;\beta) - wN)m - G(m,w) - A$$

$$\text{where } \varepsilon(N,A;\beta) = \max_{\mu}(P(\mu,Z) - \Gamma)\mu$$

$$\text{Subject to } Z = Z(N,A;\beta)$$

We assume that $\varepsilon(N,A;\beta)$ is concave in (N,A).

Long-run industry equilibrium is defined by $E\pi = 0$ or $\varepsilon(N,A;\beta) = (G(m,w) + A)/m + wN$. Combining the firm's conditions for profit maximization together with the zero expected profit condition for an industry equilibrium gives a set of equations which yield $\partial m/\partial\beta$, $\partial A/\partial\beta$, $\partial N/\partial\beta > 0$.

With open entry into the ranks of agents from a homogeneous labour force and commissions paid as a percentage (γ) of gross premium revenues, equilibrium in the agent, market is described by:

$$\gamma[\varepsilon(N^*,A^*;\beta) + \Gamma\mu^*] = wN^*$$

(where *'s indicate equilibrium levels of respective variables).

Then, variation in commission rates may be represented as:

$$\frac{\partial\gamma}{\partial\beta} = \alpha_N \frac{\partial N}{\partial\beta} + \alpha_A \frac{\partial A}{\partial\beta} + \alpha_\beta \varepsilon_\beta$$

where $\alpha_N = -[\epsilon+\Gamma\mu]\ [\gamma\epsilon_N - w+\epsilon\Gamma\mu_Z Z_N]/D < ? > 0$

$\alpha_A = -wN[\epsilon_A + \Gamma\mu_Z Z_A]/D < 0$

$\alpha_\beta = -wN/D < 0$

$\epsilon_\beta > 0$

$D = [\epsilon(N^*,A^*;\beta) + \Gamma\mu^*]^2 > 0$

Consequently, the sign of $\partial\gamma/\partial\beta$ is uncertain. If $\partial N/\partial\beta=0$ or if $|\alpha_A \partial A/\partial\beta + \alpha_\beta \epsilon_\beta| > |\alpha_N \partial N/\partial\beta|$, then $\partial\gamma/\partial\beta < 0$. These are the cases discussed in the text.

2.7 Appendix B

Effect of Independent Agency on the Consumer - Firm Negotiated Contract Equilibrium

Define μ = thousands of dollars of death benefits.

α = opportunity cost of search for a consumer.

h^* = real value scalar representing value of firm equality per thousands of dollars of death benefits

$f(h)$ = density function of firm quality in the market place

$H(h^*) = \int_{h^*}^{\infty} (h-h^*)\, dF(h)$

A = real valued variable representing technological change in consumer search; independent agency arrangements represent a higher value to A .

From Mathewson (1980), the optimal consumer search rule is given by:

$$\mu H(h^*) = \alpha/A$$

or the expected marginal benefit from search (marginal benefit per thousands of dollars of coverage times the magnitude or coverage) = marginal real opportunity cost of search (marginal opportunity cost divided by the technological change parameter). The system of consumer conditions is completed by the demand condition for the size of the contract (death benefits). This condition equates the price per thousands of dollars of coverage to the expected marginal utility from coverage including the consumer's evaluation of both policy specific and firm specific quality items. These two conditions yield the consumers reaction path described in Figure 2.1.

From standard comparative static techniques, we may show that $\partial h^*/\partial A < 0$ or for each price level increases in consumer search efficiency, such as the ability of the consumer to secure several policy quotations from independent life insurance firms from the same agent, yield increased consumer search. E' denotes the new consumer equilibrium.

FOOTNOTES TO CHAPTER TWO

1. These prices are taken from (respectively) Consumers Association of Canada (1979) and New York State Department of Insurance (1977).

