Underwriting Cycles and Insurance Solvency

Biography

Sholom Feldblum is an Associate Actuary with the Liberty Mutual Insurance Company in Boston, Massachusetts. He was graduated from Harvard University in 1978 and spent the next two years as a visiting fellow at the Hebrew University in Jerusalem. He became a Fellow of the CAS in 1987, a CPCU in 1986, an Associate of the SOA in 1986, and a member of the American Academy of Actuaries in 1989. In 1988, while working at the Allstate Research and Planning Center in California, he served as President of the Casualty Actuaries of the Bay Area and as Vice President of Research of the Northern California Chapter of the Society of CPCU. In 1989, he served on the CAS Education and Testing Methods Task Force. He is presently a member of the CAS Syllabus Committee, the CAS Committee on Review of Papers, the Advisory Committee to the NAIC Casualty Actuarial (EX5) Task Force, and the Actuarial Advisory Committee to the NAIC Risk Based Capital Task Force, and he is the quarterly review editor for the *Actuarial Review*. Previous papers and discussions of his have appeared in *Best's Review*, the *CPCU Journal*, the *Proceedings of the Casualty Actuarial Society*, the *Actuarial Digest*, the *CAS Forum*, and the *CAS Discussion Paper Program*.

Abstract

Insurance failures are associated with swings in the underwriting cycle: insolvencies are particularly high following the troughs of the cycle. Common interpretations of the cycle, which ascribe profit fluctuations to rate making techniques, underwriting optimism or pessimism, and interest rate volatility, view failures simply as by-products of poor earnings.

This paper examines the competitive forces that drive the cycle. The apparent ease of entry into the insurance market, the low price elasticity of demand, and the lack of product differentiation among rival insurers encourage aggressive firms to seek greater market shares. The industry response of reducing rates below marginal cost forces insolvencies among weaker carriers and thereby shifts strategic goals from market share gains to profitable operations. Insolvencies are not just a by-product of dismal earnings; they are a driving force behind the cycle.

The paper considers several public policy alternatives to mitigate underwriting cycles and curtail insurance insolvencies. However, the social harm caused by these proposals, as well as the implementation difficulties, often outweigh the gains. Underwriting cycles may provide a bumpy ride, but they reflect the beneficial competition of a free market.

UNDERWRITING CYCLES AND INSURANCE SOLVENCY

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UNDERWRITING CYCLES AND INSURANCE SOLVENCY

Section I: Introduction

Insurance solvency relates to the company's balance sheet: does the value of assets, as reported in the Annual Statement, exceed the value of liabilities? Underwriting cycles relate to the company's earnings statement: is net income greater or lower than the historical average?

Solvency and cycles are intertwined. A firm earning adequate profits has an improving balance sheet, while a firm that is losing money shows a weakening balance sheet. The relationship of premiums, losses, and expenses drives both underwriting cycles and insurance solvency. For instance, industry wide combined ratios peaked at 109% in 1975 and 117% in 1984. The insurance failure rate, or the ratio of insolvencies to total companies, peaked at 1.0% in 1975 and 1.4% in 1985 (Best's [1991]).

Are underwriting cycles and insurance insolvencies parallel results of other causes, or are expected and actual insolvencies one of the driving forces of the cycle? For an example of "parallel results," suppose that underwriting cycles result from interest rate volatility and cash flow underwriting. When interest rates rise, insurers cut premiums to obtain funds for investment, hoping to offset the underwriting loss with investment returns. If interest rate unexpectedly drop, the investment income does not materialize, though the underwriting losses remain: this is the nadir of the underwriting cycle.

The high interest rates encourage more speculative investments: high yield bonds, growth stocks, and real estate. These investments do well during prosperous economic periods, but have high rates of default and capital losses during recessions. The reductions in asset values contribute to the insurance failure rate. In this once-popular interpretation, underwriting cycles and insurance insolvencies both stem from interest rate fluctuations.

Or is the relationship between underwriting cycles and insurance insolvencies more direct? Are cycles caused by the competitive strategy of dominant carriers, who depress market prices in order to drive out overly aggressive but financially weak insurers? And does insurance competition subside after news of major insolvencies, letting the industry raise rates to more adequate levels?

The causes of market behavior are difficult to assess: it is easier to analyze statistics than business strategy. However, the interpretation of underwriting cycles and insurance insolvencies as parallel results of other factors implies that insurers are irrational – that these phenomena derive from the incompetency of actuaries, underwriters, or investment analysts. The interpretation of expected insolvencies as one of the causes of the cycle implies that insurers rationally set rates to maximize their long term earnings. Competitive strategy and expected insolvencies drive the underwriting cycle.

The Education of an Actuary

When I began work as a pricing actuary, I was struck by the simplicity of our rate making procedures. Actuarial techniques are cost-based: premiums are based on anticipated losses and expenses. Marketplace pricing, however, must consider supply/demand interactions, consumer desires, and competitive pressures. When I asked about this, I was told that actuaries determine the "proper" rates – those which best serve insurance companies and the public.

As the months passed, I learned that insurers do not actually set prices based upon actuarial indications. Schedule rating modifications of as much as 50% are used in the Commercial Lines, and discretionary rate deviations from actuarial indications are used in the Personal Lines. So I wondered: what is the use of our rate making procedures?

When I asked about this, I was told that the poor, misguided folk in Underwriting and Marketing always wanted lower rates. Management was forced to cut prices below adequate levels to keep everyone happy. Rate deviations and modifications were the random effects of strong officers in the field.

Years later, I understood that these deviations are not random. Underwriting cycles billow through our industry, raising and lowering the premium rates charged by insurers. The price fluctuations are not discretionary: insurers that have tried to "ride out" the cycle have lost both money and market share. Most important, these are industry wide cycles, unrelated to the internal politics of individual firms. Actuaries indicate rates, but the market sets prices.

Causes of the Cycle

Many actuaries believe that rate indications should be based only on anticipated costs. Stable actuarial rates ensure adequate returns for insurers, and they mitigate the price variations that anger consumers. Carriers may be tempted by the marketing benefits of rate cutting, but actuaries should not encourage such follies.

How naive is this view! Cost-based pricing is rarely optimal. Careful consideration of the marketplace and of competitors' actions is essential for ensuring profitable operations. And this aforementioned view is dangerous to the actuarial profession as well. For if actuaries ignore market realities, their companies relegate them to technical busy-work. If we wish to influence actual prices, we must address practical business concerns.

The view described and deprecated above is ensconced in two prevalent convictions: First, underwriting cycles are seen as external to insurer strategies. For example, the severe downturn in Commercial Lines operating income during the early 1980's is often attributed to high and fluctuating interest rates that encouraged "cash flow" underwriting. How can we price for these variations if we can not control or even predict them?

Second, underwriting cycles seem unrelated to profit cycles in other industries. Some say that insurance profits are countercyclical to general business conditions: rates are high during depressions and decline during prosperous periods. Others add that underwriting cycles vary with supply restraints, not demand pressures. Pricing techniques used in other industries are therefore inapplicable to insurance rate making.

To understand the relationship of insurance insolvencies to underwriting cycles, we must uncover the causes of the cycle. Four interpretations of the cycle are described below, emphasizing (i) actuarial rate making, (ii) underwriting philosophy, (iii) interest rate movements, and (iv) competitive strategy. The first three imply irrational business behavior and professional incompetence, leading to both underwriting losses and business failures. The fourth implies rational business behavior and long-term profit maximization. Insurance insolvencies, both expected and actual, are a driving force behind underwriting cycles, not a parallel by-product of other causes.

Section II: Interpretations of the Cycle

Actuarial Rate Making: Uncertainty and Counter-Cyclicality

Actuaries sometimes ascribe profit cycles to the uncertainty and counter-cyclicality of loss costs: (1) Property/Casualty insurance costs depend upon both random loss occurrences and uncertain macroeconomic and social trends. For random losses, think of unusual weather disturbances, such as windstorms and earthquakes. For social trends, think of unpredictable legal changes, such as retroactive liability for pollution exposures.

(2) The counter-cyclicality of insurance loss costs stems from the time lag between the compilation of historical experience and the implementation of new rates. Generally, two or more years of experience are used for rate making, losses are developed three months beyond the end of the experience period, systems processing of the historical data requires another month or two, rate analysis and filing take six months, and the rates remain in effect for one year. [Rating bureaus require an additional half year, for editing and verification of insurance data, and for notification to member companies of intended rate filings.] Thus, the time between the average loss date in the experience period and the midpoint of the effective period of the new rates may be three or more years (Cummins and Nye [1984], pages 232-236).

The uncertainty and counter-cyclicality of insurance loss costs contribute to underwriting cycles. During recessions, inflation is moderate, automobile travel is low, jury awards are less liberal, factories operate below capacity, industrial injuries are infrequent, and so forth.[1]

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[1] There are opposing influences as well. During recessions, thefts increase, leading to higher automobile comprehensive claims. Employees recently laid off are more likely to file Workers' Compensation claims for minor injuries, since there is no loss of regular income while on disability. Workers' Compensation claim severity also increases, since it is more difficult to find replacement jobs for injured employees. For a discerning discussion of the relationship between economic conditions and insurance loss costs in a depressed economy, see Tarbell [1932].

Unfortunately, little is known about the correlations between insurance loss costs and macro-economic conditions. Fairley [1979] finds that insurance losses have a slight negative correlation with stock returns. Since stock returns reflect economic conditions, this suggests that loss costs are related to economic prosperity. Other find no significant correlation between

The experience from this period, and the time lag between data compilation and rate implementation, ensures moderate rate revisions for several years.

The economy soon recovers, and loss costs rise rapidly. Insurers, wary of increasing their rates, ascribe the mounting costs to random loss occurrences. Even when the rate inadequacy is recognized, and rate revisions are requested, the time lag between data compilation and rate implementation means that the needed premiums are not earned until years later.

Historical experience continues to indicate a rate inadequacy when the economy once again slides into a recession. Insurers continue filing for rate increases, even though rates have returned to adequate levels. And so the cycle goes on.[2]

Similarly, insurer insolvencies that result from rate inadequacies are also a product of the uncertainty and countercyclicality of loss costs.[3] More responsive rate making procedures would mitigate insolvencies.

Awareness and Action

There are some factual problems with this interpretation. Are underwriting cycles truly counter-cyclical to macroeconomic conditions? (Generally not.) Are loss cost trends that

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underwriting returns and stock prices (Cummins and Harrington [1985]; D'Arcy and Garven [1990]).

In general, the relationships noted in the text are based on conjecture and intuition. This explanation of underwriting cycles fails for other reasons, and the absence of facts among adherents of this theory is simply an additional flaw.

[2] The Virginia Bureau of Insurance [1978] interprets underwriting cycles in this fashion. "The insurance cycle is usually out-of-phase with the rest of the economy. When prices for general goods and services are rising, insurance rates are often stable and insurance industry profits are decreasing. By the time that the rate of increase in the price for other goods and services diminishes, data is becoming available showing that insurance rates have not kept up with underlying costs. Insurance rates then increase rapidly and profits improve. This lag between price increases in the insurance industry and the rest of the economy is in large part due to the time required for claims to be reported and settled and for claims data to be collected and evaluated."

