

**PROFESSIONAL ETHICS
AND THE ACTUARY**

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Professional Ethics and the Actuary

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 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

The American actuarial societies emphasize professional and ethical conduct of their members, by promulgating a code of professional conduct, instituting disciplinary procedures for ethical infractions, and requiring a course on professionalism for new members. Yet the ethical ideals espoused by the societies may at times conflict with the practices that corporations expect of their personnel.

The actuary has a dual role: an objective professional providing guidance on insurance issues and a business manager promoting the goals of an insurance company. This paper examines three areas where business objectives may conflict with professional ethics: valuation, pricing, and testimony.

- Valuation actuaries provide professional opinions certifying statement reserves as being in accordance with statutory standards, even when "implicitly discounted" reserves may be booked by their employers.
- Pricing actuaries, as business managers, may determine premium rates and relativities to optimize income or market share, even when these rates conflict with policyholder equity.
- Actuaries may be asked to testify in support of their employer's objectives, even when their own opinions are different.

The *Code of Professional Conduct* prepared by the American Academy of Actuaries provides little explicit guidance to the practicing actuary facing ethical dilemmas. This paper concludes with several proposals to apply the precepts of the *Code* to the issues outlined above.

PROFESSIONAL ETHICS AND THE ACTUARY

Section I: Introduction

The casualty actuary is gaining prominence both as a business manager and as a professional expert. Company executives depend on actuaries for economic valuations, marketplace pricing, and supportive testimony. Regulators and the courts seek actuaries for statutory valuations, pricing equity, and objective testimony.

This paper examines three areas where business objectives may come into conflict with professional ethics: valuation, pricing, and testimony. It examines whether the *Code of Professional Conduct* developed by the American Academy of Actuaries provides sufficient guidance to resolve the potential conflicts, and it suggests ethical guidelines to clarify these issues.

Valuation (Section II): A Statement of Actuarial Opinion Regarding Loss and Loss Adjustment Expense Reserves must accompany insurers' Annual Statements. To provide an unqualified opinion, the appointed actuary must affirm that the stated reserves make reasonable provision for all unpaid loss and loss expense obligations according to *statutory* valuation standards.

Almost all major insurers provide unqualified actuarial opinions. And most actuaries believe that industry reserves are seriously deficient on a statutory basis.

Economic considerations often make "full value" reserves an inefficient business strategy, particularly for the long-tailed lines. Marketplace price constraints, return on equity objectives, average durations of reserves, and regulatory leverage ratios prevent some insurers from holding full value reserves. Insurance management, seeking to optimize both net income and the benefits to policyholders, may request actuaries to determine economically efficient reserve levels.

The appointed actuary faces an unusual ethical dilemma. State regulators rely on the actuary as

a professional expert to validate the reasonableness of reserves on a statutory basis. Company managements rely on the actuary as a business manager to set efficient reserves that optimize company performance and policyholder protection. The inconsistency of these two objectives, and the lack of clarity in actuarial ethical guides, hampers the goal of reserve adequacy that the actuarial statement of opinion is designed to enforce.

Pricing (Section III): Traditional actuarial ratemaking procedures, supported by statutory provisions, use cost-based pricing techniques: premiums should be sufficient to cover expected losses and expenses. Classification differentials are justified by considerations of equity: different premium rates among groups of insureds reflect differences in expected losses or expenses.

Marketplace pricing reflects the forces of supply and demand, not just costs. Classification differentials, like individual risk rating plans, are driven by competition, not merely by "actuarial equity." Price elasticity of demand and consumer information affect premium rates, even as expected costs do.

The casualty actuary is again torn between two demands. State regulators rely on the actuary as a professional expert to set rates on expected differences in loss and expense costs: that is, on statistical equity. Insurers rely on actuaries as business managers to set rates based on competitive forces, such as the price elasticity of demand. The potential inconsistency of these objectives frustrates the actuarial ideal of objective professional and efficient business manager.

Ethical issues affect insurance pricing in numerous other ways as well. Rate equity, for instance, has many meanings. How should one balance statistical correlation and social acceptability, or group averages and individual differences? Corporate objectives, such as profit maximization or market share growth, may conflict with the actuary's view of the propriety of classification by sex or marital status. The ethical questions themselves are outside the purview of this paper. Rather, we ask: "How should the actuary act if he or she is troubled by these issues?"

Testimony (Section IV): Actuaries often serve as expert witnesses at state insurance department hearings on rates of return and insurance profitability. Insurers seek supportive

testimony from their actuaries, even as they seek such testimony from their other personnel.

Most actuaries have little trouble with their firms' overall positions. But the adversarial nature of public hearings complicates their position. The testimony presented by critics of the insurance industry often avers price gouging of the public, "obscene" profits by insurers, and cartelized price-fixing by rating bureau members. The testifying actuary is aware that his or her opinion will not be the sole basis for any decision. Rather, the final judgment may be a blend of the actuary's testimony and any counter-testimony offered.

The actuary is again torn between two roles. State regulators rely on the actuary as a professional expert, submitting objective testimony at the hearing. Insurers rely on the actuary as a business manager, submitting testimony whose ultimate effect will be the benefit of the firm and its consumers. Fulfillment of either of these objectives may hamper the fulfillment of the other.

Code of Ethics (Section V):The American Academy of Actuaries has promulgated a *Code of Professional Conduct* for its members. The *Code* contains uplifting precepts, but it provides little explicit guidance for the ethical issues that practicing actuaries face.

Ethical codes have diverse purposes. Some provide justification for a "professional" appellation, for either personal satisfaction or governmental award of monopoly status. Resonant but vague ethical maxims are appropriate. Others seek to guide members in murky ethical waters. Practical case studies of ethical dilemmas are most useful.

Professional societies that seek to accomplish both goals often include practical guidelines, explanations, and case histories to accompany the ethical precepts in their Codes. Such supplements might provide additional guidance for the type of ethical problems outlined in this paper. Several illustrations are presented, to suggest both the usefulness of such practical guidelines and the potential problems inherent in formulating them.

Section II: Valuation

Actuarial Opinions and Reserve Adequacy

Loss reserve adequacy is difficult to monitor, and reserve deficiencies may foreshadow financial weakness. To safeguard insurance solvency, the NAIC requires that the Annual Statement be accompanied by a "Statement of Actuarial Opinion" regarding loss and loss adjustment expense reserves.¹

To provide an unqualified opinion, the appointed actuary signing the statement must affirm that the carried reserves

- "a. are computed in accordance with accepted loss reserving standards and principles.
- "b. make a reasonable provision for all unpaid loss and loss expense obligations of the Company under the terms of its policies and agreements.
- "c. meet the requirements of the insurance laws of the domiciliary state."

The actuary must expressly note any discounting of the reserves (Lamb [1991], page 5; [1992], page 8): Most statements of opinion acknowledge the explicit discounting adjustments permitted by statutory accounting, such as tabular discounts on Workers' Compensation long-term disability cases and discounts for certain small Medical Malpractice carriers (Yow, *et al.* [1990]), but they rarely disclose any implicit discounting.² And most of these statements are

¹ The format and scope of the Statement of Actuarial Opinion, as well as the required qualifications of the appointed actuary, are summarized in Attachment N of the October 1991 meeting of the NAIC Blanks Task Force; for discussions, see Lamb [1991; 1992] and Witcraft [1992].

² Discounted reserves may not "meet the requirements of the insurance laws of the domiciliary state." In certain jurisdictions, discounting of Workers' Compensation reserves is permitted, though Annual Statement disclosure would presumably be required. See, for instance, §4117(b) of the NEW YORK INSURANCE LAWS, which allows a 5% discount on all Workers' Compensation loss and loss adjustment expense reserves:

"§4117(b)(1): For all such compensation policies where losses were incurred more than three years prior to the date of determination, such reserves shall be the sum of the present values, at five percent interest per annum, of the determined and estimated unpaid losses computed on an individual case basis plus the estimated unpaid loss expenses computed in accordance with subsection (b) hereof.

unqualified, with no hint of potential reserve inadequacies.

Yet most actuaries believe that the industry's reserves are deficient on a statutory basis for the long-tailed commercial liability lines. For Workers' Compensation, ISO [1992] estimates a 20-25% inadequacy; Goldman Sachs (Cholnoky and Cohen [1991]) estimates a 24% inadequacy; Conning & Co. [1992], page 11, estimates a 15-39% inadequacy; and the NCCI [1992], page 3, estimates a 24% inadequacy, of which one third is attributed to statutory pension discounts (see also Fein [1991]). How can each company's reserves be adequate and the industry's deficient?

It is not as though appointed actuaries believe that industry reserves are statutorily adequate, or that their own company's reserves are more adequate than the industry's. The magnitude of the industry statutory reserve deficiency is sometimes disputed, but its existence is rarely questioned.

Full Value vs. Discounted Reserves

An alternative valuation of reserves is the present value of future loss payments for incurred claims. We refer to this amount as the "economic reserve," the "discounted reserve," or the "market value of the reserve." It differs from the statutory reserves by the amount of the

"§4117(b)(2): Where losses were incurred during the three years immediately preceding the date of determination, such reserves shall be the sum of the reserves for each year, which shall be calculated in accordance with any method adopted or approved by the National Association of Insurance Commissioners and shall be not less than the sum of the present values, at five percent interest per annum, of the determined and estimated unpaid losses computed on an individual case basis plus the estimated unpaid loss expenses computed in accordance with subsection (b) hereof."

The industry reported about \$4 billion of non-tabular Workers' Compensation reserve discounts in 1991, most which stemmed from the New York State Fund (\$1.5 billion) and other New York and Pennsylvania domiciled companies.

Ralph Blanchard has pointed out to me that many state statutes are unclear about reserve valuation. "Meeting the requirements of the insurance laws of the domiciliary state" may not necessarily imply full-value reserves.

unrecognized interest discount.³

An insurer's management may desire a discounted valuation of reserves for various reasons. It may wish to track changes in the economic net worth of the firm, or it may wish to show higher earnings or a stronger balance sheet to stockholders. But these relate to internal financial statements and stockholder reports. Are there compelling business reasons, stemming from the operations of the firm, to report discounted reserves in statutory financial statements?

Yes, there are compelling reasons. The reserve reported in the statutory financial statements affects the company's ability to write business. Actuaries are business managers, not just back-room number crunchers; they are responsible for company strategy in allocating funds among reserves and surplus. They must ensure that the setting of reserves is both theoretically justified and strategically optimal.

Economic Constraints on Carried Reserves

What business factors affect the carried reserves, besides the actuarial indications? Insurance operations – policy pricing and business volume – are constrained by the market and regulatory forces noted below. Several of these affect reserve setting decisions, as explained subsequently.

- The *financial market* imposes a cost of capital constraint. Equity is provided to insurers only if the expected return from insurance operations is at least equal to the potential return on this capital from other uses.

³ The market value of the reserve may differ from the statutory value by a market determined risk margin, in addition to the unrecognized interest discount (CAS [1991]). The risk margin may be an explicit amount; compare the "provision for adverse deviation" (PAD) in SFAS 60, paragraph 21 (FASB [1982]). Alternatively, it may be an adjustment to the loss reserve discount rate; compare Butsic [1988] for Property-Casualty insurers or the NAIC Standard Valuation Law for life insurance discount rates (Dahlman [1989]). Some analysts feel that risk margins distort the accuracy of accounting statements; compare the lack of PAD's in SFAS 97, paragraphs 18, 23, 56, and 57 (FASB [1987]) and the remarks in AICPA's Discussion Memorandum (FASB [1990]). Saunders [1986], commenting on statutory and GAAP financial statements, notes that "understatement of income used to be tolerated as a necessary evil, but opinion has shifted in the past few decades. Now, excessively conservative assumptions are considered unsatisfactory." To simplify the discussion in the text, there is no mention of risk margins, though this does not imply that they are unnecessary.

- The *product market* imposes a pricing constraint. Insurers charging premiums above market levels may lose consumers to competitors. Given a ratio of premiums to surplus, this pricing constraint becomes a return on equity constraint.

Over the long-term, the cost of capital constraint and the pricing constraint are related for the industry as a whole, though not necessarily for the individual firm. If investors demand a 15% annual return on their equity, then the product market must allow this return. If it does not, and competition is sufficiently free, then some firms will leave the market, supply will contract, and profit margins will rise. Conversely, if insurers are earning returns in excess of the cost of capital, then new firms will enter the market, thereby increasing supply and driving down profit margins.

