TITLE: EXPENSE ALLOCATION IN INSURANCE RATEMAKING

AUTHORS: Ms. Diana Childs

Ms. Childs is an Actuary with the Insurance Company of North America. She received her BS degree in Math from Penn State University. She received her FCAS in 1977, is a member of the American Academy of Actuaries and served the CAS on the Career Enhancement Committee.

Mr. Ross A. Currie

Mr. Currie is currently Associate Actuary with the Insurance Company of North America. He received his ACAS designation in 1978.

REVIEWER: Mr. David Klein

David Klein is currently Vice President and Director of Actuarial/Research Operations for The Hartford Insurance Group. He received his FCAS in 1974 and holds an MBA in Insurance from Temple University. David is on the CAS Finance Committee and served on the Examination Committee. Currently, Chairman of the ISO Actuarial Committee, he has served on a number of industry committees including the AIRAC Personal Lines Committee and the Executive Committee of the NIC/AIPSO.

Until the present time, the great majority of actuarial study and literature in the ratemaking area has revolved around analyzing and quantifying the loss component of the insurance rate. Actuaries have evolved an elaborate system in which losses are trended, developed and credibility weighted, and in which premiums are placed at current rates or at least current rate levels. At the same time, actuaries have virtually ignored the expense portion of the insurance rate, preferring to treat expenses as a constant percentage of premium. Current economic and political conditions are forcing a reevaluation of this simplistic approach towards expense allocation. Consumer groups have charged that current expense allocation procedures are discriminatory, and insurance companies are attempting to improve their pricing position through the development of rates which more accurately distribute the costs of doing business.

In this paper we shall take a look at the expense portion of the insurance rate. We shall examine the pros and cons of the traditional treatment of expenses and shall consider some alternate methodologies. Our focus will be on the personal lines; Automobile and Homeowners. At the same time, many of our conclusions and observations can be extended to other lines of insurance.

This paper does not attempt to answer all of the questions regarding expense allocation. Rather, its intention is to lay a general foundation upon which specific, detailed expense flattening procedures can be built.

Proportional Allocation vs. Expense Flattening

The traditional approach towards treating expenses in ratemaking is what we shall refer to as proportional allocation. Under this approach all underwriting expenses are considered to vary absolutely with the premium rate.

Given: R_n = the rate for a risk of a specific class = n

L_n = the underlying pure premium (including all loss expense)

E_n = the provision for underwriting expenses in R_n

Then: $R_n = L_n + E_n$ (1)

And: E_n/R_n is assumed to be constant for all n

We shall define expense flattening to be any allocation procedure in which some or all of the underwriting expense provision is considered to be independent of the final rate. Specifically, most proposed rate structures which incorporate expense flattening can be defined as follows:

$$R'_n = L_n + e_n + e \quad (2)$$

e_n = the variable expense provision (i.e., e_n/R_n is a constant for all n)

e = a flat expense loading which is constant for all n

Of course this form is only a single representative in a wide spectrum of possibilities. There is no reason to assume that all expenses which do not vary by premium should be loaded as a flat charge by exposure. It is quite conceivable, for example, that many underwriting costs will vary by territory but remain constant for other classifications.

In their most complex form, the rates resulting from a flat allocation system would look something like this.

$$R'_n = L_n + e_n + e_1 + e_2 + \ldots + e_x + e \qquad (3)$$

$e_1, e_2, \ldots e_x$ = expense loadings which vary according to some identifiable characteristic

Each of the subscripted e's represents an expense component which may vary on a risk by risk basis. For example, if certain overhead costs were found to be twice as large in one territory as in another, those costs might be assigned to variable e_1 which would be defined as follows:

$e_1 = f(t) \times 0$

0 = the overhead loading

t = territory

$f(t_1) = 1$

$f(t_2) = 2$

Notice that, in theory at least, e_1, e_2,...e_x do not have to be categorized along the same lines as the pure premium. Different territory definitions may be employed and entirely different classes may be recognized. Even in cases where the various e's change in accordance with normal rating classifications, their relativities (defined as f(t) above) need not be identical to the pure premium relativities. In the above case, for example, the pure premium rate for territory 2 is not necessarily twice that of territory 1.