[3] See Best's [1991], page 45: "The most frequent cause of insolvency . . . was deficient loss reserves, intrinsically linked to inadequate pricing."

different in prosperous times and recessionary times? (Not always.) But there are more fundamental reasons why this explanation fails.

First, this interpretation presumes that pricing actuaries are unable to learn from past mistakes, incapable of forecasting loss cost trends despite years of experience. This is not true: actuaries are proficient at estimating insurance costs and are not easily deluded by random weather disturbances, social phenomena, or macro-economic conditions. In fact, both actuaries and insurers have been aware of true loss cost trends even as rates moved in the opposite direction. For example, insurers knew that General Liability loss costs were rising rapidly in the early 1980's, but they continued cutting rates well below marginal cost.

Indications and Prices

Second, underwriting cycles are not due to actuarial rate indications. They are due to insurer reluctance to adopt actuarially recommended rate increases, to rate deviations below bureau rates, to schedule rating credits for commercial risks, and to similar "discretionary" rate reductions.[4] Underwriting cycles are as manifest in the disparity between actuarially indicated rates and marketplace prices as in the reported net income of insurers.[5]

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[4] Cummins, Harrington, and Klein [1991] note that "deviations below ISO advisory rates increased substantially from 1981 through the end of 1983, as the market softened" (pages 59-60; see also Figure 5 on page 59, as well as Cummins, Harrington, and Klein [1992], page 18).

[5] Venezian [1985] presents a more sophisticated connection of underwriting cycles with rate making techniques: "Insurers and rating bureaus often use regression of past costs, or of loss ratios, on time as a way of estimating future rate requirements. A model of this process suggests that the rates set by such methods would create a quasi-cyclical pattern of underwriting profit margins. . . . Empirical data on major lines of property and liability insurance are consistent with the hypothesis that ratemaking methods contribute to the fluctuations of underwriting profit margins."

Venezian suggests only that rate making methods contribute to the cycles, not that they cause them. But all these "rate making" interpretations search for the cycle in actuarial indications, where it does not exist; they ignore competitive pricing strategies, where the cycle is powerful.

Similarly, Pentikäinen et al. [1989] use a statistical model of underwriting cycles to examine the influences of market prices on insurance solvency. Cummins and Outreville [1987] propose a model along the same lines, though with different causal variables: (a) data collection lags, (b) regulatory lags, (c) policy renewal lags, and (d) calendar year financial reporting.

If disinterested analysts, uninvolved in the economic fortunes of particular insurers, were to generate "actuarially indicated rates" to which the entire industry adhered, there would be no underwriting cycles. Rate making procedures have little or no influence on actual profit cycles. However, insurance premium rates are different from actuarial indications. Real-world prices are not the result of mathematical exercises, whether simple or sophisticated. And it is in the prices charged on the street that we may discern the workings of the cycle.

Underwriting Philosophy

A second interpretation of insurance underwriting cycles relies on the "mass psychology" of underwriters. During profitable years, insurers grow optimistic and compete strenuously for new business. Since capacity is limited only by financial and psychological constraints, not by physical plant and equipment, supply expands. Demand is inelastic, so premium growth means attracting business from other insurers. Severe competition in a mature market requires insurers to lower prices to gain market share (Stewart [1984]; Bloom [1987]; Berger [1988]).

Profits soon decline, due to low rates and the poor quality of some risks. Underwriters become pessimistic, curtail their acceptance of marginal applicants, and file for rate increases. Profits remain low until insurers reunderwrite their business and the new rates take effect. Eventually, the rate increases and the more careful underwriting lead to increased profits, and the cycle starts anew.

The implications for insurer insolvencies are similar to those mentioned above: insolvency is an unwanted by-product of excessive optimism. The difference is one of degree. If loss cost trends delude actuaries, they fool company management as well, so insolvencies are unexpected. Company management can more easily judge underwriting optimism or pessimism, so insolvencies should not be entirely unanticipated.

Information and Coordination

Should not the supply proffered and the quantity demanded converge on an equilibrium point, and the underwriting cycles cease? Stewart [1984], explains the absence of such convergence:

> The cyclical process does not end for two reasons: lack of information and lack of coordination. Individual insurers do not and cannot know the precise amount of insurance to supply to reach equilibrium. They have different operating costs and, therefore, different break-even points or minimum acceptable margins of profit. Their perceptions and expectations of future profits or losses develop in different ways. In self-interest, they do not coordinate their actions. Collusion, furthermore, is illegal. Even when prior approval and rating bureaus had more influence on prices, insurers varied supply according to their own situations. [Page 293.]

This explanation is unusual, since the lack of strategic coordination and imperfect information should lead to stable equilibria. If firms can not coordinate prices and quantities, then the price mechanism effectively equates supply and demand. In fact, the competitive characteristics of the insurance industry that Stewart herself notes argue for a more stable equilibrium, since underwriters can quickly adjust supply to end any disparity with the quantity demanded.[6]

Uniform Psychology

The fundamental problem with this explanation is not the "lack of cooperation" or the "lack of coordination" theses. Rather it is the assumption of a uniform psychology among underwriters.

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[6] Stewart also cites a "cobweb" interpretation for the continuation of underwriting cycles: "Cycles that result from supply's responding to profit expectations are described in textbook economic theory by what is called a 'cobweb.' . . . In agriculture, as in property-liability insurance, demand is steady and supply is variable, with the result that prices tend to move with changes in supply" (page 293).

On the contrary: standard "cobweb" explanations rely on the period to period lag in revising supply. In agriculture, supply can not be adjusted rapidly, since it depends on the amount seeded in previous months, not just on the marketplace price. See, for instance, Ezekiel [1938]: "For a commodity where the production process occupies a definite interval of time, the period considered may be taken as so short that the total supply available cannot be changed within the period (as, for example, the supply of cotton or potatoes once the year's crop is harvested)" (page 426), and "The cobweb theory can apply exactly only to commodities which fulfill three conditions: . . . (2) where the time needed for production requires at least one full period before production can be changed. . ." (page 437). A six year cycle presumes a three year production lag (page 436). This is not the case for insurance: supply depends only on price and can be quickly adjusted.

Similarly, Cummins, Harrington, and Klein [1991], in describing Stewart's thesis, write (page 63): "A key element in this explanation is that competition in soft markets ultimately leads to inadequate rates. Prior academic research includes little or no formal analysis of why competition could cause prices in soft markets to fall below levels needed to cover cost expected when policies are sold and to ensure insurer financial soundness."

An individual may be more or less optimistic in different years. But how is it that ten thousand underwriters across the United States are optimistic and pessimistic in unison?

The enigma of underwriting cycles is not that any individual underwriter accepts risks in one year that he or she would reject in another. Rather, it is that profits for insurers move in tandem. In contradistinction to Steward's explanation, this phenomenon indicates a higher level of competitive strategy than we would otherwise suspect. Insurers, no less than other firms, are sensitive to the prices charged by their competitors, and they adjust their own rates accordingly.

Stewart's thesis shows the outlines of the cycle: the stable demand, the competition among insurers, the fluctuating prices, and the relatively uniform practices among underwriters at any given time. But the connections among these phenomena remain unexamined. To flesh out these relationships, we must ask: "What additional characteristics of the insurance marketplace relate to profit cycles?" and "How do these characteristics account for the fluctuations in underwriting income?"

Cash Flow Underwriting

A third interpretation of underwriting cycles relies on interest rate volatility. Insurers pay losses well after they collect premiums, particularly in the liability and Workers' Compensation lines of business. Premiums are invested in financial markets (stocks, bonds, mortgages) and earn investment income until losses are paid.

Insurance income may be divided into underwriting and investment portions. Underwriting income is the difference between (a) premium revenues and (b) loss plus expense payments. Investment income is the return on invested assets.

Interest Rates

Interest rates rose rapidly in the late 1970's, reflecting the inflationary trends in the U.S. economy. Investment income became a larger portion of insurance earnings, and underwriting income decreased. Insurers wrote policies at expected underwriting losses, since they relied on investment returns for an overall profit.

Many insurers, accustomed to underwriting profits, viewed the reliance on investment returns as a lack of "underwriting discipline." They castigated this new philosophy as "cash flow underwriting": writing policies at a loss simply to generate premium dollars for investment.

Cash flow underwriting is appropriate as long as interest rates remain high. But by the mid-1980's, new money interest rates had fallen. The lack of underwriting discipline continued; insurers kept writing policies at underwriting losses. Investment income was no longer sufficient to compensate for these losses, so insurance operating returns declined. This was the underwriting cycle nadir of the mid-1980's.[7] Similarly, the decline in interest rates and the absence of underwriting discipline led to the large number of insurer insolvencies.

This argument was popular several years ago. It has lost favor recently, since the underwriting cycle has lost no force despite the present stability of interest rates. Nevertheless, it is still useful to examine the problems with this interpretation.

Underwriting and Investment Income

First, the distinction between underwriting and investment income is specious. Cash flows must be discounted to a common date to appropriately match revenues and expenses. True insurance income is the difference between (a) premium revenues and (b) discounted loss plus expense payments.[8] True investment income is the sum of (a) the return on invested surplus funds, (b)

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[7] See, for instance, McGee [1986], page 22: "Changes in interest rates are the primary force behind the recurrent swings in the industry's profitability." To explain the intensity of the 1980's cycle in the Commercial Liability lines of insurance, McGee writes: "The combined ratio for long-duration lines of insurance should move more than the ratio for short-duration lines over the interest rate cycle, and the mix of insurance by lines will affect the timing and volatility of the property/casualty cycle" (page 25). He acknowledges that "workers' compensation lines are long-tailed, but their combined ratio does not behave as the increased interest-sensitivity principle would suggest," though he ascribes this anomaly to policyholder dividends and stringent rate regulation.

[8] Although discounted cash flows may be used to measure income, the appropriate discount rate for insurance losses is unclear. Lowe [1988] suggests a "negotiated rate" that is set by the senior management of the insurance company. Woll [1987] recommends an after-tax "risk-free" rate, such as the Treasury Bill rate. Butsic [1988] derives a "risk adjusted" discount rate based upon historical insurance experience. Fairley [1979], Hill [1979], and

the difference between actual and expected returns on policyholder supplied funds, and perhaps (c) the difference between expected returns and the return assumed in the discount rate.

When insurance income is properly measured, it is not necessarily reduced by a rise in interest rates, since liability losses are inflation sensitive. Higher interest rates that are accompanied by accelerating inflation increase the nominal settlement values of insurance losses even as they raise the appropriate discount rate for loss reserves. A jump in inflation increases investment returns and also raises expected loss payments. It should have little effect on profitability.[9]

In other words, when inflation is modest, both the discount rate and expected losses are low. When inflation accelerates, both the discount rate and expected losses increase. It is unclear

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Myers and Cohn [1987] use risk adjusted discount rates, based on extensions of the Capital Assets Pricing Model to insurance losses. The 1986 Federal Income Tax amendments use the federal midterm rate to discount losses; see Gleeson and Lenrow [1987] or Almagro and Ghezzi [1988]. Others have suggested embedded yields, as the Insurance Expense Exhibit uses, or new money market rates, as AICPA [1983] recommends and which most life insurers use. The lack of agreement on the appropriate discount rate hampers consistency among insurance companies in analyzing income.

