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Summary: The expense assumption used in the pricing process can provide the framework to enable an insurance company to achieve a desirable level of profitability, competitiveness, and cost structure. The ability to both control expenses and reflect them appropriately in pricing is necessary for an insurance company's short-term and long-term success. Mr. Gutterman presents and discusses his award-winning paper.

Ms. Katherine A. Anderson: I'm with Security Life Reinsurance. As you know expense assumptions used in pricing provides the framework to enable an insurance company to achieve a desirable level of profitability, competitiveness, and cost structure. We have Sam Gutterman with us to present and discuss his award winning paper. As you know, Mr. Gutterman was president of the SOA in 1995, and 1996, and he's been actively involved with the SOA and the industry. His contribution to the actuarial profession has been tremendous. Sam is currently the director and consulting actuary of Price Waterhouse.

Mr. Sam Gutterman: I'm pleased to present my paper entitled, *Expenses and Pricing*. I hope it proves to be of some value to you. Before I begin, I would like to pose a question to everyone. How many of you have conducted an expense analysis? Great, I'm speaking to the experts. How many of you have run a marathon or Iron-Man triathlon? Great. I think there's actually a lot in common between an event like a marathon and an expense analysis. For example, a good marathon is usually accompanied by significant planning and effort, as is with an expense analysis. It begins with training, and maybe a few short races to get in shape. Nothing glamorous. An expense analysis in most companies is not a glamorous function either. Marathoning is a part of a total health program including nutrition and cross-training aimed at improving the management of your body and

mind. So is the contribution of an expense analysis to the overall success of a corporation. It may be a one time fling done for a variety of reasons. Expense analysis can be done as a one shot project, but it also may become a pattern that can be valuable to those who make use of it. But it also has to be taken seriously; otherwise you may not finish or do as well in comparison with your objectives that you've set out. A rigorous approach to both preparing for and performing a marathon or an expense analysis is an absolute necessity in order to achieve quality results.

One reason why I wrote this paper was to attempt to fill what appeared to me to be a gap in actuarial literature in the area of expense analysis. Apart from a very limited number of papers and study notes, there's relatively little actuarial literature on this topic. Typically references to expenses are an adjunct to a separate purpose for which the paper or study material is prepared. In fact I started working on this project and this paper a long time ago when I was chairman of the SOA's Education Committee. It was clear, based on a review of the syllabus, that there was insufficient number of papers that dealt with this area in a comprehensive manner. In fact as I talked to people about the topic of the paper I got quizzical looks and the comment, "Gee that's pretty simple isn't it?" I had to chuckle back and say, "Well, it's not so simple after all."

My paper was based on the development and thought that went into many expense studies conducted while I was managing an experience study unit in a large, multi/line, insurance company and my own personal interest in this topic. Although it is based on insurance company experience much of what I have addressed also applies to other types of companies as well. The text has not yet been fully polished, its editing and a final review remains to be completed. I encourage you to interrupt and add comments since almost everyone in this room has been involved in an expense analysis. I think that we may benefit from additional viewpoints and because I've not finished the paper I might take the liberty of adding your comments as well.

The main theme of the paper is that a rigorous expense analysis can be an important actuarial function in an insurance company environment. It is, or can be, of significant importance to a company and within the scope of an actuary's work. Actuaries typically have played a supporting role in such analysis, being primarily concerned with the application of expense assumptions to serve as one component in the pricing process or reserve calculations. It serves as a major part of everyday business decision making, ranging from providing information to helping determine whether to invest in a new system or determine everyone's salary increases. That includes the management and control of business operations through budgeting and operating within the budget set. Pricing and repricing processes, the typical areas of

actuarial analysis and performance measurement, monitor the effectiveness of the management of expense control efforts. The paper refers to two methods of managing expenses: active and passive management. Passive management is the more typical and traditional route and is usually associated with cost-based pricing. Its components of expense budgeting, control pricing, and monitoring are often conducted independently. In contrast, active management of expenses involves the integration of expense control and management and performance benchmarking and setting and measuring those benchmarks. Additional topics are also covered in the paper, including certain aspects of expenses relating to financial reporting and other applications.

The first topic that I have to cover before a discussion of any expense analysis is some pricing fundamentals. I'll follow that up with a description of a typical expense analysis process and expense fundamentals. I'll then discuss what active expense management consists of, in contrast with the typical actuarial involvement in expense analysis, including its implications and options. I will then comment on the expense allocation process, as well as unit expenses and overhead expenses. Other issues will be explored if we have time, including expense modeling and performance measurement.