Practical considerations will, of course, limit the application of this very general formula. The introduction of brand new expense classifications would represent a data processing nightmare. While intuitive judgment may influence estimates of the relative cost of writing different classifications, precise quantification will often be difficult, if not impossible. In these cases the actuary may have to rely to a great extent on pure premium relativities or may be forced to ignore the existence of the differentials entirely. Legal restrictions will also be placed on the allocation of expense dollars and social implications will play as large a role as economic considerations in determining the exact allocation formula for a specific line of business.

It must always be remembered that regardless of the final formula chosen for loading expenses, we are reallocating, not reevaluating, our expense costs. Decreases in one insured's rate due to reallocation will be offset by increases elsewhere. Redefining the expense allocation procedure is not a remedy for the high costs of insurance. This may seem obvious to the actuary, but in the public forum it is often swept under the rug in the desire to lower rates for a specific classification. The

public, loudly calling for a change in the ratemaking methodology, is almost certainly doing so with the misconceived idea that this change will save them money. In fact, the insurance companies will be collecting the same total expense dollars but will be requiring a few insureds to pay a significantly lesser amount while the large majority of insureds will pay a little more. There is no such thing as a free lunch, and in examining the reasons for adopting any expense allocation procedure it has to be kept in mind that changes which will benefit some groups will consequently penalize others.

Reasons for Expense Flattening

Prior to the mid-seventies, rate changes for the personal lines of insurance were relatively infrequent and represented modest increases to account for a modest inflation rate. While rates did vary by classification and territory, the overall level of the insurance premium represented a necessary but affordable item in the household budget. Pronounced differences of territory and classification rates did not exist and overall rate levels and increases were kept to a minimal level. In practical terms, varying the expense loading with premiums certainly simplified policy processing and ratemaking procedures, and as long as pure premium adjustments reflected inflation, the collected expense dollars also increased appropriately. Additionally, since most expenses did vary directly with premiums (commissions of 20-25% were not unheard of and represented the largest component of the expense loading), there seemed little point in devising a more complicated way of reflecting expenses in the premium dollar.

In recent years Homeowners insurance rates have remained at fairly stable levels; however, the unaffordability and lack of availability of private passenger automobile insurance has reached crisis proportions. With rates skyrocketing and consumerism in vogue, the social acceptability and equity of current ratemaking techniques have come under fire. Many aspects of the insurance mechanism are being questioned, whether it is rating by age, sex, marital status or geographical location, and the expense loading methodology is a ready target for change.

The reasons for questioning the current expense allocation procedure come under two guises; social acceptability and financial equity. The primary impetus for expense flattening has come from groups outside of the industry which maintain that it is not "just" or "fair" to assign different expense charges to risks merely because of expected loss differences. It is argued that the inequities inherent in a proportional allocation system have contributed significantly to the affordability crisis. It must be recognized, however, that the expense dollars currently subject to flattening represent a relatively small portion of the overall premium and their reallocation will not solve the affordability problem. In addition, although expense flattening will obviously benefit urban and youthful motor vehicle operators, it is a two edged sword which cuts the other way when applied to Homeowners insurance. The rich, surburban home owner will actually save money with the application of a flat expense costing technique, while the urban row home owner will be penalized. For this latter reason consumer groups understandably neglect to call for similar reforms in the pricing of

Homeowners insurance. Thus while the ostensible justification of expense flattening is a moral one, social activists actually advocate it only when it reduces the cost of insurance to certain selected economic groups. There is considerable danger in pricing an insurance product in response to social objectives, for unless there is some financial justification for revising pricing procedures great harm will be done to the industry and, ultimately, to the consumer.

Fortunately, expense flattening can be justified for financial reasons. From a pure equity standpoint, insurers would like rates to accurately reflect the costs of issuing a policy. If one vehicle's pure premium is three times that of another, does that also imply a threefold difference in incurred expenses? Matching expenses to policies as expenses are incurred provides not only a more accurate pricing mechanism but guards against the loss of collected expense dollars due to shifts in the mix of business, particularly within the territorial and classification distribution.