[9] For the relationship of liability losses to market interest rates, see Butsic [1981]. McGee [1986] is aware of the inflation sensitivity of liability losses: "Inflation also has an impact on the relationship between the competitive price of insurance and interest rates. If costs of settling claims are expected to rise through time, a higher premium or investment return will be necessary to cover future costs. To the extent that rising interest rates reflect anticipated inflation, they should not affect insurance premiums" (page 23).

McGee hypothesizes that "uncertainty about the inflation outlook" in a competitive industry depresses market prices to those of the most optimistic insurer. Widely fluctuating interest rates lead to greater uncertainty and therefore a decline in insurer profitability. This explanation ignores McGee's own statement that as long as inflation and interest are correlated, different inflationary expectations should not affect insurance premiums.

Cummins, Harrington, and Klein [1991], page 68, note that interest rate fluctuation is not by itself a sufficient explanation of underwriting cycles: ". . . prices in competitive insurance markets would reflect the interest earnings on funds held between the premium payment and loss payment dates. Thus, prices should fall when interest rates rise and rise when interest rates fall. This is not a problem unless insurers overreact to interest rate changes or unless serious pricing errors are common." [These remarks assume a positive equity duration for insurers. If liability loss payments are entirely inflation sensitive, the inverse relationship between interest rates and insurance prices does not hold.]

which effect is stronger.[10]

Asset-liability matching theory also implies a different outcome than that suggested by "cash-flow underwriting" interpretations of the underwriting cycle. The average duration of Property-Liability insurers' assets is longer than that of their liabilities. A drop in interest rates, as occurred in the mid-1980's, causes an increase in profits, not a decrease in profits. In fact, those insurers that bought long-term bonds at high yields in the late 1970's and early 1980's enjoyed above average investment returns in the mid- and late-1980's.[11]

Financial Competence

Finally, and most fundamentally, a "cash-flow underwriting" interpretation of underwriting cycles assumes a widespread incompetence among insurance company investment managers and underwriters. It presumes either that investment managers were surprised by the fall in interest rates in the mid-1980's or that underwriters are unable to adjust rates for changes in investment income. But no one was shocked by the fall in interest rates in the 1980's. On the contrary: financial analysts were surprised that interest rates stayed high even after inflation subsided. Similarly, good underwriters aim at long-term operating profits. They are not easily deceived by steady changes in investment returns.

Interpretations of the underwriting cycle abound. The majority presume that someone is erring: rate making methods are naive, underwriters are simplistic, regulation is rigid, or investment managers are deceived. Such explanations search for a cause where it is not to be found. Insurers are no less rational than other firms are. They exist in a highly competitive market, where the foolish firm does not long survive.

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[10] The traditional view is that the effect on losses is stronger, so accelerating inflation hurts insurers. Butsic [1981], in a rigorous examination of this question, concludes that the effect on the discount rate may be stronger, depending on the inflation sensitivity of the losses.

[11] For the effect of interest rate changes on the returns of mismatched portfolios, see Bierwag, Kaufman, and Toevs [1983] or Redington [1952]. For an analysis of asset and liability durations of Property/Casualty insurance portfolios, see Feldblum [1989].

Section III: Competition and Profits

To understand the relationship of underwriting cycles to insurer solvency, we must briefly step aside from insurance and delve into economics and business theory. We ask: "What is the relationship between competition and profits?"

We consider first the economist's perspective, examining competitive, monopolistic, and oligopolistic market structures. We then analyze the insurance industry from a concrete business viewpoint, examining policy differentiation, policyholder loyalty, and the ease of entry into the insurance marketplace. We ask: "Given the structural characteristics of the insurance industry, what price-cost margin should we expect?"

Textbook Models: Competition and Monopoly

Undergraduate economics textbooks present two market models: pure competition and single firm monopolies. These models are meant only to illustrate the forces that determine prices, not to depict actual practice.

In pure competition, prices are determined by industry-wide supply and demand. No individual firm can unilaterally affect market prices. If a firm restricts supply, its competitors take up the slack. If a firm raises prices, consumers purchase the product elsewhere.

In a monopolistic industry, a single firm dominates the market. Entry of competing firms is sufficiently restricted that the monopolist can adjust the quantities supplied and the prices charged to maximize its profits.

Competition

What market price results from each model? Suppose that the price in a competitive industry exceeds the marginal cost of producing the product. Any firm could cut prices slightly, garner a greater market share, and increase its profits.

Similarly, if the market price were below marginal cost, firms would soon leave the industry

and employ their capital elsewhere. Equilibrium is achieved when price equals marginal cost.

Equilibrium is a central concept in economics. Equilibrium means that there is no tendency for prices to either rise or fall.[12] Economists maintain that equilibria generally obtain in free markets. Underwriting cycles, however, seem a stark example of disequilibrium: prices continually fluctuate.

Monopoly

Under suitable conditions, the monopolist will not price its product at marginal cost if it seeks to optimize its income.[13] When price equals marginal cost, there are no economic profits for

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12 Industrial economists, when considering firm behavior, speak of Nash equilibria (Nash [1951]). A Nash equilibrium obtains when no firm has an incentive to modify its production or price strategy. If firms seek to maximize their income, this implies that no firm can obtain greater profits by raising or lowering its price or by increasing or decreasing the quantity that it supplies. Waterson, using a game-theoretic approach to industrial economics, defines a Nash non-cooperative equilibrium as the "point such that each player's strategy maximizes his expected payoff if the strategies of the others are held fixed" (page 41). Friedman [1983] uses a similar definition: "A [Nash] noncooperative equilibrium consists of *n* particular strategies, one for each firm, so chosen that no single firm could possibly have obtained higher profits if it, alone, had selected a different strategy" (page 49). Fudenberg and Tirole [1989] summarize the formal theory of Nash equilibria.

When market conditions cause firms to have different strategies – some seek stable current income and others seek to increase sales – Nash equilibria often dissolve. This phenomenon underlies the model of underwriting cycles developed below.

13 These conditions are that either the marginal cost rises as quantity supplied increases or the demand curve slopes downward. Marginal cost is the cost of producing an additional unit of the good. In insurance, this is the expenses and anticipated losses of writing an additional policy, not the average expenses and losses incurred on the current book of business. The demand curve is the relationship between consumer demand and the product's price. In insurance, this is the number and size of policies and endorsements desired by consumers at each premium rate.

Both conditions are satisfied in the insurance market. (1) The demand curve in many lines of business is nearly vertical, because of statutes, regulations, and business policies that mandate coverage (see Sherdan [1984] and Feldblum [1990b]). (2) The marginal cost curve rises sharply, despite the preponderance of variable costs in insurance. As D'Arcy and Doherty [1988] note: ". . . an insurer writing a large quantity of policies will eventually have to relax underwriting standards to increase the quantity further, and the newer policies could have a higher expected loss ratio" (page 9). That is, at low quantities, insurers can "skim the cream,"

the firm. But if the monopolist restricts output, consumers "bid up" the price to obtain the scarce good. Price exceeds marginal cost, and the firm receives additional profits.

At equilibrium, the market price equals marginal revenue. (Marginal revenue is the extra income earned by selling an additional item. This should be distinguished from the average revenue obtained on the current policy portfolio.) In a purely competitive marketplace, price equals marginal revenue which equals marginal cost. In a monopolistic market, marginal revenue generally exceeds marginal cost. In other words, prices are higher in a monopolistic market than they would be in a competitive market.[14]

Actual Market Structures

These market structures rarely exist in their ideal forms. Even when there are thousands of firms selling similar products, competition is seldom perfect. For instance, grocery stores exist all over, selling the same foods: is this not pure competition? But most individuals use the nearest corner grocery for small purchases, and do not bother to price shop. In other words, the grocery store may have a near monopoly within a small neighborhood.[15]

Monopolies are equally hard to maintain. IBM dominated the market for mainframe business computers in the 1960's, and it enjoyed large price-cost margins during those years. But competitors soon entered wherever profits beckoned - computer peripherals, software programs - and they quickly gained significant market shares.[16]

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selecting the best risks. At higher quantities, insurers offer coverage even to mediocre and poor risks. Thus, marginal costs rise as the number of policies issued increases.

[14] For textbook presentations, see Samuelson and Nordhaus [1989], Mansfield [1975], chapters 8 and 9, Varian [1987], chapter 25, Douglas [1982], chapters 9 and 10.

[15] Scherer [1980] comments: "Even when firms produce physically identical commodities, complete homogeneity is not likely to be attained because of differences in location. . . . When producers are located at different points on the map, their products are said to be *spatially differentiated*" (page 325).

[16] On the history of IBM's market dominance in the mainframe computer industry and the entry of competitors in peripheral equipment and software products, see Brock [1986]. Government sponsored monopolies, such as municipal utilities, cable TV franchises, and

Nevertheless, these two models are important, for they set the bounds of the price range. If capital can be transferred to other uses, firms will not price below marginal cost.[17] And if supply is adequate, firms will not price above the monopoly price.

This price range is wide, since the monopoly price may be well above marginal cost. So if the market is neither purely competitive nor monopolistic, what prices will actually be charged?

Economic Models

Economics is rigorous. Theorists provide the needed assumptions, then "prove" the desired conclusions. But these assumptions are invariably idealistic. The equations are mathematically perfect but of limited practical value.

We can not proceed without a theoretical framework. We will deal with price-cost margins, Nash equilibria, entry conditions, and price elasticity of demand. However, we are interested not in formulating theorems but in understanding a business phenomenon: the underwriting cycle. So we must step gingerly over the coming terrain.

We can view this distinction from another perspective. Economic models abstract reality. They

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telephone service until the 1980's, are different. These industries have strictly regulated rates; they do not price by supply and demand considerations.

The diversity of insurance rate regulation affords a range of insurance markets. In some states, such as Massachusetts and Texas, insurance rates are set by the regulator or by official rating bureaus. In other states, such as Illinois and pre-1989 California, the free market determines insurance prices. Insurance rate regulation is a factor (albeit a minor one) in underwriting cycle severity.

[17] Transferring capital can be difficult, and firms may price below marginal cost in a declining industry. The personal insurance lines present an excellent illustration of this. Over the past 40 years, direct writers have steadily garnered most of the Personal Lines market, and they have consistently attracted the better risks among the insured population. Independent agency companies have a declining market with worsening risk quality. Many of these companies are slowly moving to other lines of business (such as Commercial, Specialty, Reinsurance, and substandard auto), experimenting with less expensive distribution systems (such as direct mail), or trying to start joint ventures with other financial institutions (such as life insurers, health insurers, and securities brokers). Meanwhile, average Personal Lines returns for independent agency companies are below marginal cost.

isolate some elements, and the results are determined from the assumptions. The business world is represented by succinct mathematical expressions.