It's my belief that there are two fundamental approaches to pricing: market-based pricing and cost-based pricing. The following is a simplified description of these methods, the primary difference being the starting point. Market based pricing is where the market determines the price of a product. If this approach is followed, the actuary's role is to determine the level of costs that can be recovered and the amount of profits or return on capital that can be expected to be achieved at that market price. If the company deviates from the market price, it has to determine whether it is then willing to participate in the market at that price by adjusting its expense recovery or expected profit margin accordingly. In contrast, cost based pricing first involves the determination of the elemental costs involved in the product underlying it and reflecting expected costs and desired corporate objectives, including rates of return and expected sales volume. If the market determines that the amount of expected sales is not achievable at the price so determined, then an iterative of process results reflecting potential compromises in cost levels for other objectives. This latter method is the one that many actuaries typically follow because of their knowledge of fundamental costs, although the former market based pricing may be more realistic and effective. In either case the role of expense analysis is similar; that is to reflect expense levels under possible alternative scenarios in order to determine the company's price offer. What deviations should be made in the price or what changes in the underlying costs need to be made in order to achieve a given level of profitability can then be determined. Performance measurement, often referred to by actuaries as

experience analysis, is usually a significant aspect of the pricing process. In fact, it is difficult for me to believe that a successful firm does not understand its cost structure, of which expenses may be a significant part in an insurance company. This monitoring of experience forms a significant part of the feedback loop that most companies conduct. If you remember the paper by Bob Shapiro, he referred to that as the product development process and what Australian actuaries are now calling the actuarial control cycle. In fact, as I will mention later, the measurement of the degree of achievement of pricing assumptions or expectations can represent an important component of the management of overall corporate performance expectations.

I'd like to briefly describe a typical expense analysis cycle. Although this could represent the best practice in this area, both the circumstances in which a study is conducted and its objectives could imply that other approaches or modifications to such an approach would be more suitable. The first step is to review the previously used methodology, if any, to assure that it is still appropriate for the use intended and to plan for changes, if deemed appropriate. The methodology may include such decisions as how to reflect overhead expenses. You may not want to change methodology for each study; otherwise significant distribution systems or market position disruptions may result. Second, the process of gathering relevant raw experience data, including both expense and relevant unit data, must be undertaken. Of course if relevant or reliable historical experience is unavailable, alternative sources or methods have to be developed.

Third, once the raw data have been compiled, it needs to be adjusted in some way to form a proper basis to be applied to project future expected conditions. Fourth, this adjusted experience then needs to be transformed into experience or expense factors to take into account such things as unusual expenses or sales for reflection into pricing formulas. For many expenses these factors are indeed unit expenses. Unit expense levels that are not directly variable and even so-called fixed expenses almost always seem to change; therefore, historical experience factors are rarely usable as is. In this step, relevant adjustments need to be made based on expected changes and conditions in the period for which the pricing, but it is just expected to be applicable.

It is one thing to determine specific expense factors for a given product for pricing it is just as important to test expense recovery of the business being priced against that level expected or hoped for. Indeed, it may be appropriate to validate expense recovery for the overall company to assure that an adequate degree of expected expense recoveries is anticipated. The actuary must remember that the level of expense recovery or coverage is not the only business objective of the firm although in many cases it is a crucial one. Once the study is completed, it is obvious to me

that performance measurement should be performed on a regular basis. It has not been acceptable for quite a while to wait until it is determined that another rate book is needed to monitor expense performance. Monthly or quarterly performance reporting is typical now. Of course, a detailed study may be less frequently provided. When needed, that is if the data looks funny or one or more of a set of business objectives are not expected to be achieved or performance deviates from expected levels, all or some of this cycle may be repeated. In any case, the process should be repeated either on a regular basis or when the need for such a project occurs. In my experience, expense analysis almost always takes longer than what you first expect it to take.

Is there an optimal expense level or an optimal set of expense factors? I believe that this question can only be answered in the context of the given business strategy, typically involving multiple sets of objectives. For example, a company may set targets or benchmarks relative to a given market share, degree of desired pricing conservatism, level of service, or the type of distribution system involved. On the other hand, some management may view this question simply as an exercise to determine how to reduce costs or maximize profits. This may be an appropriate approach; however, it may be better to assure yourself that the broad business perspectives are understood and to assess the basis for determining benchmarks to be used. Bottom line, expense analysis is a study of the degree to which the firm is efficiently using its resources. If it is not, changes are needed in order to do so.

Active vs. Passive Expense Management

Active expense management can be viewed as the opposite of passive management, for which inertia is honored and business as usual is a trademark. Cost plus pricing is often associated with passive expense management. Historical expense levels and resulting expenses are accepted as future indicators and results will just happen accordingly. Active management is by contrast a more prospective approach. In a more active expense management process in which historical expense levels and an inflationary trend are not accepted, actuaries can provide several key roles.

Measurement of historical expenses is always important, incorporating the allocation and analysis of the components of expenses. Benchmark development not only includes the setting of assumptions, but also the determination of whether the assumption set is an appropriate one relative to corporate objectives and market prices. It also includes an analysis of the implications of those objectives so that management can confirm that those objectives remain appropriate in the future. The determination of expense levels provided for during pricing is appropriately tied into the budgeting and monitoring of costs.

Pricing is, of course, a traditional actuarial function in insurance companies that incorporates the expected benchmarks developed. The pricing process can provide information as to the level of desirable expenses under various price and sales assumptions as well as alternative scenarios. Lastly, management of the feedback loop is of significant importance, including the determination of when costs have significantly deviated from those assumed and whether cost control processes have worked according to plan.