Expense Categories Subject to Flattening

The expenses associated with issuing and servicing an insurance policy can be segregated into loss adjustment expenses (those expenses incurred to investigate, litigate, and settle claims) and underwriting expenses (those expenses incurred while issuing the policy).

This paper is concerned with the allocation of underwriting, as opposed to loss adjustment expenses; however, loss adjustment expense is equally susceptible to a flattening procedure. Generally speaking, loss adjustment expense is considered to vary directly with dollars of loss. It seems obvious that claim count also influences loss expense cost. The possibility of loading claims expense into the rate as a composite factor of frequency and severity or other alternatives leaves a wide variety of possibilities which are open to future actuarial study.

While a good deal can be said for varying the loss expense loading as a function of loss, the opposite is true of the current rationale for including underwriting expenses in the rating structure as a function of pure premium.

Commisssions, the expense dollars paid to the agents for their efforts in underwriting, placing, issuing and servicing the policy, have historically been determined as a fixed percentage of the final premium. Interestingly, a modification of this approach has been avoided by proponents of expense flattening; however, the reasons for the omission may be related to those groups' unwillingness to oppose the various independent agents' associations and not belief in the equity of the current system. Differences in costs among territories (rural vs. urban) and in placing insurance for certain less desirable insureds certainly justify part of the commission differential inherent in the current

rating structure. Still, the possibilities of flat commissions or a graduated scale of commission rates deserve further research to determine an appropriate cost accounting charge. It is the opinion of the authors that some form of flat charge plus percentage of premium provides more equity among insureds and also provides incentive to the agent to place difficult risks.

State premium taxes are levied against each company as a function of the direct premium writings for a given line and state. The cost is passed on to the consumer in the same manner as the charge is levied on the company. This procedure is the only way a company can ensure that it will collect exactly the dollars which the state will require as payment. While this charge amounts to an average of only 2-3% of premium, the expense allocation issue offers the opportunity for the states to study their procedures in assessing premium taxes on the insurance companies and in turn the insured.

Other Acquisition Expenses represent the insurance company's costs (ex commission) to issue a policy. Included in this area are advertising fees, computerized rating and policy issuance systems, postage and telephone charges, travel expenses, salaries, and other miscellaneous items. The General Expense category includes salaries, rents, equipment, boards, bureaus and association fees, and other overhead items in an insurance company's budget. Historically, they have averaged 10-12% of the premium dollar.

These two categories, Other Acquisition Expense and General Expense, are the most susceptible to an alternative form of expense allocation. The basic question regarding these items seems to be "Do any two risks with differing pure premiums also cost differing amounts from an administrative expense standpoint?" This question may be posed of two Homeowners policies - a $100,000 single home in an affluent suburban area and a $15,000 row home in an inner city area. Both of these policies utilize identical computer routines to rate the policy, require the same paper to be processed for policy issuance, and take up computer space to record the policy in the company's data system, yet the current premium charges reflect different amounts to pay for these items. The pricing of Automobile policies follows the same pattern, with the higher priced risks paying a large share of the company's expenses. An age 17 unmarried principal male operator with a rating factor of 3.50 is also paying 3 1/2 times the dollar amount of an over 30 male operator for the general expenses of an insurance company.

The answer to this question is both yes and no. Unfortunately, there is no clear-cut solution, and in fact each company must examine its own policy issuing systems, rating procedures, and other associated overhead expenses to determine which costs are variable and which are fixed.

Many of the areas influencing the cost of writing a policy are subject to judgment and intuition, and any company studying the expense flattening issue must compromise between accuracy and practicality. A recent study

of expenses for Private Passenger Automobile Insurance completed by the Insurance Services Office concluded that 75% of the Other Acquisition and General Expenses and Miscellaneous Taxes are fixed while the remaining 25% are variable. It was further recommended that per car fixed expense loadings be developed by state and coverage. Companies can be guided by these conclusions but should study their own circumstances to determine the appropriateness of the application of this study to their individual situation.