2. G. Butters (1977) provides a thorough analysis of such a pure price shopping market. We take the Butters calculation for the equilibrium price variance, and for a set of Canadian life insurance prices for 1977, calculate the optimal consumer search for each category of insurance policy (where a category is defined by type of policy, age at which the policy is issued sex of the purchaser, coverage in the policy) that yields the observed variance of prices. The implied optimal consumer search is not consistently reasonable. For example, if we estimate the per unit cost of life insurance firm advertising (including agents' fees) at 30% of the lowest-priced firm in each category of insurance policy (an assumption which favours easy consumer search), 25 year old males buying $10,000 yearly renewable (to age 70) term insurance must find it optimal to search 6 hours over 7 underwriting firms. Fifty-five year old women buying $50,000 of non-participating whole life insurance must find it optimal to search 110 hours over 29 underwriting firms. Obtaining price quotes over the telephone is not a particularly time consuming activity per quote. If all consumers exhaustively search all possibilities, they are fully informed and the distribution of prices should collapse to a single competitive firm. Therefore, 25 year old males and 55 year old females in the above example must be sufficiently unproductive in searching prices that in 6 and 110 hours respectively, they do not sample exhaustively. This is an unreasonable restriction.

3. We assume that some consumers have zero search costs to avoid the problem that arises when search costs are bounded below to be strictly positive. [In this case, lowest priced firms could raise prices by less than the search costs and realize no loss of consumers purchasing their goods.] The only equilibrium price in this case is the monopoly price. See Butters (1977) for a discussion of this point.

4. For New York we use 10 year cost data due to the nature of the sample. [Life insurance prices for the New York Sample

are collected for policies issued at ages 20, 35 and 50.] Many companies underwrite renewable term to a maximum of age 65 so that 20 year calculations suffer from a serious reduction in the same size at age 50.

5. S.342(13) of the Ontario Insurance Act prohibits agents from acting for more than one company, except under the "single case agreement". The single case agreement refers to a situation where an agent may seek to underwrite insurance from a company he does not represent provided his own company does not underwrite the desired policy and consent in writing has been obtained to seek the policy elsewhere from his own company (with copies of the written consent submitted to the Superintendent of Insurance). While the above refers to the Ontario Insurance Act, it should be noted that in 1924, the "Uniform Life Insurance Act" was adopted by all provinces except Quebec in an attempt to introduce uniformity in the provincial laws concerning insurance.

6. Boyle (1981) records the commission rates (both first year and renewal) for participating and non-participating life insurance contracts for the largest 10 firms and the remainder of the industry. Between these two groups, over both policy types, commission rates are non-increasing with size. In terms of our analysis, this indicates that personal sales efforts do not outweigh advertising size effects.

7. See Albert Mowbray, Ralph Blanchard and C. Arthur Williams, Jr., Insurance: Its Theory and Practice in the U.S., 398(1969).

8. One of the great laments for many commentators in the life insurance industry is the high turnover in agents. This reflects the inability of even these agents themselves to forecast accurately their abilities to succeed in the business.

9. Practices that currently dominate the Canadian industry.

10. See S. Kellner and G.F. Mathewson (1980) and our discussion in 3.1.

11. For the property-liability industry, Frech and Sampone (1980) argue that independent agents represent a more service inten-

sive and more costly sales agent than exclusive agents. They argue that insurance firms operating in regions where price competition is more restricted due to rate regulation, are induced to engage in excessive non-price competition, specifically the use of independent agents.

12. See J. Stiglitz (1979).

13. Later, we argue in favour of retention indices over interest adjusted net cost figures as indices that are free from possible manipulation by life insurance firms unlike 10 year and 20 year interest adjusted cost data where firms may inflate the cash surrender value at the horizon to reduce the calculated cost or protection. Retention data are not used in this chapter as these are not available.

CHAPTER 3

A SELECTIVE SURVEY OF PREVIOUS STUDIES OF THE ECONOMICS OF LIFE INSURANCE MARKETS

3.1 The Pricing and Marketing of Insurance, A Report of the U.S. Department of Justice to the Task Group on Antitrust Immunities, January 1977.

As insurance is a state regulated activity in the U.S., it is exempt from federal antitrust regulation. This report of the U.S. Department of Justice addresses the question of whether this scheme of regulation and immunity is in the public interest. While the report concentrates on the property liability branch of the industry, where there are rate setting bureaus for the purpose of setting prices in contrast to the life branch of the industry, there are some comments on life insurance. Here, we summarize only these comments.