Active expense management has taken many forms and shapes over the years, often following the preaching of famous management consultant guru that some believe should be referred to as fads. In my opinion, although these are sometimes implemented because of the Lemming theory of management programs—that is management does not want to be seen as not using today's best management practices and guidebooks—they sometimes have good ideas underlying them. However, they also serve as an excuse for better cost control or cost cutting. Some of the approaches espoused over the last 15 years have included zero-based budgeting, total quality management (TQM), activity-based pricing, re-engineering, and outsourcing. I'll briefly describe some of these methods and the underlying thoughts behind them.

Zero-Based Budgeting

Zero-based budgeting can be viewed as an attempt to move away from passive expense management, without taking current operations as a given. Sometimes managers are concerned that the expense budgeting processes is not taking a hard look at the expenses expected to be spent in the upcoming period. It is a bottom up approach, one that attempts to force management to decide whether each expense is worthwhile. The focus is on the specific type of expenditure, such as travel to meetings in Hawaii, but it can also include all such expenses. It proved to be a useful approach when it was first introduced, although in some cases it was just applied once a year and after one or two versions it wasn't used or followed up at all. In addition, unless applied in a focused manner, sometimes the result was the status quo because the people preparing these budgets were also responsible for the budgets and potentially reducing the costs.

As a result, it gave control to the wrong people in the organization. Sometimes broad-brush guidelines are provided such as "Start looking at all your processes, but cut your costs by 5%." That approach is good, but it tends to be ineffective in terms of strategically managing the business. Although TQM focuses on quality, especially by improving service, it emphasizes getting employees involved in determining their own destiny and doing things right. In addition to quality improvements, expense reduction opportunities are supposed to be equally assessed. Through developing buy-in with those directly affected, management

implementation of expense reduction programs not only had a less significant negative effect on employees, but also were more enthusiastically taken because they were driven from the bottom up. As an active expense management strategy, however, the effects are typically limited because, like zero-based budgeting, overall corporate objectives are typically poorly communicated. Yet, it does have the advantage of being bottom-up in involving the individuals affected.

Activity-Based Costing

Activity-based costing (ABC) is basically an approach aimed at improving management information through what some view as being more indicative of underlying costs than traditional cost accounting approaches. Such costs, particularly in manufacturing, have traditionally focused on overall labor costs and margins. This has proved particularly popular in manufacturing, but in the last couple of years it has also been applied to the insurance industry. In general, it has enabled firms to price in a manner more consistent with costs, as that pricing can be performed in a more accurate manner. Its focus on activities, functions, or drivers of expenses is a valuable aspect of the approach. Thus, with changes in product mix, the resulting values are more dependable over a longer period of time than a more traditional approach.

Recently there has been a movement toward activity based management; that is trying to integrate the pricing process with expenses that utilize ABC. The result is a movement to more active expense management. In terms of identifying across processes by expense drivers, many people think that this is of long term benefit to anyone who's involved in pricing.

Reengineering

Reengineering, an expense approach utilized in the 1990s, focuses on processes as well. Like zero-based budgeting, reengineering focuses on whether all expenses are necessary. In this case, reengineering determines whether each process is necessary and then, once that's determined, whether it can be streamlined and simplified. Although I believe the major focus of this approach is a good one, it may have been used too often to cut costs to an absolute minimum, ignoring that people are not machines, and that, in fact, a looser operation may be more effective overall. It recently has been criticized as focusing only on cost control and not permitting a firm to be able to grow. Its positive aspect is looking at processes, making sure that what's being done is necessary and relatively efficient. So the approach underlying it is a good one; in some cases it has been the applications that have gone awry.

Outsourcing

The last method of active expense management that I'll mention is outsourcing. This has been a key management strategy of the 1990s. It permits firms to focus on

those activities that are germane to the business by delegating nonessential functions to others. These jobs can be done more efficiently at competitive rates, allowing management to devote their attention to those functions that will result in an improved chance at a success of a firm. This is in fact a method that has been utilized for many years. A good example is building maintenance. Oftentimes that's outsourced to outside entities, because management doesn't want to get involved nor has the expertise to manage those functions. The perceived importance of this approach can be seen through the increasing use of consultants to perform core functions of a firm in order to increase and improve feelings of responsibility for the job performed. Outsourcing sometimes has its disadvantages because of possible reductions in inside expertise; that is, being able to judge the relative effectiveness of the job done. Overall results may not improve as much as desired. I think that focus is of importance to management and may be useful to control costs over the long term. Expense management can be viewed in a manner similar to the pricing process.

Aggregate Analysis

An alternative approach compared to the management ones described above, is to start at the desired level of overall expenses. This level can be determined on the basis of a percentage increase from the prior year or even on a bottom-up basis. The allocation of overall expenses to each operating area is determined, keeping in mind the overall expense budget or expense target. The next step is controlling that level of overall expenses to the desired levels and, of course, monitoring the overall results. Then, based on the measurement of actual results, the reward is developed. This reward may take the form of incentive compensation.

The Role of Feedback

The last one, which is inherent in most processes, involves cycling back when appropriate. Of course, depending on the company and its culture, the order can change depending on whether it starts bottom-up or top-down; the comparison of either budgeted or actual benchmark values can be introduced at any stage in this process.

