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# VALUING FUTURE NEW BUSINESS IN VALUE-ADDED FINANCIAL REPORTING

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## ABSTRACT

This paper examines inclusion of the value of future new business in value-added financial reporting. The objective of the paper is to develop methods to provide useful information to management that links the pricing, planning and reporting processes.

An overview of value-added financial reporting provides an introduction to methods currently used for in force business. Year end variance analysis is described as a means to compare actual to expected change in value.

A discussion of reasons generally given for not including the value of future new business in value-added financial reporting is followed by an argument why it should be included.

Assumptions needed to value future new business are described. The paper bases production estimates on projection of the number of agents and productivity per agent. This allows for a more valuable analysis of actual to expected results at year end.

The effects of various assumptions on the value of future new business are examined. Sample calculations are provided.

Finally, a method to analyze variances in actual to expected value added by future new business is developed. These variances are due to current year results and revisions in future new business assumptions.

Numerical results presented are illustrative only to show relative effects of various assumptions.

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# CHAPTER 1

## INTRODUCTION TO VALUE-ADDED FINANCIAL REPORTING

Value-added financial reporting is emerging as a valuable internal reporting method throughout the insurance industry. It has its roots in actuarial appraisal methodology used for mergers and acquisitions. The basis of the method is the annual determination of the economic value of the organization. Change in economic value from beginning to end of year, the "value-added", measures the organization's performance over the year.

The chapter begins with an overview of value-added financial reporting including discussions on calculating economic value, determining the hurdle rate and calculating value added. A year-end analysis of variance similar to a source of profit analysis follows allowing results to be broken down to actual experience versus expected assumptions. Next, the link of pricing, planning and reporting through value-added financial reporting is presented as a major advantage of the system. Practical aspects of implementing value-added financial reporting are discussed. Finally, other measures such as statutory accounting practices and generally accepted accounting principles are discussed as compared to value-added financial reporting.

### OVERVIEW OF VALUE-ADDED FINANCIAL REPORTING

Value-added financial reporting focuses on the economic value of the organization. It is based on the Anderson pricing method which many companies use in the pricing process[7]. Future cash flows are projected using most likely assumptions and discounted at the desired return on capital to derive the economic value of the organization. Generally, only cash flows from business in force are considered in value-added financial reporting. The following discussion approaches value-added reporting from this perspective. Valuing future new business will be examined later.

## CALCULATING ECONOMIC VALUE

The economic value of an organization is free surplus plus the present value of future cash flows from in force business. Free surplus is statutory capital and surplus plus items that are allocations of surplus (e.g. MSVR) and certain non-admitted assets less any required surplus.

Future cash flows are defined as distributable earnings. Recall that value-added financial reporting has its roots in appraisals of stock companies. Thus, distributable earnings are the amount that can be distributed to shareholders: statutory earnings less any increase in required surplus plus net investment income earned on required surplus. In terms of mutual companies, distributable earnings may be considered as transfers to surplus.

Formulas to calculate the present value of distributable earnings are the same as would be used in pricing. Atkinson [2] presents a thorough discussion of pricing formulas.

While statutory earnings are not the best measure of financial performance, they recognize that statutory reserves and surplus must be set aside[12]. Maintaining a strong statutory surplus is not only required by state insurance departments, but also by rating agencies which have gained considerable influence in recent years.

## DETERMINING THE HURDLE RATE

The rate used to discount distributable earnings is known as the hurdle rate. It is generally defined as the cost of capital for the organization. Merdian [11], provides a thorough discussion of the determination of the hurdle rate as follows:

"Whether a company is a stock or a mutual, company management has been entrusted with capital provided by the owners (stockholders and policyholders, respectively) and should seek to obtain returns on this capital commensurate with the risks undertaken.

To determine the hurdle rate, management can utilize the Capital Asset Pricing Model (CAPM) which is described elsewhere in the syllabus. Briefly, the CAPM breaks expected returns into three components -- the risk free rate of return, the rate of return on average equity investments and the business risk factor which identifies the variance in risks between different companies and industries. In formula terms, the CAPM can be represented as shown below:

$$ROR = (I+R_r) + B(R_m-I-R_r)$$

where

ROR = ownership rate of return

I = long-term inflation rate

$R_r$ = real rate of return

B = business risk adjustment factor

$R_m$ = rate of return on average equity investments

In the formula above, $(I+R_T)$ represents the risk-free rate of return available to investors. It has been suggested that rates of return on long-term U.S. Treasury bonds represent a reasonable proxy for this rate. The term $(R_m\text{-}I\text{-}R_T)$ represents the additional return over the risk-free rate that an investor, policyholder or stockholder, desires in an average equity-type investment. Historically, this additional desired return has approximated 6%. The remaining factor, beta (B), adjusts expected yields for varying risks associated with different types of equity investments, and is quite subjective.

In addition to using the CAPM to determine an appropriate hurdle rate, management must also consider the company's capital structure which will have a significant impact on its cost of capital. Two sources of capital, debt and equity, are generally available. Certain company structures, however, permit access only to equity capital. For example, most mutual companies have access only to internally generated capital and are unable to tap either external debt or equity markets.

The CAPM as defined above can be used to determine a company's cost of equity capital. The cost of debt capital is typically the after-tax interest expense paid on debt. Equity capital tends to be more expensive than debt capital so that a company's overall mix of debt and equity will determine its cost of capital.

All of the considerations enumerated above often produce a hurdle rate currently in the range of 12-20% for companies writing primarily individual life insurance in the United States or Canada. Each company is unique in terms of its capital structure, markets and products, however, so that each company may have a unique hurdle rate, and the range given above should be viewed only as a guide. In addition, large multi-line companies may find it appropriate to use different hurdle rates for different lines of business to reflect the underlying risks associated with each line."

Most companies develop hurdle rates even in the absence of value-added financial reporting. Pricing requires a hurdle rate to discount future book profits. Even GAAP reporting aims to achieve a target ROE or hurdle rate. Generally, the same hurdle rate should be used throughout pricing, planning and financial reporting to maintain consistency. The actual hurdle rate used depends on the financial goals of the organization.

## CALCULATING VALUE ADDED

Two methods are available to calculate value added. The first is a straight-forward comparison of beginning and ending economic value plus distributable earnings. The second breaks increase in value into pieces that allow for better analysis of value added. It should be noted that both methods produce the same total value added.

Under the first method, value added during the year equals distributable earnings plus net investment income on free surplus plus year-end in force value less beginning of year in force value. Example 1-1 demonstrates value added for a company with two lines of business with a 15% hurdle rate for Line A and a 12% hurdle rate for Line B.

Example 1-1:

VALUE ADDED FOR XYZ LIFE 1990

| | Line A | Line B | Free Surplus | Total |
|---|---|---|---|---|
| Beginning Value | $60 | $50 | $25 | $135 |
| Ending Value | 76 | 56 | 22 | 154 |
| Increase in Value | $16 | $ 6 | $(3) | $ 19 |
| Distributable Earnings | (4) | (1) | 5 | 0 |
| Value Added | $12 | $ 5 | $ 2 | $ 19 |

Beginning and ending value have been calculated as discussed previously. For each line of business, future expected distributable earnings are discounted to the valuation date at the hurdle rate. Free surplus is adjusted statutory surplus. The increase in value could be attributed to the addition of profitable new business, one less year of discounting, or extra value produced by more business in force at year end than projected due to, for example, less lapsation than expected.

Distributable earnings are the current year's statutory profits less increases in required surplus. Writing new business often involves a first year statutory loss. This example assumes such a loss. Free surplus has been transferred to each line to support new business. The net result is no earnings that can be distributed to shareholders. If business in force at the beginning of the year had generated more statutory earnings or there had been less surplus strain from new business, net distributable earnings may have been positive.

