

CHAPTER EIGHT

INSURANCE PROFITABILITY

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INTRODUCTION

Measurement of profitability is to some extent, like beauty, in the eye of the beholder. The connotation of the word *profitability* is highly dependent upon who is assessing profitability and to what purpose. To investors and insurers, *profitability* has a golden ring to it. To policyholders of a stock insurer it sounds like *markup*, while to those insured by a mutual company it is neutral. Insurance regulators either encourage profitability, when concerned with solvency, or seek to curtail it, when regulating rates. The IRS seeks to inflate it and consumer groups seek to minimize it.

In most businesses there is a clear distinction between historical profitability, which within a given set of accounting rules and conventions is relatively well established, and prospective profitability. In the property-casualty insurance business, however, there is no such clear-cut demarcation. At the end of a year only about 40% of the incurred losses for that year will have been paid by the typical property-casualty insurer. It is several years before an insurer knows with relative certainty how much money it made or lost in a given period. When *history* depends upon the *future*, things have a tendency to become confusing.

The extent to which reported profits depend upon estimated liabilities for unpaid losses provides property-casualty insurers with some opportunity to manage reported results by strengthening or weakening loss reserves. Because deficient reserves must ultimately be strengthened and redundancies must ultimately be recognized, the interplay between current reserving decisions and the amortization of past reserving decisions adds an additional level of complexity to the problem of measuring property-casualty insurance profitability.

In this paper I will attempt to avoid staking out any position regarding the qualitative assessment of profitability. Hopefully both pro-profit readers and anti-profit readers will find my positions overwhelmingly convincing. Nor will I address the convolutions of potential reserve strengthening and weakening and the associated amortization of redundancies and deficiencies. For the sake of understanding, I will simply pretend that profitability is subject to consistent and accurate determination under a given set of accounting rules and conventions.

PROFIT V. RATE-OF-RETURN

It is important at the outset to distinguish between *profit* - the excess of revenues over expenditures - and *rate-of-return* - the ratio of profit to equity, assets, sales or some other

base. Profit, no matter how uncertain, is a monetary value representing the reward to owners for putting their assets at risk and has an absolute meaning in the context of currency values. Rate-of-return is a measure of efficiency which has meaning only relative to alternative real or assumed rates-of-return.

Profit is important to investors and management as sources of dividends and growth. To insureds and regulators profits provide additional security against insolvency. Rate-of-return is important to a prospective investor as a means to compare alternative investments and to an economist as an assessment of economic efficacy. These are valid and useful functions and I do not wish to minimize their importance. But the arena in which property-casualty insurance company profitability measurement is most discussed is that of rate regulation, and this paper is written in the context of what I consider appropriate in a ratemaking or rate regulatory environment.

Since rate-of-return, however expressed, begins with profit in the numerator, it seems appropriate to begin with a discussion of the measurement of property and casualty insurance company profit.

PROFIT - RATEMAKING BASIS

While it has long been realized that the investment of policyholder-provided funds is a source of income to a property and casualty insurance company, it was not until the 1970s that such income actually constituted an important part of insurance company profit. Even today it is common to hear references to *underwriting profit*, while the investment counterpart is generally termed investment *income*, not investment *profit*. In Lewis E. David's *Dictionary of Insurance* (Littlefield, Adams & Co., 1962) there is a definition for *Underwriting Profit* but not for *Profit*, *Investment Income*, or *Interest Income*. The International Risk Management Institute's *Glossary of Insurance and Risk Management Terms* (RCI Communications, Inc., 1980) includes both *Underwriting Profit* and *Investment Income* but continues the distinction between profit and income.

Common usage notwithstanding, there are few who would contend today that investment activities should be separate from underwriting activities in the measurement of insurance company profit. And were it not for rate regulation, statutory and GAAP accounting procedures would probably suffice for the vast majority of profit calculations. Rate regulation, however, has forced property and casualty insurers to make a somewhat artificial distinction between investment income arising from the investment of policyholder funds and that arising from the investment of shareholder funds. Even in the case of mutual companies which are owned by their policyholders, the distinction is necessitated by the fact that last year's policyholder-owners may not be this year's policyholder-insureds.