A useful technique in active expense management, one I find to be particularly useful, that is getting the CEO involved in the process. Too often lower-level management is expected to follow zero based budgeting whatever the techniques used, but too often, if the CEO isn't involved with the communicating process, there will be a considerable lack of interest and participation in lower-level management. There is nothing better than compensation or performance incentives to focus management's attention. It has to be noted, though, that it can be quite difficult to design effective incentive compensation programs. Often the problem is weighing the various factors involved. An obvious case is a situation where a distribution

system has in its performance compensation expense reduction or controlling expenses. Suddenly the next year management typically finds out that, in fact, expenses are indeed controlled but sales have dropped off considerably, so you have to be very careful in designing such a program in order not to weigh one factor too much. Expense modeling, which I'll mention later, is an effective means of developing a better basis for communication and management information. I think being up front with information can be extremely important in such processes. Making them relevant to the individuals affected is key.

Before an expense analysis project is initiated, I believe that the analyst must have a firm grasp on both the experience data as well as the business objectives of the firm. You may question this because sometimes the person developing the expense data is a low-level member of the organization, possibly an actuarial student. It is important to give whomever is doing the analysis an understanding of the total business objectives, because many choices occur in the process. Ignoring or just looking at data as data without a context can produce misleading results. There are many potential nuances of expenses. Only with luck do broad measurement of expenses represent sustainable expense levels. Unusual events happen all the time; so much so that typically the unusual is the usual. In order to relate expenses to prospective pricing, the expense analyst needs to recognize business objectives and strategies. Ivory-towerish pricing does no one in the company any good. There are many levels of refinement that an expense analysis project can take. It is necessary to plan project resources and corresponding refinement level before beginning the work. The analyst could come back after an hour saying, "I've completed the expense project," or it could be a month until you really dig into the details. I think that the amount of resources used has to be consistent with the objectives and the importance of the project.

Unit Expense Basics

Now for a few fundamentals that everyone is familiar with, but I'll review anyway. It is important to recognize the degree to which any expense is variable or varies with some activity measure. Of course, it seems obvious that fixed expenses plus variable expenses equal total expenses. Unfortunately for expense analysis, life is not that simple, because the distinction between such expenses depend on either or both of the time periods being studied or the range of exposure or activity measurements involved. In fact, it depends on the conditions being studied. For example, if the decision at hand is whether to sell a company, all of the expenses are variable.

The actuary would typically develop a total cost curve with one axis representing expenses and the other corresponding units. Variable expenses are those that vary over the unit range being studied. Marginal expense is not so much concerned with

expense allocation, but represents the level of expenses that change as a result of a change in a single exposure or activity unit. Marginal expenses may not be linear, but can be step based where the expenses do not change with each unit change, depending on the type of expenses involved; for example, expenses may only change when a new employee is hired rather than with every policy issued or maintained. In many cases the level of unit expenses, that is some expenses divided by some exposure measurement or unit, is more sensitive to the unit selected than the expenses themselves. This is often an overlooked aspect of expense analysis. As a result, it is important both to select appropriate units and measure them properly.

In addition, the units selected may vary depending on the application. In pricing it is common to select a pricing variable as units, such as policies or premiums. For management information, other units may be selected.

Table 1 illustrates some simple concepts, with three alternative scenarios for a category of expenses whose closest expense driver is the number of policies. It could arise in the case that the manager is deciding the financial implication of alternative scenarios. Two expense categories are given: employee expenses, presumably salary and related expenses and nonemployee expenses. The range of the number of policies involved are between 50,000 and 60,000. Note that the nonemployee expenses are directly related with the number of policies, while the employee expenses are related to the number of employees.

TABLE 1
EXPENSE ANALYSIS FUNDAMENTALS EXAMPLE

Scenario	Number of Policies	Number of Employees	Employee Expenses	Non-Employee Expenses	Total Expenses	Unit Expenses
1	50,000	50	\$1,000,000	\$100,000	\$1,100,000	\$22.00
2	55,000	50	1,000,000	110,000	1,110,000	20.18
3	60,000	55	1,150,000	120,000	1,270,000	21.17

The increase in employee expenses may result from full capacity being reached at the 55,000 policy level. Note that the total expenses range from \$1.10 million to \$1.27 million. In this case between 55,000 policies variable and marginal expenses are the same within the range shown in the amount of \$10,000. However, while the marginal expense is \$160,000 between 55,000–60,000 policies, the variable expense is \$170,000, or the amount of expenses above \$1.10 million given. The fixed expense within this range of policies is the difference between the total expenses and the variable expenses. The marginal increase per unit is quite large and could represent the necessity of hiring an additional team once you hit the critical mass at this point of 55,000 policies. This example shows that the actuary

must be able to understand what's going on and what's driving the expenses in such a unit.