- *Financial regulation* limits leverage ratios, both the premium to surplus ratio and the reserves to surplus ratio. Premium to surplus ratios in excess of three to one cause a failure of the first IRIS test. High reserves to surplus ratios (in excess of, say, five to one), may lead to tighter regulatory scrutiny of the insurer's operations and disallowance of various insurer requests.⁴
- *Statutory accounting* in most jurisdictions requires that undiscounted ("full-value") reserves be carried on the company's books, except in special circumstances. Even financial reinsurance, or loss portfolio transfers, have only a limited effect on statutory financial statements.⁵

⁴ See NAIC [1989]. This leverage test derives from the "Kenney rule," which originally recommended a 2 to 1 ratio for fire insurance (Kenney [1967]). The A. M. Best Corporation, other rating agencies, and many state insurance departments examine "reserves to surplus" leverage ratios as well (Best's [1991B], pages xiii-xiv; Federman [1992]).

⁵ In 1991, the NAIC revised the statutory accounting treatment for loss portfolio transfers by adopting the New York procedure (NAIC *Accounting Practices and Procedures Manual*, page 22-6). NEW YORK INSURANCE REGULATIONS, §112.6, "Accounting and Reporting for Loss Portfolio Transfers," require the insurer to "record, without recognition of the loss portfolio transfer, its loss and loss expense reserves on a gross basis on its balance sheet and in all schedules and exhibits." The reserves transferred are shown as a negative write-in liability on line 21 of page 3. The increase in surplus (that is, the reserves transferred minus the consideration paid) must be segregated from unassigned surplus and shown as a write-in item on line 23 of page 3 and termed "loss portfolio transfer account." This surplus gain is not "earned" until the actual liabilities have been terminated. The "loss portfolio transfer account"

A Workers' Compensation Illustration

Each of these constraints may be justified individually; taken together, they are inconsistent. To see this, suppose an insurer with \$100 million of real (or economic) net worth provides Workers' Compensation coverage. To simplify the illustration, initial net worth is assumed to be the same as statutory surplus.⁶

To model the insurer's operations, we posit the amount of premium that it writes. Insurers providing "high-risk" coverage, such as Medical Malpractice or Products Liability, may use a low premium to surplus ratio (say, one to one). Insurers providing "low-risk" coverage, such as Auto Physical Damage, may use a high premium to surplus ratio (say, three to one).

Insurance Risk

Workers' Compensation insurance has attributes of both high-risk and low-risk lines.

- *High Risk:* Benefits are paid gradually, leading to long lags between premium collection and claim settlement, high average reserve "duration," large asset holdings in relation to premium, and therefore high asset risks. To the extent that risk is correlated with the size

is reduced as the primary insurer recovers funds from the reinsurer in excess of the consideration paid. In sum, financial reinsurance transactions do not eliminate the statutory requirements for full value reserves.

⁶ To isolate the effects of the loss reserve valuation basis, the analysis below ignores the differences caused by deferred acquisition costs, or the "equity" in the unearned premium reserve. Alternatively, it assumes that premium is booked as it is collected, as permitted for Workers' Compensation by statutory accounting (NAIC [1990]). Note that the financial and product market constraints relate to the cost of equity capital (or net worth, not statutory surplus) and to real pricing margins, which are more closely connected to net worth than to statutory surplus. Similarly, the analysis uses a ratio of written premiums to net worth, not written premiums to statutory surplus, to highlight the effects on the reserves to surplus leverage ratio. The results would be the same were statutory surplus used everywhere, though the relationships would be more complex.

of reserves, Workers' Compensation would be a high risk line.⁷

- *Low Risk:* Compensation benefits are mandated by statute. Although social expectations affect the types of injuries that are deemed compensable, loss costs have not exhibited the wide fluctuations characteristics of the other long-tailed liability coverages. Workers' Compensation operating ratios are of average stability, suggesting an average level of risk.⁸

We therefore assume that the insurer writes at a two to one premium to net worth ratio, or

⁷ On the average payment lag between premium collection and claim settlement, see Kahane [1978] and Fairley [1979]. We assume an average payment lag of about four years for Workers' Compensation, though this figure varies by jurisdiction, being longer in Pennsylvania or Minnesota, for instance, and shorter in Texas. Woll [1987], page 510, using Schedule P data, estimates an average payment lag for incurred losses of 2.74 years and an average settlement date for Workers' Compensation outstanding losses of 3.64 years. Woll has since updated the latter estimate to about 5 years, implying an average payment lag for incurred losses of about 4 years. Cummins and Weiss [1991], page 142, give a shorter average duration for Workers' Compensation, though without showing the derivation of the figure.

Both Woll and Cummins and Weiss rely on published industry data, which provide only ten years of historical payment patterns. Private calculations using 40 year patterns from a major insurer indicate average payment lags for incurred losses greater than 5 years. Long duration compensation cases are primarily lifetime pension cases, with a reserve run-off after ten years that is substantially slower than the run-off implied by the exponential decay model applied to the first ten years of payments (as used by Woll, following McClenahan [1975]).

⁸ Fluctuations have been greater in the other Commercial liability lines of business. Products Liability outstanding loss costs, for instance, depend on potential insurer liabilities for toxic tort (asbestos) claims and Environmental Impairment (pollution) claims. These costs vary with statutory enactments, such as the 1980 CERCLA legislation, and judicial precedents, such as the 1983 Jackson Township case. See Hamilton and Routman [1988], Burke [1990], and Manta and Welge [1990] for summaries of the underwriting and legal issues, and Cholnoy and Cohen [1989] for the effects on insurance company financial statements.

On the relative stability of Workers' Compensation operating ratios compared with those of the other commercial liability lines of business, see Feldblum [1990]. Profit fluctuations, which affect insurance risk and the leverage ratios that would be considered prudent, differ from average profit. Workers' Compensation has not been profitable, despite the average level of risk; see Fein [1991].

\$200 million of premium a year.⁹ We assume also that

- The financial markets impose a 15% cost of equity capital constraint,
- The product market allows a 5% after tax profit margin (after the time value of money has been considered), and
- Equity capital earns a 5% after tax investment return.

At the assumed two to one premium to net worth ratio, the 5% profit margin provides a 10% return on net worth. This profit margin, combined with the 5% investment yield on capital, produces a total return of 15%, which equals the cost of equity capital. Assuming that other expenses sum to 25%, the discounted loss provision in the rates is 70%, or \$140 million a year. In sum,

Present value of losses = 70% of premium,
Present value of expenses = 25% of premium, and
Net worth = 50% of annual premium.

The average lag from receipt of premiums to payment of losses is about four to five years for Workers' Compensation. To simplify the calculations, and to avoid any criticism that these results are driven by overestimates of the lag, we assume that compensation reserves are three times the annual premium, implying a lag of about four years.¹⁰

With annual premium of \$200 million and a 70% loss ratio, discounted loss reserves are \$420 million. At an 8% interest rate, full value reserves are $\$420 \times 1.08^3$ or \$529 million. Policyholders' surplus is

beginning net worth + retained earnings – statutory reserves + economic reserves

or \$100 million + retained earnings – \$529 million + \$420 million = earnings – \$9 million.

⁹ Two to one is the industry average premium to surplus ratio over the past 20 years on a consolidated basis, though this figure has been declining steadily (Best's [1991A], pages 124 and 132; Feldblum [1993B]). In the illustration here, we begin with the premium to net worth ratio, determine the amount of reserves, and then examine the effect of setting full value reserves vs. discounted reserves on "reserves to surplus" leverage ratios.

¹⁰ A more precise calculation the tabular discounts on certain compensation claims already in Schedule P data and the size of the discount rate for economic reserves for valuing economic reserves. The three to one reserves to premium ratio in this example is a rough approximation that simplifies the calculations.

If the insurer does not retain any of its earnings (e.g., they are all paid out as stockholder dividends), policyholders' surplus is negative and the firm is statutorily insolvent. Even if it retains some of its earnings, its statutory surplus is about zero.¹¹ Yet the firm is earning a 15% return on equity, implying successful performance.¹²

Changing the Scenario

Successful achievement of targeted returns may produce unacceptable statutory results. Economic constraints limit the insurer's ability to prevent regulatory concern:

- Raising premium rates would add profit and increase retained earnings, thereby reducing the statutory surplus strain. But raising rates conflicts with product market constraints. If firms with capital problems are compelled to raise rates to avoid surplus strains, then firms with other sources of capital (such as other financial intermediaries, or insurers writing predominantly other lines of business) would enter this market and force rates down. In short, competition does not allow individual firms to raise prices above an economically justifiable level.
- Reducing the "premium to net worth" leverage ratio would reduce the "reserves to surplus" ratio and thereby mitigate the surplus strain. For instance, if the insurer writes at a one-to-one premium to net worth ratio, economic reserves are \$210 million, statutory reserves are \$265 million, and surplus equals retained earnings plus \$45 million.

But reducing the "premium to net worth" ratio conflicts with the "cost of equity capital" constraint. At a one to one premium to net worth ratio, a 5% profit margin on premium, combined with the 5% investment return on capital, yields a 10% total return on net

¹¹ The beginning net worth is before the insurer begins writing Workers' Compensation policies. The average lag of four years is appropriate in a steady state. Retained earnings are accrued between the inception of the Workers' Compensation business and the steady state period. The mathematics are simplest if retained earnings just compensation for inflation, with any additional earnings distributed to stockholders.

¹² I am indebted to Richard Homonoff and Gary Gregg, who first pointed out these relationships to me.

worth, which is lower than the cost of equity capital. Investors would not supply funds to a firm that promises such meager returns.

In sum, these economic constraints are inconsistent with (i) the statutory requirements for undiscounted reserves and (ii) the regulatory yardstick of a "reserves to statutory surplus" leverage ratio.

The valuation actuary can not change the yardstick. As a business manager, though, he seeks to optimize the economic performance of the firm. If he recommends statutory reserves that are implicitly discounted, he may be unable to sign an unqualified Statement of Actuarial Opinion. If he recommends full value statutory reserves, his company may face regulatory questions or intervention.¹³

Valuation and Professional Conduct

The AAA *Code of Professional Conduct*, Precept 4, concerns "Practice Standards":

"An actuary shall ensure that professional services performed by or under the direction of the actuary meet applicable practice standards."

Annotation 4-3 adds:

"Laws and regulations may establish restraints and obligations on the part of the actuary towards designated publics. The requirements of laws and regulations are binding . . ."

The *Code* is clear: the actuary must set full value reserves if these are required by law or regulation. Insurance practice, which is constrained by business reality, not by the AAA *Code*, is also clear: many insurers have been setting implicitly discounted reserves, and actuaries have been giving unqualified opinions approving them.

¹³ Other considerations also affect this decision. For instance, the IRS assumes that Annual Statement reserves are at undiscounted values. Showing discounted reserves in Schedule P with no disclosure reduces the tax basis loss reserves and increases taxable income, thereby increasing tax liabilities. Similarly, showing discounted reserves with no disclosure overstates apparent income and may hamper rate filing requests. These considerations strengthen the need for accurate reserve estimates with full disclosure of the valuation basis.

Section III: Pricing

The valuation actuary deals with financial statements and state regulators. The ethical dilemmas stem from the conflicting demands of business operations and regulatory prescriptions.

The pricing actuary deals with the public. The personal auto actuary, for instance, sets premium rates and classification relativities that determine the prices paid by drivers for insuring their vehicles.

Equity is the foundation of insurance pricing; but equity has many meanings. In other industries, price discrimination is suspect. Yet insurance premiums are equitable if they correspond to the anticipated losses and expenses on the policy. If the anticipated losses and expenses differ among insureds, and if this difference can reasonably be estimated, then equitable premiums should differ among insureds (Williams [1969]; McClenahan [1990]).

Herein lie the ethical dilemmas, which we group into three categories:

- If statistical evidence supports a rate differential, but social considerations, to which the actuary subscribes, argue against it, how should the actuary proceed?
- If considerations of group equity support a rate differential, but considerations of individual equity argue against it, how should the actuary proceed?
- If a premium rate differential is supported by economic considerations, but not by considerations of equity, how should the actuary proceed?