Underwriting cycles, however, are complex phenomena, and no two companies react identically to their course. We will not try to determine the exact duration or severity of the cycles. Rather, we seek to understand the driving forces behind insurance pricing.

We begin, therefore, with an abstract model, of pricing in a competitive market with a limited number of firms.[18] Our emphasis will be on Nash equilibria and conjectural variation. We then revise the model, discarding the idealism and adding reality. Finally, we construct an insurance model, based on the characteristics of the Property/Casualty industry, to explain underwriting cycles and their relationship to insurance solvency.

Conjectural Variation

Suppose two rival firms, producing identical products, each have 50% of the market. Consumers are conscientious price shoppers with excellent information, so if either firm underprices the other it will quickly capture the entire market. If the firms compete by setting prices, then a static microeconomic analysis implies that both firms will set prices at marginal

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[18] In truth, there are thousands of American insurers, and dozens of new ones enter the industry each year. This is a central characteristic of the insurance model that we develop further on. For clarity of exposition, however, we begin with a model of a limited number of firms.

Supplier interdependence is enhanced by high market concentration. Some economists use four firm concentration ratios of 50% or greater, or a Herfindahl-Hirshman index of about 1,000 or greater, as indicators of possible interdependence. (See, for example, the June 1984 Justice Department merger guidelines for antitrust action.) The Personal Auto insurance industry shows a four firm concentration ratio of 40% and a Herfindahl-Hirshman index of 610 on a national basis, and corresponding average figures of 53% and 1,000 on a statewide basis. These figures depend on the definition of the market: state versus national and individual line versus all insurance products. Inter-industry comparisons of market concentration must use similar criteria of market definition; if so, insurance shows low relative concentration. On automobile insurance, see Klein [1989], Table 1 (page 12) and Table 4 (pages 18-19); on Workers' Compensation insurance, see Countryman [1982], Table 1 (page 17), Klein [1986], and Appel and Gerofsky [1985; 1987].

cost.[19] For if one firm prices above marginal cost, the other firm can charge slightly less, gain the other 50% of the market, and increase its total profits.

This analysis is static: it considers only a single time period. Dynamic models presume that firms respond to their rivals' competitive actions. Moreover, each firm anticipates how its rivals will respond *before* implementing its own strategy. Economists term this conjectural variation: "Each firm believes that its choice of price will affect the price selected by its rivals."[20]

Suppose again that two firms producing identical products and competing on price each have 50% of the market. In the static analysis, if the market price exceeds marginal cost, then either firm may slightly reduce its price and garner the entire market. In reality, the

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[19] Firms may compete either by setting prices or by choosing the quantities they supply. Price and quantity are interrelated, since the industry demand curve sets a one-to-one relationship between them. If firms compete by choosing the quantities they supply, "Cournot competition" implies that the resulting price will exceed marginal cost. The price-cost margin varies inversely with the number of firms: one firm (pure monopoly) produces the greatest profits, and an infinite number of firms (pure competition) eliminates economic profits. See Tirole [1988], pages 218-221, or Scherer [1980], pages 152-155.

Manufacturing firms with long production cycles may compete by choosing the quantities that they supply. A Cournot analysis is appropriate for them. Insurers have almost no supply restrictions; rather, they compete on premium rates. A "Bertrand" analysis, which results in price equaling marginal cost, is the appropriate model (see below in this note). See Tirole [1988] pages 209-212, or Varian [1987] pages 461-464.

The appropriate model for insurers depends on their supply constraints. Unlimited capacity implies that firms compete by setting prices. Severe capacity constraints imply that firms compete by choosing quantities. For an analysis of the limits on insurance capacity, see Stone [1973]. Stone's analysis applies to large Commercial risks, where random losses may adversely affect an insurer's income or even solvency. In practice, there are no capacity constraints in the Personal Lines and in small Commercial risks. Moreover, for some large risks, the availability of reinsurance mitigates the capacity constraints.

For a general discussion of insurance supply, see Stewart [1984]. Steward correctly notes that insurance supply is determined by psychological and financial considerations, not by plant, equipment, labor, or other physical restrictions. The ability of insurers to quickly revise quantities and prices is an essential aspect of the underwriting cycle; see Section V below.

[20] Tirole [1988], page 244. For a mathematical development, see Varian [1984], pages 102-103, or Waterson [1984], pages 18-19. Porter [1980] presents a non-mathematical discussion of the strategic consideration of expected rival responses.

businessman wonders: "If I cut my price to increase market share, how will my rival respond?"

Clearly, the rival will match the price cut – at least if a small reduction in price enables it to retain its market share. If both firms presume that the other will match a price cut, neither will initiate the price reduction.[21]

We formulate this mathematically as follows: Let P^m be the current *market* price, and P^c be the *competitive*, or marginal cost, price. Let "v" be a discount rate for future earnings (the discount rate is treated more fully below). Suppose that each firm knows that if it reduces its price below P^m, its rival will immediately and continuously charge P^c. Finally, assume that a price cut below the current market price promptly attracts the entire consumer population.[22]

The current market price, P^m, provides total industry earnings of E^m, a positive amount. The marginal cost price, P^c, provides zero economic profits; that is, $E^c = 0$. If both firms maintain the current market price, P^m, their earnings will be $(E^m + vE^m + v^2E^m + \ldots)/2$ for each. If either firm slightly shades prices, its earnings will be E^m in the current period.[23] Since its rival quickly cuts prices to marginal cost, its earnings are 0 in all future periods.

If the firms are to be dissuaded from cutting prices, then E^m must be less than $(E^m + vE^m + v^2E^m + \ldots)/2$. That is,

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[21] That is, conjectural variation influences optimal business strategy. If an insurer believed that its peer companies use cost-based pricing and that they do not consider competitive pressures, it would have no disincentive to reduce rates in order to gain market share. In practice, insurers' prices are strongly affected by those of their rivals. This is most evident in the Personal Automobile market, where the major direct writers carefully examine their rivals' rates, by territory and classification, to set their own prices.

[22] These are the ideal assumptions so endearing to economists. We will return to reality in a few paragraphs.

[23] This is a theoretical model. It assumes that an infinitesimal price reduction attracts the entire market. In insurance, (1) a substantial rate reduction is required to gain market share, and (2) shifts in the insured population occur at renewal time, not continuously. The model of underwriting cycles developed below incorporates these realistic elements.

$$1 < (1 + v + v^2 + \ldots)/2, \text{ or } v > 1/2.$$

This makes sense. If "v" is high enough (more than one half in this instance), firms are unwilling to sacrifice future earnings for immediate profits. Conversely, if "v" is low, firms disregard future earnings and emphasize short-term results.[24]

Discount Rates

The discount rate measures the relative value of a dollar of future earnings compared with a dollar of present earnings. The interest rate is a part – but only a small part – of this. More important is the uncertainty about future market conditions. Perhaps consumer demand will slacken, other suppliers will enter the industry, restrictive regulations will impede price adjustments – and future profits will dissipate. Perhaps demand will grow and entry barriers will harden, increasing future profits. Perhaps rival firms will differentiate their products and segment the market.[25]

Future earnings in an inflationary economy are worth less in real dollars. In a competitive market, they are also uncertain: anticipated profits may never materialize. Business strategy, which determines the quantities supplied and the prices charged, affects the realization of future profits.

The size of the discount rate ("v") needed to discourage price cutting varies with the number of competing firms. If there are two firms of equal size, "v" must be greater than 1/2, as the equation above implies. If there are ten rival firms of equal size, "v" must be greater than

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[24] For more complete discussions, see Tirole [1988], pages 245-251, or Shapiro [1989].

[25] Describing the discount rate, δ, Shapiro [1989], page 362, note 58, writes: "Formally, δ may be thought of as the product of two terms: $\delta = \mu e^{-iT}$, where μ is the hazard rate for the competition continuing (*i.e.*, the probability that the game continues after a given period, given that it has not previously ended), and e^{-iT} is the pure interest component of the discount factor, with period length T and interest rate i.

9/10 to discourage price cutting.[26] The insurance market has hundreds of rival firms in the major lines of business, so this simple model implies that the discount rate must be near unity to discourage price cutting. Why, then, do insurers reduce rates as the cycle turns down? To answer this problem, we present a more sophisticated model. First, however, let us take another detour: How does a firm choose an "optimal" price?

Limit Pricing and Entry Barriers

The optimal price depends upon the strength of entry barriers. If entry barriers are low, new firms enter the market. Entrants can not gain market share if they charge the current price, so they have little to lose by price cutting.[27] Incumbent firms rarely let the market price remain high enough to attract new entrants.

The cut-off price between attracting and discouraging new entrants is termed the "limit price." But why should the limit price be any different from the competitive marginal cost price? If all firms have the same production costs, then any price exceeding marginal cost attracts new entrants.

But firms do not all have the same production costs. In particular, new firms face a fixed (sunk) cost of entry, so the limit price exceeds the marginal cost price.[28]

In theory, there are few barriers to entry in insurance. The insurer need build no factories to manufacture its product; it may contract for the needed actuarial, underwriting, and loss adjustment skills; and statutory capitalization requirements are relatively low. The firm may

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[26] That is, E^m must be less than $(E^m + vE^m + v^2E^m + \ldots)/10$. Thus, $1 < (1 + v + v^2 + \ldots)/10$, or $v > 9/10$.

[27] In underwriting parlance, we speak of new entrants "buying" market share. A new firm may suffer operating losses for several years before it develops a profitable book of business. This is particularly true in insurance, since new entrants attract the marginal and unprofitable risks.

[28] On limit pricing, see Milgrom and Roberts [1982]. Insurers face few fixed costs, particularly in lines of business dominated by the independent agency distribution system. Entry into the Commercial Lines insurance marketplace is deceptively easy – new firms believe they can enter quickly. Thus, there is a short span between the marginal cost price and the limit price.

simply "hang out a shingle" and begin writing policies.

In practice, this is not correct. In the Personal Lines market, the direct writers are profitable whereas the independent agency companies are losing money. Yet few independent agency companies have successfully switched to direct writing or exclusive agency distribution systems. In other words, the constraints on the distribution system are powerful, raising large entry barriers to the *profitable* insurance markets.

Two major life insurance companies, Prudential and Metropolitan Life, entered the Property/Casualty Personal Lines market in recent years. Both companies had strong underwriting, actuarial, and distribution systems, enormous capital, and extensive experience in life and health insurance. Yet both companies have had trouble transforming the newly acquired Personal Lines risks into profitable books of business. These hidden barriers to entry are strong deterrents to prospective insurers.

In other words, the traditional barriers to entry, such as minimum efficient production scales, or the advertising budget needed to place products on retail shelves, are not important in insurance. The insurance "distribution" barrier to entry does not involve getting consumers to purchase policies. Rather, it involves getting *good risks* to purchase policies.

We return to this topic later on, in our model of underwriting cycles. Note, however, how deceptive these barriers to entry are. It is easy to enter the insurance market, since there are no major capital or regulatory barriers. It is far more difficult to enter successfully.