Similar to Canadian life insurance firms, U.S. life insurance firms have not used rate bureaus to fix life insurance prices. Although there is some sharing of loss data for the purposes of mortality table formulation. (In Canada, Schedule D of the (uniform) Insurance Act specifies interest rates and mortality tables for use in valuation of life insurance contracts). In contrast to Canada, three U.S. States (New York, Illinois, Wisconsin) have laws that limit life insurance company expenses including agent's commissions and these laws apply to all of the life insurance transacted by these companies in the U.S. In regulating these expenses, there is an implicit judgement that market forces may not work to control such expenses, especially agent expenses. In the absence of some controls such as these, some industry commentators feel that sales expenses would increase.

In Canada, there are no such laws regulating expenses nor are we in favour of such laws. While we would not argue that the current price-coverage-quality-sales effort packages are socially optimal, there is evidence that both explains why we observe in equilibrium differences amongst firms in their sales and marketing expenses that are profit maximizing and demonstrate that in long-run equilibrium, insurance prices equal marginal costs and Canadian firms do not earn excess profits. While this evidence appears in Kellner and Mathewson (1980), we briefly discuss the contents of the model and the empirical results.

Consistent with our negotiated bilateral exchange model, Kellner and Mathewson specifies a more complete firm model where life insurance firms segment the retail market according to the information held by consumers and engage in optimal selling efforts. Each segment of the retail market contains individuals that have a common price elasticity of demand. The most informed and knowledgeable consumers purchase from firms that incur no selling expenses i.e. the firms that are direct writers. As we progress to the least informed consumers, optimal selling expenses of firms increase. Even though all firms have access to the same production and marketing technology, larger selling expenses define a larger efficient firm size i.e. a larger zero profit output. Therefore, in the presence of fixed costs (set-up costs) common to all firms, the existence of any given efficient firm size is determined not only by technological conditions, but by the distribution of consumers according to their knowledge of alternative life insurance products and firms i.e. their marginal opportunity cost (productivity) to search.

Recognizing that life insurance firms are multiple output firms (producing individual life insurance, individual annuities, group life insurance, group annuities) and estimating production function parameters from first-order conditions for firm profit maximization over four cross-sectional samples (1961, 1966, 1971 and 1970) of Canadian federally-registered firms yields:

1) evidence that in all years life insurance production is not characterized by increasing returns to scale.

2) evidence that there are some jointness economies that alone justify multiple output production.

3) evidence that life insurance firms do not earn excess profits.

Therefore, this empirical work provides further support for a model specification that explains why life insurance firms differ in their sales and marketing efforts and why there are sales and marketing expenditures that may not be socially optimal but do not yield excessive firm profits. Part of the task of the life insurance agent in our model is to screen consumers to define the relevant set of potential consumers for each firm's price-quality-coverage package. Such price discrimination in this model has no negative efficiency implications. Part of the task of the agent given the profit maximizing objectives of the firm is to exploit consumers who are not fully informed to increased firm revenues. If these consumers undervalue the product, then these persuasive selling effects leave consumers better off ex-post than they would otherwise be. Symmetrically, if these consumers overvalue the product, then these persuasive selling efforts leave consumers worse off ex-post than they would otherwise be. In our view, it is impossible to separate these joint outputs of sales agents. Rather, our message is that corrective measures that increase the consumer's knowledge and therefore the consumer's ability to self-protect are more productive than regulating sales efforts.

3.2 Cost Disclosure in Life Insurance, Federal Trade Commission Staff Report, June 1979.

This section briefly quotes the empirical findings reported in the Federal Trade Commission Staff Report. The recommendations of the report are incorporated in Section 3.4. To quote from the FTC report:

> Among the important findings of this report are:
>
> 1. The average rate of return paid by the industry to all ordinary life insurance policyholders in 1977 was between one and two per cent;
> 2. The rate of return on new policies is, in many instances, substantially below alternatives readily available in the market place;
> 3. A significant number of holders of old policies are locked into a low-yield, fixed-dollar investment unsuited to cope with current inflation;
> 4. There are severe, but unannounced, penalties for early withdrawal of savings through life insurance policies. Unlike the withdrawal penalties mandated by Federal deposit regulations, the penalties imposed by life insurance companies do not merely reduce the return earned on the principal: they often reduce and sometimes even eliminate the principal itself. The consumer loss resulting from first-year lapse alone exceeds 200 million dollars a year. Just to break even, many policies bought in 1977 will have to be held until 1987.
> 5. Price competition is so ineffective in the life insurance industry that companies paying 20-year rates of return of 2 per cent or less compete successfully against companies that pay 4 to 6 per cent. This disparity should be contrasted with the banking industry, where differences of a quarter of a per cent are considered to be competitively crucial.

3.3 The Insurance Industry, Fourth Report on Life Insurance, The Select Committee on Company Law (Ontario Legislature), June 1980.

We summarize the recommendations of relevance to our study in the above report with the exception of disclosure laws which are discussed in 3.4 together with the FTC's recommendations on disclosure.

First, we consider corporate structure and market advantage. Some opinions of the Ontario Select Committee are confirmed by our empirical work here and elsewhere (Kellner and Mathewson (1980)). First, our results indicate that there is no difference in performance between joint stock and mutual insurance companies, in agreement with the Select Committee (p.429). Other opinions of the Committee's find less support from our empirical work. The Committee comments on the monopoly of the industry in providing products where life expectancy is a consideration e.g. life annuity. While we are in favour of permitting other financial intermediaries to compete in life annuities, evidence in Kellner and Mathewson (1980) indicates that our life insurance firm profit maximizing equilibrium over all product lines (life insurance and annuities) is consistent with an industry equilibrium or zero (excess) profits.

With respect to the marketing of life insurance, the Select Committee advocates a more active role for the Superintendent of Insurance "in requiring from life insurers an explanation of their products and information activities in order to satisfy himself that adequate and fair explanation of such products is being presented to the consumer" (p.116) but does not consider the prior approval of policy forms and the like is needed. The Committee also recommends that standard definitions of life insurance products be developed and that options to renew, convert or extend coverage be made available at appropriate cost on all policies (p.116). Obviously, the problem is the measurement of the appropriateness of any cost figure. The Committee also recommends standardization of rider coverage and separate disclosure of the costs of options. We are in favour of such standardization but stress the need to focus on the key informational issues in light of apparent limitations on consumer information technology (see 2.4). Pointing consumers in the right direction at the outset would permit those who wish to pursue research further to do so. (See our empirical results in 2.3).

The Committee expresses concern over high lapse rates (almost 12% in Canada) and favours point of sale disclosure on both initial and replacement sales and a twenty-day "money-back" period in replacement situations. High lapse rates are a clear indication of ex post consumer discontent. Public information policies should seek to provide ex ante incentives for consumers to self-protect. What is needed is not only point-of-sale disclosure but simple and clear statements that enable consumers to self-protect before the life insurance agent enters the picture. We favour longer money-back periods of six months.

The Select Committee is in favour of dropping the single representation requirement for life insurance agents so that agents would be free to sell the policies of any company subject only to their contract with the company sponsoring them. At the same time, the Committee favours agent sponsorship and strenghening the responsibility of the sponsoring insurer under the law (p.340-1, p.356-9). This recommendation is consistent with our empirical research. Further, the Committee recommends removal of some entry barriers into the ranks of agents, e.g. any restriction on part-time agents, (p.361).

3.4 Cost Disclosure

Summary of the Issues

The purpose of cost disclosure in life insurance would be to provide summary information to consumers about the policies offered in the market. This information would help the consumer in the complex purchasing decision. Unfortunately, there has been tremendous disagreement in the life insurance industry and literature about the form this information should take and how it would best be conveyed to consumers.

The debate on the design of a cost disclosure system for life insurance has focussed mainly on the nature of information to be provided. The most important specific issues debated are the following:

1) Should rates of return be disclosed as an aid to consumers in their choice among policy types?

As an example, the Linton yield of a whole life policy is that rate of return necessary to earn on a savings account such that the combination of the savings and a renewable term policy would be equivalent to the whole life policy. The yield so determined (which depends on the term premiums used in the calculation) would be used by consumers in their decision of whether to buy whole life or to "buy term and invest the difference". The Federal Trade Commission Report recommends the disclosure of rates of return.