Finally, free surplus can only add value to the organization by generating investment income. Any remaining change in the amount of free surplus is due to transfers into and out of the surplus account. Another way to reconcile the beginning and ending free surplus is to add investment income on free surplus to beginning free surplus and subtract (add) any transfers out of (into) free surplus.

A more useful view of value added during the year rearranges the above formula setting value added during the year equal to the sum of: the hurdle rate times the beginning of year in force value plus net investment income on free surplus plus value added by new business issued during the year plus variances between actual and expected experience[12]. Example 1-2 considers the results of Example 1-1 using this alternative viewpoint.

Example 1-2:

VALUE ADDED FOR XYZ LIFE 1990

| | Line A | Line B | Free Surplus | Total |
|---|---|---|---|---|
| Hurdle Rate X Beginning Value | $9 | $6 | $0 | $15 |
| Inv. Income on Free Surplus | 0 | 0 | 2 | 2 |
| Value of New Sales | 2 | 3 | 0 | 5 |
| Variances | 1 | (4) | 0 | (3) |
| Value Added | $12 | $5 | $2 | $19 |

The hurdle rate times beginning value is the expected value added by in force business if actual experience equals that expected. The value of new sales is the present value of distributable earnings at issue. Variances are due to differences between actual and expected experience.

This view allows for a more valuable analysis than available in Example 1-1. The hurdle rate times the beginning value is attributable to actions of prior management. The value of new sales and variances are attributable to current year management. Through this analysis, management can focus on items that are more under their control.

Nicholson[12] provides clarification of the measurement of current management performance:

> "It is easy to see why value added is a better measure of current management than any other system. The manager of a line of business should be expected to achieve a minimum ROE for the line equal to the hurdle rate. This is the rate that will be realized on business in force if actual experience is equal to that assumed. The manager can achieve higher return by writing new business on a profitable basis and by realizing actual experience better than assumed. On the other hand, unprofitable new business and experience worse then assumed will drive the rate of return below the hurdle rate."

In this example new sales are adding value in both lines. This indicates business priced at a return greater than the hurdle rate. New sales priced at a return lower than the hurdle rate would subtract value.

The positive variance in Line A is due to experience better than expected. The negative variance in Line B not only signifies experience worse than expected but also indicates that the value of new sales may be overstated. Further analysis of variances can provide insight into results.

## YEAR-END VARIANCE ANALYSIS

To analyze variances, sources of gain are calculated on an actual and expected basis. The difference between actual and expected sources of gain equal the "sources of variance." Breaking down variances into these components reveals the underlying causes of the variances and demonstrates areas where performance can be improved[4].

Example 1-3 provides an illustration of variance analysis in the value-added format.

Example 1-3:

ANALYSIS OF VARIANCE - LINE B

| | EXPECTED | ACTUAL | VARIANCE |
|---|---|---|---|
| Interest Gain | 6 | 4 | (2) |
| Mortality Gain | 4 | 5 | 1 |
| Withdrawal Gain | 3 | 1 | (2) |
| Expense Gain | (2) | (3) | (1) |
| Total Gain | 11 | 7 | (4) |

Mortality experience has been better than expected, but interest, withdrawal and expenses have been worse. If these variations are considered one time fluctuations, future assumptions need not change. However, any trends should be recognized by altering future assumptions.

When assumptions are changed, the value of the organization changes accordingly. Changes in assumptions which are under the control of management, such as expenses, lapsation and interest margins, are usually included in the value added in the year of the change. However, changes in assumptions not controllable by management, such as taxes, correction of errors and changes in methodology, are "midnight changes" and included in an extra value calculation after the regular year-end calculation. These types of changes do not affect the year-end value of the current year but rather the beginning of year value for the following year.

## QUESTIONS ANSWERED BY VALUE-ADDED FINANCIAL REPORTING

Wenner and LeBer [16] discuss the concept of shareholder value analysis as is being used more frequently in industries other than insurance. The basic concepts are the same as described above for value-added financial reporting. Future cash flows are discounted to arrive at an economic value. The economic value is then used not only for financial reporting, but more importantly, during the decision process.

Four fundamental questions more easily answered through shareholder value analysis are:

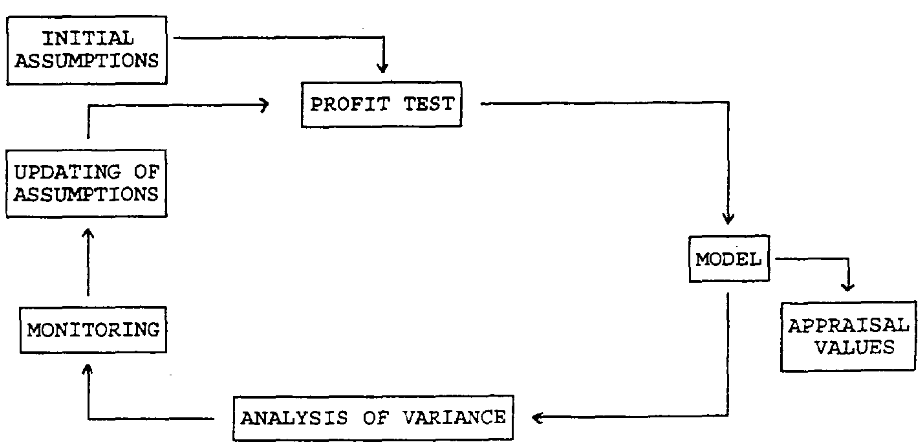
1. How well has our portfolio been doing?
2. Do our plans make sense?
3. How much better could we do?
4. What should our priorities be?

## LINK OF PRICING, PLANNING, AND REPORTING

A major advantage of value-added financial reporting is the natural link it provides from pricing, to planning, to reporting and back to pricing again. The present value of distributable earnings is key in all three areas so that a common "language" can be used throughout. The lack of a common "language" under other measures is often responsible for confusion as to the real meaning of numbers presented to management by actuaries. By definition, identical assumptions to pricing are required in value-added financial reporting. This is not the case under many other financial reporting systems currently used. Finally, variance analysis in value-added financial reporting provides the impetus for changing pricing assumptions as well as reporting assumptions. Actual to expected variances may provide more timely information about appropriateness of assumptions than a formal study.

Goford [5] describes the natural link between pricing and reporting as well as the use of variance analysis to update assumptions. Figure 1-1 best describes the control cycle.

Figure 1-1:



Initial assumptions are used to test profitability of individual products. These same assumptions are used in a model office to determine total value. Analysis of variance is used to compare actual and expected changes in value. Monitoring variances allows for expeditious updating of assumptions which are used to reprice individual products and the cycle is complete. The efficient use of the control cycle may be the most significant advantage of value-added financial reporting.

## PRACTICAL ASPECTS OF IMPLEMENTING VALUE-ADDED FINANCIAL REPORTING

Value-added financial reporting requires model office projection techniques. Model office projection is described by Atkinson[2]. Model cells are created to represent blocks of business. Blocks of business may be split into groups such as plan of insurance, underwriting status, issue age and average size band. Models are validated to closely reproduce actual policy counts, insurance amounts, premiums and reserves.

Experience assumptions are developed based on recent company experience and expected trends. Industry data is available where company data is insufficient. Such assumptions include mortality, lapsation, premium continuance, policy loan activity and expenses. Pricing and planning generally require development of these same assumptions.

The model office is projected forward using experience assumptions and pricing formulas for each cell individually. Each cell's results are aggregated to arrive at the total results for the model office. The total present value of distributable earnings is used to derive economic value.

Special reports are needed to determine value added during the year and examine variances between actual and expected results. These reports would be similar to examples given previously in this chapter and could be maintained in a spreadsheet.

Model office projections are currently employed by many companies not already using value-added financial reporting. The planning process is enhanced by the use of detailed models that more accurately project future results of the organization. Most companies will soon be required to perform model office projections as state insurance departments implement proposed changes to the Standard Valuation Law.