While Profit and Contingencies is construed as an item of expense in the insurance rate, the proper allocation of profit to an insured is a difficult and complicated issue to resolve. A study of the concept of risk and its application to territory, classification, limit and other rating criteria is required before a proper determination of the apportionment of the profit and contingency charge can be made. The authors feel that such a study is beyond the scope of this paper and, in fact, is wide enough in scope to be the sole topic of a paper on the subject. With respect to this treatise, we will continue to treat the profit and contingency factor as a variable loading in the insurance rate.

Once those expense categories which will be subject to flattening have been selected, the actual flat expense charge is arrived at in a straightforward manner. The flat expense charge per exposure will be determined by dividing the total variable expenses now subject to flattening by the appropriate exposure base.

An Example

A company markets an insurance product which is priced in accordance with standard, proportionally allocated expenses. The business is segregated into two classes and the following data applies.

	Variable	Class 1	Class 2	Total
Exposures	X	5,000	5,000	10,000
Rate	R	$50	$150	
Premium	P	$250,000	$750,000	$1,000,000
Permissible Loss Ratio	PLR			60.0%
Allowance for:				
Gen. Expense & Other Acq.	C1			13.3%
Remaining Underwriting Expense	C2			26.7%
Total Underwriting Expense	C			40.0%
Actual Loss & Loss Expense	L'			$650,000

Given the above situation, the appropriate flat expense charge equals $10 and is calculated as follows. (This example assumes that 75% of all General and Other Acquisition expense is subject to flattening.)

$$e = (.75 \times C1 \times P)/X = (.75 \times .133 \times \$1{,}000{,}000)/10{,}000 = \$10$$

If we are revising rates as well as incorporating flat expenses then some sort of expense trending might also be appropriate. For purposes of illustration, we will assume that e', the trended expense charge = $12.

At the same time a revised variable expense provision is calculated.

$$C' = (.25 \times C1) + C2 = 30\%$$

Basic Ratemaking Techniques Using Flat Expense Allocation

We have separated those components of the expense loading which will be assigned on a proportional basis from those which will be charged using some type of flattening procedure. The problem which now remains is to build our revised allocations into the ratemaking process.

In order to simplify our presentation, we shall assume that the rating formula used for flattening expenses follows the basic form:

$$R'_n = L_n + e_n + e \qquad (2)$$

Our formulas can, however, be adapted to accept the more complex form shown in formula (3).

Under the traditional approach of proportional allocation, the rates for a line of business are developed in accordance with formula (1). In the initial stage of a conversion to flat expenses, we wish to convert the individual classification rates to a formula (2) form without revising the underlying pure premiums or overall collected expenses. This is accomplished in a three step procedure.

1) Calculate the pure premium underlying present rates
2) Add the new flat expense provision
3) Load the total for the remaining variable expenses.

Using our previous example as an illustration, we develop new rates of $57 and $143 for classifications 1 and 2, respectively.

Pure Premium for class 1 = $50 x .6 = $30

Pure Premium for class 2 = $150 x .6 = $90

$R_1' = (\$30 + \$10)/.70 = \$57$

$R_2' = (\$90 + \$10)/.70 = \$143$

In general terms, the revised rate (R') for class n is calculated using the following formula:

$$R'_n = ((1-C) \times R_n + e)/(1-C') \qquad (4)$$

Note that e/(1-C') is a constant. Therefore, if we so choose, we can present the revised rate in terms of a multiplier to the current rate plus a constant term.

$$R'_n = KR_n + h \tag{5}$$

$$K = (1-C)/(1-C') = .857 \tag{6}$$

$$h = e/(1-C') = \$14 \tag{7}$$

Essentially, formula (5) defines a rate which includes a provision for flat expenses as a combination of a loss rate and an expense rate, where each of these component parts includes a loading for variable expenses.