The firm's objectives are to increase its profits and sometimes to enlarge its operations. It is concerned with statistical evidence, group equity, and legal constraints. Business managers are agents of the firm, and their actions should further the firm's interests. As an employee, the actuary helps shape the pricing policy of the firm. But if the actuary believes that the business needs of the firm conflict with ethical principles, how should he or she act?

Classification by Sex (Pricing Illustration 1)

Social policy, unless enacted into law, is often nebulous. Some view aspects of affirmative action, abortion rights, and poverty programs as social engineering, justified only by legislative approval. Others view them as moral imperatives, which individuals should support even by civil disobedience.

These perspectives extend to insurance pricing issues, such as territorial differentials and classification by sex. This paper does not judge the ethical propriety of any classification dimension. Rather, it asks: "If the actuary views certain classification variables as socially unacceptable, but these variables inure to the benefit of the firm, how should he or she act?"

As an illustration, consider classification by sex. The sex of the driver is used as a classification dimension for certain age groups by most Personal Automobile insurers. This classification dimension raises two ethical concerns:

- Is classification by sex socially unacceptable regardless of its relationship with future insurance loss costs?
- Does classification by sex substitute a proxy variable that has no intrinsic relationship to insurance losses for the true risk attributes that affect losses? And if so, is classification by sex unacceptable as a proxy variable?

The discussion below illustrates the ethical conflicts that the actuary may face; it does not purport to answer these questions.

Social Acceptability

Some people consider sex a socially unacceptable rating variable for personal automobile insurance. They draw an analogy to classification by race in life insurance. African-Americans have shorter average life expectancies than whites have. During the first half of this century, many insurance companies charged higher life insurance premium rates for African-Americans. As discrimination by race became less acceptable (and eventually proscribed), insurers ceased to use this classification variable.

Those who believe that discrimination by sex is ethically no different from discrimination by race advocate the complete elimination of sex as a rating variable in personal automobile insurance. For instance, James Stone, former insurance commissioner of Massachusetts, argued that social concerns about discrimination by sex override statistical evidence of predictive power (Stone [1978], page 165). Similarly, in 1982 the Pennsylvania Supreme Court ruled that sex-based auto rate classifications are "inherently unfairly discriminatory" because they fail to treat "equals equally."¹⁴

In rebuttal, some maintain that the proper analogy is to the use of sex as a rating variable in life insurance. Women have longer average life expectancies than men of the same age, so their life insurance rates are lower. Similarly, women drivers have lower average accident rates than similarly situated men, so their Personal Auto premiums are lower.

Counter-arguments abound. Some critics of insurance classification systems agree with this analogy, but they argue that sex should be prohibited as a rating variable in life insurance as well. For instance, in July 1992, the Maryland insurance department ruled that gender-based life insurance premiums violate the state's Equal Rights Amendment. Where federal law prohibits discrimination by sex, as is true for employee benefits, the Supreme Court has struck down sex based differentials.¹⁵

¹⁴ On the Pennsylvania decision, see the *Journal of Insurance Regulation*, Volume 7, No. 1 (September 1982), pages 11-12. On consumer opinions regarding classification by sex, see Aetna [1978], page 30: "First, some people – probably a small minority – seem to think that the use of criteria such as sex, age and marital status is simply unfair, and that they should be abandoned regardless of the impact on affordability." Forgue [1983], page 329, summarizing a consumer survey of automobile insurance classifications, notes that "the practice of charging males higher automobile insurance premiums than females was thought to be to some degree unfair by 77.0 percent of the respondents" and "86.1 percent supported to some degree an elimination of sex as a rating factor." He concludes that "the use of either sex or marital status as a rating factor is strongly and consistently felt to be unfair by licensed drivers" (page 335).

¹⁵ See *City of Los Angeles, Department of Water et al. v. Manhart et al.* (435 SCT 702 [1978]) and *Arizona Governing Committee for Tax Deferred Annuity and Deferred Compensation Plan v. Norris* (103 SCT 3492 [1983]). In these cases, the Supreme Court ruled that benefit plans requiring women to make larger contributions than those of male co-workers receiving the same pension benefits, as well as benefit plans that provide smaller pension benefits for women who make equal contributions to those of male co-workers, are in violation of Title VII of the Civil Rights Act of 1964.

Others differentiate between the use of sex in life insurance and its use in personal auto insurance. Male physiology is different from female physiology. Sex has a direct relationship to life expectancy, so it is a proper rating variable for life insurance. Race appears to have no significant intrinsic relationship to life expectancy. Most differences by race in mortality rates may reflect differences in socioeconomic status stemming from social or cultural forces, not physiological differences. Life insurance premium rates should depend upon the underlying factors affecting mortality, for which race would be an unacceptable rating proxy. Similarly, some feel that differences by sex in accident frequencies reflect other factors, such as mileage or maturity; personal auto premium rates should reflect these factors, for which sex may be an unacceptable proxy.¹⁶

This dispute will not be resolved here. The purpose of this exposition is simply to show that the ethical issues are not illusory. Many informed citizens believe that sex is not an acceptable rating variable for personal auto insurance, and actuaries are not immune from this opinion.

The business side of this issue is clear. As long as sex is a permitted rating variable, an insurer

¹⁶ Berin, Stolnitz, and Teitlebaum [1990], page 52, note that male-female differences in mortality rates have widened during the 20th century, despite the convergence of life-styles, and they suggest that there may be "some genetic element that contributes to the lower mortality rates enjoyed by women." Cf. also the "Report of the Committee to Recommend New Mortality Tables for Valuation," (*TSA*, Volume 33, 1981) which notes (page 622) that "Mortality differences by sex are clearly demonstrated by current mortality studies, and the differences are becoming greater. Population statistics show that the ratio of the age adjusted death rates for males and females increased between 1920 and 1970 from 108 to 175 percent." [Note, however, that the causes of male-female mortality differences are disputed by other actuaries.]

On mortality rate differences by race, for example, homicides among young black males or fatalities attributable to poverty or hygiene-related illnesses presumably stem from socioeconomic status. To the extent that these are society's "fault," it seems unfair to charge African-Americans more for life insurance. Some disease differences by race or ethnic group, such as sickle cell anemia or Tay Sachs disease, may be independent of socioeconomic status, though their effects on mortality rates are minor.

For opposing views on the relationship of driver sex and mileage with personal auto accident frequency, see Butler, Butler, and Williams [1988] and Miller *et al.* [1979].

which does not use it may be at a competitive disadvantage.¹⁷ The pricing actuary who sees sex as an ethically unacceptable rating variable faces a moral dilemma, particularly if competitive strategy calls for more reliance on classification by sex. For instance, rating differentials by sex may be extended to older drivers or to other lines of business, such as renters insurance.¹⁸

These issues are of pressing importance for both public policy and for the pricing actuary's work. This paper takes no stand regarding these issues. It does not discuss the ethical propriety of particular actuarial practices. Rather, it discusses potential conflicts between the roles of the actuary as a business manager (i.e., an agent of a firm) and as a professional.

Law, Ethics, and Professional Conduct

The AAA *Code of Professional Conduct*, Precept 9, deals with potential conflicts between the actuary's work and legal proscriptions:

"An actuary shall not perform professional services when the actuary has reason to believe that they may be used to mislead or to violate or evade the law."

The *Code of Professional Conduct* deals only sparingly with ethical considerations (see Section V below). The extra-legal obligations discussed in the *Code* relate primarily to actuarial practice and qualification standards (Precepts 3 and 4). Nevertheless, one might extend Precept 9 to cover ethical obligations as well:

"An actuary shall not perform professional services when the actuary has reason to believe that they may be used to violate or evade ethical duties."

This seems reasonable for those ethical imperatives that justify civil disobedience. Some people

¹⁷ On the ethical behavior of business firms in a free market, compare Friedman [1962], page 133: ". . . there is one and only one social responsibility of business – to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition, without deception or fraud."

¹⁸ Lest the reader misinterpret the import, the impartiality of this discussion should be emphasized. Many actuaries do not believe that rate differentials by sex are improper. In fact, some argue that unisex rates are inequitable and are therefore morally suspect. In addition, unisex rates may aggravate availability problems and thereby harm consumers.

feel that certain ethical imperatives take precedence over existing law. Since legal duties take precedence over professional services, as noted in Precept 9, these ethical imperatives take precedence over professional services as well. Many people believe that sexual discrimination issues are at least as important as most statutes. Some believe that these issues are comparable to the civil rights issues of racial discrimination which may justify civil disobedience.¹⁹

The *Code of Professional Conduct* applies to all actuaries, most of whom consider classification by sex to be equitable, at least in certain instances or for certain lines of insurance. To be universally applicable, the *Code* must be general: it prohibits that which is clearly wrong, but it leaves the ambiguous untouched. In practice, ethical dilemmas come in shades of gray, for which noble precepts provide insufficient guidance. Section 5 of this paper suggest how case studies and code clarifications may assist practicing actuaries in applying the *Code's* Precepts to actual situations.

Reunderwriting (Pricing Illustration 2)

Reunderwriting is a necessity in Personal Automobile insurance, however distasteful it may be to both the insured and the insurer. Were all policies non-cancellable, agents would lose their authority to quickly bind risks. Insurers would carefully consider each application before issuing a policy. The good risk gains from reunderwriting, since it allows quicker approval of new business.

Most underwriting cancellations are clearly defensible. Suppose a young driver who recently obtained his license is issued an automobile insurance policy. Two months later, he carelessly hits another driver in a blind intersection. A month afterwards, he negligently collides with another car while entering the freeway. The insurer pays twice for the accidents, and declines to renew the policy.

Let us change the details ever so slightly. Suppose that two months after the policy is issued, the new driver enters a blind intersection and is hit by another car. A month later he is struck

¹⁹ There is no intention that the *Code* ought to be reinterpreted in this fashion. Official interpretations are the prerogative of the American Academy of Actuaries, not of individual members. But each actuary must apply the general precepts of the *Code* to practical situations. This paper illustrates the variety of applications that are possible.

by an oncoming car while entering the freeway. In both cases the young insured collects liability payments from the other driver's insurer.

Good drivers are cautious. They enter blind intersections carefully, rarely hitting others and rarely being hit themselves. They enter freeways only when there is a wide enough passage between oncoming cars. This young driver has not been cited for any violations nor is he at fault in any accidents. But he shows all the signs of a poor risk. Were he applying for a new policy, the insurer would have no qualms about denying it.

Is he truly a poor risk? Perhaps he was indeed careful when entering the blind intersection, but he could not possibly have seen the oncoming car. Perhaps he was indeed careful when entering the freeway, and the other car was truly negligent.

Insurers rely on objective statistics. Accidents are more frequent among young drivers than among middle-aged drivers, among males than among females, among bachelors than among married individuals. The statistics are no less objective here: *drivers involved in accidents for which they were not at fault are more likely to cause future accidents than drivers who were never involved in accidents at all.*

Group versus Individual Equity

Group equity is achieved when the premium relativities among groups correspond to the anticipated losses and expenses of these groups. In a perfectly free and unregulated market, premium rates would adjust to expectations of hazard. In practice, state regulators often constrain pricing freedom, so indicated premium differentials affect underwriting actions. If the allowed premium rate for a group or a member of a group is significantly lower than the indicated rate, then rejection of the application, non-renewal of the policy, or cancellation of the contract may take the place of a premium surcharge.

Individual equity is achieved when

- the premium initially charged to a risk corresponds to its expected losses and expenses, and
- changes to the premium correspond to objective changes in the estimate of the hazard.

The first criterion differs from group equity only in that characteristics of the particular risk are taken into account, such as by experience rating or schedule rating. These rating plans are not discussed here.

The second criterion, changes to the premium rate, often presents ethical issues. The changes need not stem from the "fault" of the insured. For instance, suppose an urban area has a 2.250 Personal Automobile territorial relativity in 1993. A year later, based on analysis of more recent data, the pricing actuary revises the relativity to 2.500. Premium rates will increase even for drivers who caused no accidents in 1993. Reanalysis of the data, or analysis of more recent data, is an objective means of quantifying the hazard.

Similarly, a building situated in an otherwise vacant lot with no adjoining structures may have a low fire insurance rate. If an ill-protected warehouse with flammable contents is erected adjacent to it, the premium rate may increase. External "exposure" is an objective measure of the fire hazard.