Other than model office projections and reports detailing the value added, no additional bookkeeping is required as future statutory values are used to determine economic value. Since many companies currently are, or soon will be, performing model office projections, value-added financial reporting is merely an offshoot of these annual projections.

## DISCUSSION OF OTHER MEASURES

While the purpose of the paper is not to argue for the use of value-added financial reporting, a brief discussion of other measures as compared to value-added follows. Financial reporting methods widely used include statutory accounting practices (SAP), and generally accepted accounting principles (GAAP). Both methods are required by external audiences and consequently are designed to meet the primary needs of those audiences.

SAP is required for annual reporting to state insurance departments. The primary goal of SAP is maintaining solvency with focus on the balance sheet. Conservative reserving assumptions are required and acquisition expenses are charged fully in the year of issue[11]. Since individual life insurance products generally produce a first year loss, a year of high sales can produce an overall loss for the company even if the new business is priced profitably. Further, a year of low sales or high lapsation can produce a sizable gain.

GAAP is required for annual reporting of stock companies to the SEC. The primary goal is protection of investors with focus on timing of revenue and matching to expenses. Acquisition expenses are deferred and amortized to match revenues over the life of the contract. Under SFAS 60 reserving assumptions must provide margins for adverse deviations and are "locked in" until such time as a loss is recognized. SFAS 97 removes the provision for adverse deviations and subsequent "lock in" for products defined as universal life. Like SAP, GAAP may also produce a first year loss.

Both SAP and GAAP may not accurately reflect the results of management's actions over the current year. The bulk of current year earnings may be generated by business sold many years ago and not the result of actions taken by current management[12]. For the purpose of internal reporting, management may want to focus more on results of their actions.

Value-added financial reporting is used almost exclusively for internal reporting to management. It is occasionally used externally in Europe. The primary goal is measurement of change in the economic value of the organization with focus on changes due to management's actions over the current year. Profitably priced new business adds value in the year of issue.

SAP and GAAP provide a retrospective view of past performance as is appropriate when reporting to external audiences. Value-added is more prospective, concentrating on future cash flows, which may prove more useful to internal audiences. The trade-off is the introduction of some subjectivity as to the assumptions used to project future cash flows. However, these same assumptions are used in pricing and planning so all financial processes are tied more closely together.

An example may help clarify the differences between value-added financial reporting and other measures. Assume management has authorized a special one-time bonus to agents linked to a high volume of total sales in the current year. In the planning process, the cost of the bonus was weighed against future profits generated by increased sales and total long-term profitablility will be enhanced.

At year-end SAP and GAAP most likely will have produced a first-year loss for the current year on the extra new business, a negative affect on total current year results . On the other hand, assuming the extra new business was priced profitably, value-added financial reporting will show an increase in value due to the extra new business sold, a positive affect on value-added results. While it may not be appropriate to report future profits to external audiences, the total value added may best help management measure the long-term effects of their actions.

In conclusion, while SAP focuses on solvency maintenance and GAAP focuses on matching revenues to expenses for the current year, value-added financial reporting focuses on matching actions by management in the current year to change in the economic value of the organization.

The balance of the paper assumes an organization has decided that value-added financial reporting is appropriate for internal measurement of its actions and results. With this assumption, the paper proceeds to discuss various aspects of including future new business in value-added financial reporting.

## CHAPTER 2

## WHY FUTURE NEW BUSINESS IS OFTEN NOT VALUED AND WHY IT SHOULD BE

As mentioned previously, new business issued in future years is often not included in value-added financial reporting. This chapter discusses reasons why future new business is not valued. An argument for valuing future new business is presented. Finally, advantages of valuing future new business will be discussed.

### WHY FUTURE NEW BUSINESS IS OFTEN NOT VALUED

Future new business is often not valued because it requires many subjective assumptions be made including future production levels and sales mix. Such assumptions are not usually required by traditional pricing and reporting. Consequently, actuaries as well as marketing people may not be comfortable projecting future production. Further, the subjectivity of these assumptions can leave the process open to manipulation and error.

Projecting future production levels may be particularly difficult for organizations with sales concentrated in highly competitive markets. Sales volume can be cyclical depending on the organization's response to market cycles. Accurately predicting market cycles only compounds the subjectivity of new business assumptions.

For an organization that does not market its products through a captive agent force, projecting sales may be equally difficult. Total sales volume is often best estimated by first projecting the field force. Sales from a noncaptive field force may also be cyclical.

If future production is expected to be level from year to year, the value of future new business can be relatively stable. The resulting small change in value of future new business has an even smaller effect on total value added. Therefore there is little utility in valuing future new business.

LeBlanc and Warnock [7] argue:

> "Although actuarial appraisals of economic value usually include a component for the value of future new business, it is convenient to omit this component from value-based financial measurement since its determination involves a high degree of subjectivity, and the utility of the value-based approach is not significantly diminished by omitting future new business from the economic values."

## WHY FUTURE NEW BUSINESS SHOULD BE VALUED

For a company making material investments in its field force, the value added by future new business can have a significant impact on total value added. Material investments could include agent retention programs, increased commissions, agent recruiting programs and agent financing programs. Value-added measures can be quite beneficial in determining the benefits of making such investments. Including future new business in the reporting process provides tighter surveillance of these programs.

Introduction of new products that significantly change expected profitability and sales mix also affect the value of future new business. As product shelf-life gets shorter and profitability margins are squeezed by increased competition, such shifts in profitability and sales mix seem likely. Including shifts in expected profitability and sales mix in reporting allows management to better react to changing business conditions.

While subjective assumptions about future production are not required by traditional pricing and reporting, they are often utilized in the planning process. These future production assumptions are often sales goals based on "gut" decisions or extrapolation of previous years' results. Including future new business in reporting allows for closer scrutiny of these assumptions, improving the planning process.

Future production assumptions are generally made implicitly in traditional pricing. Chalke proposes a pricing method that explicitly uses such subjective assumptions to arrive at optimal decisions[3]. The result is required future production that optimizes profit at a given price. Expected profit is measured in total dollars rather than a unit measure.

Valuing future new business in value-added financial reporting completes the pricing, planning and reporting cycle. Future production assumptions are used explicitly in planning and either implicitly or explicitly in pricing. Actual to expected variance analysis similar to that described in Chapter One provides a means to verify and adjust these assumptions on a regular and timely basis.

Consider again the example of the organization providing a bonus to agents for increased production. Assume, instead, management authorizes a special one-time bonus to agency managers who recruit a certain number of new agents. In the planning process, the cost of the bonus was weighed against the value of future business generated by the new agents. If the value of future new business is not included in the reporting process, economic value may actually be reported as lost since the cost of the bonus and new agent financing may be greater than the value of new business sold by new agents in the current year. However, management's actions have increased the long-term economic value of the organization. Therefore, the basic value-added financial reporting concept of matching actions by management in the current year to change in economic value of the organization suggests including the value of future new business.

## ADVANTAGES OF VALUING FUTURE NEW BUSINESS

A major problem with most measures of field force performance is that too much emphasis is placed on current year sales rather than profitability of those sales. Typical value-added financial reporting improves on this by valuing current year new business. However, actions which improve profitability of future new business, such as improving agent retention or increased recruiting of new agents, go unmeasured. Valuing future new business accounts for such actions by increasing the total value of the organization. The net effect is field force goals tied more closely to those of the home office.

Life and health insurance is generally long-term in nature. Often the results of investments in new business are not known for many years. Similarly, investments in the field force do not produce positive results for several years. Increased competition and falling profit margins intensify the need to know the results of such investments earlier. Valuing future new business, while only an estimate, conveys the results of such investments more quickly.