When an insured purchases a policy of insurance, and pays for it up front, he or she suffers what is known as an *opportunity cost* by virtue of paying out the premium funds in advance of losses and expenses actually being paid. In theory, the policyholder could

have invested the funds in some alternative until they were actually needed by the insurer. Where insurance rates are regulated for excessiveness, it is appropriate that this opportunity cost be recognized.

The opportunity cost should be calculated based upon the cash flows associated with the line of business, and should reflect the fact that not all cash flows go through invested assets - some portion being required for the infrastructure of the insurer. The buildings and desks and computer software which were originally purchased with someone else's premium dollars are now dedicated to providing service to current policyholders and should be viewed as being purchased at the beginning of the policy period and sold at the end.

Most importantly, the calculation should be made at a risk-free rate of return. It must be understood that the insured has not purchased shares in a mutual fund. The existence of an opportunity cost does not give the policyholder a claim on some part of the actual earnings of the insurer. Should the insurer engage in speculative investments resulting in the loss of policyholder supplied funds, the company cannot assess the insureds to make up the shortfall. By the same token, investment income over and above risk-free yields should not be credited to the policyholders in the ratemaking process.

Finally, investment income on surplus should be excluded from the ratemaking process. Policyholders' surplus represents owners' equity which is placed at risk in order to provide the opportunity for reward. While it provides protection to policyholders and claimants, the surplus does not **belong** to them. In fact, the inclusion of investment income on surplus creates a situation in which an insurer with a large surplus relative to premium must charge lower rates than an otherwise equivalent insurer with less surplus. In other words, lower cost for more protection. This, in my opinion, does not represent equitable or reasonable rate regulation.

One final distinction needs to be made. Rate regulation is generally a prospective process, and the methods and procedures recommended herein are designed to be efficacious on a prospective basis. When applied retrospectively, as in the case of excess profits regulations, it must be remembered that a single year of experience is rarely sufficient to assess the true profitability of a line of property and casualty business. In the case of low-frequency, high-severity lines such as earthquake, it may require scores, or even hundreds, of years to determine average profit on a retrospective basis.

RATEMAKING BASIS - NUMERICAL EXAMPLES

Consider a property and casualty insurer which writes only private passenger automobile insurance with the following expectations:

TABLE 1

PRIVATE PASSENGER AUTOMOBILE ASSUMPTIONS

(THOUSANDS OF DOLLARS)

Premium	\$100,000
Loss Ratio	0.65
Expense Ratio	0.35

Loss Payout

Year 1	0.25
Year 2	0.35
Year 3	0.20
Year 4	0.12
Year 5	0.08

For purposes of this example, no distinction is made between pure losses and loss adjustment expenses. Premiums are assumed to be paid at policy inception, expenses at mid-term and losses at the midpoint of each year. Assume further that the risk-free rate of return is 6% per year and that 100% of underwriting cash flows are invested.

Shown below are the assumed cash flows along with the present value of those flows at 6% per year. The indicated profit—that is, the 6% present value of the underwriting cash flows—is \$7,776 or 7.78% of premium.

TABLE 2

PRIVATE PASSENGER AUTOMOBILE RESULTS

(THOUSANDS)

Time	Premium	Loss	Expense	Total Cash Flow	6.0% Present Value
0.0	\$100,000			\$100,000	\$100,000
0.5		\$(16,250)	\$(35,000)	(51,250)	(49,778)
1.5		(22,750)		(22,750)	(20,846)
2.5		(13,000)		(13,000)	(11,238)
3.5		(7,800)		(7,800)	(6,361)
4.5		(5,200)		(5,200)	(4,001)
Total	\$100,000	\$(65,000)	\$(35,000)		\$7,776

It is imperative that it be understood what this represents. This is the *a priori* expected net present value of the underwriting cash flows. It reflects the opportunity cost expected to be suffered by the average policyholder for the risk-free income lost through the advance payment of funds not yet required for infrastructure, loss payment or expense payment.