When the insured is hit by another car, the change in the estimate of hazard is more subjective. If his or her involvement in the accident stemmed from lack of care, then the original estimate of the hazard was too low. If his or her involvement in the accident was coincidental, then the original estimate of the hazard should not be changed.

The liability of the insured affects the "subjectivity" of this change in the estimate of hazard. If the insured hits another car and is liable for the accident, the presumption is that the accident stemmed from lack of care. If the insured is hit by another car or is not liable for the accident, the presumption is that the accident was coincidental.²⁰

The insurer is concerned only with group equity, which affects its optimal pricing strategy.

²⁰ Liability is based on negligence of the insured. Thus, a determination of liability is an "objective" indication that the insured failed to exercise proper care. The same reasoning applies to traffic violations, in that they are "objective" indications of careless driving.

Once again, there is no intention here to define "equity" or "objectivity." Numerous definitions of each have been proposed, each with some justification. Similarly, there is no intention here to argue that any reunderwriting action is morally right or wrong. Rather, the discussion above shows that ethical dilemmas related to underwriting equity do occur. This paper asks: "When such a dilemma arises, how should the actuary proceed?"

The actuary may be concerned with individual equity as well. The actuary may agree with the insurer that the driver who has been hit by another car is probably a worse risk than previously judged. But he or she may be uncomfortable with changing the premium rate on these grounds alone.

How does this situation differ from other pricing decisions of the firm? Is it the pricing actuary's responsibility to judge the ethical propriety of every underwriting cancellation or application rejection?

This situation differs in that the actuary's recommendation becomes the basis for the insurer's actions. Suppose the Underwriting Department is implementing new reunderwriting guidelines, either for an underwriting handbook or for an automated reunderwriting system, and it asks the pricing actuary for guidance. The actuary may say: "Involvement in an *at fault* accident indicates potentially higher risk; a rate increase or non-renewal of the policy may be warranted." But should accidents be considered solely if they stemmed from the fault of the insured? Business strategy says no. The underwriting action may differ depending on the type of accident, with *at fault* accidents a clearer indication of greater hazard, but all accidents should be considered. For some actuaries, ethical standards may say yes: only at-fault accidents should be considered in reunderwriting decisions.

Price Elasticity of Demand (Pricing Illustration 3)

In a free market, prices are affected by demand elasticity. The price elasticity of demand is the ratio of the relative change in quantity to the relative change in price; that is

$$\text{price elasticity of demand} = (\Delta Q / Q) + (\Delta P / P).$$

For instance, if a change in price from \$100 to \$90 induces an increase in the quantity sold from 1,000 units to 1,200 units, then the price elasticity of demand at the point of 1,000 units is $(+200/1,000) + (-10/100) = -2$.²¹

²¹ Since the price elasticity of demand is generally negative, economic convention is to multiply the result by -1 , so the elasticity is 2 in this example. Since the price elasticity depends on the current point on the demand curve, a rigorous definition uses infinitesimal changes: price elasticity of demand = $(\Delta Q / Q) + (\Delta P / P)$, as $\Delta P \rightarrow 0$, or $(\partial Q / Q) + (\partial P / P)$.

The price elasticity of demand is a fundamental determinant of pricing strategy. The change in profit resulting from a price change equals the change in revenue minus the change in cost. The change in revenue is the difference between quantity times price at the old and new prices.

If a small price reduction induces a large increase in the quantity demanded, the additional revenue is positive. If it exceeds the additional cost of producing the extra goods, then the supplier should lower the price. Conversely, if the price reduction stimulates only a small increase in the quantity demanded, so the additional revenue is negative, or if the additional cost of producing the extra goods exceeds any revenue increase from reducing price, then the supplier should not lower the price. Similar considerations affects decisions to increase prices.

The price elasticity of demand differs among groups of buyers, because of their intrinsic characteristics and because of competitive pressures. Grocery shopping offers clear examples. An inner city grocery store, with no supermarkets offering competition in the neighborhood, may enjoy fewer price restrictions than does a suburban grocery store located near a large supermarket. The suburban grocery store may find high price elasticities at prices near those of the supermarket: if the supermarket charges \$1.19 for a particular item, then a grocery store price of \$1.15 may produce high sales whereas a price of \$1.25 may produce low sales. As a result, the suburban patrons of the grocery store have a higher price elasticity of demand than comparable inner city patrons have.

If the price elasticity of demand varies by classification, then optimal insurance pricing strategy supports price differentials, regardless of "equity."²² Rate differentials based on

²² In theory, price discrimination among groups of buyers is constrained by the Robinson-Patman Act. In practice, price discrimination is common. For example, physician fees may depend on the patient's ability to pay. The justification is moral: poor patients cannot afford high prices, so altruistic physicians provide treatment below cost. Critics of this practice argue that the price discrimination serves to maximize profits, since poorer patients are more price conscious and choose the less expensive physician. Wealthier patients are more concerned with the quality of care than with the price, so they are less likely to switch physicians.

Insurers are exempt from the federal antitrust statutes to the extent that they are regulated by the states. [Presumably this applies to the Robinson-Patman Act as well, though it is not mentioned in final clause of the McCarran Ferguson Act.] The Robinson-Patman Act provides an exemption for price differences justified by cost differences, such as quantity discounts. Since costs depend on the characteristics of the insured, insurers may vary rates by classification as

differences in anticipated losses and expenses promote insurance equity and are expressly permitted. Rate differentials based on price elasticity of demand have dubious justification.²³

An illustration should clarify this. Suppose two large commercial insureds seek Workers' Compensation, Commercial Auto, and General Liability coverage. The two risks are identical in all respects but one: the first insured is considering self-insurance, while the second insured desires a standard policy.

The pricing actuary estimates the expected losses plus expenses as \$460,000 for each risk. The underwriter believes that if the premium charged exceeds \$500,000, the first insured will opt for self-insurance, whereas the second insured will pay a premium up to \$520,000 before looking elsewhere. The schedule rating plan is sufficiently flexible that any premium between \$400,000 and \$600,000 can be justified.

The optimal business strategy is clear: charge \$500,000 for the first insured and \$520,000 for the second insured, providing total profits of \$100,000 [= \$500,000 - \$460,000 + \$520,000 - \$460,000]. But the rate discrimination is not equitable, since there is no difference in expected costs between the two risks. If the premium is \$500,000 for both risks, total profits are only \$80,000; if the premium is \$520,000 for both risks, the first risk opts for self-insurance, and total profits are only \$60,000.

One might argue that the actuary ought simply to forecast the costs and expected profit margins; the final rate charged to each insured should be selected by the underwriter.²⁴ So we turn to a rate relativities example, where the task is entirely within the purview of the actuary.

long as the premiums reflect anticipated losses and expenses (Carlson [1951]).

²³ For instance, the Pennsylvania Unfair Insurance Practices Act prohibits rate discrimination between individuals of essentially the same hazard, unless the differentials are in accordance with rating statutes and regulations; see Horn [1978], pp. 77-78. Superficially, Precept 9 of the AAA *Code of Professional Conduct*, which deals with potential conflicts between the actuary's work and legal proscriptions (see above) may be pertinent to rate differentials based on price elasticity of demand. But few instances of price differences can be ascribed solely to price elasticity of demand; considerations of equity are generally involved as well. Marketplace pressures govern market prices; equity and elasticity are not easily disentangled.

²⁴ Note, however, that Precept 9 relates to the work product of the actuary *being used* to violate the law.

Twenty years ago, drivers above age 65 were surcharged for Personal Automobile insurance. As drivers age, reflexes slow, and the accident hazard increases.

This is true. But older persons drive less, and they often drive more carefully. Personal Automobile accident frequency declines steeply when the insured retires (Feldblum [1993A]). Many carriers now offer retired driver discounts that reflect the decreased accident frequency.

But they reflect it only partially. Drivers over age 65 have generally been with the same carrier for many years, and they are unlikely to price shop at renewal time. That is, retired drivers are less price conscious; they have a lower price elasticity of demand. The optimal premium discount is less than the indicated differential. For instance, if the indicated discount is 20%, the carrier may offer 10%. With the smaller discount, the carrier still retains most of the renewals, but it earns a greater profit.

The rate relativity for older drivers is justified partly by differences in expected costs and partly by differences in the elasticity of demand, though only the former is sanctioned by statute. Should the pricing actuary recommend the rate relativity that is optimal from a business perspective (somewhere between 0% and -20%) or the rate relativity indicated by the data (-20%)?²⁵

²⁵ Other considerations further muddle the waters. Were there no regulatory restrictions on insurance ratemaking, marketplace competition might ensure equitable prices. But onerous rate regulation forces insurers to underprice certain classifications. The insurer must compensate for these losses with higher prices in other classifications.

In addition, retired drivers have the lowest rate among all age groups even with the -10% relativity. The complaint is that the discount is not sufficiently large. The common criticism of insurance classification schemes is that some surcharges are excessive, leading to unaffordable policies for some drivers. Many critics advocate further flattening of the rate structure. According to these critics, actuarially insufficient discounts for low risk classes are sometimes to be desired, not avoided.

Section IV: Testimony

Insurance issues, such as premium rates, profitability, classification systems, and solvency, are increasingly coming into the public limelight. Actuaries play a central role in public hearings, for two reasons:

- Insurer managements, cognizant of actuarial expertise in these areas, depend on actuaries to defend company positions.
- Actuarial societies characterize their members as objective professionals, on whom both sides of a debate may rely for an unbiased opinion.

These two roles of the actuary are often in conflict, either potentially or in practice. As a business manager, the actuary is no different from other officers of his company. Judicial bodies, whether courts or hearing boards, view all company personnel as potentially biased, serving the interests of their employers. As a professional, the actuary purports to remove the shackles of prejudice and to present objective testimony on insurance issues.²⁶ The success of the Casualty Actuarial Society, the Society of Actuaries, and the American Academy of Actuaries in promoting this role of the actuary has been extremely beneficial to their members. It has also exacerbated some potential conflicts, which this section discusses.

²⁶ Cf. the Canadian Institute of Actuaries' Recommendation 6.01, quoted by Karp [Landry, Flahavan, Karp, and Smith: 1988], page 600:

"The actuary should recognize that while the expert acts in an adversarial system and is usually retained by one of the opposing parties, the role as an expert witness is to assist the court in its quest for truth and justice."

Similarly, Karp cites the comments prepared for the Vancouver Actuaries Club in November 1985 by the Chief Justice of the Supreme Court of British Columbia:

"In the last 20-30 years . . . we have experienced a new phenomenon – the expert advocate in many disciplines who is clearly not a disinterested professional. This breed of expert is easy to identify and he has little credibility. Fortunately, this is not often seen with actuaries but it is not uncommon with economic experts, physicians, psychologists and social workers. I think it is essential, if the high regard we all have for actuaries is not to be diluted, for expert witnesses to be models of objectivity and reasonableness."

Casualty actuaries testify in two areas:

- They testify in support of rate filings, to justify trend factors, loss development factors, expense loadings, or profit provisions. The actuary is a skilled technician and expert witness, explaining items which lay persons can not independently evaluate. Public policy issues are not directly involved.
- Issues of profitability, classification, and solvency are being increasingly aired in public forums. Actuaries and economists testify on public policy questions such as
 - What is a fair rate of return for the insurance industry?
 - What types of classification schemes are fair to insureds?
 - What solvency measures are fair to both policyholders and insurers?

Ethical issues arise when questions of "fairness" are addressed. Let us begin, though, with rate filings, since they present fewer difficulties.

Rate Filings

Business managers in highly competitive, unregulated industries face few ethical problems when setting prices. Competition keeps prices from rising too high; costs keep prices from falling too low. Prices float about a market determined equilibrium point.

In most lines of insurance, competition is keen. Two facets of insurance regulation, however, disrupt the price mechanism. First, in many jurisdictions insurers must justify rate revisions, particularly rate increases. Second, there is often strong political pressure on state regulators to keep prices low.

Many insurers and rating bureaus expect that regulators in certain jurisdictions will approve only part of any rate increase requested, particularly in politically sensitive lines like personal automobile and workers' compensation. In anticipation of this, some insurers and rating bureaus request larger rate increases than are needed, knowing that the approved increase will not be excessive. For instance, if an insurer expects a regulator to grant only half of the rate request, and a +10% increase is needed to keep Workers' Compensation rates

adequate, the insurer may file for a +20% increase. [The flexibility of ratemaking procedures, and the judgment used in selecting development factors, trend factors, credibility weights, risk loads, and profit provisions, allows sufficient latitude in the actuarial rate indication.]