The second and most debated aspect of the cost disclosure issue is:

2) The choice of an index for comparison of similar policies

More than twenty different indices have been suggested for use in disclosure and there is little consensus on which of these indices is most appropriate. The index most widely in use in the United States and one which has been endorsed by several industry committees is the interest-adjusted net cost which is equal to the present value of the first twenty premiums (net of dividends) minus the present value of the twentieth cash value. An alternative index which has been endorsed by a committee of the Canadian Institute of Actuaries and recommended by Professor J. Belth is the company retention index as defined in Section 1.3 of this report. This index is part of the system of price disclosure recommended by the Ontario Select Committee, based on a recommendation by Professor Belth, (see below).

3) The extent and nature of information that should be contained in the disclosure statements in addition to the index

The Federal Trade Commission report recommends the inclusion of additional information in the disclosure statements: preliminary policy information, including information designed to convey the benefits of comparing costs; a brief explanation of the cost index information and how it can be used; a policy summary showing, for example, premiums, dividends, cash values and death benefits for the first five years and representative years thereafter; the interest assessed policyholders for paying premiums other than annually; and information concerning the existence of, and how to exercise, the mandatory "cooling-off" period.

4) The timing of disclosure

The various mechanisms and timing that have been suggested for cost disclosure are: i) an annual (or biannual) cost guide, listing of the indices offered in the market, and available for purchase by consumers; ii) the mandatory provision of such a guide by the agent to the consumers before any purchase; iii) the mandatory provision of the index value of only the policy sold (and other policy information) before purchase; and iv) the mandatory provision of the policy's index after the sale but before the end of a "cooling-down" period. Of these options, iii) corresponds to the usual concept of disclosure or "truth-in-selling" in other markets (e.g. unit-pricing, disclosure of interest rates in automobile financing, etc.). However, it is held by some that the value of a cost index has no intrinsic warning to a consumer and therefore, the disclosure of the index value of a particular policy is meaningful only if there is an immediate opportunity for comparison with the index values of other policies. The countering argument is that if market contracts change frequently, it would be expensive to keep the cost guides up-to-date or that because of the infrequency of up-dating there would be reduced incentive for demand price adjustments. The option i), which involves no regulation as such has been undertaken with the publishing of various cost guides; because of evidence that "third-party" sources of information are seldom sought out by consumers, the mandatory provision of a guide ii) is considered by some to be a necessary regulation.

Price Disclosure System Recommended by the Ontario Select Committee

The Ontario Select Committee recommends a system of price disclosure which has been acclaimed as one of the most advanced in North America. The system, based on recommendations by Professor J. Belth, would require:

1) provision of general information about types of life insurance and various methods of calculating its costs

2) detailed policy information, provided at the point of sale, and setting out
    i) premiums, dividends, death benefits and policy surrender benefits
    ii) separate information on costs and benefits of options.
    iii) for policies other than term policies, these cost indicators: a) company retention index to facilitate comparisons of costs of similar policies between companies, b) cost of the policy per $1000 of protection (an index to be developed by the industry and Superintendent), c) rate of return information.

3) Yearly financial information attached to the policy, setting out surrender values, premium by age, amount payable on death, cash value benefits, yearly rate of return, etc. and giving, for specified periods of time, the three cost indicators set out under b).

4) At policy renewal, or every five years, updated versions of the information contained in c) and information on options available or taken, loans outstanding and dividends on deposit and interest thereon, and any

changes effecting the individual's status as a policy holder, such as expiry of options.

In addition, the Committee recommends that "the Superintendent ensure that a comprehensive annual survey of life insurance prices is made available to the public ... [and] to publish this annual survey be placed on the life insurance industry".

Comment on the Select Committee's Disclosure Program

A framework useful for evaluating any consumer information regulation including the analysis of the cost disclosure issues is provided by Mazis et al (1980). Integrating theories of economics, consumer behavior and law, these authors develop a structure for assessing alternative regulatory approaches to informational problems that is based on relative costs and benefits with respect to three standards: incentive compatability, communication effectiveness and "First Ammendment" protection.