As stated earlier, one of the advantages of value-added financial reporting is the link of pricing, planning and reporting. Valuing future new business strengthens this link. Much management effort is directed towards improving sales in both the current and future years. Including the value of future new business in the control cycle provides more timely measurement of the results of management decisions directed towards future new business.

# CHAPTER 3

## ASSUMPTIONS NEEDED TO VALUE FUTURE NEW BUSINESS

This chapter examines assumptions needed to value future new business. The number of years of future production to be projected has a major impact on the value of future new business. Estimating future production requires determination of both total amount of production and sales mix (the distribution of total production by product, sex, smoker status and age).

Once future production estimates are known, cash flows from that production are projected via a model office. Cash flow projection assumptions are briefly discussed.

Finally, cash flows from future production must be discounted. The chapter concludes with a discussion of the selection of an appropriate hurdle rate when valuing future new business.

### NUMBER OF YEARS OF FUTURE PRODUCTION

The number of years of future production has a substantial impact on the value of future new business. Assuming new products add value, the more years of future production, the higher the value of that production. However, the effect on change in value from year to year is more important than the absolute value.

Selecting too few years of production may not allow the effects of long-term programs to emerge. Too many years of production leave room for too much subjectivity at best and outright manipulation at worst. Overly optimistic production assumptions in later years can greatly increase value without having to be realized in the near term. Close scrutiny of production assumptions based on annual variance analysis can help keep this problem in check.

The number of years of future production should be the shortest period that allows the effects of long-term programs to emerge. The effects of this assumption will be examined further in a later section.

## TOTAL AMOUNT OF PRODUCTION

"An Agency Planning Model" provides a method for projecting future sales that can be adapted for use on a company-wide basis[9]. The total amount of production in a year is the production per agent multiplied by the projected number of agents. Formulas for production projection and sample projections are provided in Appendix A.

It is not necessary to project production this way to value future new business. Production could be projected by extrapolating sales from recent years. However, the usefulness of valuing future new business is enhanced through more extensive year-end variance analysis with this method. Not only can variances in total production be analyzed, but the components of production can also be examined.

This paper assumes a captive agency force in all future production estimates. Estimating production from other sources such as brokerage or direct business will be left as future research.

## PRODUCTION PER AGENT

Production per agent is the amount of sales expected from each agent. This paper uses units of insurance per agent but other measures such as annualized premium or policy count could also be used. Sales performance in recent years as well as company goals should be incorporated into projected production per agent. In addition, industry-wide trends should be considered.

Production per agent should be estimated from company data and broken down by agent class. This paper defines agent class by calendar year of service but it could also include distinctions such as professional designations (i.e., CLU's and non-CLU's). Industry production averages are available in LIMRA's annual "Agent Production and Survival"[8].

## PROJECTED NUMBER OF AGENTS

The projected number of agents is the current number of agents and future recruits projected forward with retention. Agent recruiting should be based on past experience and internal goals. Agent retention should be estimated from company experience if available. LIMRA's annual "Agent Production and Survival" provides industry retention experience. The effects of company programs designed to build the sales force by either augmenting recruiting efforts or improving retention should be included in the respective assumptions.

## SALES MIX

Production should be further split by sales mix as profitability may vary by product, sex, smoker status and age. The splitting is most easily performed by applying percentages of each classification to the total production. The percentages are derived from company sales records and can be adjusted for expected changes in the future.

The application of percentages to total production allows production to be distributed to model cells for model office projection. Production is first split by product then by the distribution of sex/smoker status and age within that product. Table 3-1 shows distribution of production over a cross section of model cells.

Table 3-1:

| TOTAL PRODUCTION SPLIT BY PRODUCT | | WL PRODUCTION SPLIT BY SEX/SMOKER | | F/NS WL PRODUCTION SPLIT BY AGE | |
|---|---|---|---|---|---|
| Product | Percent | Sex/Smoker | Percent | Age | Percent |
| WL | 40.00% | F/NS | 32.00% | 25 | 31.00% |
| ART10 | 60.00% | F/SM | 13.00% | 35 | 35.00% |
| | | M/NS | 35.00% | 45 | 23.00% |
| | | M/SM | 20.00% | 55 | 11.00% |

If total production is 10,000,000 units, then production for the WL female nonsmoker age 25 cell is 446,400 units, or 10,000,000 times .40 times .32 times .31. Production for other cells would be determined by applying the appropriate percentages.

Production could further be split by different average sizes, premium modes and issue months. The number of cells increases rapidly as production is split more finely, improving accuracy but complicating the model and increasing run time.

## CASH FLOW PROJECTION

Once production is distributed across the model cells, a model office can be run to project future cash flows. Premium and investment income, benefits, expenses and reserves are projected for each cell. Selection of assumptions needed to project cell cash flows is crucial to an accurate assessment of value.

Cash flow projection assumptions are described by Atkinson [2]. These assumptions include interest, mortality, lapse rates, expenses and income tax. Industry experience for mortality and lapsation is available in SOA reports but company experience is more valuable. Greater year-end variances could result from using industry experience. Expenses are best derived from company experience. Interest and income tax should reflect current economic and regulatory outlooks. Finally, expected future changes and trends should be factored into the cash flow projection assumptions.

Formulas for a simplistic cash flow projection as well as sample projections are provided in Appendix B. In practice, more sophisticated projections would be used. The reader should refer to Atkinson [2] for further detail.

## DISCOUNTING CASH FLOWS

Economic appraisals often use a dual-interest method for discounting cash flows from future new business. The pricing hurdle rate is used to discount cash flows to issue and a higher rate is used to discount to the appraisal date. This higher rate reflects uncertainty about future new business. Turner [15] and the Actuarial Standard of Practice No. 19, "Actuarial Appraisals" [1], suggest this method.

In the context of value-added financial reporting, the hurdle rate represents the desired rate of return. Discounting at a higher rate from issue to valuation date would imply a higher desired rate of return during this period. Also, varying interest rates could distort the change in value. Since the aim of value-added financial reporting is measuring the change in value rather than a sale price, using a level hurdle rate removes any distortions and inconsistencies. Generally, the hurdle rate for future new business should be the same as that for in force business.

# CHAPTER 4

## FUTURE NEW BUSINESS VALUE CALCULATIONS

This chapter examines the effects of various assumptions on the value of future new business. Assumptions examined include years of production, sales mix, agent recruiting, agent retention and productivity per agent. Further, the annual change in value is examined over sets of assumptions.

### DESCRIPTION OF PRODUCTS

Two sample products are used to illustrate the effects on value of varying sales mix and projection periods: nonparticipating whole life and ten-year annual renewable term. A single cell for each product, a 35 year old male nonsmoker, is used to simplify models as the purpose of the research is to demonstrate relative effects of various assumptions. Actual models would incorporate cells over a full range of ages and sex/smoker classes.

The sample cells have been intentionally designed to produce different rates of return and break-even years so as to magnify the effects of varying sales mixes. Table 4-1 summarizes present value of profits per unit discounted at 10%, 12% and 15%. Formulas, assumptions and calculations are available in Appendix B.

Table 4-1:

PROFITABILITY MEASURES OF TWO SAMPLE CELLS

| | | | PRESENT VALUE OF PROFITS PER UNIT ISSUED | | |
|---|---|---|---|---|---|
| PRODUCT | SEX/SMK | AVG SIZE | DISC @ 10% | DISC @ 10% | DISC @ 15% |
| WL | 35 MNS | 50,000 | $ 5.99848 | $ 3.92782 | $ 1.70537 |
| ART10 | 35 MNS | 150,000 | 0.23858 | 0.16770 | 0.07714 |

## BASE PROJECTION WITH VARYING YEARS OF PRODUCTION

Level production is assumed in the base projection so that the effects of varying production assumptions can be seen later. Retention and recruiting assumptions were selected to generate a level number of agents each year. Further, production per agent is held level. Production Projection One in Table A-1 in Appendix A projects level production. Sales are mixed across the cells as follows: 40% WL and 60% ART10. Remember that these cells have been designed to produce different rates of return. Further projections will vary sales mix. Formulas for present value of profits are available in Appendix C. Table 4-2 summarizes the present values of profits calculated in Table C-1 of Appendix C at 10%, 12% and 15% hurdle rates for projections incorporating 1, 3, 5 and 10 years of production.