In fact, there is insufficient information given in Table 1 to distinguish between fixed and variable expenses to begin with. All we know is the variation of total expenses within the range of policies provided during the experience period. The only observation we can make is that the expense values over the range of the number of policies given is as shown in Table 1. For example, fixed expenses could be zero—with no policies there would be no expenses or \$1.1 million if a minimum of 50 employees had to exist in order to service any business at all. As for marginal expenses, I did not tell you whether the increase in expenses all resulted from an increase in expenses actually spent or represented a combination of increases spent and an increase in those expenses allocated. Even with a simple table of numbers you should find its underlying elements and the components of its expenses. Not only do you need to grasp the simple, underlying concepts, but it's very important to understand what's really going on and driving the expenses to begin with.

Experience Allocation

There is insufficient time to fully explore expense allocation approaches that can be utilized. If a company only had one product sold through one distribution system, through one legal entity, and with one risk classification, no allocation issues would exist, this problem would be far simpler. However, this is not reality. In fact, many approaches are possible. Such approaches could be managed by a cost accountant and could be found in a good cost accounting book or Norman Nodulman's expense study note provided in the current SOA syllabus. They range from armchair or eyeball methods to the use of more refined time studies. In some cases, uniform approaches are applied for an entire company. In others, different methods are used depending on the amount of the expenses or the number or type of functions and/or products sold by the specific organizational unit.

One can easily get too refined and costly to administer an advanced cost accounting system. This is something that you have to cost justify. Most actuaries, though, would like to have the most information available. Internal company disagreements, which are sometimes heated, can arise in the allocation process as tables develop, particularly for overhead or nondirect expenses. This disagreement is more likely to arise in the case where profit responsibility is decentralized—for example, if a strategic business unit structure is used. Many problem areas exist in allocation particularly in the case of relatively small product lines or if a particular organization is servicing many products. The allocation of expenses is important because it affects the raw material used in the actuary's pricing.

An old argument in this area is the distinction between allocation of expenses by organizational unit or by functions. In the easy case where each unit performs only one function, there's no problem. However, it is not uncommon that an organizational unit performs multiple functions, possibly including an overhead function as well. Of course an actuary would like to have data segmented in all possible ways or have some expenses identified by one approach and other expenses by another, or maybe even a combination. However, practically speaking it may only be possible to utilize one cut of the expense data.

The advantages of organizational allocation include its simplicity. In addition, such information relates to whom is responsible for the expenses; you only have to go to one person to find out what's happening. It is also consistent with the preparation of most companies' budgets. As a result it may make the use of budgeted expense dollars easier.

On the other hand, functional expenses may be more realistic measures of overall expenses, particularly in view of the increased use of teams and complicated organizational structures. It is much more frequent in large companies, in particular as companies grow even larger in the future and consolidation continues, this problem may be exacerbated. Also, if organizations change more, continuity may never occur.

Exposure units are just as, if not more, important as accurate expenses. Often the units are variables that are used in a pricing formula. If allocations are performed on the basis of a given type of unit, they may be more accurate if the same units are used in pricing. But this isn't mandatory. The use of premiums can be problematic. For example, a product line could use both annual and single premiums; obviously the allocation among such products can vary significantly depending on how this difference is handled. Alternative approaches may be appropriate. Sometimes formulas are used, such as making a single premium being "worth" one-sixth the amount of the single premium, to be consistent and combinable with annual premiums. In addition, if unit expenses are determined based on annual premiums, it would be appropriate to apply them in the pricing formula on the same basis, rather than an annualized premium basis. In some cases the effect is 3–5%, but in some cases and for some products with very small margins, even that can be significant. With respect to claims, the decision of what percentage of expenses should be distributed by dollars of claims versus number of claims can effect your company's competitive position, particularly for large group cases as well in the analysis of profitability by products, as dynamics of expenses occur. This process is both more accurate and more reflective of changes if the units used are expense drivers.

Expense Drivers

Since I've mentioned expense drivers a couple of times, it may be useful to define this term more carefully. Simply put, an expense driver is a measure that directly varies with or is highly correlated with a given type of expense. A number of such measures can be used for a particular type of expense. An example is the number of applications made, which is a driver for underwriting costs. A less direct measure is the number of policies sold, although the latter is more often used because it more directly relates to the factors used in a pricing formula. Expenses may also be driven by the types of applications, such as whether medical underwriting is involved. In such cases the use of drivers may be more complicated.

Expense drivers are important because they determine future expense levels; that is, they may be used to project the future level of expenses in expense modeling and pricing and do not have to be adjusted as often if drivers are not reflected. They are also the focus of ABC applications.

Overhead Expenses

Overhead expenses can be the most controversial area of expense analysis in pricing. First, there are several definitions of overhead that you have to explore before you decide which approach to use. One definition covers any fixed expense either in a given range of probable exposure units or in the context of the current environment. Another is any unallocated expense. Overhead can include such expense categories as rent, although such expenses are often reasonably and noncontroversially allocated in proportion to such measures as space use or salary of individuals, assuming that these at least move in the same direction.

I'll describe three general methods commonly used by actuaries in pricing. They may be treated differently in management or financial reporting. Full allocation, sometimes referred to as the full absorption method; macropricing, or separate treatment of these expenses; and marginal pricing, which ignores such expenses.