These are the bounds postulated by industrial economics. In the long run, prices will not remain below marginal cost or above the limit price.[29] The actual prices charged depend on the number of firms, the extent of "conjectural variation," the discount rate assumed by each firm, and other factors affecting the price-cost margin.

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[29] In the short run, this is not true. In declining industries, prices often sink below marginal cost. In expanding industries, incumbent firms may price above the limit price, allowing new entrants even as they reap large profits. Numerous other short term exceptions are discussed in the economics literature.

The theoretical economist would ascribe the insurance industry's low profitability to the competitive characteristics of its market.[30] But we need a more specific analysis to understand underwriting cycles, so we ask: "How do the nature of the insurance product and the operations of the insurance carrier affect anticipated profits?"

Section IV: Insurance Industry Characteristics

An industry's structure and the characteristics of its products influence both expected profits and strategic possibilities. Three considerations germane to insurance are

1. Product differentiation and substitute products,
2. Cost structures and barriers to entry, and
3. Consumer loyalty and price shopping.

We begin with these insurance attributes, in preparation for the analysis of underwriting cycles and their relationship to insurer solvency.

Product Differentiation

When firms supply products with varying attributes, such as automobiles, computer hardware, and fashion clothing, each of them may enjoy some market power and associated economic profits. When the products of competing firms do not vary much, as is true in agriculture, all firms may be constrained by the prices of the most efficient producer. In short, product differentiation increases expected profits.

Most insurance policies are indistinguishable to the average consumer. In certain lines of business, such as Workers' Compensation and no-fault Auto Insurance, benefits are mandated by statute. Even where no laws impede differentiation, product diversity is hard to maintain. Improved policy forms can be copied by rivals, so advantageous innovations are transient.

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30 Plotkin [1967, 1969, 1970, 1979] has documented the relative profitability of insurers vs. other firms. See also Braithwaite [1987], Banfield [1986], and Bailey [1969].

The existence of close substitutes for an industry's products has a similar effect: substitutability constrains profitability. For instance, aluminum often can be substituted for steel. Aluminum prices constrain steel profitability, regardless of competition in the steel industry.

In many lines of business, there are few substitutes for insurance. The Personal Lines consumer has no choice but to purchase an Auto Insurance or Homeowners' policy. Similarly, most business owners must buy Workers' Compensation insurance, since self insurance techniques are feasible mostly for large and sophisticated companies. The rising claims consciousness of the public, and the increasing predilection of Americans to turn to the courts, strengthens the demand for Commercial Liability products. Small businesses have no alternative other than to buy insurance protection.

In sum, the lack of product differentiation means that individual insurers have difficulty increasing prices and profits. But the lack of close substitutes for an essential product means that the industry as a whole can raise or lower premium rates without losing consumer demand. Formally, aggregate consumer demand for insurance products is inelastic with respect to price, but inter-firm elasticity is high.

Cost Structures and Barriers to Entry

We distinguished above between traditional and "hidden" barriers to entry. Traditional barriers depend on cost structures: minimum efficient plant size, up-front capital requirements, the time needed to enter, and production process learning curves. Potential entrants observe these costs, which influence their willingness to join the industry.

Insurance has few traditional barriers to entry. Almost all costs, whether losses, loss adjustment expenses, commissions, salaries, and premium taxes, are variable, not fixed.[31] No plant need be built, no expensive equipment is required, and statutory capitalization

[31] The distinction between variable and fixed costs differs from the actuarial distinction between costs that vary directly with premium and those that do not. Salaries of non-managerial personnel are variable costs, though they do not vary directly with premium. The other expenditures listed in the text are both variable costs and vary directly with premium; see Feldblum [1990a].

requirements are low.[32] Moreover, most costs are paid either on the policy effective date (e.g., commissions) or after the policy is in force (e.g., losses).[33] The cash flows from "producing" an insurance policy are positive, thereby facilitating the entry of new firms. Underwriting intricacies are not readily discernable, and many entrants believe that there is no significant learning curve. Finally, a firm can contract for underwriting, actuarial, accounting, and loss adjustment skills, so little time is needed before writing policies.

As we noted earlier, the "hidden" barriers to entry in insurance are powerful. It is easy to enter the insurance marketplace; it is far more difficult to enter successfully. New entrants attract marginal risks, and actual insurance losses are high in early policy periods. It takes many years to obtain a profitable book of business (Conning & Co. [1988]; Feldblum [1990b]).

So new firms continuously enter the insurance market. Were earnings steady, the high rate of entry would depress expected profits. But fluctuating earnings, and the "hidden" entry barriers discussed above, impair the chances of successful operations. Many new entrants, with low quality books of business, do not last through the trough of the first underwriting cycle.

Consumer Loyalty

Price changes affect purchasing decisions. If the price for a particular brand of toothpaste rises 10%, many buyers of that toothpaste may switch to other brands.

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[32] Mayerson [1969], page 151, notes that "the initial capital and surplus requirements of most states are much too low under present condition." Danzon [1983] examines the relationship of state licensing statutes to entry barriers, in terms of delay of operations and cost of entry. She finds average delays of 6 to 10 months, and an average personnel cost per state for entry expenses of $100,000. She notes that these costs are too small to serve as entry barriers. See also Klein [1986], pages 91-92, who shows high entry and exit to the Workers' Compensation market.

[33] Other acquisition expenses and certain administrative and underwriting costs are expended before premiums are received. The National Council on Compensation Insurance, using a 1977 study of Massachusetts Workers' Compensation expenses, estimates that only 14% of "other expenses" (i.e., general expenses, other acquisition costs, and miscellaneous taxes, licenses, and fees; thus, about 2% of insurance costs) are paid before the policy's inception; see WCRIBM [1977] and Feldblum [1991]. Mahler [1987] estimates that only 20% of "company expenses" (that is, general expenses, other acquisition expenses, and one half of unallocated claim expenses; thus, about 3% of insurance costs) are paid prior to the policy's inception; see his Appendix II, pages 269-270.

Some goods have large "switching costs." Consumers of large electrical equipment may not change suppliers unless prices rise substantially, since such a switch would involve costs of installation, inspection, testing, retraining, and adapting other machinery. In other words, consumer loyalty to a particular brand or supplier depends upon the costs of changing products.[34] High switching costs impede competition and raise expected profits.

Toothpaste, unlike large electrical equipment, has no "switching costs." Consumers have no constraints, either *ante hoc* or *post hoc*, on the brands they choose. When switching costs are absent, competition more easily dissipates economic profits.

Insurance seems similar. At renewal time, a consumer can purchase coverage from a competing carrier with no additional costs or gaps in coverage. This implies low expected profits in insurance.

In truth, insurance is not at all like toothpaste, particularly in the Personal Lines. Insureds rarely compare competitors' prices when their policies come up for renewal, whether or not they made such comparisons when they first obtained the coverage.[35] Only if an insurer dramatically raises its rates will policyholders begin searching out other agents or carriers.

Over the long term, insurance is no different from other goods. Higher than average prices cause a slow but steady loss of market share, which is extremely difficult to win back. But in the short term, a reputable insurer can maintain a higher than average price-cost margin without a significant loss of business.

Were insurance earnings steady, long-term expected profits would be low. The lack of product

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[34] Porter [1980] defines switching costs as "one-time costs facing the buyer of switching from one supplier's product to another's" (p. 10), and he adds: "Switching costs may include employee retraining costs, cost of new ancillary equipment, cost and time in testing or qualifying a new source, need for technical help as a result of reliance on seller engineering aid, product redesign, or even psychic costs of severing a relationship."

[35] Fox [1980] reports that most of the auto policyholders who made cost comparisons did so at least two years prior to the survey date; see particularly his Tables 2 and 3 on page 23. Feldblum [1988a] describes the relationship of policyholder information to insurance industry market structure.

differentiation and the apparent ease of entry would force insurers to price close to marginal cost. But the lack of close substitutes, consumer loyalty, and the difficulty of successful entry facilitate short-term price fluctuations. These characteristics of the insurance industry underlie the model of underwriting cycles in the following sections.[36]

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[36] We have assumed pricing freedom for insurance companies. But should not the strict rate regulations in many jurisdictions limit profit fluctuations?

This question is not related to the strategic model of this paper. It is an empirical problem: if the states carefully regulate insurance prices, why do profits fluctuate so widely?

One common answer is that rates are adequate during profitable periods. During the troughs of the cycle, competitive price cutting either eliminates or severely reduces operating profits. Regulation sets the adequate rate level, but it can not prevent individual price reductions.

Were this true, the low long-term average profits would cause investors to withdraw their capital from the Property/Casualty insurance industry. This has not happened: in the mid-1980's, insurers raised enormous capital in the stock and bond markets (see Matison [1987], and contrast Balcarek [1968]). If long-term profitability is reasonable, and profits are depressed during the troughs of the cycle, then profits must be more than adequate during good years. How is this possible, given the sophistication of actuarial pricing and the strictness of state regulation?

The underwriting cycle of the early 1980's was most evident in General Liability rates. An explication of the ISO rate making procedure for this line dissolves the dilemma posed above. Premiums are set equal to anticipated losses, expenses, and profit, using conservative estimates:

(A) Losses: ISO uses nominal loss payments, not the present value of future loss payments. Woll [1987] notes that General Liability losses are paid on average four to five years after the accident date. At an 8% discount rate, General Liability nominal loss values are about 40% above their present values at the inception of the policy. More sophisticated pricing models discount premiums, losses, and expenses to the same date.

(B) Expenses: Before the conversion to "loss cost" analyses, rating bureaus used expense provisions sufficient for most insurers, not just for efficient ones; see, for instance, Resony [1951], page 224, and the quotation from Mowbray in Longley-Cook [1964]. Longley-Cook [1966] has argued that even rating bureau *pure premiums* should be adequate for the less efficient or less profitable insurers. In the 1950's, stock companies had fire insurance loss ratios about 10 points above those of mutual companies. Longley-Cook opines: "It would seem logical, therefore, for the fire rating bureau to promulgate rates at a level which provides the correct profit margin for the stock member companies and for mutual companies to use these rates or such lower rates as they may wish, by deviations or independent filings."

(C) Profit: ISO incorporates a risk load in the determination of General Liability increased limits factors. This risk premium, distinct from the underwriting profit provision, represents a 5-10% return on surplus. See Miccolis [1977], Feldblum [1990c], as well as the references cited therein, for descriptions of risk loading procedures.

Section V: Dynamics of the Underwriting Cycle

Profit Cycles

Profit fluctuations may take two forms. In the first form, the market is in equilibrium during certain periods. External influences change costs, supply, or demand and thereby shift expected profits. Disequilibrium results until the price mechanism forces profits back to the original level. If external influences again affect the market, the fluctuations start anew.

Such profit fluctuations are rarely cyclical. For instance, weather conditions affect farm produce and profits: an unexpected frost may damage citrus fruit production, or a severe drought may lower crop supply. The affected farmers suffer from lost production, while other farmers benefit from higher prices. Prices and profits fluctuate, but the pattern is not cyclical.