Table 4-2:

| | PV OF PROFITS - 1/1/91 - BASE SALES MIX LEVEL PRODUCTION | | |
|---|---|---|---|
| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
| 1 | $ 9,727,977 | $ 6,396,252 | $ 2,787,043 |
| 3 | 26,611,242 | 17,206,243 | 7,317,965 |
| 5 | 40,564,354 | 25,823,902 | 10,743,992 |
| 10 | 65,751,626 | 40,477,078 | 16,085,655 |

The economic value of future new business is clearly sensitive to the hurdle rate and the number of years of production projected. Note that five years of production does not produce five times the present value of profits as one year of production. This is due to further discounting of profits from point of issue.

## SALES MIX

The base projection distributed sales across two products 40% WL and 60% ART10. Tables 4-3 and 4-4 summarize present values of profits calculated in Tables C-2 and C-3 of Appendix C for projections with 100% of sales in WL and ART10 respectively.

Table 4-3:

| | PV OF PROFITS - 1/1/91 - 100% WL LEVEL PRODUCTION | | |
|---|---|---|---|
| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
| 1 | $ 22,950,700 | $15,028,177 | $ 6,524,892 |
| 3 | 62,782,494 | 40,426,563 | 17,132,468 |
| 5 | 95,701,332 | 60,674,001 | 25,153,319 |
| 10 | 155,124,330 | 95,102,059 | 37,658,963 |

Table 4-4:

| | PV OF PROFITS - 1/1/91 - 100% ART10 LEVEL PRODUCTION | | |
|---|---|---|---|
| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
| 1 | $ 912,828 | $ 641,635 | $ 295,144 |
| 3 | 2,497,074 | 1,726,030 | 774,963 |
| 5 | 3,806,368 | 2,590,503 | 1,137,775 |
| 10 | 6,169,823 | 4,060,424 | 1,703,450 |

While extreme, these tables demonstrate the effect that sales mix can have on the value of future new business. The mix of sales among them can have a significant impact on the value of future new business, particularly if a shift in sales mix occurs such as what might happen with the introduction of a new product.

Sales mix includes more than distribution of sales among products. The distribution of sales by sex, smoker status, age, average size and premium mode for each product may also be desirable. The importance of this further distribution depends on the balance of profitablility across these statuses.

## PRODUCTION LEVELS

So far projections have assumed level production. Assuming level production, constant sales mix and pricing assumptions produce constant present value of profits and no value will be added from one year to the next.

Value can be added by improving profitability of products, adjusting sales mix or increasing production. Product profitability is constrained by competitive requirements. Sales mix may be difficult to influence. However, management has much greater control of production. Recall the example in Chapter Two of the organization whose management authorized a special bonus to increase agent recruiting.

Production growth is possible by increasing the number of agents or productivity per agent. The number of agents can be increased by augmenting recruiting efforts or improving agent retention. The following discussions incorporate each method of production growth individually and finally all together.

**AUGMENTED RECRUITING**

Possibly the easiest way to increase production is by augmenting recruiting efforts. While new recruits will have lower productivity and retention than seasoned agents, they have an immediate impact on total production.

Production Projection Two in Table A-2 assumes an increase in recruits from 350 per year in Production Projection One to 450 per year. Such an increase may be possible through a recruiting bonus as described in the example in Chapter Two. Retention and productivity are as in Production Projection One. Table 4-5 summarizes the present values of profits calculated in Table C-4 in Appendix C at 10%, 12% and 15% hurdle rates for projections incorporating 1, 3, 5 and 10 years of production.

Table 4-5:

PV OF PROFITS - 1/1/91 - BASE SALES MIX
AUGMENTED RECRUITING

| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
|---|---|---|---|
| 1 | $ 10,087,492 | $ 6,632,637 | $ 2,890,044 |
| 3 | 28,936,928 | 18,699,866 | 7,946,907 |
| 5 | 45,204,155 | 28,746,007 | 11,940,403 |
| 10 | 75,796,289 | 46,537,849 | 18,423,190 |

Of course augmenting recruiting is not without cost. The initial cost of selection and training should be included in projections as an overhead expense. Also, increasing the number of recruits may result in reduced agent quality overall if standards are lowered to achieve growth. The net result may be lower retention and productivity per agent, an undesirable long term effect.

## IMPROVING AGENT RETENTION

Great expense is incurred selecting and training agents. Much of this expense could be avoided by retaining current agents. Improving agent retention will enlarge the field force given the same recruiting levels, or require less recruiting to maintain the same field force size. Also, improved retention should result in a more seasoned field force with higher average productivity per agent.

Production Projection Three in Table A-3 assumes an improvement in retention of 1% per year for five years. Recruiting and productivity are as in Production Projection One. Table 4-6 summarizes the present values of profits calculated in Table C-5 of Appendix C at 10%, 12% and 15% hurdle rates for projections incorporating 1, 3, 5 and 10 years of production.

Table 4-6:

| | PV OF PROFITS - 1/1/91 - BASE SALES MIX IMPROVED RETENTION | | |
|---|---|---|---|
| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
| 1 | $ 9,727,977 | $ 6,396,252 | $ 2,787,043 |
| 3 | 26,995,584 | 17,451,299 | 7,420,045 |
| 5 | 42,081,335 | 26,767,071 | 11,122,785 |
| 10 | 72,490,647 | 44,441,240 | 17,556,660 |

## INCREASING PRODUCTIVITY PER AGENT

Increasing productivity per agent allows for higher overall production with a level field force. Some increase in productivity may naturally occur with inflation. Changes in productivity may or may not be uniform across agent classes.

Production Projection Four in Table A-4 assumes an increase in productivity per agent of 4% per year. Recruiting and productivity are as in Production Projection One. Table 4-7 summarizes the present values of profits calculated in Table C-6 of Appendix C at 10%, 12% and 15% hurdle rates for projections incorporating 1, 3, 5 and 10 years of production.

Table 4-7:

| | PV OF PROFITS - 1/1/91 - BASE SALES MIX INCREASED PRODUCTIVITY | | |
|---|---|---|---|
| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
| 1 | $ 9,727,977 | $ 6,396,252 | $ 2,787,043 |
| 3 | 27,621,022 | 17,850,763 | 7,586,870 |
| 5 | 43,615,333 | 27,727,357 | 11,512,383 |
| 10 | 76,564,350 | 46,869,258 | 18,476,126 |

## SIMULTANEOUS IMPROVEMENTS IN RECRUITING, RETENTION AND PRODUCTIVITY

Recruiting, retention and productivity per agent will likely be changing simultaneously. These are not independent variables. Rather, they are interrelated to varying degrees.

Production Projection Five in Table A-5 assumes all three production improvements: an increase in recruiting to 450 per year, an improvement in retention of 1% per year for five years and an increase in productivity per agent of 4% per year. Table 4-8 summarizes the present values of profits calculated in Table C-7 in Appendix C at 10%, 12% and 15% hurdle rates for projections incorporating 1, 3, 5 and 10 years of production.