It is equally important to understand what this does not represent. It is not the money expected to be earned by the insurer from writing private passenger automobile insurance for one year. The insurer should expect to earn something greater than the risk-free rate of return in exchange for taking the risk that losses and expenses may exceed expectations. Nor is it the expected profit arising to owners for the year as it excludes funds generated from the investment of retained earnings and other income.

Note that this methodology is independent of level of surplus, actual investment results and past underwriting experience. It can be equitably applied to all companies and it is firmly grounded in both the substance of the insurance transaction and fundamental economic realities.

RATE-OF-RETURN—THE APPROPRIATE DENOMINATOR

As the examples above indicate, while it is fairly easy to calculate the dollar value of the *a priori* expected net present value of the underwriting cash flows associated with a given book of business under a given set of assumptions, the dollar value itself is of little value to a rate regulator charged with the assessment of whether proposed rates are inadequate or excessive.

Now it is imperative that we understand that it is the *rates* which are being regulated, not the rates-of-return. I am unaware of any rating law which states that "rates-of-return must not be excessive ..." Rate regulatory attention focused upon rate-of-return must be within the context of determination of what might constitute a reasonable profit loading in the rates, not as an attempt to equalize rates-of-return across insurers.

Two candidates for the denominator seem to be common - sales and equity. Assets might be an appropriate denominator from the standpoint of measuring economic efficiency, but equity is clearly the favorite of those seeking to measure relative values of investments while sales is favored by those who view profit provisions in the context of insurance rates themselves.

RETURN ON EQUITY

While there is little doubt that equity is an appropriate basis against which to measure company-wide financial performance of a property and casualty insurer, as I see it there are two basic problems with return-on-equity as a basis for measuring rate-of-return in rate regulation.

The first problem with return on equity is that it forces the regulator to forgo rate equity for rate-of-return equity.