An "incentive compatible" remedy is one which is compatible with sellers' incentives, i.e., which relies on the incentives provided by the market place to achieve the desired impact and here we extend the definition of Mazis, et al slightly - which does not result in adverse incentives in the marketplace. The main incentive problem that has arisen in the life insurance market with the use of cost indices is the so-called manipulation problem:

> "Manipulation" can be defined as the structuring of a policy's benefits (cash values, dividends, etc.) or its premium structure to make the policy appear more attractive on a particular cost index then it actually is. Thus a company may be able to change the cash flows in a policy in a manner that dramatically reduces its apparent cost on a particular index without offering any increased value to the policyholder.

Examples of manipulation are steepening dividend scales and increasing the twentieth year cash value; the importance of later dividends and the twentieth year cash value is overstated by most indices, including the popular interest-adjusted cost. The problem of manipulation has been considered so important in the United States that state control or regulation has been considered as a means of prohibiting the practice. Both the Federal Trade Commission group and the Canadian Society of Actuaries Committee note that the retention index is less subject to manipulation than the interest-adjusted net cost method. There has, however, been theoretical dispute as to the appropriateness of the retention index for cost disclosure (Scheel, 1975). The present author has elsewhere provided a defense of the retention index against these criticisms and has shown that, in a formal sense, the retention index is the unique index that is not subject to manipulation (Winter 1980c). We strongly agree that the retention index developed by Professor Belth is the best single index for disclosure.

However, on the basis of the second standard suggested by Maxis, et al, - communication effectiveness - we have strong reservations regarding the disclosure programme recommended by the Select Committee. The system is obviously easily understandable to someone familar with life insurance or to an intelligent layman, but may not go far enough in simplifying the consumer's decision. The recommended system may present too much information and be too complex in its present form. There is strong evidence, some presented in the Federal Trade Commission report and some reported there, that when information is not presented in very simple terms, it is disregarded or even misunderstood by consumers. We would suggest that the following changes be considered in the Select Committee programme:

1) That information on various methods of calculating costs be eliminated or relegated to an appendix.

2) That the retention index for the policy be presented, but that the benefits and costs not be separately disclosed (in particular, that the benefits not be separated into "savings" and "protection" benefits).

3) That no other cost (such as suggested in 2, iii), b, section 3.4 above) be presented.

4) That only one time horizon be used in the calculation of the index and that yearly cost calculations be eliminated.

5) That the cost guide be supplied to the consumer (at cost) by the agent, with the policy being offered by the agent underscored.

The fifth suggested change is based on the belief that disclosure would be more effective if the consumer were able to directly compare, costs; the retention index may mean little to some consumers if presented for one policy alone. The mandatory provision of a cost guide was recommended by the Federal Trade Commission Committee and is part of the American National Association of Insurance Commissioner's system of price disclosure.

The marginal benefits of the suggested simplification of the disclosure system must, of course, be compared with the marginal costs resulting from the decrease in the amount of information provided. Consumer experiments such as those directed by Professor J. Jacoby for the Federal Trade Commission are necessary to determine the costs and benefits and to aid in the design of an optimal disclosure system.

FOOTNOTES TO CHAPTER 3

1. This section incorporates discussion in the Federal Trade Commission Report, Cost Disclosure in Life Insurance (hereafter FTC report).

2. First Report to the Council of the Canadian Institute of Actuaries from the Committee on Cost Comparisons (unpublished).

3. Option ii) was suggested in the FTC report and iv) in the U.S. National Association of Insurance Commissioners Disclosure system (cf. FTC report). Option iii) and i) are recommended by the Ontario Select Committee (see below).

4. Report of the Ontario Select Committee on life Insurance.

5. Ibid.

6. Mazis, et al, "A Framework for Evaluating Consumer Information Regulation", Working Paper, Federal Trade Commission, June 1980.

7. The last of these has no apparent relevance to the cost disclosure issue.

8. FTC report, p.149.

9. FTC report, p.159 and Appendix IX.

10. FTC report, Appendix IX"

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