Table 4-8:

| PV OF PROFITS - 1/1/91 - BASE SALES MIX IMPROVED RECRUITING, RETENTION AND PRODUCTIVITY | | | |
|---|---|---|---|
| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
| 1 | $10,087,492 | $ 6,632,637 | $ 2,890,044 |
| 3 | 30,519,100 | 19,709,258 | 8,367,752 |
| 5 | 50,649,693 | 32,137,258 | 13,305,721 |
| 10 | 98,904,333 | 60,135,245 | 23,472,220 |

## ANNUAL CHANGE IN VALUE

Present values of profits at 1/1/91 have been calculated for the five production projections. More important than the value of future production is the change in value from year to year. To derive the change in value, present values of profits are needed for projections beginning at 1/1/92. Tables 4-9, 4-10, 4-11, 4-12 and 4-13 summarize the present values of future profits calculated in Tables C-8, C-9, C-10, C-11 and C-12 at 10%, 12% and 15% hurdle rates for projections incorporating 1, 3, 5 and 10 years of production beginning at 1/1/92. The actual numbers presented are illustrative only. However, they do demonstrate the effect each assumption can have on value added by future new business.

Table 4-9:

| PV OF PROFITS - 1/1/92 - BASE SALES MIX LEVEL PRODUCTION | | | |
|---|---|---|---|
| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
| 1 | $ 9,727,977 | $ 6,396,252 | $ 2,787,043 |
| 3 | 26,611,242 | 17,206,243 | 7,317,965 |
| 5 | 40,564,354 | 25,823,902 | 10,743,992 |
| 10 | 65,751,626 | 40,477,078 | 16,085,655 |

Table 4-10:

PV OF PROFITS - 1/1/92 - BASE SALES MIX
AUGMENTED RECRUITING

| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
|---|---|---|---|
| 1 | $10,702,553 | $ 7,037,046 | $ 3,066,257 |
| 3 | 30,033,100 | 19,412,899 | 8,252,833 |
| 5 | 46,555,956 | 29,617,009 | 12,309,182 |
| 10 | 77,409,347 | 47,561,740 | 18,848,182 |

Table 4-11:

PV OF PROFITS - 1/1/92 - BASE SALES MIX
IMPROVED RETENTION

| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
|---|---|---|---|
| 1 | $ 9,851,142 | $ 6,477,234 | $ 2,822,330 |
| 3 | 27,545,964 | 17,805,401 | 7,569,552 |
| 5 | 43,197,056 | 27,470,029 | 11,410,804 |
| 10 | 74,402,854 | 45,609,253 | 18,015,105 |

Table 4-12:

PV OF PROFITS - 1/1/92 - BASE SALES MIX
INCREASED PRODUCTIVITY

| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
|---|---|---|---|
| 1 | $10,117,095 | $ 6,652,101 | $ 2,898,525 |
| 3 | 28,725,862 | 18,564,793 | 7,890,344 |
| 5 | 45,359,946 | 28,836,451 | 11,972,879 |
| 10 | 79,626,924 | 48,744,028 | 19,215,171 |

Table 4-13:

| PV OF PROFITS - 1/1/92 - BASE SALES MIX<br>IMPROVED RECRUITING, RETENTION AND PRODUCTIVITY | | | |
|---|---|---|---|
| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
| 1 | $ 11,267,164 | $ 7,408,284 | $ 3,228,017 |
| 3 | 33,582,556 | 21,690,798 | 9,211,009 |
| 5 | 55,617,525 | 35,294,307 | 14,615,926 |
| 10 | 107,514,008 | 65,410,575 | 25,554,394 |

The increase in value for 1991 is derived by subtracting 1/1/91 present value of profits from 1/1/92 present value of profits. Tables 4-14 through 4-23 contain the dollar increase in value as well as percentage increase.

Table 4-14:

| DOLLAR INCREASE IN VALUE - BASE SALES MIX<br>LEVEL PRODUCTION | | | |
|---|---|---|---|
| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
| 1 | $ 0 | $ 0 | $ 0 |
| 3 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 |

Table 4-15:

| DOLLAR INCREASE IN VALUE - BASE SALES MIX<br>AUGMENTED RECRUITING | | | |
|---|---|---|---|
| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
| 1 | $ 615,061 | $ 404,409 | $ 176,213 |
| 3 | 1,096,172 | 713,033 | 305,926 |
| 5 | 1,351,801 | 871,002 | 368,779 |
| 10 | 1,613,058 | 1,023,891 | 424,992 |

Table 4-16:

DOLLAR INCREASE IN VALUE - BASE SALES MIX
IMPROVED RETENTION

| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
|---|---|---|---|
| 1 | $ 123,165 | $ 80,982 | $ 35,287 |
| 3 | 550,380 | 354,102 | 149,507 |
| 5 | 1,115,721 | 702,958 | 288,019 |
| 10 | 1,912,207 | 1,168,013 | 458,445 |

Table 4-17:

DOLLAR INCREASE IN VALUE - BASE SALES MIX
INCREASED PRODUCTIVITY

| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
|---|---|---|---|
| 1 | $ 389,118 | $ 255,849 | $ 111,482 |
| 3 | 1,104,840 | 714,030 | 303,474 |
| 5 | 1,744,613 | 1,109,094 | 460,496 |
| 10 | 3,062,574 | 1,874,770 | 739,045 |

Table 4-18:

DOLLAR INCREASE IN VALUE - BASE SALES MIX
IMPROVED RECRUITING, RETENTION AND PRODUCTIVITY

| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
|---|---|---|---|
| 1 | $ 1,179,672 | $ 775,647 | $ 337,973 |
| 3 | 3,063,456 | 1,981,540 | 843,257 |
| 5 | 4,967,832 | 3,157,049 | 1,310,205 |
| 10 | 8,609,675 | 5,275,330 | 2,082,174 |

Table 4-19:

PERCENTAGE INCREASE IN VALUE - BASE SALES MIX
LEVEL PRODUCTION

| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
|---|---|---|---|
| 1 | 0.00% | 0.00% | 0.00% |
| 3 | 0.00% | 0.00% | 0.00% |
| 5 | 0.00% | 0.00% | 0.00% |
| 10 | 0.00% | 0.00% | 0.00% |

Table 4-20:

PERCENTAGE INCREASE IN VALUE - BASE SALES MIX
AUGMENTED RECRUITING

| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
|---|---|---|---|
| 1 | 6.10% | 6.10% | 6.10% |
| 3 | 3.79% | 3.81% | 3.85% |
| 5 | 2.99% | 3.03% | 3.09% |
| 10 | 2.13% | 2.20% | 2.31% |

Table 4-21:

PERCENTAGE INCREASE IN VALUE - BASE SALES MIX
IMPROVED RETENTION

| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
|---|---|---|---|
| 1 | 1.27% | 1.27% | 1.27% |
| 3 | 2.04% | 2.03% | 2.01% |
| 5 | 2.65% | 2.63% | 2.59% |
| 10 | 2.64% | 2.63% | 2.61% |

Table 4-22:

PERCENTAGE INCREASE IN VALUE - BASE SALES MIX
INCREASED PRODUCTIVITY

| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
|---|---|---|---|
| 1 | 4.00% | 4.00% | 4.00% |
| 3 | 4.00% | 4.00% | 4.00% |
| 5 | 4.00% | 4.00% | 4.00% |
| 10 | 4.00% | 4.00% | 4.00% |

Table 4-23:

PERCENTAGE INCREASE IN VALUE - BASE SALES MIX
IMPROVED RECRUITING, RETENTION AND PRODUCTIVITY

| YEARS OF PRODUCTION | PV PROFITS DISC @ 10% | PV PROFITS DISC @ 12% | PV PROFITS DISC @ 15% |
|---|---|---|---|
| 1 | 11.69% | 11.69% | 11.69% |
| 3 | 10.04% | 10.05% | 10.08% |
| 5 | 9.81% | 9.82% | 9.85% |
| 10 | 8.71% | 8.77% | 8.87% |

The percentage increases in value vary by production projection and years of production. The number of years of production can have a significant impact on change in value depending on the production assumptions used. This is an area that opens the valuation of future new business to manipulation. However, careful analysis of variances and subsequent adjustment in assumptions should keep this potential problem in check.