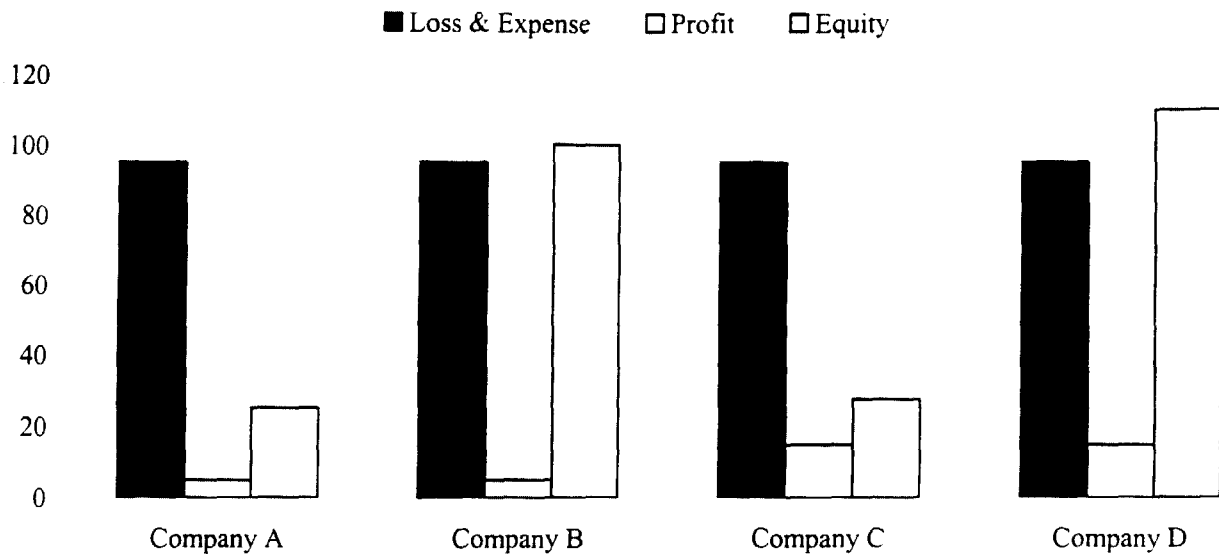


FIGURE 1. FOUR COMPANIES

Consider the example above. Here we have four companies, each writing the same coverage in the same market and providing the same level of service with an expected pure premium and expense component of \$95. Companies A and B propose rates of \$100 while companies C and D request approval of \$110. Companies A and C are leveraged at a writings-to-surplus ratio of 4:1 while companies B and D are at 1:1.

The concept of rate equity would seem to require that companies A and B be treated identically as would C and D. But if we attempt to use equity as a base for rate-of-return this becomes a problem. Assume that the regulator has determined that a 15% return on equity is the appropriate benchmark for excessiveness. Our two highly-leveraged companies, A and C, project returns-on-equity of 20% and 55% respectively, while B and D are at 5% and 13.6%, respectively. If we use the return-on-equity benchmark we are forced to conclude that one \$100 rate and one \$110 rate should be disapproved as excessive while one \$100 rate and one \$110 rate are approved. We have subordinated rate equity to rate-of-return equity.

The second problem with return-on-equity in rate regulation is that it requires that equity be allocated to line of business and jurisdiction. And, no matter how much the rate-of-return advocate may wish to ignore the fact, there is no such thing as North Dakota Private Passenger Automobile Surplus - unless, of course, we are dealing with a company which writes North Dakota private passenger automobile insurance exclusively.

The fact is that the entire surplus of an insurer stands behind each and every risk. It supports all of the reserves related to all of the claims and policies issued by the company. And any artificial allocation of that surplus in no way limits the liability of the company to pay claims or honor other financial commitments.

By requiring the allocation of surplus to line and jurisdiction, the return-on-equity basis ignores the value inherent in unallocated surplus. In essence the method treats a multi-line national company with \$100 million of surplus, \$1 million of which is allocated to North Dakota private passenger automobile, identically with a North Dakota automobile insurer capitalized at \$1 million. While the \$99 million of "unallocated" surplus provides protection to the insured which would not be available from the small monoline insurer, this additional protection is assigned zero value where surplus is allocated.

There is also the problem of an equitable allocation basis. Just how should surplus be allocated to jurisdiction and line? How should the investment portfolio be assigned in order to track incremental gains and losses in allocated surplus? What do you do in the case of surplus exhaustion? Can any return be excessive when measured against an equity deficit? Or should the surplus simply be reallocated each year without regard to actual results? These are tough questions which must be answered by those seeking to allocate surplus.

"BENCHMARK" PREMIUM-TO-SURPLUS RATIOS AS A METHOD FOR SURPLUS ALLOCATION

Some regulators, when faced with the questions raised in the previous section, have proposed using average or target ratios of premium to surplus as "benchmarks" or "normative" ratios.

In the chart below, return on equity is assumed to be 12.5%. This corresponds to a return on sales of 25% where writings are 50% of surplus and 2.5% where the risk ratio is 5:1.