Moreover, suppose that the +10% rate increase is not only sufficient, but it is also the maximum increase that the market will allow. If the regulator approves the +20% increase, the insurer will provide greater schedule rating credits and policyholder dividends to maintain its market share. The +20% requested rate revision is simply a tactic to obtain the needed +10% increase.²⁷

But to obtain the +10% increase, the actuary must testify that a +20% increase is warranted. For instance, the filing may use a +12% annual average claim cost trend factor, based on historical trends, although the actuary believes that future economic and inflationary conditions will keep the trend factor within +10% per annum. Similarly, a workers' compensation filing may use a -5% profit provision, though the actuary believes that -8% is more appropriate for this line of business.

Some actuaries conceive of rate hearings as a strategic game. If the actuary believes that to obtain a +10% increase he must testify that +20% is warranted, his conscious may gnaw at him for a day or two, but he is unlikely to consider his testimony in conflict with ethical conduct. Other actuaries would refuse to testify for any request in excess of 10%.²⁸ In general, though, the ethical issues are more salient in other forums, to which we now turn.

Public Policy

Ethical issues are more pronounced in testimony regarding public policy, for several reasons:

²⁷ This strategy may backfire. In certain lines of business, some regulators now assume that rating bureau rate filings are systematically overstated. This hardens their resolve to deny rate requests, and it deepens their distrust of pricing actuaries.

²⁸ Compare Cripe [1991], page 20: "If you don't support a particular position, don't testify. If you are requested to testify in support of it, decline. If your company insists, consider a career change. There are a lot of good actuarial jobs. You only have one reputation." See also Paquin [1983].

- The actuary does not testify merely as a skilled technician explaining the derivation of rate filing parameters. When testifying on insurance profitability, for instance, he discusses issues of equity: what is a *fair* rate of return? When the topic is equity, ethical considerations become paramount.
- Opposing testimony is generally presented at forums dealing with public policy issues. Often the counter-testimony is misleading, such as the argument that insurers make "obscene" profits. Such counter-testimony transforms the forum from reasoned debate to political maneuvering. How closely should the actuary hew to objectivity?

Fair Rate of Return

Consider the extended debates on the fair rate of return to insurance companies, most recently in California, and previously in Massachusetts and New Jersey. Actuaries, economists, financial analysts, and representatives of various organizations have testified on the appropriate means of measuring the rate of return and choosing a target level.

Several attributes are common to the debates in each of these jurisdictions:

Competition: When competition among insurance companies is free, marketplace forces determine the rate of return. Furthermore, many economists believe that when competition is sufficient, the marketplace determined rate of return is both optimal and "fair." The issue of "fair rate of return" arises when restrictive regulation so impedes competition that the price mechanism fails to work. In fact, the "fair" rate of return is sometimes defined as the rate of return that would exist in a competitive market.

Regulation: Restrictive regulation is justified as a means of helping consumers by thwarting excessive rates and insurer profits. Many actuaries believe that these concerns are illusory: insurer profits, being lower than those of comparable industries, are rarely excessive.

In many cases, the restrictive regulation itself seems unfair to insurers, since it denies them a reasonable return on their investments. Oppressive regulation may drive insurers from the jurisdiction and cause the involuntary markets to grow. In the long run, consumers are hurt as much as insurers, since coverage becomes unavailable, product innovation declines, and the

quality of service in the assigned risk pools is poor.

Uncertainty: Actuaries are of varied opinions about the appropriate measure of rate of return.

- Should one compare insurance returns with those of comparable industries?
- Should one use financial models to estimate the cost of equity capital (and thereby the target rate of return)?
- Should one consider returns on premium, equity, or assets?
- What leverage ratios should one use to transform returns from one base to another?
- Should one consider returns on all funds or only on policyholder supplied funds?
- How should unrealized capital gains, whether on stocks or bonds, be handled?
- Should one consider accounting returns, whether statutory or GAAP, or financial returns?

Despite this diversity of opinion, most actuaries agree that much of the opposing testimony is politically motivated distortion of insurance profitability. Examples of this include the use of

- paid loss to written premium ratios along with the inclusion of investment income,
- the exclusion of various assessments imposed on insurers, such as those for involuntary markets or guarantee funds, and
- the consideration of primarily unprofitable years to set a target rate of return.

In private conversations, actuaries often reveal their uncertainty about many of these issues:

- Should cost of equity capital calculations derived from the Capital Asset Pricing Model use arithmetic or geometric averages?
- How does insurance risk vary by line of business? Should this risk affect leverage ratios, discount rates, or expected returns?
- Why are accounting returns for the insurance industry consistently lower than financial returns?

Each of these issues is material. The difference between arithmetic and geometric averages gives a two point difference in the cost of capital. Accounting returns have averaged about three or four points below financial returns over the past 20 years. Actuaries have linked insurance risk to target leverage ratios, discount rates, and the expected returns.²⁹ Rare is the actuary who has definite opinions on all these matters.

²⁹ See Feldblum [1992; 1993B] on the first two issues. Regarding the third issue, note that the California rate of return calculations use a 1:1 premium to surplus ratio for other liability but a 5.5:1 ratio for automobile physical damage.

Uncertainty rarely makes for persuasive testimony. Some hearing officers recognize uncertainty for honesty; others interpret uncertainty as naivete. Most insurers desire strong, convincing testimony from their witnesses, not soft remarks about a range of possible answers.

Counter-testimony: The situation is complicated by the counter-testimony. Suppose the actuary believes that the fair rate of return is 15% on equity, but his employer wishes to argue for a 20% return. He can find support for the figure, though he does not believe that it is correct. He knows that the economist providing opposing testimony will argue for a 10% return on equity. The actuary suspects that the hearing officer, who is not an expert on this subject, will split the difference between the two opinions. From private conversations, he knows that the economist also believes that the fair rate of return is 15%, and the 10% figure is being presented only in anticipation of the insurer's argument for a 20% return. How should the actuary testify?

- As a business manager, who is the agent of the insurer, the actuary should testify for a 20% return.³⁰ He should support this figure even as the economist will support a 10% return. *The approved return will probably be about 15%, which the actuary thinks is correct.*
- As a professional, the actuary should testify for a 15% return on equity, and he should present convincing support for this opinion. He knows that the hearing officer can not evaluate the quality of the support. Instead, he will probably split the difference between his testimony and that of the economist, leading to 12.5% return on equity.

If the actuary informs his employer that the correct figure is 15%, his employer might say: "Even if you believe that 15% is the correct figure, you must testify for 20% to obtain that. *If you desire an equitable outcome, your testimony must be biased.*" How should the actuary respond?

³⁰ Thus, the "restatement" of the law of agency states that "an agent is subject to a duty to his principle to act solely for the benefit of the principle in all matters connected with his agency" (§385). Similarly, Valesquez [1988], page 357, says that "the employee's main moral duty is to work toward the goals of the firm and to avoid any activities which might harm those goals."

Section V: Code of Professional Conduct

The American Academy of Actuaries has promulgated a *Code of Professional Conduct* to "identify the professional and ethical standards by which the actuary is expected to abide and thereby serve the public interest." The *Code* contains 16 Precepts that summarize the standards along with 23 Annotations that provide "additional explanatory, educational and advisory material to members of the actuarial profession on how the Precepts are to be interpreted and applied."

Does the *Code* provide guidance for the practicing actuary facing the ethical dilemmas outlined above? In particular,

- Is the *Code* intended to deal with these issues?
- Is the *Code* hortatory or practical?
- If the *Code* is intended as a guide to ethical issues, how might it be improved to assist the practicing actuary?

Professional Conduct and Ethics

Does the *Code* deal with professional conduct or with ethics? The title mentions professional conduct, but the first sentence speaks of "ethical standards" and the "public interest." Professional conduct implies ethical action – that is, behavior that transcends mere comportment with the law.³¹

³¹ Although the American Academy's Actuarial Standards Board [1991], page iv, notes that "The Guides and Opinions address ethical issues," other professional codes often have more explicit emphasis on ethics, such as

- The American Medical Association's "Principles of Medical Ethics."
- The American Bar Association's "Code of Professional Responsibility," which contains four sections, one of which is "ethical considerations."
- The Professional Standards of the American Institute of Certified Public Accountants, whose sections include "Concepts of Professional Ethics" and "Ethics Rulings."
- The American Society of CLU's "Code of Ethics," and
- The Society of CPCU's "Code of Ethics," which consists of seven "Specified Unethical Practices" and three "Unspecified Unethical Practices."

The relationship between professional conduct and ethical behavior stems from the nature of a "profession." Professions are characterized by the rigorous intellectual training required of practitioners, as exemplified by the extensive university education in medicine, law, and theology since the end of the European Middle Ages.³²

Actuarial science shares this attribute of rigorous intellectual training. Passing the actuarial examinations is an arduous prerequisite for entry into the profession. Regulatory acceptance of the actuary's qualifications stems primarily from the actuarial societies' maintenance of high educational standards.

Another attribute characteristic of professions relates to ethics. The professional serves the public, not simply his employer, and he or she is therefore held to higher ethical standards than are other individuals. Thus, the physician serves the interests of his patient; the lawyer is encouraged to work *pro bono* for indigent citizens; the public accountant considers the interests of all stakeholders in a firm.³³

³² On the characteristics of a profession, cf. Barber [1963]: "Professional behavior may be defined in terms of four essential attributes: a high degree of generalized and systematic knowledge; primary orientation to the community interest rather than to individual self-interest; a high degree of self-control of behavior through codes of ethics internalized in the process of work socialization and through voluntary associations organized and operated by the work specialists themselves; and a system of rewards (monetary and honorary) that is primarily a set of symbols of work achievement and thus ends in themselves, not means to some end of individual self-interest." Appelbaum and Lawton [1990], page 4, write: "A profession consists of a group of people organized to serve a body of specialized knowledge in the interests of society." Bayles [1981] says: "Three necessary features have been singled out by almost all authors who have characterized professions. First, a rather extensive training is required to practice a profession. . . . Second, the training involves a significant intellectual component. . . . Third, the trained ability provides an important service in society. . . . In short, professions provide important services that require extensive intellectual training."

³³ It has been argued that the altruism implied by the commitment to public service is no more than a sham devised to legitimize the monopolistic interests of the profession. While the monopolistic character of most professions can not be gainsaid, the role of ethical codes in supporting the monopoly is unclear. For instance, the medical profession, by control over medical school accreditation, limits the supply of physicians, and by control over the authority to prescribe drugs, it raises the demand for physicians. As a result, medical services are unaffordable by the poor and unavailable in many neighborhoods, but physicians' incomes are kept high. Were it not for AMA control over medical school accreditation and drug prescriptions, the supply of physicians would increase, other professionals (such as nurses) could substitute for doctors in poor neighborhoods, and medical incomes would decrease. The

Most actuaries work for private carriers, consulting firms, rating bureaus, or state insurance departments. Few casualty actuaries serve individuals or the general public.³⁴ The actuary is a businessperson, and the AAA *Code* reflects this. Except for the first precept, the *Code* deals with professional behavior, not ethical behavior. The actuary's relations are with employers and clients, not with consumers or with the public.

Professional Integrity

The first precept, which alludes to ethics and the public, warrants additional comment:

Professional Integrity

"Precept 1. An actuary shall act honestly and in a manner to uphold the reputation of the actuarial profession and to fulfill the profession's responsibility to the public."

"ethical" injunctions of public service, altruistic behavior, and high standards legitimize the monopolistic practices and help avert public criticism.

Similarly, the American Bar Association's Code proscribes the unauthorized practice of law, and (until they were struck down by the courts) "ethical" precepts prohibited certain forms of advertising. These proscriptions reduce competition and increase lawyers' incomes, although they are justified as maintaining high quality legal service. The diversion of wealth from society to a particular group can hardly be labeled altruism.

Public accountants have exclusive authority to certify the financial statements of publicly traded firms. By representing the interests of the public, the accounting profession can justify the need for extensive audit work and the resultant high incomes.