## CONCLUSIONS

The hurdle rate chosen has a significant impact on the value of future new business and the dollar increase in value from year to year. However, the percentage increase in value is not affected as strongly. Since the future new business will eventually become in force business, the hurdle rate should be consistent with the rate used for the in force block of business. This removes any discontinuities when future new business value becomes in force value.

The significance of sales mix on the value of future new business depends on the balance of profitablility by product, sex, smoker status, age, average size and premium mode. The sales mix used should be consistent with what is actually expected based on past experience and trends. The development of new products may have a major impact on sales mix and the value of future new business as sales are shifted to the new product. Variance analysis should be used to regularly update expected sales mix.

The value of future new business and annual increase in value depend heavily on production assumptions. Programs to augment recruiting, improve retention and increase productivity can have long term effects on the value of future new business. Expenses associated with such programs should be recognized. Production assumptions should be consistent with past experience and reasonable expectations. Annual variance analysis will aid in the detection of faulty assumptions.

The years of production to be used depends on how much weight management wishes to put on the value of future new business. If special programs are in place to increase the value of future new business, the years of production should be sufficient to recognize the effects of such programs. However, a lengthy production period could lead to manipulation especially if production increases sharply in later years.

The reasonableness of assumptions can be checked through annual actual to expected variance analysis. Results consistently different than expected may indicate invalid assumptions. Variance analysis is presented in the next chapter.

# CHAPTER 5

## ANALYSIS OF VALUE ADDED BY NEW BUSINESS

This chapter discusses analysis of change in future new business value as well as variances between projected and actual value added. Finally, revision of future new business assumptions is examined.

### TOTAL VALUE ADDED BY NEW BUSINESS

At year-end value is added by new business in two ways, the value added by new business actually sold during the year and the change in future new business value. New business sold during the current year adds value to the in force component. The total value added by new business sold during the year is the sum of projected value added and any variances from that projection.

| | |
|---|---|
| | Projected value of current year new business |
| + | Variance between projected and actual sales |
| + | Variances in experience assumptions |
| | Total value added by new business sold in current year |

The change in future new business value is due to expected change in future new business value, field force variance and change in value due to assumption revisions.

| | |
|---|---|
| | Expected change in future new business value |
| + | Field force variance |
| + | Change in value due to assumption revisions |
| | Total value added by change in future new business value |

## FUTURE NEW BUSINESS VALUE SPLIT INTO CURRENT AND FUTURE YEARS' VALUE

Future new business value can be split into value of new business to be sold in the current year and new business to be sold in future years. The advantage is easy comparison at year-end of projected and actual value added by current year sales. Further, differences can be broken into variances by assumption.

Production Projection Five with five years of production is used as a base projection. The value of current year new business is the value of one year of production. The value of future years' new business is the difference between the value of five years of production and one year of production.

Table 5-1 splits the present value of profits from five years of production into current year new business value and future years' new business value. Profits projected from 1/1/91 are discounted at 12%.

Table 5-1:

PV OF PROFITS - DISC @ 12% - BASE SALES MIX
IMPROVED RECRUITING, RETENTION AND PRODUCTIVITY

| DATE | PV PROFITS 1 YR PROD | PV PROFITS 5 YRS PROD | CUR YEAR NEW BUS VAL | FUT YEARS NEW BUS VAL |
|---|---|---|---|---|
| 1/1/91 | $6,632,637 | $32,137,258 | $ 6,632,637 | $25,504,621 |

Current year new business value at 1/1/91 is the present value of profits provided by sales in 1991. Future years' new business value at 1/1/91 is the present value of profits provided by projected sales in 1992 through 1995.

VARIANCE IN VALUE ADDED BY NEW BUSINESS ACTUALLY SOLD IN CURRENT YEAR

Assume actual value added by new business sold in 1991 was only $5,219,272 instead of $6,632,637 as projected. Upon examination it is discovered that production goals were exceeded, 4,028,038 units of insurance were sold compared to 3,967,486 projected. This variance in production was due to a combination of fewer agents recruited but higher productivity per agent.

Further examination showed that sales mix varied considerably from projected. Projected sales mix was 40% WL and 60% ART10. Actual sales mix was 30% WL and 70% ART10. Recall that ART10 is a less profitable product than WL. Therefore while production was higher than projected, sale of less profitable business resulted in less value added overall.

As a side note, sales have been mixed across only two sample cells for simplification. In reality sales would be mixed more finely as profitability can vary by categories other than product type, age and sex, for example. Thus sales could be as expected for each product, but value added could still vary from projected due to the mix of sales among each product class.

So far this discussion has centered on variances in the components of value rather than variances in value. By changing one component at a time and calculating value, variances in value due to variances in components can be analyzed.

By changing projected number of agents to the actual number, the variance due to actual to expected number of agents is isolated. Table 5-2 projects 1991 production with the actual number of agents and projected productivity per agent.

Table 5-2:

| | PROJECTION OF 1991 PRODUCTION<br>ACTUAL NUMBER OF AGENTS - PROJECTED PRODUCTIVITY PER AGENT | | | | | |
|---|---|---|---|---|---|---|
| | ************** CALENDAR YEAR OF SERVICE ************* | | | | | |
| | RECRUITS | SECOND | THIRD | FOURTH | FIFTH + | TOTAL |
| AGENTS | 400 | 266 | 133 | 85 | 395 | 1,279 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 565,600 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,896,786 |

The projected production is then spread across the projected sales mix. The resulting value of 1991 production is $6,514,443 as calculated in Table 5-3. The variance due to number of agents other than projected is - $118,194 ($6,514,443 - $6,632,637).

Table 5-3:

| | TOTAL VALUE CALCULATION - TOTAL PRODUCTION OF 3,896,786 UNITS | | | |
|---|---|---|---|---|
| | % PRODUCTION | TOTAL UNITS | PVP per UNIT | TOTAL PVP |
| CELL #1 | 40% | 1,558,714 | $3.92782 | $6,122,348 |
| CELL #2 | 60% | 2,338,072 | $0.16770 | 392,095 |
| TOTAL | | 3,896,786 | | $6,514,443 |

Next, changing projected productivity per agent to the amount actually realized results in the change in value due to variance in actual to expected productivity per agent. Table 5-4 projects 1991 production with the actual number of agents and productivity per agent.

Table 5-4:

| | PROJECTION OF 1991 PRODUCTION ACTUAL NUMBER OF AGENTS - ACTUAL PRODUCTIVITY PER AGENT | | | | | |
|---|---|---|---|---|---|---|
| | ************** CALENDAR YEAR OF SERVICE ************ | | | | | |
| | RECRUITS | SECOND | THIRD | FOURTH | FIFTH + | TOTAL |
| AGENTS | 400 | 266 | 133 | 85 | 395 | 1,279 |
| PROD/AGT | 1,508 | 3,056 | 3,499 | 3,645 | 4,650 | |
| TOT PROD | 603,200 | 812,896 | 465,367 | 309,825 | 1,836,750 | 4,028,038 |

The projected production is again spread across the projected sales mix. The resulting value of 1991 production is $6,733,864 calculated in Table 5-5. The variance due to productivity per agent other than projected is $219,421 ($6,733,864 - $6,514,443).

Table 5-5:

| | TOTAL VALUE CALCULATION - TOTAL PRODUCTION OF 4,028,038 UNITS | | | |
|---|---|---|---|---|
| | % PRODUCTION | TOTAL UNITS | PVP per UNIT | TOTAL PVP |
| CELL #1 | 40% | 1,611,215 | $3.92782 | $6,328,563 |
| CELL #2 | 60% | 2,416,823 | $0.16770 | 405,301 |
| TOTAL | | 4,028,038 | | $6,733,864 |

Finally, actual production is spread across actual sales mix. The resulting value of 1991 production is $5,219,272 as calculated in Table 5-6. The variance due to sales mix other than projected is -$1,514,592 ($5,219,272 - $6,733,864).