Once the rates have been modified to incorporate flat expenses, the next area of concern to the ratemaker is the calculation of rate level adjustments due to changing experience. Estimates of overall rate level need are calculated in a manner almost identical to that used when a proportional allocation system is in place. The familiar method of adjusting overall rate levels is:

I = LR/PLR = indicated rate level change

LR = experience loss ratio adjusted to current rate and prospective loss levels

PLR= permissible loss ratio

To accomodate rates which incorporate flat expenses, we replace the loss ratio term in the formula with a loss and flat expense ratio, and we replace the permissible loss ratio with a permissible loss and flat expense ratio.

$$I = ((L' + e'X)/P) / (1-C') \qquad (8)$$

L' = losses developed and adjusted to prospective levels

e' = trended flat expense dollars per risk

X = number of exposures

P = total premium at current rates

Again using our previous example:

L' = $650,000

e' = $12

X = 10,000

P = $1,000,000

C' = .30

I = (($650,000 + $120,000)/$1,000,000) /.70 = 1.10

This calculated indication represents the necessary increase in rate level in order to maintain premium adequacy. Its primary use is one of measuring overall profitability and financial position, for unlike the indication developed under a proportional allocation system this modification cannot be applied directly to the individual classification rates. In order to maintain independence between the loss and expense portions of the final rates, two separate adjustments must be calculated.

M_L = overall loss rate modification = $(L'/P_L)/(1-C')$ (9)

P_L = premiums less fixed expenses = $P-hX$

M_e = overall expense rate modification = e'/e

In our example:

P_L = \$1,000,000 - \$14 (10,000) = \$860,000

M_L = (\$650,000/\$860,000) /.70 = 1.080

M_e = \$12/\$10 = 1.200

If revised rates are to be based on overall rather than classification loss experience then these factors can be applied directly to the individual loss and expense rates. If, however, class experience has some degree of credibility then the modification of the loss rates can be adjusted accordingly.

$$M_{L_n} = ((L'_n/P_{L_n})\, Z_n + (L'/P_L)(1-Z_n))/(1-C') \qquad (10)$$

Note that the individual class modifications must receive a subsequent adjustment to achieve the proper overall change.

This revised approach towards expense allocation will not affect credibility levels in Automobile or Homeowners insurance where credibility is based on claim counts and exposures. However, if flat expenses are introduced in a line where premium has been used as a credibility measure, then some revision in credibility values should be considered.

We have now developed a basic approach towards making rates when a system of expense flattening is used; however, before moving on it is necessary to briefly mention some of the practical considerations with which we must deal when using this system.

Separate loss premium and expense premium information must be available to the ratemaker. Accurate exposure data is also necessary in order to properly evaluate the magnitude of the flat expense loadings.

Flat expense costs will obviously be subject to inflation, and expense trending procedures must be developed. In many cases loss trend is being applied to expenses as an interim measure. It is obvious, though, that in most cases loss trend is not an appropriate measure of increasing expense costs. Automobile crash parts, liability judgments, and medical

costs are certainly rising faster than general expenses. In the case of Homeowners insurance, trend factors are tied in to construction cost indices. The authors feel that if expenses are subject to the application of trend factors, then these factors should be developed using CPI-type wage and price indices which correspond, however roughly, with those costs which underlie an insurance operation.

The question of whether flat expenses should be allocated on a statewide, regional or countrywide basis must also be addressed. Costs associated with the operations of field offices will be influenced by local economic conditions, while EDP and Home Office operation expense could reasonably be assigned on a countrywide basis. At the moment, flat expenses by state are determined by applying existing, variable, loadings to state premiums. This methodology assumes that while certain expenses are flat within a state, on an interstate basis expenses continue to be a function of premium dollars. While this approach may not appear to be valid from a theoretical standpoint its use must be continued as long as state regulations vary with regards to expense flattening categories and procedures, for it is the only way to insure the collection of adequate expense dollars.

The implementation of an expense flattening procedure also introduces a new element when filing for rate changes which do not equal the required overall indication. It is often the case, for example, that for political or marketing reasons Automobile rate changes fall a great deal

below indications. Should rate shortfalls be absorbed solely by the loss portion of the rate? Or should it fall on the expense rate as well? If these costs are to be shared it must be decided whether the division will be proportional or according to some other standard.