Each of these criticisms is contested, and this paper takes no stand on their validity. High professional incomes are maintained by monopolistic organizational structures, which are supported by various attributes of the professional societies, including the Codes of Ethics. It is unclear, though, whether the net effect of the altruistic rationales in the professional codes is beneficial or harmful. If the monopolization would occur anyway, but the ethical precepts encourage at least some members to serve the public interest, then they are beneficial. If the monopolization would be less severe without the altruistic justification, the "ethical" precepts may be harmful to society. See, for instance, Larson [1977] and Kultgen [1982; 1988], who advance similar criticisms of ethics codes, and Bowie [1979] and Davis [1987], who defend the merits of such codes.

³⁴ Hunter [1990] argues for pro-bono actuarial work, but such instances are rare.

The precept has three clauses:

- "An actuary shall act honestly . . ." One might rephrase this as "An actuary shall not be dishonest." Few would dispute this, and equally few believe that this is peculiar to actuaries. One can say: "We should all act honestly; no one should be dishonest."
- ". . . in a manner to uphold the reputation of the actuarial profession . . ." The clause is vague: What is the reputation that the actuary is to uphold? What behavior serves this function? Rephrasing clarifies: "The actuary shall not perform acts that disgrace the profession." Again, few would dispute this, and few could claim that it is peculiar to actuaries. In any case, upholding the reputation of the profession is legitimized by self-interest, not just by ethical considerations.
- ". . . and to fulfill the profession's responsibility to the public." Nowhere in the *Code* is the profession's responsibility to the public revealed. The acts that fulfill it are performe unknown. A critic might claim that the words have fluff, but no substance.

This precept has no Annotations. There are no illustrations, no case studies, no clarification,³⁵ Let us consider, though, what guidance might be useful.³⁶

³⁵ Contrast the Code of Ethics of the Society of CPCU: ". . . the Institute periodically publishes *Guidelines*, advisory *Opinions*, *Summaries of Previous Rulings* and similar materials designed to assist CPCUs and CPCU candidates in interpreting the various *Code* provisions, understanding their rationale and applying them to frequently-encountered situations which require ethical judgments" (CPCU [1979], page 2). Other professional codes of ethics, such as that of the American Bar Association, have even greater emphasis on practice. Cf. Horn [1978], page 65: "In so far as the interests of practicing attorneys and their clients are concerned, the strength of the ABA Code seems to lie in the specificity of its ethics rules. One may question some of the rules. Yet, if complex ethical issues are to be dealt with effectively, they cannot be circumvented by total reliance upon a small number of broad guidelines. They must either be dealt with specifically or left entirely to varying individual judgments of what is proper. Because the ABA Code gets specific, it is lengthy. Therein is a lesson which other organizations have yet to learn. They are content to tell their practitioners to "be ethical." They just have not told them what that really means, and in that sense they have missed the point."

³⁶ In truth, there is no consensus on what guidance is appropriate, which may account for the lack of specifics in this Precept. This section is the text is therefore illustrative, not normative. It suggests how the Precept might be clarified, not how it should be clarified. Normative guidelines must stem from the AAA or from its representative bodies, not from

Precept 1: Actuarial Honesty

An actuary shall act honestly, even if alternative courses of action would better please an employer or client. An actuary may not justify dishonest means by invoking a laudable end.

Annotation 1-1: The Precept categorically prohibits dishonest actions. A refusal to act is acceptable as long as it does not harm third parties. For instance, an actuary may refuse to testify in support of a rate filing if he or she can not honestly defend it.

A refusal to act is not acceptable if it harms third parties. For instance, a claims examiner, aware that the accident victim needs compensation, may offer a settlement that is unjustifiably low. An actuary involved in this transaction has a responsibility to seek a fair settlement of the claim.

The duty to act is sometimes an ethical responsibility. Although a refusal to act is not normally a cause for disciplinary action, each case must be examined individually.

Annotation 1-2: Insurance is both a business enterprise and a political struggle. It is a business enterprise in that consumers exchange a fixed premium for an uncertain loss. It is a political struggle in that various interest groups vie for society's wealth. The actuary may not employ dishonest political actions to achieve a laudable business goal. For instance, dishonest testimony may not be used to achieve adequate rates. Dishonest opposing testimony may be countered only by actuarially justified arguments.³⁷

Precept 2: Ethical Responsibilities

An actuary has an ethical responsibility to the public, in addition to professional responsibilities to employers and clients. Although an actuary may devote his or her efforts primarily to

individual actuaries.

³⁷ This section illustrates form, not content. Alternative precepts can be equally well supported by moral reasoning. For instance, ineffective rebuttals of dishonest testimony adversely affects the public. Safeguarding the innocent from harm may be sufficient justification for "aggressive" testimony.

employer or client services, the ethical responsibility to the public may not be dismissed.

Annotation 2-1: Ethical responsibilities are not specifically defined by the *Code*, since they depend on changing social norms and individual beliefs. In general, ethical responsibilities entail the avoidance of unjustified harm to other parties.

For instance, actuarial advice on rating or classifications may benefit an employer or client but may harm certain consumers. Higher premiums for certain groups, if actuarially justified, do not constitute harm. Rating or underwriting practices that constitute "unfair discrimination" may not be supported by the actuary, whether or not these practices are prohibited by statute. The actuarial profession recognizes that "unfair discrimination" is not easily defined. Each case of alleged unethical action must be examined individually to judge whether disciplinary action is warranted.

Annotation 2-2: Insurance concepts may be unclear to the public. Such concepts include policy provisions, rating classifications, and claims practices. Actuaries should educate the public regarding these concepts and should intervene to help individuals unfamiliar with their rights. *The actuary is often more competent than others to identify instances of improper underwriting, classification, or claims practices.*

Case Studies

These annotations are still general; undue detail is not appropriate for a professional code. The Society of CPCU, which places great emphasis on professional ethics, concretizes the *Canons* in its Code in two ways:

- The Society of CPCU has prepared case studies to illustrate the reach of the Code.
- Many issues of the CPCU quarterly newsletter contain a column on ethics. Members of the Society of CPCU are encouraged to respond to the ethical queries that are posed.

The *Code of Professional Ethics of the American Institute for Property and Liability Underwriters* [1979], contains twenty "hypothetical case studies," which "did not arise from . . . any actual proceeding" but are "based upon abbreviated case summaries and assumptions that are designed to maximize their educational value." Some textbooks on professional ethics follow

the same pattern. Appelbaum and Lawton [1990], for instance, contains nineteen brief "decision scenarios" to illustrate the ethical principles.

An alternative format, pioneered by the Harvard Business School and used here, is to present actual case studies. Velasquez [1988], for instance, contains extended case studies of ethical problems that have arisen in American business: antitrust, job discrimination, environmental impairment, employee drug tests, bribes, and similar issues.³⁸

Two case studies are presented below. Case studies are not textbook examples: there are no "right" or "wrong" answers that can be rigorously derived from a thorough understanding of theoretical principles. Nevertheless, many actuaries believe that certain actions are ethically proper or suspect. The actuarial profession would be well served by having members of the American Academy's Actuarial Board of Counseling and Discipline, or other representatives of the actuarial societies, compose illustrative discussions of these case studies, both for new actuarial designees and for other actuaries dealing with such issues.

The two case studies relate to pricing and valuation. In each instance, the facts and ethical dilemmas are presented. As far as possible, public documents are used: court decisions, published memoranda, and FASB statements. No "resolutions" of these case studies are provided, since there are no universally accepted resolutions to these problems.

Pricing Case Study: Development of the Ford Pinto

The development of the Ford Pinto deals with a corporation's responsibility for consumer safety. It is a particularly appropriate case study for actuaries, since some of the ethical issues pertain to projections of automobile accidents and the associated costs of human injury and death.

The facts are drawn from the appellate court decision resulting from a May 1972 Pinto accident, in which the driver of the automobile, Lilly Gray, died, and a thirteen year old passenger, Richard Grimshaw, suffered severe burns, physical disfigurement, and the loss of

³⁸ Similarly, Callahan [1988] contains short case studies at the end of each chapter.

several fingers and an ear.³⁹ Additional details are drawn from the case studies in Valesquez [1988] and Callahan [1988].

In the mid-1960's, the Ford Motor Company was losing market share to subcompact cars, particularly the German Volkswagen. In 1968, Mr. Lee Iaccoca, then executive vice-president of Ford, implemented a project to quickly design and build an inexpensive, lightweight car, the Ford Pinto, that could compete against the Volkswagen. His objective was "to build a car at or below 2,000 pounds to sell for no more than \$2,000" (*Grimshaw*, page 360). Valesquez [1988], pages 119-120, describes the effects on the car's design (see also *Grimshaw*, pages 360-362):

Although the normal preproduction testing and development of an automobile takes about forty-three months, the Ford teams managed to bring the Pinto to the production stage in a little over two years. Because the Pinto was a rush project, styling preceded engineering and dictated engineering design to a greater degree than usual. Among other things, the Pinto's styling required that the gas tank be placed behind the rear axle, leaving only nine or ten inches of "crush space" between the rear axle and rear bumper. In addition, the differential housing had an exposed flange and a line of exposed bolt heads which were sufficient to puncture a gas tank driven forward against the differential upon rear impact.

Safety tests performed by Ford, which highlighted the potential injuries that might result from rear-end collisions, were reviewed by Ford's management. The court records in *Grimshaw*, page 360, describe the tests:

These prototypes as well as two production Pintos were crash tested by Ford to determine, among other things, the integrity of the fuel system in rear-end accidents. . . . Mechanical prototypes struck from the rear with a moving barrier at 21-miles-per-hour caused the fuel tank to be driven forward and to be punctured, causing fuel leakage in excess of the standard prescribed by the proposed regulation. A production Pinto crash tested at 21-miles-per-hour into a fixed barrier caused the fuel neck to be torn from the gas tank and the tank to be punctured by a bolt head on the differential housing. In at least one test, spilled fuel entered the driver's compartment through gaps resulting from the separation of the seams joining the rear wheel wells to the floor pan.

Callahan [1988], page 296, paints an equally dismal picture of these tests from a memorandum attached to the statement of J. C. Echold (director of automobile safety for Ford):

Internal memos showed that Ford crash-tested early models of the Pinto before production

³⁹ *Grimshaw v. Ford Motor Co.*, 119 Cal. App. 3d 757, in West's *California Reporter*, Volume 174 (St. Paul, Minnesota: West Publishing Co., 1982), pages 348-399.

"at a top-secret site, more than forty times and . . . every test made at over 25 mph without special structural alteration of the car . . . resulted in a ruptured fuel tank." Stray sparks could easily ignite any spilling gasoline and engulf the car in flames. Several years later, a spokesperson for Ford acknowledged that "early models of Pintos did not pass rear-impact tests at 20 mph."

Nevertheless, Ford continued with production of the Pinto. Grimshaw, pages 360-361, notes:

When a prototype failed the fuel system integrity test, the standard of care for engineers in the industry was to redesign and retest it. The vulnerability of the production Pinto's fuel tank at speeds of 20 and 30-miles-per-hour fixed barrier tests could have been remedied by inexpensive "fixes," but Ford produced and sold the Pinto to the public without doing anything to remedy the defects.

Costs and Benefits

A Ford study titled "Fatalities Associated with Crash Induced Fuel Leakage and Fires" compared the costs and benefits of design improvements that would have eliminated or reduced the hazard of gas tank rupture. The estimated cost of the design improvements was \$11 a vehicle.⁴⁰ The study concluded:

The total benefit is shown to be just under \$50 million, while the associated cost is \$137 million. Thus the cost is almost three times the benefits, even using a number of highly favorable benefit assumptions.

Benefits:

Savings - 180 burn deaths, 180 serious burn injuries, 2100 burned vehicles.
Unit cost - \$200,000 per death, \$67,000 per injury, \$700 per vehicle.
Total benefits - 180 x (\$200,000) plus
180 x (\$ 67,000) plus
2100 x (\$ 700) = \$49.15 million.

Costs:

Sales - 11 million cars, 1.5 million light trucks
Unit cost - \$11 per car, \$11 per truck
Total costs - 11,000,000 x (\$11) plus
1,500,000 x (\$11) = \$137 million.

The estimates of the number of accidents resulting from the fuel tank hazard (180 burn deaths, 180 serious burn injuries, and 2,100 burned vehicles) were based on internal Ford studies.

⁴⁰ These figures are drawn from a memorandum attached to the statement of J. C. Echold, as reproduced in Valesquez [1988] and Callahan [1988].