Underwriting cycles take a different form: no phase is in equilibrium. Insurer strategies during profitable years drive rates down; changed strategies during poor years push rates up.

At two points in the cycle, in the upswing and the downturn, prices pass through the same point. But the underlying forces are different. One reflects a downward driving price strategy founded on high rates; the other reflects an upward driving price strategy founded on inadequate rates. This difference may be missed by an outsider looking at a snapshot of industry income. But the disparity is keenly felt by the businessman struggling for profits.

The Profitable Years

If there is no equilibrium point, there is no good place to begin analyzing the cycle. Yet we must start somewhere. So we begin, perhaps arbitrarily, at the top, as in 1977-78 or 1986-87: income is high and insurers are satisfied.

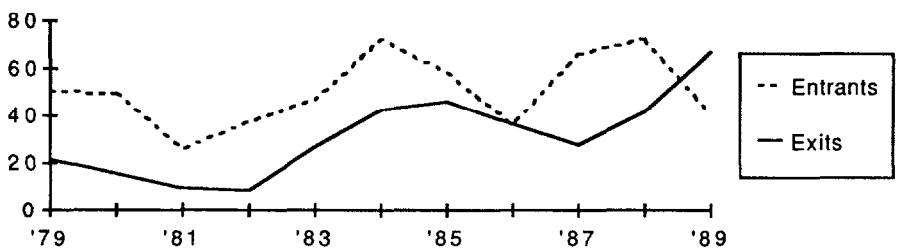
Thus, ISO's General Liability rates are well above market prices in most years. Insurers discount these rates based on competitive pressures. They are constrained by marketplace forces, not by actuarial indications.

Entry and Exit

Satisfaction breeds desire. Outside firms are enchanted by the ease of insurance operations: simply write the policy, collect the premium, and pay less in claims while you invest the assets. There are few explicit barriers to entry, so new firms join the industry.

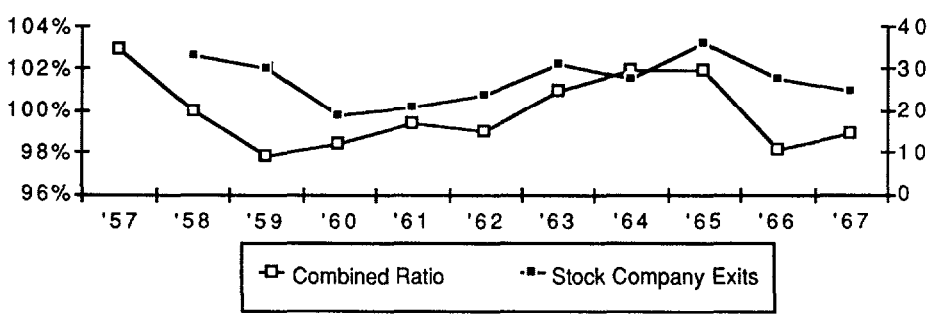
Figure 5 shows insurance company entries and exits during the past decade. Note the prevalence of entry into an industry earning below average profits and with low growth potential. Many of these entrants quickly fail. Insurance company exits climbed during the unprofitable 1984-85 and 1989 periods, and dipped in the profitable 1980-82 and 1987 periods.[37]

Figure 5: Insurance Company Entries and Exits



[37] See Stern [1990]. Nelson [1971] presents the following data on combined ratios and stock company exits for 1957 through 1967, and he notes that the number of exits is correlated with the combined ratio with a lag of one year:

Figure 6: Combined Ratio (left) and Stock Company Exits (right)



New insurers can not sell their policies at the going market rate. Entrants must discount prices in any industry. This is all the more true in insurance, where it is hard to attract new customers. But new insurers believe that they have little to lose by charging lower rates. They have no income now, so any price above marginal cost is additional profit.

Price Shaving and Market Shares

New entrants charging low rates are an unwelcome thorn to insurers. Equally unwelcome is the change in strategy among existing insurers.

The model presented in Section III, "Competition and Profits" assumes an equal division of the market among insurers. Suppose, instead, that there are 10 firms: one has 50% of the market, 8 have 6% of the market, and 1 has 2% of the market, and that the appropriate discount rate is 10% per annum. Let us restore the ideal assumptions for a moment: if any firm cuts prices it immediately attracts all consumers. Moreover, if any firm cuts prices, its competitors reduce their prices to marginal cost.

The large firm presently earns 50% of the industry's economic profits. If current pricing continues, it will earn this amount in perpetuity. Using the notation of Section III, where "P^M" is annual economic profits at the market price, and "v" is the discount rate, the present value of this profit stream is $(50\%)(P^M)(1 + v + v^2 + \ldots)$. This equals or $5(P^M)$ at a discount rate of 10%. If the insurer cuts prices slightly, it earns a bit below P^M in the current year, but no economic profits in all future years. The large firm has an incentive to continue its present pricing strategy.

Now consider the firm with only 2% of the market. It now earns 2% of the industry's economic profits. If conditions do not change, it will earn this amount in perpetuity. The present value of its profit stream is $(2\%)(P^M)(1 + v + v^2 + \ldots)$, or $0.2(P^M)$ at a 10% discount rate. If it cuts prices slightly, it earns almost P^M in the current year. The small but aggressive firm has a strong incentive to cut prices.[38]

[38] Harrington and Danzon [1991] suggest that the aggressive marketing strategy of small firms may result from an inability to avoid the "winner's curse." In competitive bidding among suppliers, a firm which provides unbiased bids will generally win only when its offered price is too low. When its offered price is too high, another supplier will generally win.

Realistically, of course, the small insurer will not instantly capture the entire market with a small price reduction. Most policyholders are loyal to their current insurers, and they often ignore competitors' rates at renewal time. The small firm's rate decrease would slowly increase its market share: say, 10% a year. Although substantial, the gain is not overwhelming.

The large insurer expects different outcomes. A carrier with 50% of the market may have already saturated its target customer populations. Even if it desires to grow rapidly, there are few new insureds for it to attract. The large firm's rate reduction may increase its market share only 1% a year.

Rival Responses

Competitive responses to rate cuts by a small firm or a large firm also differ, particularly in insurance. Premium rates vary by classification, territory, type of coverage, and similar dimensions. Rate comparisons can be an exhausting task, especially when the classification schemes of the insurers differ. So carriers do not monitor premium rates of small companies. In Personal Auto insurance, insurers analyze the rates charged by State Farm, Allstate, and a handful of other large carriers. The premiums charged by smaller insurers are revealed only in industry-wide accounting statistics. Actual rates, although publicly available in rate filings, are almost never examined.

Moreover, rivals do not react swiftly to rate cuts by small insurers. If a firm with 1% of the market has a 10% growth in business, and the new business is drawn evenly from its rivals, then the other firms suffer only a 0.1% decrease in volume. If an insurer with 50% of the market has the same growth, its rivals lose 10% of their business.

Harrington and Danzon differentiate between established and inexperienced firms: ". . . established firms in stable markets have learned to make formal or informal adjustments to their loss forecasts in order to avoid the curse. The availability of information from agents and brokers also may facilitate this process. . . . Inexperienced firms may use nonoptimal forecasts, placing too much emphasis on their own information or drawing incorrect inferences from the actions of other firms."

Thus, when rates are high, small insurers are tempted to cut prices aggressively.[39] Their actions may not be noticed, responses of rivals will be delayed, they may increase market share rapidly, and their revenues will climb. Large insurers, however, have less incentive to reduce rates. Their market shares increase more slowly, their actions are quickly noticed, competitors respond swiftly, and the premium lost on existing business may exceed that gained on new insureds.

The incentive for an incumbent insurer to reduce rates depends on the expected profits in its renewal book of business. Renewal business is generally more profitable than new business, and insurers strive to maintain policyholder loyalty. An incumbent insurer may reduce its own rates to avoid the loss of profitable renewal business to a competitor.[40]

The profitable phase of the underwriting cycle is in disequilibrium. Some firms enjoy current earnings, others aggressively seek to grow, and entrants clamor to join the industry.

Competitive Strategies

Profits influence business strategies. As the profitable phase of the underwriting cycle continues, more firms ignore short term income and seek growth. For simplicity, let us differentiate strategies between (a) aggressive growth and (b) price maintenance. Assume that

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[39] Anderson and Formisano [1988], in a study of six insurance failures between 1975 and 1985, found rapid premium growth, expansion to other states, and inadequate pricing to be three of the most significant causes of the insolvencies. For instance, in the years preceding the insolvencies, Reliable Insurance Company and All-Star Insurance Company had premium growth of over 50% per annum. Wisconsin Surety Company expanded from 2 states to 13 states in 6 years, and Eastern Indemnity Corp. expanded from 1 state to 34 states in 5 years. The aggressive marketing strategies of these insurers eventually led to their failures. As Anderson and Formisano comment (page 460): "rapid growth . . . can realistically only be accomplished by pricing below cost and taking an unreasonable proportion of poor risks." Similarly, Best's [1991], page 39, notes that "approximately 81% of all insolvencies occurred in companies experiencing unusual growth trends, which we defined as growth outside industry norms of 5% to 25%."

[40] On relative loss ratios in new versus renewal business, see Feldblum [1990b]. Harrington and Danzon [1991] speak of the future profits on renewal business as "intangible capital" and comment: "Intuitively, the greater is intangible capital, the greater the normal margin between price and marginal cost and hence the greater the net revenue gain (i.e., the lower the revenue reduction compared to last period's revenue) from cutting price to preserve market share, especially if the intangible capital is policy-specific on renewal business."

at time "t," w% of firms emphasize aggressive growth and (100 - w)% of firms emphasize price maintenance. The change in "w" depends upon the sign and magnitude of economic profits, labeled "p" here. If economic profits are positive, or $p > 0$, then $\partial w/\partial t > 0$. In other words, when insurance seems profitable, more firms seek aggressive growth. Moreover, the larger the economic profits, the more rapidly this change occurs, or $\partial^2 w/\partial t \partial p > 0$.

This price maintenance strategy is not sustainable. If your rivals are cutting prices and gaining market share, you must either respond or disappear. But the optimal response depends on the number of firms reducing rates. If the percentage of firms aggressively seeking market share is small, then it is reasonable to hold prices above marginal cost. The high level of policyholder loyalty to the insurer means that insurance market share growth is a slow process. For instance, suppose that 10% of firms are aggressively cutting rates, or w = 10%. (For simplicity, assume that firms are of equal size, so 10% of firms means 10% of the market.) If such discounts provide a 10% annual growth in market share, then these firms will have 11% of the market after a year's time, and their rivals will remain with 89% of the market. The maintenance of high prices has led to a 1% reduction in market share – a small loss compared to current profits.

If 50% of firms are aggressively reducing prices, the outcome changes. The same 10% market share growth for these firms reduces their rivals' portion from 50% to 45%. Short term profits do not offset a 10% loss of business.

The Nadir of the Cycle

How might one respond? Following rates downward is no remedy. The insurance industry has thousands of firms, a competitive structure, and invitingly easy entry conditions. Expected profits would be extremely low if prices were left purely to market pressures.