Return on Equity Regulation

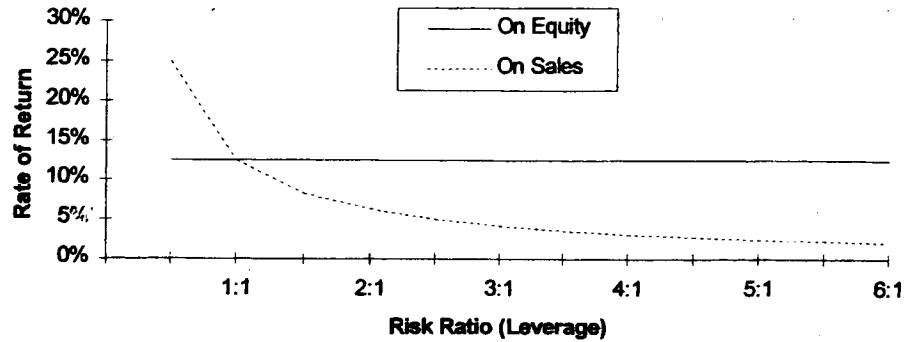


FIGURE 2

But what happens if we decide to use a benchmark risk ratio of 3:1 to allocate surplus to this particular line for this particular jurisdiction? As shown below, the return on equity will equal 12.5% only in the case where the risk ratio is actually 3:1. Where the risk ratio is lower, the return on equity will be lower. Where the risk ratio is above 3:1, the return on equity will exceed 12.5%.

Return on Equity Regulation

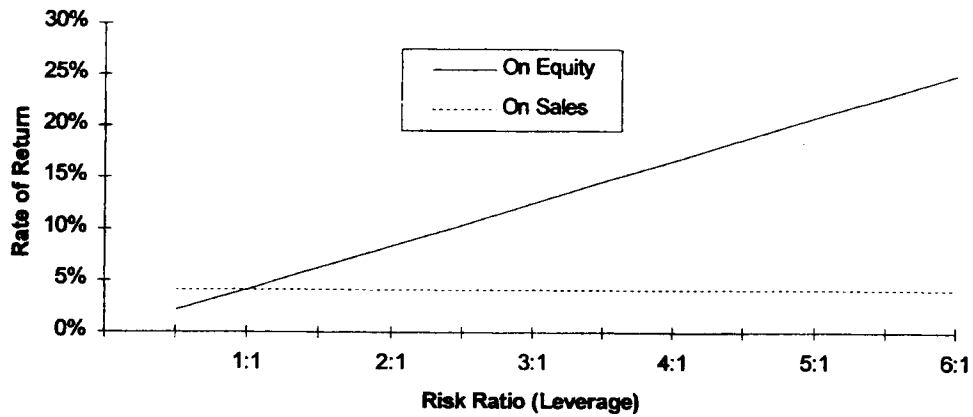


FIGURE 3

But the return on sales is now a constant $(12.5\%/3) = 4.1667\%$ regardless of the actual risk ratio.

While the use of the benchmark writings-to-surplus ratio has eliminated the surplus allocation problem, the result is not return-on-equity regulation but return-on-sales regulation. And while there is nothing wrong with return-on-sales as a regulatory basis, this represents an excruciatingly complex method for return-on-sales regulation.

RETURN ON SALES

Return-on-sales relates the profit provision in the premium to the premium itself. For anyone who is familiar with the concept of *markup*, it is a natural way to view the profit component. It provides meaningful and useful information to the consumer. If you tell someone that 5% of the price of a loaf of bread represents profit to the grocer, that is helpful in the assessment of the "value" of the bread. If, on the other hand, you tell that someone that the price of the bread contains a 12.5% provision for return-on-equity to the grocer, the information is next-to-useless.

Return-on-sales based rate regulation is simply the establishment of benchmarks for what constitutes excessive or inadequate profit provisions as percentages of premium. It can be as simple as the 1921 NAIC Profit Formula which allowed 5% of premium for underwriting profit (and an additional 3% for conflagrations) or it can be as complicated as the use of benchmark writings-to-surplus ratios applied to permitted return-on-equity provisions. But however the allowable provisions are established, the application is premium-based, and independent of the relationship between premium and equity. As such, return-on-sales results in true rate regulation, not rate-of-return regulation.

PROFITABILITY STANDARDS

Whether rate-of-return is measured against sales or equity, the rate regulator must make a determination as to what constitutes a reasonable, not excessive, not inadequate, provision for profit in insurance rates. In order to keep the various components of the typical rate filing in perspective, I have prepared the following chart which represents an approximation of the composition of a typical private passenger automobile rate filing.