The average value of a human life (\$200,000) was derived from a National Highway Traffic Safety Administration study, which provided the following detail:

<i>Component</i>	<i>1971 Costs</i>
<i>Future Productivity Losses</i>	
<i>Direct</i>	\$132,000
<i>Indirect</i>	41,300
<i>Medical Costs</i>	
<i>Hospital</i>	700
<i>Other</i>	425
<i>Property Damage</i>	1,500
<i>Insurance Administration</i>	4,700
<i>Legal and Court</i>	3,000
<i>Employer Losses</i>	1,000
<i>Victim's Pain and Suffering</i>	10,000
<i>Funeral</i>	900
<i>Assets (Lost Consumption)</i>	5,000
<i>Miscellaneous Accident Cost</i>	200
 <i>Total per Fatality:</i>	 \$200,725

Discussion

The ethical issues in the Pinto case relate primarily to the Ford Motor Company's alleged disregard of consumer safety in its quest for corporate profits. The trial court jury, for instance, granted a \$125 million punitive damage award to Richard Grimshaw, reflecting Ford's "malicious" conduct.

Our interest is in actuarial conduct, not the propriety of Ford's action. Assume that you are a consulting actuary specializing in Personal Auto accident costs. The Ford Motor Company is doing a cost-benefit analysis of design requirements for a new car. Ford engineers have estimated the expected performance of the vehicle with various designs. You are asked to quantify

- the expected number of accidents with each design,
- the social cost of these accidents, and
- the expected liability of the company for these accidents.

1. Should an actuary consider the ethical implications of a client's use of an actuarial report? Precept 9 of the AAA *Code of Professional Conduct* says "*An actuary shall not perform professional services when the actuary has reason to believe that they may be used to mislead or to violate or evade the law.*" Should the actuary also consider whether the services may lead to actions that are ethically "improper"? What uses of actuarial services are ethically "improper"?
2. How should human suffering be compared with production costs? Is the utilitarian analysis outlined in the Ford Pinto case a proper method? Should actuaries include other considerations as well?
3. How should an actuary estimate the "social cost" of automobile accidents? In the analysis in this case study, "victim's pain and suffering" is 5% of the total cost. In auto liability cases, "pain and suffering" often exceed economic damages. How should the actuary value such intangible losses when estimating social welfare costs?

Valuation Case Study: Environmental Impairment Liabilities

Setting bulk reserves for environmental impairment exposures is a difficult task for the valuation actuary. The uncertainty in the estimates, the variation in industry practice, the lack of clear directives for either statutory or GAAP reporting, and the enormous size of the potential liabilities often lead to disagreements between appointed actuaries and company managements. The following hypothetical case study highlights the professional conduct issues related to the Statement of Actuarial Opinion.

Caroline Roemer was promoted to appointed actuary by the Board of Directors of the Commercial Accident Insurance Company in December 1992. Commercial Accident, the largest writer of general liability insurance, specializes in products coverage for large manufacturers and malpractice coverage for professional associations, such as physical therapists and speech pathologists. It writes no personal lines or Workers' Compensation coverage, and moderate amounts of Commercial Multiperil, Commercial Auto, and Commercial Property.

Adverse Medical Malpractice experience in the 1970's and General Liability experience in the early 1980's weakened Commercial Accident's balance sheet. The company wrote \$5.5 billion

in premium in 1992, of which \$3.8 billion was for *Other Liability and Products Liability*. Statutory surplus at December 31, 1992, was \$2.3 billion, and reported loss and loss adjustment expense reserves were \$9.5 billion.

The company holds \$650 million in bulk reserves for environmental impairment exposures. Case reserves for reported pollution claims are often insufficient, and much of the corresponding loss payments comes from surplus. The company is involved in 235 declaratory judgment actions against policyholders, and it has 11,500 reported pollution claims.

The company's actuarial, legal, and claims departments do careful studies of the potential liabilities related to environmental impairment exposures. Caroline estimates that the additional bulk reserves needed for these exposures ranges from \$400 million to over \$3.5 billion on an undiscounted basis, with a "best guess" projection of \$1.2 billion. She estimates the present value of these liabilities at about 50% of the undiscounted amounts.

Commercial Accident's management is aware of the potential severity of the environmental impairment exposures, having responded to federal, state, and rating agency inquiries on this topic. Because of the company's financial condition and the great uncertainty in the bulk reserve estimates, management is averse to reporting additional bulk reserves in the annual statement or in SEC documents. Additional disclosure, it is argued, may invite further legal action and do more harm than benefit to policyholders.

Caroline agrees with the company's perspective, but she is troubled by the requirements for the *Statement of Actuarial Opinion* regarding loss and loss adjustment expense reserves. She has requested a meeting with the company's president, chief financial officer, and legal counsel to discuss the wording of her opinion.

Robert Brokaw, the company's president, opens the meeting by stressing the uncertainty in the bulk reserve estimates. Stephen Billig, senior vice president and company counsel, notes that the ultimate liability will depend greatly on the resolution of several declaratory judgment actions, though the litigation will continue for many years before the decisions are final. Timothy Kanner, the chief financial officer, adds that GAAP accounting does not require the *booking of uncertain loss contingencies*.

Tim: We are already holding nearly \$1 billion in case and bulk reserves for environmental impairment exposures. I don't dispute Carol's estimate that our ultimate loss payments will probably be higher, but additional reserve bookings are not warranted. The Statement of Financial Accounting Standards #5, which gives the GAAP approach to reporting of loss contingencies, says:

"An estimated loss from a loss contingency shall be accrued by a charge to income if both of the following conditions are met:

- a. Information available prior to issuance of the financial statements indicates that it is probable that an asset had been impaired or a liability had been incurred at the date of the financial statements. It is implicit in this condition that it must be probable that one or more future events will occur confirming the fact of the loss.*
- b. The amount of the loss can be reasonably estimated."*

Steve: The potential payments on our pollution exposures don't meet either of these conditions. In a few cases, we expect to be judged liable for clean-up costs. Most other cases depend on the resolution of the declaratory judgement actions. The various states have interpreted the CGL policy clauses and exclusions in different ways, and many court decisions are later reversed on appeal.

Bob: Even when we believe that we will be judged liable, we can't estimate the amount. The total costs of clean-up are unknown, and our insured's share is entirely uncertain. With joint, several, and strict liability for clean-up of Superfund sites, and with hundreds of potentially responsible parties involved in the major cases, it is nearly impossible to quantify the amounts that we will ultimately pay.

Carol: There may not be a GAAP requirement to accrue the loss, but even GAAP requires disclosure. In fact, Statement #5 goes on to say:

"If no accrual is made for a loss contingency because one or both of the conditions in paragraph .105 are not met, or if an exposure to loss exists in excess of the amount accrued pursuant to the provisions of paragraph .105, disclosure of the contingency shall be made where there is at least a reasonable possibility that a loss or an additional loss may have been incurred. The disclosure shall indicate the nature of the contingency and shall give an estimate of the possible loss or range of loss or state that such an estimate cannot be made."

Steve: This is a GAAP standard. Are such disclosures needed in the Statement of Actuarial Opinion?

Carol: The NAIC instructions are not as clear as GAAP standards, but disclosure of items affecting the potential adequacy of loss reserves is required. Moreover, the actuary must state in the Statement of Opinion that

"the amounts carried in the balance sheet on account of the items identified above . . . make a reasonable provision for all unpaid loss and loss expense obligations of the Company under the terms of its policies and agreements."

It is not clear whether the "reasonable provision" requirement means we should accrue amounts even for environmental impairment exposures in our statutory statements.

Bob: How do we compare with other carriers? Is everyone else actually booking reserves for these exposures?

Tim: On a percentage basis, we are about average for the industry. Because of our size, though, we have more exposure, so the dollar amounts are greater for us.

Carol: That's true. But the statement of actuarial opinion is a new requirement, and there are probably many actuaries concerned about this exposure.

Steve: Aren't our reserves redundant for other blocks of business, at least on a discounted basis? The statement of opinion says that the reserves *"make a reasonable provision for all unpaid loss and loss expense obligations of the Company under the terms of its policies and agreements."* One could interpret "reasonable provision" to mean economically sufficient reserves. The IRS takes off nearly two billion dollars when they discount our reserves to compute our taxable income. That's even larger than your best estimate of the additional reserves needed for environmental impairment exposures.

Tim: And doesn't the statement of opinion relate to total reserves, so redundancies in one area can make up for potential deficiencies in another area?

Carol: That's correct, but the actuary is required to disclose whether the reserves are adequate on a full value or on a partially discounted basis. States vary in their approach to reserve discounting. Even in a given insurance department, different financial examiners have different views on this issue.

Discussion

Many of these views were expressed at the CAS seminar on Environmental Issues held in Boston in October 1990. There is much disagreement regarding proper professional conduct for valuation actuaries. The following questions highlight some of these issues:

1. What should guide the valuation actuary's professional practices when clear instructions from actuarial bodies are lacking? Should actuaries look to "industry practice"? How do GAAP disclosure requirements relate to the valuation actuary's disclosure responsibilities in statutory statements?
2. How should business objectives affect the valuation actuary's statement of opinion? How should the valuation actuary reconcile his roles as an independent professional and a business manager? To what extent is the appointed actuary's opinion independent of management's views, either in theory or in practice? Is more or less independence desirable? For instance, should appointed actuaries be consultants only, and not company employees? Would consultants be more or less independent? Should valuation actuaries have "whistle-blowing" responsibilities, as is true in England, where the actuary must inform the Board of Directors and then the regulatory authorities, at any time during the year, if the company's operations endanger its future solvency or reserve adequacy? Are whistle-blowing responsibilities realistic?
3. What role should "public policy" considerations play in the actuary's statement of opinion? For instance, suppose the valuation actuary believes that reserves are excessive on an economic basis but insufficient on a full-value basis. Furthermore, he presumes that a qualification to the statement of opinion would invite regulatory intervention and harm the company's consumers. Should these considerations affect the statement of opinion?
4. What audit responsibilities should be given to the actuarial bodies, such as the American Academy of Actuaries and the Casualty Actuarial Society? Should the CAS or the AAA prescribe or suggest valuation methods and tests of reserve adequacy? Should the CAS or the AAA offer to review actuarial opinions that are of concern to particular state insurance departments? Would peer review by other actuaries encourage more objective statements

of opinion? Or would peer review lead to costly and protracted dissension within the actuarial societies?

Conclusion

Developing a *Code of Professional Conduct* is but a first step to resolving the ethical issues raised by the actuary's dual role as objective professional and business manager. Equally important – and more difficult – is the application of the *Code* to practical situations, by additional guidelines, interpretations, and case studies. This is the task remaining for the actuarial profession.

References

- Aetna Life and Casualty, *Automobile Insurance Affordability* (March 1978).
- Appelbaum, David, and Sarah Verone Lawton (eds.), *Ethics and the Professions* (Englewood Cliffs, NJ: Prentice-Hall, 1990).
- Barber, Bernard, "Some Problems in the Sociology of Professions," *Daedalus*, Volume 92 (Fall 1963), page 669-688; reprinted in part as "Professions and Emerging Professions," in Joan C. Callahan (ed.), *Ethical Issues in Professional Life* (New York: Oxford University Press, 1988), pages 35-39.
- Bayles, Michael D., *Professional Ethics* (Belmont, CA: Wadsworth Publishing Co., 1981).
- Berin, Barnet N., George J. Stolnitz, and Aaron Teitlebaum, "Women's Status: A Matter of Mortality," *Contingencies*, Volume 2, No. 1 (January/February 1990), pages 48-54.
- Best's *Aggregates and Averages: Property-Casualty*, 1991 Edition, (Oldwick, NJ: A. M. Best Company, 1991A).
- Best's *Key Rating Guide: Property-Casualty*, 1991 Edition (Oldwick, NJ: A. M. Best Company, 1991B).
- Best's *Insurance Management Reports*, Property/Casualty, Release No. 31 (August 3, 1992).
- Bowie, Norman E., "Business Codes of Ethics: Window Dressing or Legitimate Alternative to Government Regulations?" in *Ethical Theory and Business*, edited by Tom L. Beauchamp and Norman E. Bowie (Englewood Cliffs, NJ: Prentice-Hall, 1979), pages 234-239.
- Burke, R. Stephen, "Pollution Exclusion Clauses: The Agony, the Ecstasy, and the Irony for Insurance Companies," *Northern Kentucky Law Review*, Volume 17 (1990), pages 443-472.
- Butler, Patrick, Twiss Butler, and Laurie L. Williams, "Sex-Divided Mileage, Accident, and Insurance Cost Data Show That Auto Insurers Overcharge Women," Part I in *Journal of Insurance Regulation*, Volume 6, No. 3 (March 1988), pages 243-284, and Part II in Volume 6, No. 4 (June 1988), pages 382-420.
- Butsic, Robert P., "Determining the Proper Interest Rate for Loss Reserve Discounting: An Economic Approach," *Evaluating Insurance Company Liabilities* (Casualty Actuarial Society 1988 Discussion Paper Program), pages 147-188.
- Callahan, Joan C., (ed.), *Ethical Issues in Professional Life* (New York: Oxford University Press, 1988).
- Carlson, Thomas O., "Rate Regulation and the Casualty Actuary," *Proceedings of the Casualty Actuarial Society*, Volume 38 (1951), pages 9-72; discussions by H. J. Ginsburgh, pages 222-223; Allie V. Resony, pages 223-225; Dudley M. Pruitt, pages 225-230; R. W. Griffith, pages 230-236; author's review of discussions, pages 236-239.