Full allocation is the traditional approach to handling overhead expenses. The logic underlying this approach is that all expenses must be recovered by revenue somehow; thus some allocation is necessary. Traditional approaches used vary by company experience and types of products provided. In some cases a more detailed formula is applied, possibly as a function of other direct expenses or a type of expense such as noncommissionable direct expenses. By definition such expenses are fully allocated in financial reporting, although there are exceptions with certain expenses allocated to a corporate account if one exists. Typically they're also required to be allocated in rate filings. A primary disadvantage of this method is that it may be somewhat arbitrary, as I'm sure anyone going through an expense analysis process has recognized. For a given business unit, an overhead

expense is something that cannot be controlled by the business unit head; thus many believe it should be a below-the-line item. Also, by definition there is no direct expense driver underlying expense overhead. As a result, changes in units that are utilized do not affect the level of such expenses and should not be reflected in expense models on a unit basis.

Macropricing was made popular in actuarial circles by Shane Chalke in a transaction paper and study note. In it he advocates the allocation of variable expenses over the particular decision range being addressed. It does not consider those expenses that do not vary over that particular decision range. Although a strength, it is also a disadvantage, which is that such a range may vary depending on the specific application involved and indeed the viewer or user of the actual outputs of such an analysis. As a separate exercise, overhead or fixed expenses over the decision range are considered on a macro level basis. In fact, this approach is more consistent with economic theory. It is also not affected by the typically arbitrary or judgmental allocations of overhead. It forces the person pricing to look at the overall profitability of a book of business, product line, or company, which I consider to be a good thing, and not to simply focus on a specific product or specific product pricing cell. However, this approach is also not intuitive enough for many managers to grasp. Extensive education may be needed in order to understand profit margins before overhead expense allocations. Profit margins, not including overhead, may give the impression that prices can be reduced. If this method is utilized, education will be essential. In monitoring and performance, benchmarks also will have to be well understood.

The last of the three general methods is marginal pricing, which is often discussed in actuarial meetings, but not many actuaries admit to using it as a pricing approach. Depending on the period in the underwriting cycle in a certain insurance product lines, it may in fact be a common method. I would note that it may be viewed as a special case of the macro method I just described with no overhead expense recovery provided. Note that certain states do not allow a loss leader that may result from a literal application of this method. This method cannot be soundly applied, unless a company understands its implications. An expense model is quite useful in this regard.

I would like a show of hands from those people who have done expense analyses and have operated with overhead expenses. How many typically use the full allocation method? How many use the macro-level method? A handful. How many of you use the marginal pricing method? No admitted takers, OK. That's not unexpected.

Development Expenses

I'd like to discuss briefly a possible treatment of one special issue, development expenses. It is a special type of nonrecurring expense that can be defined as a large investment with a specific portion of expected return on sales (or some other source of profits) occurring in a future period. The accounting profession has recently discussed whether such expenses in areas such as software development should be immediately expensed or recognized as a capital cost. The general conclusion is that such expenses should not be capitalized in financial reporting. However, possible alternative treatments exist in a pricing context. If there's a continuous amount of development being conducted, it is common to treat such expenses as a recurring expense and included in a manner consistent with overhead or a function in which such development occurs. However, if it really is unusual, several approaches can be taken. It is funny how people with profit responsibility claim that such expenses will never recur again, but at the same time how much unusual expenses occur every year.

I'll describe three possible approaches to this issue. First, treat this type of expense as an investment made by surplus in the development of a line of business or distribution system. It is common if a new product line or company is involved. The market does not recognize such cost as recoverable unless you were the first to enter a non-competitive market. This is also the soundest method from an economic standpoint. As a second approach, the expense can be allocated using exposure units over the useful lifetime of whatever is being developed. Unfortunately, in this area, the market price may not permit this approach. Third, you could also treat it as an investment with a higher required return than other investments, varying by risk level. Such a method is sometimes used to measure the investment in the distribution system. In this regard, sometimes a distinction is made between regular investment necessary to maintain a given level of distribution capability and an increase in this capability. The former is simply an ongoing expense; the latter is the growth of the distribution system treated as a developmental expense. However, if allocation is done over a period greater than a year, it is quite common to forget about it in that second, third, or fourth year conveniently or otherwise in future pricing projects.

You have to understand the approach you're intending to take, communicate that effectively and clearly to management, particularly if you leave an area to your successors. For pricing it is not only necessary to analyze historical experience, but you have to project unit expenses or overhead expense levels over the period in which the given set of prices will be in effect. Of course it may be difficult to determine that period. My best recommendation is to use judgement depending on the assessment of current or possible future changes in market or company position. As I have noted several times already, the more that unit expenses use expense

drivers as units, the less frequent adjustments will be needed in the future. It has to be a dynamic process that always factors in your best judgement. The application of judgment should not be taken lightly, its appropriation and “accuracy” also depend on the expected stability of the product and expense performance.