Indeed, premium rates do not drop slowly when the cycle heads downward. Rather, prices cascade downward, to well below marginal cost. Industry wide Annual Statement operating income was negative in 1975 and again in 1984-85. Moreover, the reported operating ratios conceal the true severity of underwriting cycles, for several reasons:

First, accounting data does not include a "reasonable profit" margin, though the economist's

marginal cost does. For instance, a 2% accounting return on equity is an economic loss.

Second, most insurers desire steady earnings, particularly if their financial statements are scrutinized by government regulators or by stockholders. Insurers tend to under-reserve during poor years, thereby increasing net income. Conversely, when profits improve, insurers strengthen reserves of prior years, dampening their reported earnings.[41]

It is difficult to quantify these effects, since the "reasonable insurance profit margin" is much disputed and reserve strengthening and weakening is difficult to quantify. Nevertheless, rates were surely below marginal cost during 1974 and 1983 as well.

Third, the severity of the cycle differs by line. General Liability rates, for example, were below marginal cost in 1982 and perhaps in 1981 also. In other words, an accurate analysis of

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[41] Butsic [1989], page 15, comments: "Examining historical data reveals that the real accident-year cycle is even wilder than published calendar-year loss ratios indicate. This suggests reserving is a problem: insurers under-reserve when results are worsening and over-reserve when profits improve. It isn't clear whether management is overruling actuarial indications or actuaries are bowing to pressures to smooth reported income."

Cholnoky and Cohen [1989], pages 1-3, observe: "Accuracy and adequacy [of loss reserves] tend to fluctuate over the course of the underwriting cycle. . . . Companies typically underreserve current accident years during a downcycle. They may also release prior accident year reserves to support earnings. In an upcycle, companies reverse this process: they overreserve current accident years and strengthen prior years." Similarly, Conning and Co. [1987] show reported and restated underwriting cycles and conclude (page 2): "Behind the reported underwriting cycle lies a more severe accident-year cycle."

Ryan and Fein [1988] chronicle this process in Workers' Compensation: "Changes in reserve adequacy tend to occur in cycles. . . . A period of relative reserve strengthening occurred between 1977 and 1981. This was followed by a period of declining adequacy from 1982 through 1985, when reserve weakening equal to more than 40% of premium took place. In the period 1986 through 1991, we expect that reserves will once again be strengthened, as the cyclical process continues. . . .

"The stages of the cycle appear to be restorative; that is, the reductions in adequacy on the downside are compensated by roughly equal increases once reserve strengthening resumes.

"The impact of reserve changes on the loss ratio is obvious . . . : they make bad years look better and good years look worse than they actually were. At the beginning of this cycle, from 1978 through 1981, extremely good results were obscured by modest reserve strengthening. In the following four years the opposite condition prevailed: the very dismal accident year results were masked by significant reserve weakening. As the cycle progresses, we see further reserve strengthening, which should persist into the 1990's."

income adjusted for reserve changes by line of business with a reasonable profit provision shows severe price inadequacies for years in a row.

To recapitulate: during profitable years, there are incentives for small firms to aggressively seek market share and for new firms to enter the insurance industry. The lack of product differentiation, the positive cash flow from insurance operations, and the ease of entry would normally reduce or eliminate profits from the industry.

Yet total consumer demand for insurance is inelastic with respect to price. The difficulty of price comparisons and consumer loyalty to insurers provide a large potential profit margin.

The deciding factor is business strategy. If firms aggressively seek market share by cutting rates, profits decline for all insurers. Formal agreements to maintain high prices are not sustainable in an industry as competitive as insurance. Rather, small firms and new entrants may be dissuaded from pursuing overly aggressive strategies by the competitive reactions of incumbent insurers.

Thus, the downward rate spiral is not a reflection of simple competitive pricing. Rather, it is a competitive response to aggressive strategies. By temporarily cutting rates below marginal cost, incumbent insurers hope to persuade more aggressive but short-sighted firms to modify their objectives from market share to profitability.

Changing Strategies

Indeed, as operating profitability decreases, overly aggressive insurers begin to rethink their strategy. First, low prices no longer attract additional consumers, since even the major firms have cut rates. Second, if profits remain negative, all firms suffer.

The changes in insurer strategies are revealed in the insurance trade press and trade conferences. As the cycle deepens, laments on the evils of price cutting become frequent, and exhortations to refrain from the unprofitable pursuit of premium abound. These public proclamations are disavowals of aggressive intentions. Insurers say: "We renounce the use of rate reductions to gain market share, for we see the folly of our ways."

We can model the change in strategy as follows. As the trough of the underwriting cycle continues, more firms renounce market share gains and seek profitable business. Since economic profits are now negative, $\partial w/\partial t < 0$. In other words, when insurance seems unprofitable, more firms renounce aggressive growth and seek profitable business. Moreover, the larger the economic losses, the more rapidly this change occurs, or $\partial^2 w/\partial t \partial p > 0$.

Industry Discipline

When the cycle turns up, insurers who previously engaged in competitive "warfare" seem to raise rates in unison. Politicians, consumer activists, and the legal community suspect antitrust violations. But there is no collusion, no intercompany agreements, and only a general knowledge of competitors' intentions.[42]

Rather, the change in behavior reflects the change in strategy. The public exhortations during the trough of the cycle are not accompanied by rate increases. Each insurer knows that if it raises prices unilaterally, it will lose business, not return to profitability. In fact, most insurers always knew that severe rate cutting is destructive to the industry. The public statements are intended to persuade other firms to cease overly aggressive behavior. They are not explanations of any firm's current actions.

Consider again the formal model. If economic profits are sufficiently negative long enough, most firms will have shifted their emphasis from market share growth to maintaining profitable rates. Yet a high price maintenance strategy is profitable only if all or most firms in the industry follow this path. Indeed, after two or three years of prices below marginal cost, most firms are committed to writing profitable business. But how does one move from a low price situation to a high price situation?

Market Leaders

In a highly competitive and fragmented industry like insurance, firms can not easily monitor the actions, much less the strategies, of their rivals. They need a barometer of industry feelings.

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[42] See the class action antitrust complaint in Van de Kamp [1988] and an industry response by the Insurance Information Institute [1988] for illustrations of this debate.

Rate filings make dull newsprint. "The Automobile Insurance Company has requested a 5.1% rate increase in Arizona for Bodily Injury coverage, 4.3% for Property Damage, . . ." Who would ever read such details?

The National Underwriter periodically records State Farm's rate filings (often only State Farm's filings) in various jurisdictions. State Farm is the market leader and low cost carrier in Personal Lines coverages. It serves as the barometer of industry movement through the underwriting cycle.[43] By examining and following State Farm's actions, other firms maintain a close grasp on industry price movements, even if they lack the resources to monitor competitive rates on their own.

When other carriers see State Farm raising rates, they know that firm strategies have shifted sufficiently to allow maintenance of high prices. Insurers follow (or sometimes even anticipate) the market leader in the various jurisdictions, leading to the good years of the cycle.

In the Commercial Lines, there is no clear market leader. The major Commercial Lines insurers, such as Aetna, Travelers, Hartford, AIG, Liberty Mutual, and CIGNA, have relatively small countrywide market shares. Other carriers do not follow AIG's General Liability rates the way they examine State Farm's Personal Auto rates. Consequently, the industry trade press rarely mentions Commercial Lines rate actions.[44]

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[43] Moreover, State Farm has a sophisticated monitoring system to analyze the rate actions of its peer companies. Not only do State Farm's rates affect a large percentage of the insured population, but they are an accurate reflection of the strategies of other carriers.

[44] Personal Lines risks are manually rated, so State Farm's rate manual is an accurate reflection of marketplace prices. Large Commercial Lines risks may be loss rated, composite rated, schedule rated, or retrospectively rated. The rate manual is but a crude guide to actual prices. In fact, many General Liability classifications are "A-rated," so there are no manual rates to examine.

In the Personal Lines, price changes are effected by rate filings. In the Commercial Lines, price changes are effected by varying schedule rating credits and debits, by modifying the premium payment pattern, by changing policyholder dividend plans, and by similar "non-manual" methods. Thus, rate comparisons are more difficult in the Commercial lines of business.

Rating Bureaus

Rather, Commercial Lines insurance strategies are revealed by deviations from bureau rates or bureau loss costs. The National Council on Compensation Insurance (NCCI), and state bureaus in certain jurisdictions (e.g., California, Massachusetts, Pennsylvania), provide advisory Workers' Compensation rates or loss costs for all classifications. Similarly, the Insurance Services Office (ISO) provides loss cost data for the other Commercial Lines. Most insurers use NCCI or ISO rates as a benchmark, and file rate deviations or independent rates with state insurance departments.

After several years of unprofitable operations, insurers know that the industry is ready to increase rates. ISO (or another rating bureau) provides the catalyst. When private insurers follow ISO loss costs, without seeking major deviations, firms know that the industry is committed to profitable rates. The individual carriers may then curtail schedule rating credits and other price modifications, confident that their rivals are doing the same.

Profits encourage aggressive rate cutting. After one or two good years, insurer strategies begin emphasizing market share growth, and new firms are attracted to the industry. The cycle begins anew, in perpetual disequilibrium.

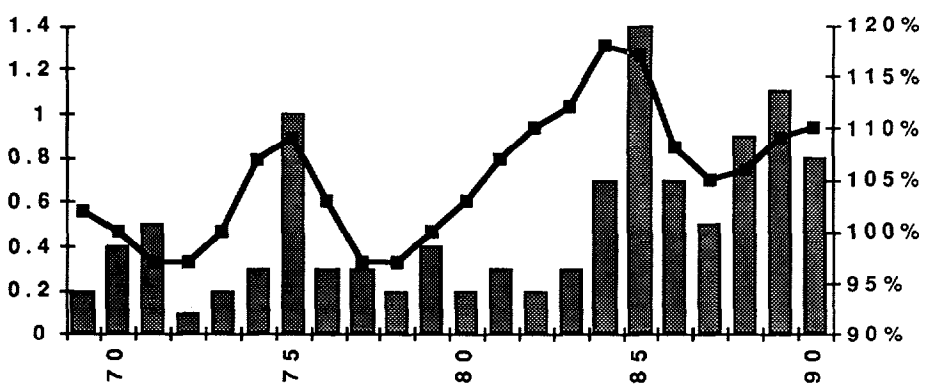
Section VI: Cycles and Solvency

Operating income speaks with a soft voice: it bends the cycle and slowly influences its course. Insolvencies come with a crash: they break old habits and shift insurer strategies.

We sometimes think of insolvencies as a mere by-product of insurer earnings. When the industry does well, few firms fail; when it does poorly, insolvencies multiply. Dismal earnings and insolvencies seem to be parallel results of poor managers, unskilled actuaries, or inept underwriters.

On the contrary: insurers are rational, and their personnel are sophisticated. When naive insurers compete too aggressively, the industry drives prices down, forcing its weakest members to fail. Only when the drive for market share subsides, from fear of further insolvencies, do prices and profits return to adequate levels.