Casualty Actuarial Society, Committee on Reserves, "Risk Margins for Discounted Loss Reserves," *Casualty Actuarial Society Forum* (Winter 1991), pages 139-160.

Cholnoky, Thomas V., and Jeffrey Cohen, *Property/Casualty Insurance Industry Loss Reserve Analysis* (Goldman Sachs, November 8, 1991).

Cholnoky, Thomas V., and Jeffrey Cohen, *Property/Casualty 10K Loss Reserve Disclosures* (Goldman Sachs, May 31, 1989).

CPCU, *Code of Professional Ethics of the American Institute for Property and Liability Underwriters* (Malvern, Pennsylvania: American Institute for Property and Liability Underwriters, 1979).

Cripe, Frederick, "Testimony and the Actuary," *The Actuarial Digest*, Volume 10, No. 1 (February/ March 1991), pages 7 ff.

Cummins, J. David, and Mary A. Weiss, "The Structure, Conduct, and Regulation of the Property-Liability Insurance Industry," in Richard W. Kopcke and Richard E. Randall (eds), *The Financial Condition and Regulation of Insurance Companies* (Harwich Port, Massachusetts: Federal Reserve Bank of Boston, June 1991), pages 117-154.

Dahlman, Gary E., "1980 Amendments to the Standard Valuation Law," *Society of Actuaries Course 1-340 Study Note 340-36-89* (1989).

Davis, Michael, "The Use of Professions," *Business Economics*, Volume 22, No. 4 (October 1987), pages 5-10.

Fairley, William [1979], "Investment Income and Profit Margins in Property-Liability Insurance: Theory and Empirical Results," *The Bell Journal of Economics* 10 (Spring 1979) pages 192-210, reprinted in J. David Cummins and Scott E. Harrington (eds.), *Fair Rate of Return in Property-Liability Insurance* (Boston: KluwerNijhoff Publishing, 1987), pages 1-26.

Federman, Paula R., "Capitalization of Property/Casualty Insurance Companies," *Insurer Financial Solvency* (Casualty Actuarial Society 1992 Discussion Paper Program), Volume 1, pages 231-268.

Fein, Richard I., "Where We Are Now - The Financial Crisis of Workers Compensation," *NCCI Digest*, Volume 6, Issue 2 (June 1991), pages 17-27.

Feldblum, Sholom, "Asset Share Pricing for Property-Casualty Insurers," *CAS Forum*, Winter 1993A.

Feldblum, Sholom, "Ethics and Insurance: Dilemmas for the Thoughtful Underwriter," *CPCU Journal*, Volume 43, No. 2 (June 1990), pages 72-75.

Feldblum, Sholom, "Pricing Insurance Policies: The Internal Rate of Return Model" (*Casualty Actuarial Society Part 10A Examination Study Note*, May 1992).

- Feldblum, Sholom, "Risk Loads for Insurers," *Proceedings of the Casualty Actuarial Society*, Volume 77 (1990), pages 160-195.
- Feldblum, Sholom, "Statutory Returns on Surplus and the Cost of Equity Capital," (forthcoming, 1993B).
- Financial Accounting Standards Board, "Statement of Financial Accounting Standards No. 60: Accounting and Reporting by Insurance Enterprises" (June 1982).
- Financial Accounting Standards Board, "Statement of Financial Accounting Standards No. 97: Accounting and Reporting by Insurance Enterprises for Certain Long-Duration Contracts and for Realized Gains and Losses from the Sale of Investments" (December 1987).
- Financial Accounting Standards Board, Discussion Memorandum, an analysis of issues related to *Present Value-Based Measurements in Accounting* (December 1990).
- Forgue, Raymond E., "Consumer Opinions of Automobile Insurance Classifications, Pricing Practices and Proposed Reforms," *Journal of Insurance Regulation*, Volume 1, No. 3 (March 1983), pages 323-337.
- Friedman, Milton, *Capitalism and Freedom* (Chicago: University of Chicago Press, 1962).
- Giffin, Andrew F., Vincent Travis, and William Owen (eds.), *Automobile Insurance Risk Classification: Equity and Accuracy* (Boston: Massachusetts Division of Insurance, 1978).
- Grimshaw v. Ford Motor Co.*, 119 Cal. App. 3d 757, in West's *California Reporter*, Volume 174 (St. Paul, Minnesota: West Publishing Co., 1982), pages 348-399.
- Hamilton, Thomas M. and Eric L. Routman, "Cleaning Up America: Superfund and Its Impact on the Insurance Industry," *CPCU Journal*, Volume 41, No. 3 (September 1988), pages 172-184.
- Hiltz, Starr Roxanne, "Why Black Families Own Less Life Insurance," *Journal of Risk and Insurance*, Volume 38, No. 2 (June 1971), pages 225-235.
- Horn, Ronald C., *On Professions, Professionals, and Professional Ethics* (Malvern, Pennsylvania: American Institute for Property and Liability Underwriters, 1978).
- Hunter, J. Robert, "How to Get Really Rich as an Actuary – Meet the Challenge of Pro-Bono Efforts," *The Actuarial Review*, Volume 17, No. 2 (May 1990), pages 6-7.
- Insurance Services Office, *Analysis of Loss and Loss Adjustment Expense Reserves at Year-End 1988* (New York: Insurance Services Office, December 1989).
- Kahane, Yehuda [1978], "Generation of Investable Funds and the Portfolio Behavior of the Non-Life Insurers," *Journal of Risk and Insurance*, Volume 45, No. 1 (March 1978), pages 65-77.
- Kenney, Roger, *Fundamentals of Fire and Casualty Insurance Strength*, Fourth Edition (Dedham, MA: The Kenney Institute Studies, 1967).

- Kultgen, John, *Ethics and Professionalism* (Philadelphia: University of Pennsylvania Press, 1988).
- Kultgen, John, "The Ideological Use of Professional Codes," *Business and Professional Ethics Journal*, Volume 1, No. 3 (1982), pages 53-69.
- Lamb, R. Michael [1992], "Statement Changes, NAIC Expectations Spelled Out for 1991," *The Actuarial Review*, Volume 19, No. 1 (February 1992), pages 8, 16.
- Lamb, R. Michael [1991], "1991 NAIC Casualty Actuarial Opinions," *Actuarial Digest*, Volume 10, No. 6 (December 1991/January 1992), pages 5 ff.
- Landry, Patrick, William F. Flahavan, Ian Karp, and William David Smith, "Actuarial Testimony," *Record - Society of Actuaries*, Volume 14, No. 1 (1988), pages 593-614.
- Larson, Magali, *The Rise of Professionalism* (Berkeley, CA: The University of California Press, 1977).
- Lowe, Stephen P., and Stephen W. Philbrick [1986], "Issues Associated with the Discounting of Property/Casualty Loss Reserves," *Journal of Insurance Regulation*, Volume 4, No. 4 (June 1986), pages 72-102.
- Manta, Joseph G., and Mark A. Welge, *Toxic Tort • Environmental Hazards Litigation Workshop* (Philadelphia, 1990).
- McClenahan, Charles L., "A Mathematical Model for Loss Reserve Analysis," *Proceedings of the Casualty Actuarial Society*, Volume 52 (1975), pages 134-153; discussion by David Skurnick, Volume 53 (1976), pages 125-127.
- McClenahan, Charles L., "Ratemaking," in Matthew Rodermund, et al., *Foundations of Casualty Actuarial Science* (New York: Casualty Actuarial Society, 1990), pages 25-90.
- Miller, Nicholas F., Jr., Thomas C. Strohmenger, F. H. Holderman, Rex Davis, Michael McCabe, John N. Reid, Richard G. Woll, William H. Goodson, Mavis A. Walters, John Connors, R. L. Jewell, Galen Barnes, Richard E. Munro, and Dale Nelson, *Automobile Insurance Risk Classification: A Report of the Advisory Committee* (May 1979).
- "Report of the Committee to Recommend New Mortality Tables for Valuation," *TSA*, Volume 33 (1981), pages 621-624.
- NAIC [1990] Emerging Issues (EX4) Working Group, minutes of June 4, 1990, Meeting (90-2), Part 2, "Recording of Direct Premiums Written by Workers' Compensation Carriers as They are Billed or Collected"; issue summary by Norris W. Clark and Robert K. Loo, "Recording of Direct Premiums Written by Workers' Compensation Carriers as They are Billed or Collected" (November 28, 1989); comments by Daniel L. Barry, May 25, 1990; Ben F. Hernandez, "Method of Recording Workers' Compensation Insurance Premiums (March 23, 1990); Charles A. Quick and Robert B. Tschudy, "Discussion Paper: Accounting for Workers' Compensation Premium" (May 23, 1990).

National Association of Insurance Commissioners, *Using the NAIC Insurance Regulatory Information System: Property and Liability Edition* (Kansas City, Missouri: NAIC, 1989).

National Council on Compensation Insurance, *Issues Report, 1992: A Summary of Issues Influencing Workers Compensation: Harnessing the Forces of Change* (Boca Raton, Florida: National Council on Compensation Insurance, 1992).

Noris, Peter [1985], *Asset/Liability Management Strategies for Property and Casualty Companies*, (Morgan Stanley, May 1985).

Paquin, Claude Y., "The Actuary as Expert Witness," *Transactions of the Society of Actuaries*, Volume 35 (1983), pages 417-442; discussions by Barnet N. Berin, page 443; by Daniel J. McCarthy, pages 443-448; by Robert J. Myers, pages 448-450; by Murray Projector, pages 450-452; by Thomas P. Tierney, pages 452-455; by Robert Tookey, pages 455-456; author's review of discussions, pages 456-465.

Saunders, R. Arthur, *Life Insurance Company Financial Statements: Keys to Successful Reporting* (Chicago: Teach 'Em, Inc., 1986).

Stone, James M., "Excerpt from the Opinion, Findings and Decision n 1978 Automobile Insurance Rates," in Andrew F. Giffin, Vincent Travis, and William Owen (eds.), *Automobile Insurance Risk Classification: Equity and Accuracy* (Boston: Massachusetts Division of Insurance, 1973).

Valesquez, Manuel G., *Business Ethics: Concepts and Cases* (Englewood Cliffs, NJ: Prentice-Hall, 1988).

Yow, James W., Warren P. Cooper, Jan A. Lommele, and Robert L. Sanders [1990], "Discounting Guidelines Subcommittee of the Advisory Committee to the NAIC Casualty Actuarial Technical Task Force: Final Report" (November 1990).

Williams, C. Arthur, Jr., "Unfair Rate Discrimination in Property and Liability Insurance," in Spencer L. Kimball and Herbert S. Denenberg (eds.), *Insurance, Government, and Social Policy: Studies in Insurance Regulation* (Homewood, IL: Richard D. Irwin, Inc., 1969), pages 209-242.

Witcraft, Susan E. [1992], "Valuation Actuaries and Property-Casualty Insurance," *Insurer Financial Solvency* (Casualty Actuarial Society 1992 Discussion Paper Program), Volume II, pages 853-866.

Woll, Richard G. [1987], "Insurance Profits: Keeping Score," *Financial Analysis of Insurance Companies*, (Casualty Actuarial Society 1987 Discussion Paper Program), pages 446-533.