Projections

The following are some factors to consider in projecting unit expenses. The use of expense budgets can be somewhat problematic. First, different companies use such budgets in different ways and for different purposes. Some are stretch budgets, while others are more realistic. Some are only developed on an overall basis, with little detail available for use of either the pricing actuary or the expense analysis actuary. Thus, actual results in a particular area of a company may vary significantly from expected overall results. If you don't understand the basis of the budget philosophy, you may very well be misusing those budget numbers. Although it may be appropriate to consider the probable impact of expense control efforts, it may be hazardous to be optimistic about all such efforts. Sometimes, something unusual occurs that proves to offset all of the expense savings planned. The use of sales budgets can be more controversial. In some companies such budgets always seem optimistic. Should the actuary reflect what appears to you to be wildly optimistic assumptions? I think that the best course is to run a set of expected profitability analyses on alternative bases. The resulting expense benchmarks can also be useful for communication to nonactuaries.

Inflation may be reflected in expense budgets in the short term. However, if a long duration product is involved, budgets are not useful or available. It is common to use a general inflation assumption in a manner consistent with interest assumptions applied in the pricing process. However, such long term unit expenses as maintenance expenses often do not vary consistently with general inflation levels. Look at your own experience as a case in point. In this regard it is useful to develop an expense model, possibly a simple one to see how sensitive future unit expenses are to changes in overall inflation, plausible expense levels, anticipated company changes, or persistency in sales scenarios.

For many years, technology has been promised to reduce overall operating expenses. In some cases it has, but I'd suspect that most of the times it has not. Before your final expense report is produced, a number of further steps or checks may be quite useful. Overall expense coverage should be reviewed on a macro basis. Although this may be difficult if a single product is being priced, the availability of an up to date expense model may be quite useful.

Unit expense factors should not vary significantly across similar products. It is always useful to make such comparisons to judge the reasonableness of the results.

Spot-checking, i.e., reasonableness checking, is also quite important. Consistency across assumptions can also be used. Significant changes of overall expense assumption levels can develop significant animosity amongst your distribution system and be of more strategic importance than you might otherwise think possible.

As I mentioned during my discussion of the pricing process earlier, expense analysis in the context of pricing is not over until verification that prices meet objectives occurs. Feedback loops must always occur. A comparison of resulting overall expense margins should be compared where practical, to that of competition. This may be tricky to obtain, with the possibility of getting them from alternative sources, which I'll mention in a moment. Also, the last step should be to derive expense benchmarks so that future performance can be compared to that assumed.

Lack of Data

A common problem that many actuaries have come up against is the lack of experience data. This can happen when a new product line is introduced or there's a start-up company involved and no track record is available. Several possible approaches can be taken to this problem; however, as I previously mentioned most of the start-up costs will never be recovered and should be considered separately as an investment in the start-up operation. If a new product is involved, you should compare expense assumptions of similar products in the same company. Of course, any differences in the products should be reflected. You can look to peer companies, but identifying peers to compare against may in itself not be easy if you talk to different people in your distribution system, different peers are being compared to, particularly at the lowest price level. This should be addressed when determining expected market positioning.

Financial statements of such peers may be available but are sometimes difficult to use because of the aggregations involved. Reverse engineering can be tried, but the results may not always be reliable as many assumptions are involved. For industry expense studies you can use other sources such as consultants or reinsurance companies who sometimes can be quite helpful because of their experience with many insurance companies. Ideally, budgeting and planning assumptions should be your most relevant source. However, you have to judge for yourself how reliable they are and how much developmental expenses versus ongoing sustainable expenses are involved.

Expense Models and Benchmarks

I've referred to expense models several times. I think that they are quite useful, particularly if long duration products are included. They can be limited to expenses expressed in terms of applicable units or they can be one part of the output of a

corporate financial or GAAP model. Certainly some financial packages include such methodology. In any event, it may be simple or refined depending on the type of problem being examined and the resources available. They can be used in many areas, including specific pricing assignments, benchmark development, and valuation of overall budget levels relative to pricing assumptions. They're most useful when they are run under alternative scenarios. Simple communication of the results of such model runs can be of limited use to management. I believe that there is a definite need for reliable and well-communicated performance benchmarks as I've mentioned earlier, including both expense benchmarks and unit expense benchmarks. They can serve as early warning indicators or drivers of profitability.

Such benchmarks may include results from previous periods, budgeted or other expense values, or pricing assumptions. A complexity resulting from the long-term nature of some of our products is that a choice is possible in terms of use of the original or the current assumptions. In most cases, current assumptions are most useful in such an analysis; however this may be supplemented if a source of profit explanation is desired.

Any set of benchmarks should be kept as simple as possible. Specific assumptions by necessity have to be aggregated. However, this needs periodic validation. Particularly if communicated to upper management, you can't afford to become too detailed. It is also important to get buy-in as to the form and measures used for such benchmarks. The right approach for one company and one set of management may be a wrong one for another set. It is quite important, as I've mentioned several times during this presentation, to educate your audiences about the technical terms and approaches that are utilized in the expense analysis and the pricing process. Overhead, nonallocated expenses, development, and nonrecurring expenses need to be reflected in the development of an early warning mechanism, based on a set of key indicators. Above all, the message is keep it simple. One complexity that may be considered is the use of different levels of detail for different sets of users. For example, you shouldn't drown your marketing people with administrative expense details. If you do, your whole expense report and monitoring system may never be picked up from a person's desk. The qualitative explanation of reasons for deviations from benchmarks may in some cases be more important than the mathematical deviations themselves.