Cycles and solvency are closely linked. Insolvencies are most frequent at the nadir of the cycle, as shown in the graph below (drawn from A. M. Best [1991] data). But the relationship is the reverse: the underwriting cycle turns when insolvencies become too frequent.



(Columns show insolvencies as a percent of insurance companies [left axis]; the dark line shows industry-wide combined ratios [right axis].)

Section VII: Implications

As each cycle rolls through the industry, insurers ponder: "What determines the severity and frequency of underwriting cycles? What lines of business are most subject to them? How do state regulation and statutes influence them?" It is time to answer these questions.

Policyholder Loyalty and Price Elasticity

The beckoning of profits leads the cycle. Why drive rates down if you can not recoup the losses later? Firms would prefer to price at marginal cost rather than lose money over the long term.

Periods of high prices are sustainable only if consumers do not reduce their purchases of the good and do not switch to rival suppliers. In other words, the price elasticity of demand must be low enough that consumer demand will not drop substantially when suppliers raise prices.

Policyholder loyalty results from the difficulty of price comparisons. Personal Lines policyholders may be unaware of price slashing by competing insurers, since they rarely price shop at renewal (Feldblum [1988b]). An insurer can maintain high prices for a short period without a major loss of market share when its competitors begin cutting rates.

Price increases, however, encourage insureds to seek better rates elsewhere. Unilateral price increases cause a loss of market share, as consumers switch to rival carriers. Industry-wide price increases are easier to sustain, since consumers can not do better elsewhere in the marketplace. Thus, the descent to the trough of the cycle is precipitated by a small group of insurers, but the return to profitability is a uniform movement.

Underwriting Cycles by Line

The history of underwriting cycles in America illustrates these relationships. During the 1960's and 1970's, underwriting cycles were most pronounced for Personal Automobile and

Workers' Compensation insurance.[42] In the 1980's, General Liability and other commercial liability lines showed the greatest fluctuations in profitability: negative in 1981-1984 and highly positive in 1986-1988.

This difference is influenced by demand elasticities and barriers to entry. Personal Automobile and Workers' Compensation insurance are statutorily mandated by Financial Responsibility or compulsory insurance laws. Price elasticity of demand is low.[43]

The opposite was true for General Liability until the 1970's. Believing that they had little exposure to liability hazards, many small businesses declined to purchase the coverage. Large corporations often used other risk management techniques, such as self-funding and captives.

In the 1950's and 1960's, many Personal Lines insurers used bureau rates, either as actual rates or as a baseline for pricing. By the 1980's, the low cost direct writers, such as State Farm and Allstate had garnered most of the Personal Lines market. The efficient distribution systems of these insurers formed strong barriers to entry or expansion by other firms.

The opposite course has characterized the Commercial Liability lines of business. The major

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[42] See Stewart [1984] Exhibits 5-3, 5-4, and 5-8 on pages 290, 291, and 295. Note how the cycles in automobile insurance mirrored those for the industry as a whole, whereas General Liability showed no clear pattern until the late 1970's. Similarly, Best's [1991: Insolvencies], page 33, notes that "while the majority of insolvencies during the 1970s occurred in personal lines companies, commercial lines companies accounted for the majority in the 1980s."

[43] On the low price elasticity of demand, see Feldblum [1990b], page 62; Sherdan [1984], page 58; Bloom [1987]; and Strain [1966], page 448. Strain summarizes the influences on elasticity as "The greater the tendency for the public to buy an insurance coverage without the need for sales stimulation (as to comply with financial responsibility laws, or workmen's compensation acts, or mortgage protection requirements), the more inelastic the demand for insurance." Financial Responsibility laws require a driver involved in a motor vehicle accident either to show evidence of insurance or to post a court bond (Morill [1965]; Mehr and Cammack [1980], pages 308-329; Bickelhaupt [1979], pages 646-678). Employers must provide Workers' Compensation insurance, with minor exceptions relating to farm employment, household work, or businesses with few workers. Employers financially strong enough to self-insure may provide the statutory benefits on their own. For history and detail, see Myers [1985], pages 884-900, Kulp and Hall [1968], pages 191-250, and Chamber of Commerce [1990]. Many states allow group self-insurance (NAIC [1984]). This increases the price elasticity of demand, since consumers have another risk management technique.

direct writers do not dominate these markets. Moreover, the lengthening tails in these lines and the rising interest rates in the 1970's increased the disparity between bureau rates and marginal cost.

Low price elasticity of demand leads to powerful underwriting cycles, as exemplified by General Liability in the 1980's. Market dominance by large carriers, combined with strong barriers to entry, reduces the severity of the cycle, as shown by the Personal Lines in recent years.

Regulation and Social Developments

Changes in state regulation may influence underwriting cycles. During the 1960's and early 1970's, many states moved from prior approval regulation to open competition laws.[44] Competitive rating laws allow more freedom for private insurers to vary premium rates in attempts to gain market share or increase profits.

The 1980's showed the opposite trend. California adopted prior approval regulation in November 1988, with the passage of Proposition 103, and consumer groups in other states are pushing similar legislation. Meanwhile, the low cost direct writers are driving agency companies out of the Personal Lines market. Tighter governmental regulation and increasing market concentration may dampen the severity of Personal Automobile underwriting cycles.

Social developments in the 1980's have had the opposite effect on the Commercial Liability lines. The expansion of tort law doctrines, and the increasing unpredictability of jury awards, have made coverage essential even for small firms. State regulation is not restrictive, since commercial insureds can fend for themselves and do not need the governmental protection that ordinary citizens require. Commercial liability rate filings, except for Workers' Compensation, are infrequently contested by state regulators, in contrast with the bitter disputes about Personal Automobile insurance rates.

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44 See NAIC [1969], page 310: "It is the sense of the Subcommittee . . . that . . . reliance be placed upon fair and open competition to produce and maintain reasonable and competitive prices for insurance coverages . . ." See also DOJ [1977]).

Consequently, General Liability promises potential profits for the discerning insurer.[45] In the late 1970's, insurers complained vociferously about rising and unjustified liability awards. The criticism was correct: the American legal system encourages lawsuits and the redistribution of wealth from the public to the trial bar. But a secondary effect of these complaints was to impress upon businesses the need for liability coverage.

Numerous suppliers - major carriers, small firms, and new entrants - joined the fray, and insurers began positioning themselves (that is, cutting prices to build market share) for the anticipated profits. The aggressive competition threatened to eliminate the foreseen returns.

So General Liability entered the trough of a severe underwriting cycle, with firms slashing rates well below cost. The consequences were striking: when rates rose in 1985, there was an almost complete absence of aggressive price cutting.[46]

And the cycle continues. The aggressive competition that precipitated the rise in rates in the mid-1980's led to price cutting a few years later. The waning influence of rating bureaus and administered pricing systems in the fragmented insurance market will lead to even more severe swings in premiums.

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[45] See Feldblum [1988b]. This promise may prove illusory. Insurers who provided CGL coverage in the 1960's and 1970's are now facing enormous asbestos, pollution, and products liability litigation (Hamilton and Routman [1988]; Manta and Welge [1990]). Nevertheless, the potential is alluring.

[46] The power of underwriting cycles is often misunderstood. Much of the American legal community and the business public concluded that the dramatic and uniform rise in commercial liability insurance rates must be the result of collusion. Yet no evidence of such behavior could be found. In fact, collusion is nearly impossible in the fragmented insurance market.

Even the Attorneys General's antitrust complaint was confined to allegations of boycott in policy form development, statistical support, and coverage exclusions. Pricing in concert is never mentioned (Van de Kamp [1989]). The California Attorney General's office explains that pricing in concert is protected by the McCarren-Ferguson Act and so was not contested. An alternative explanation is that the Commercial Liability insurance rate increases were characterized not by pricing in concert but by the competition driving the underwriting cycle.

Section VIII: Public Policy

How might underwriting cycles by controlled? The following section discusses several possibilities and points out the limitations of government action.

Restrictive Regulation

Restrictive rate regulation might eliminate profit potentials and dampen underwriting cycles.[47] But restrictive rate regulation increases insurance availability problems more than it reduces potential profits.[48] Moreover, meaningful rate regulation in the Commercial Liability lines of business may not be realistic, since oversight of schedule credits would require a policy by policy review. Unless an industry structure is naturally monopolistic, social welfare fares better with marketplace pricing than with governmental control. This is no less true for insurance than for other industries.

Elasticity of Demand

Removing statutory requirements for Personal Automobile and Workers' Compensation insurance, and curtailing judicial awards in commercial liability cases, might increase the price elasticity of demand for insurance. But the statutory insurance requirements help the victims of motor vehicle and workplace accidents. The benefits they provide outweigh the disadvantages of premium rate fluctuations.

The unpredictability of jury awards in commercial liability cases provide little social benefit, and the harm to society extends beyond insurance availability and rate fluctuation concerns. Unfortunately, the extremely limited success of tort reform efforts in the early and

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[47] Empirical evidence is conflicting whether profit fluctuations are greater in states with open competition or prior approval rating laws; see Harrington [1984] for a review of the literature, as well as D'Arcy [1988], Outreville [1990], and Tennyson [1991] for recent studies.

[48] Massachusetts and New Jersey have sought to promote social goals by restricting underwriting and pricing freedom in Personal Automobile insurance, but the dislocations in the insurance marketplace have exceeded any benefits; see Joskow [n.d.].

mid-1980's highlight the intractability of this problem. To restate this: the trial bar is a powerful interest group that opposes tort reform. The result of the pervasive attorney involvement in insurance claims are bloated insurance costs and the redistribution of wealth from citizens to a particular profession (see AIRAC [1988; 1989]). More volatile underwriting cycles are simply an additional side-effect.

Consumer Information

Greater consumer price information would reduce loyalty to the current insurer and mitigate the severity of underwriting cycles.[49] Firms would not be able to sustain high prices in the face of competitive price cutting without rapidly losing market share. Prices closer to cost would prevail over the duration of the underwriting cycle.

Life insurance regulation demonstrates the difficulty of providing price comparisons. The NAIC Life Insurance Solicitation Model Regulation requires that insurers illustrate surrender cost and net payment cost indices for 10 and 20 year durations, but few consumers examine these numbers (see Black and Skipper [1987]). Such comparisons are difficult, and few individuals expend the effort to understand them.

The same is true for Property/Casualty insurance. Consumers do not forgo price comparisons because the information is not available. Rather, the information is not available because the price comparisons are so difficult and distasteful (see Feldblum [1988a].

Underwriting cycles are a means of maintaining long-term profits, not a random occurrence that removes them. Regulators and consumer advocates must note that these profits are still less than those earned in other financial industries. Insurance underwriting cycles are the display of competitive pricing in a free marketplace. They provide a bumpy ride, but they render greater benefits for the consumer.

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[49] Numerous studies have recommended that states make insurance price information accessible to consumers; see Virginia Bureau of Insurance [1978], recommendation #5, or NAIC [1980], pages 440-441.

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