These and other general problems must be handled if a ratemaking system using flat expenses is to be effective. Of course, each line of business also has special considerations which must be addressed.

Expense Considerations in Automobile Insurance

Since the main thrust of expense flattening has been aimed at Private Passenger Automobile insurance, various methodologies have already been investigated, documented, and implemented in a few states. As we mentioned previously, the Insurance Services Office prepared a study of expenses concluding that 75% of company General Expenses and Miscellaneous Taxes, Licenses, and Fees are fixed. This result was incorporated into an expense flattening program implemented in rate revisions filed after January 1, 1979. The ISO has chosen to develop expense fees by coverage (based on the average expense loading currently in the rate) and by state, with the fees applicable on a per car basis.

Several questions arise from this proposal which each insurer should investigate. Specifically, each company needs to determine if the flat expense fee should apply per car or per policy and whether or not different charges are required by coverage. Should the same expense fees apply to renewal as well as new business and should any charge be made for mid-term endorsement activity?

Frequently companies issue one policy to insure multiple exposures and, while there is some additional expense incurred in the rating and processing of a multi-car risk, it is not likely to be proportional to that of a single car risk. A thorough investigation of the billing and policy issuance systems should provide sufficient information to determine the extent of the cost savings which results when writing a multi-car policy. In general, expense savings can be found in the areas of postage, paper, telephone and telegraph costs, and related processing expenses. Most companies issue a single policy for a multi-car risk, thereby reducing processing costs. At the same time, however, installment premium payment modes may be more prevalent with a multi-car risk, thus offsetting the savings obtained from the single policy issuance. Each company needs to determine if a significant cost difference exists in the issuance of a single vs. a multi-car policy and the feasibility of implementing a per policy charge within its systems capabilities.

Another aspect of ISO's expense flattening proposal requires comment. The ISO technique develops flat expense fees by coverage based on the variable loading currently in the coverage rate. As an example, consider a state in which the current average rates by coverage are:

Liability	$225
Comprehensive	$ 50
Collision	$125

If it is determined that 10% of the rate represents fixed expense, then flat expense fees of $22.50, $5.00 and $12.50 would apply to the respective coverages. A policyholder with a Liability-only policy would pay $22.50 in expenses; one with Liability and Comprehensive, $27.50; and one with the full complement of Liability and Physical Damage, $40. The actual expense differential between a Liability and Comprehensive policy and one which also includes Collision coverage is minimal since most of the rating information is already available in the data base. The largest expense is incurred in adding the first Physical Damage coverage. The above approach defeats the purpose of matching actual expenses to policies and instead allocates fixed expenses to coverage on the basis of pure premium. This is just as arbitrary as the current ratemaking procedure. A reasonable alternative is to determine a basic expense fee to be charged on the initial coverage written and a second, smaller fee if any secondary coverages apply.

An investigation of the costs to issue a new vs. a renewal policy or to add an endorsement will likewise determine if it is worthwhile to distinguish the expenses incurred by these transactions.

In all of these areas, the issue of expense flattening requires a complete re-examination of the costs to issue a policy and a re-thinking of the insurance industry's approach to charging for them.

Expense Considerations in Homeowners Insurance

The use of expense flattening in Homeowners insurance can create some problems if its application is not carefully planned. Three areas which should receive the actuary's attention are:

1) The impact of expense flattening on the pricing of policies which provide for automatic increases in face amount.
2) The assignment of expenses to Tenants insurance.
3) The pricing of endorsements.

In recent years insurance companies have attempted to offset the effects of inflation on Homeowners business by including what are referred to as "inflation guard" provisions in the standard policy. These provisions provide for a periodic, automatic increase in the policy face amount. This increase will, of course, result in a premium increase for the insured without the necessity of a rate revision. Under a ratemaking system which uses proportional allocation of expenses, this pricing mechanism will result in the collection of increased expense dollars along with the pure premium increase. This effect is lost, however, for any flattened expenses. As long as there is no revision in rates, insureds will continue to contribute the same flat expense premium

regardless of the face value of the policy. The use of flat expenses will therefore necessitate an increase in the number and amount of rate level adjustments as inflation acts upon the flattened portion of the rate. To some extent the use of flat expenses will nullify the principle objective of an "inflation guard" system; an increase in collected premium without all of the problems inherent in filing and implementing a rate level change.