Summary

I'd like to add a brief summary to my comments. First, I believe that expense analysis is important to the success of a company and to the success of a product or product line. The determination that a company can't compete profitably in a given market is an extremely important piece of information that management must

clearly recognize. Active expense management is quite important to the overall profitability of a company and should be viewed as an important part of an expense analysis and pricing process. A rigorous pricing process and consistent use of pricing benchmarks is a key to an insurer's success. In conclusion, actuaries have the tools to be key players in expense analysis and expense management.

From the Floor: I completed my fellowship two years ago, and vaguely remember the old pricing note. I was wondering if there is a chance that this could become a new study note for fellowship exams. I was just wondering if you knew.

Mr. Gutterman: I think the topic is an important one that most actuaries should be familiar with particularly in an insurance company context.

From the Floor: I noticed you talked about some early warning indicators that your expenses weren't coming in the way you put in the pricing. What kind of indicators might those be? Are you looking at units coming in or different values from the ones you projected?

Mr. Gutterman: Typically, it represents deviations from expected results. Such early warning indicators are really something you must analyze because of the nonrecurring types of expenses and statistical noise regarding sales for the units that come through. However, you have to be very careful sometimes. Even normal values may be serious early warning indicators, so I think it's important to understand what's underlying the expense unit numbers as well as the actual ratios themselves.

Mr. Herget: I have the privilege of being on the Project Oversight Group (POG) that's reviewing Sam's paper, and I just want to make another plug for it. I think Sam has been too modest. This paper addresses many issues I think many actuaries should know about when they price a product or prepare a financial statements. Members of the POG were very impressed with what we saw. It fills a gap in the literature that really doesn't exist. As Sam said before, there are bits and pieces here and there, but with his experience he's been able to pull together many concepts and I wrote down a few that I'm not sure were covered. If you get through every chapter, you'll have a good understanding of how to deal with variable, step-rate, and fixed expenses. You'll be able distinguish between marketing and administrative and between deferrable and nondeferrable expenses. You'll be able to deal with the investment expenses. You'll be able to consider whether you should have a capital account, and what expenses should be allocated to a capital or a corporate account. The pricing actuary will be able to use these, and the illustration actuaries should be able to use the results of this expense study. A person who prepares *FAS 60, 97 or 120* numbers will have better insight if this type

of expense analysis is done. You'll be able to use numbers for loss recognition, and cash-flow testing. You could prepare divestiture estimates. You could use this for purchase accounting. You could certainly do a better job on your forecasting or planning given the falloff of business and the rise of new business. You'll be able to consider expenses allocated to base policies and riders, and which riders you should pick up. You should be able to consider holding company expenses that aren't in the life company and even consider some expenses that might be part of earnings, such as management bonus plans. Should those have been priced for or is that a result of profits from these policies? Both the Financial Reporting Section and the Product Development Section, as well as the Finance Practice Area, have all agreed to contribute some dollars to fund the publication of this paper.

Mr. Alan W. Finkelstein: I have two questions. The first is rather simple: Will there be a point in time when your paper will be made available on the Society's Web site? I'm not on any of the sections that are going to receive the paper automatically. Second, let's say you're building a financial model in an operational budget. What's the best way to handle the investment of company capital? How would you amortize it, and how would you determine your return on investment using the principles that you presented?

Mr. Herget: What we would like to do is publish it. We feel that there is some authenticity to a published bound volume that appears on your desk. It establishes a tone of credibility, but we also know it's easier to distribute the work over the Web site, so it is likely that all Section members will probably get that as part of their dues and anybody that's not a Section member we'll charge anyone who's not a section member to receive the entire publication.

Mr. Finkelstein: I did a financial model for a product using a five year projection period, but on top of the results from the insurance operations there's also an operational budget for the section of the organization that's going to manage the business. I was wondering how to take the expense analysis that you've done to come up with, for instance, an investment in company capital? How would you amortize it, and how would you show your return on investment using the principles that you've presented?

Mr. Gutterman: I think that your question revolves around the proper treatment of corporate overhead. I think that's what you're talking about.

Mr. Finkelstein: Yes.

Mr. Gutterman: A little about management. As I mentioned, I describe in the paper three approaches that can be used for that purpose. The constraint is

obviously marketplace structure, that will determine how much you can recover. It's something that is much more individualized in terms of a company and how they approach it, and the philosophy of how much to invest in terms of how you amortize it over a period of time. In today's world, where there is no such thing as a rate manual, the shelf life cycle of a product may be a year and in some cases even less are far more difficult to active. This really leads to the question of expense control and active management because you have to understand, you have got to be able to understand the level of investment you have in this product development corporate solution. There is no one right answer. You have to recognize market condition, corporate accepted profit margin, but I think you have to look at all the factors involved in the overall business in terms of whole expected profitability.

Ms. Anderson: As you can tell the value of this paper is tremendous. It provides a lot of insight for Sam's ongoing work.