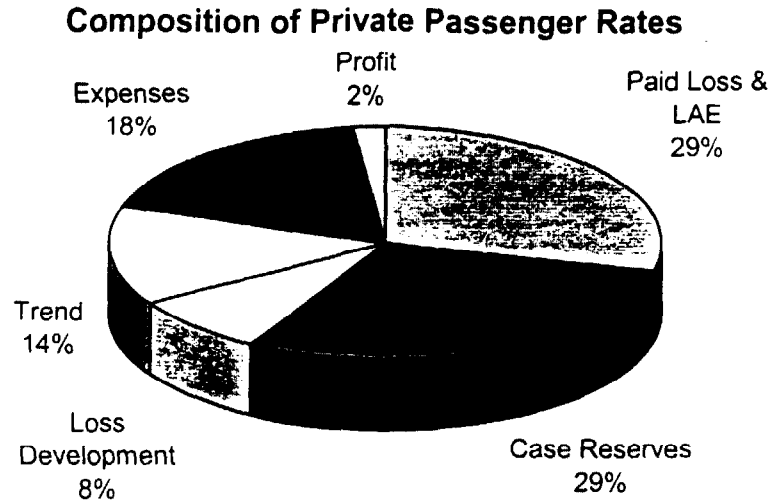


FIGURE 4

It is important to understand that there is typically a great deal of uncertainty in the calculation of indicated property and casualty insurance rates. In the private passenger example above, over 50% of the rate is comprised of estimated unpaid losses and trend. With a profit provision of approximately 2%, a small underestimation can eliminate the profit altogether. (On the other hand, a small overestimation can effectively double the profit.)

While the *CAS Statement of Principles Regarding Property and Casualty Insurance Ratemaking* states that "the underwriting profit and contingencies provisions are the amounts that, when considered with net investment and other income, provide an appropriate total after-tax return" there is no universally-accepted view of what constitutes an *appropriate* return. The application of rate regulatory authority in the U. S. evidences wide disparity. It is quite possible that a profit provision which might be viewed as excessive in one jurisdiction might be deemed inadequate in another.

There is, however, a relationship between the benchmark for excessiveness adopted within a jurisdiction and the resultant market conditions. Unlike public utilities, which are generally monopolistic and which have customer bases which are considerably more homogeneous than are insurance risks, property and casualty insurers can react to inadequate rates by tightening underwriting and/or reducing volume. In any given jurisdiction, the size and composition of the residual market, the number of insurers in the voluntary market, and the degree of product diversity and innovation are all related to the insurance industry perception of the opportunity to earn a reasonable return from the risk transfer.

Given the relationship between rate adequacy and market conditions, the proper benchmark for excessiveness for a regulator is that which will produce the desired market characteristics. And any regulator who believes that this relationship is less powerful

than a well-crafted econometric argument for a given maximum profit provision is destined to learn a lesson about the distinction between theory and practice.

CONCLUSION

This discussion has focused on the measurement of profitability in the rate regulatory environment. It must be understood that insurance company management and owners will necessarily have different, and not necessarily consistent, needs when it comes to the measurement of profitability. Management will be primarily concerned with the relative risk and return expectations associated with alternative lines of business and jurisdictions. Shareholders will be more interested in returns relative to alternative investments while policyholder-owners of mutual companies will focus on premium savings and dividends. No single basis for the measurement of profitability will adequately meet the needs of all of these interests.

Where rate regulation is concerned, however, it is clear that there must be a consistent basis for the assessment of what constitutes excessiveness in a rate which can be equitably applied to all insurers and which will facilitate fair treatment of policyholders. Such a basis is the return-on-sales approach.

It has been alleged that actuaries have made a profession out of taking something simple and making it complex. While I certainly do not agree with that allegation, William of Ockham pointed out in the fourteenth century that simplicity is to be preferred over complexity. There are simple ways to measure profit and there are very complex ways. Similarly, there are complex ways to assess rate-of-return by jurisdiction and line of business and there are simple ways. Let us not assume that the complex ways are preferable solely because they are not simple.