The expenses inherent in carrying a book of Tenants business are generally inseparable from those accompanying the Homeowners forms. The same processing and billing systems are used, and to a great extent the entire Tenants product is treated as another Homeowners form. This implies that the flat expense charge for a piece of Tenants business should be the same as that of a Homeowners policy. The implementation of identical charges creates a practical problem in that Tenants policyholders will often receive substantial rate increases as a result. This can be illustrated by looking at one company's experience for a single representative state.

	Homeowners	Tenants	Combined
1978 Earned Premium (000)	$4,778	$417	$5,194
1978 Earned Exposures	24,588	4,990	29,578
Average Premium	$194	$83	$176

If 10% of the total premium is subject to flattening, then the per policy charge based on combined experience equals $18. Thus, the new average premium for a Homeowners policy would equal $193 ($194 x .9 + $18) while the average Tenants policy would increase by 12% to $93. This Tenants increase would fall even more severely on renters with low contents values. In the above case, more than 50% of the exposures carried contents coverage of $8,000 or less at an average premium of $62. For these insureds, the average increase resulting from expense flattening exceeds 19%.

The use of identical expense charges for Homeowners and Tenants business is impractical from both social and marketing standpoints regardless of the financial equity of the system. A possible solution to flattening expenses for Tenants insurance is to adopt a separate charge even though Tenants expenses cannot be segregated from those of the Homeowners forms. In the above case, flat expense charges of $19 and $8 could be adopted for Homeowners and Tenants business, respectively.

The possibility of flattening expenses incurred when adding endorsements to a Homeowners policy must also be considered. As was true in the case of pricing a Tenants policy, the dollar impact of any change in the allocation of expenses is of as much concern as the equity of the pricing method. In many cases it will be concluded that the pricing of endorsements is best left unchanged due to the small costs involved, but this decision should be a conscious one which is made only after evaluating each particular situation with care.

Conclusion

Expense flattening is a subject which demands more attention than the actuarial profession has devoted to it. It continues to be a subject for public debate, and consumer pressure is rapidly forcing the adoption of legally mandated flattening procedures. Unfortunately, these procedures are often convoluted and lack firm statistical justification. Expense flattening is here to stay, and a continued lack of actuarial input will only insure the continued adoption of inconsistent, unjustifiable flattening schemes.

In this paper we have presented the basic concepts underlying the proper allocation of underwriting expenses, and we hope that it will open the door to further research in this area. Hopefully, by answering some of the questions and correcting the misconceptions which surround expense flattening we will serve both the industry and the public by helping to provide insurance products whose prices accurately reflect their associated costs.

Glossary of Variables

R_n = the rate for a risk of a specific class n

L_n = the underlying pure premium in R_n

E_n = the provision for underwriting expenses in R_n

R'_n = revised rate for class n after expense flattening

e_n = the variable expense provision in R'_n

e = the flat expense loading which is constant for all n

$e_1, e_2, \ldots e_x$ = expense loadings which vary according to some characteristic

O = overhead loading

t = territory

X = exposures

P = premium

PLR = permissible loss ratio

C1 = gen. expense and other acq. allowance

C2 = remaining underwriting expense allowance

C = total underwriting expense

L' = actual loss and loss expense

e' = trended flat expense charge

C' = revised variable expense charge

K = multiplier = (1 - C)/(1 - C')

h = constant = e/(1 - C')

Glossary of Variables (Cont)

I	=	indicated rate level change
LR	=	experience loss ratio at current rates and prospective loss levels
M_L	=	overall loss rate modification
P_L	=	premiums less fixed expenses
M_e	=	overall expense rate modification
M_{L_n}	=	loss rate modification for class n
L'_n	=	actual loss and loss expense for class n
P_{L_n}	=	premiums less fixed expenses for class n
Z_n	=	credibility assigned to class n