Table 5-6:

TOTAL VALUE CALCULATION - TOTAL PRODUCTION OF 4,028,038 UNITS

| | % PRODUCTION | TOTAL UNITS | PVP per UNIT | TOTAL PVP |
|---|---|---|---|---|
| CELL #1 | 30% | 1,208,411 | $3.92782 | $4,746,421 |
| CELL #2 | 70% | 2,819,627 | $0.16770 | 472,851 |
| TOTAL | | 4,028,038 | | $5,219,272 |

Total variance between projected and actual value added by current year sales is the sum of variances due to number of agents, productivity per agent and sales mix. Table 5-7 reconciles projected and actual value added by current year sales.

Table 5-7:

RECONCILIATION OF PROJECTED & ACTUAL VALUE ADDED BY CURRENT YEAR SALES

| | | |
|---|---|---|
| Projected Value Added | | $ 6,632,637 |
| + Var - No. of Agents | (6,514,443 - 6,632,637) | + (118,194) |
| + Var - Prod. per Agent | (6,733,864 - 6,514,443) | + 219,421 |
| + Var - Sales Mix | (5,219,272 - 6,733,864) | + (1,514,592) |
| Actual Value Added | | $ 5,219,272 |

Variances in experience assumptions also affect the value added by new business sold during the year. This example did not address these variances due to interest, mortality, withdrawal and expenses. However, the concept is the same as is discussed in Chapter One.

Variance analysis may reveal necessary revisions in assumptions. For example, the variance due to the number of agents may be viewed as a random fluctuation, but the variances in productivity per agent and sales mix may indicate a major shift in sales. Variance analysis also calls attention to sensitivity of new business value to each assumption. The effects of revising future new business assumptions are examined in a later section.

## EXPECTED CHANGE IN FUTURE NEW BUSINESS VALUE

At the end of 1991, current year new business value is added to in force value. The present value of profits provided by 1992 sales move from future years' new business value to current year new business value. Profits from 1996 production are added to future years' new business value. All values are discounted to 1/1/92. Table 5-8 contains future new business values for 1/1/91 and 1/1/92 and the expected change in value. New business value at 1/1/91 and 1/1/92 are calculated in Tables C-7 and C-12, respectively, in Appendix C.

Table 5-8:

FUTURE NEW BUSINESS VALUE - 1/1/91 AND 1/1/92

| DATE | CUR YEAR NEW BUS VAL | FUT YEARS NEW BUS VAL | TOTAL NEW BUS VAL |
|---|---|---|---|
| 1/1/91 | $ 6,632,637 | $25,504,621 | $32,137,258 |
| 1/1/92 | 7,408,284 | 27,886,023 | 35,294,307 |
| CHANGE | 775,647 | 2,381,402 | 3,157,049 |

The expected change in future new business value utilizes the same projections and assumptions as were used to calculate value at the beginning of the year. Any change is due to projected assumptions with annual improvement or growth. Variations from these projections also change value and are examined in the following sections.

## EFFECT OF ACTUAL VS. EXPECTED FIELD FORCE ON FUTURE NEW BUSINESS VALUE

Variances in current year recruiting and retention will affect future new business value without assumption revisions. If the number of agents at the beginning of the year differs from previous projections, the projected number of agents in all future years will also differ. Consequently, production will deviate from previous projections as will new business value.

Assume actual 1991 recruiting and retention deviated from expected as described earlier. Production Projection Six in Table A-6 combines the actual production data for 1991 with future production assumptions consistent with Production Projection Five. The field force at the beginning of 1992 numbers 1400 instead of the 1419 projected in Production Projection Five. Resulting 1992 production is 4,371,460 units of insurance rather than 4,431,895 as originally projected.

Production in future years is similarly affected. More importantly, future new business value is affected by the number of agents differing from the original projection. Table 5-9 compares 1/1/92 future new business value originally projected to that projected given the actual number of agents. 1/1/92 future new business value resulting from actual field force is calculated in Table C-13 in Appendix C.

Table 5-9:

1992 NEW BUSINESS VALUE - ACTUAL VS. EXPECTED FIELD FORCE

| PROJECTION | CUR YEAR NEW BUS VAL | FUT YEARS NEW BUS VAL | TOTAL NEW BUS VAL |
|---|---|---|---|
| Expected Field Force | $ 7,408,284 | $27,886,023 | $35,294,307 |
| Actual Field Force | 7,308,707 | 27,765,643 | 35,074,350 |
| Field Force Variance | (99,577) | (120,380) | (219,957) |

The change in the current year new business value is almost as great as the change in the new business value of the subsequent four years. Besides the usual effects of discounting, agent retention is a factor. The difference in projected agents becomes smaller as future recruits become a greater share of the field force. In fact, by 2001 the number of agents is the same under both projections (a small difference is removed due to rounding).

The number of agents deviating from projection will have the greatest effect on the immediate year's new business value. The effect the deviation will have on future years' new business values depends on magnitude of the deviation and future years' recruiting and retention projections.

## REVISING FUTURE NEW BUSINESS ASSUMPTIONS

Future new business values change further by revising assumptions. Assumptions may require modification due to actions of management. Such actions could include implementation of programs to increase production or introduction of new products. Annual variance analysis may indicate the need to revise assumptions associated with existing programs. Exogenous factors not under control of management may also require assumption changes.

Recall from Chapter Four that under Production Projection Five, agent productivity was assumed to increase at a rate of 4.00% per year. Given the experience of 1991, productivity projections are revised to increase 4.50% annually. Production Projection Seven in Table A-7 includes actual 1991 recruiting and retention and 4.50% annual increase in agent productivity in future years. Sales mix is revised to that experienced in 1991: 30% WL and 70% ART10. Table 5-10 compares 1/1/92 new business value projected given the current number of agents to that projected given further revisions in productivity and sales mix. Future new business value resulting from actual field force and revised productivity is calculated in Table C-14 in Appendix C. Future new business value resulting from actual field force, revised productivity and revised sales mix is calculated in Table C-15 in Appendix C.

Table 5-10:

1/1/92 FUTURE NEW BUSINESS VALUE - REVISED
ACTUAL NUMBER OF AGENTS, PRODUCTIVITY & SALES MIX

| PROJECTION | CUR YEAR NEW BUS VAL | FUT YEARS NEW BUS VAL | TOTAL NEW BUS VAL |
|---|---|---|---|
| Actual Field Force | $ 7,308,707 | $27,765,643 | $35,074,350 |
| Actual Field Force - Revised Productivity | 7,573,649 | 29,094,317 | 36,667,966 |
| Actual Field Force - Revised Productivity and Sales Mix | 5,870,173 | 22,550,380 | 28,420,553 |
| Change due to Productivity Revision | 264,942 | 1,328,674 | 1,593,616 |
| Change due to Sales Mix Revision | (1,703,476) | (6,543,937) | (8,247,413) |
| Change due to Assumption Revision | $(1,438,534) | $(5,215,263) | $(6,653,797) |

The effect of the revised projections on future new business value is considerable. The increase in projected productivity per agent produced an increase in future new business value. However, the drastic shift in sales mix to a less profitable product has decreased value by a large margin.

In reality, such a large sudden shift in sales mix would probably only occur with the introduction of a new product. If so, management has subtracted value by developing a less profitable product without a compensating increase in production. Overly optimistic production assumptions would be revealed through annual variance analysis of new business sold.

Further possible assumption revisions not illustrated above would include recruiting and retention projections. Also, revisions to pricing assumptions such as interest, mortality, withdrawal and expenses would be included.

Revisions to future new business assumption should be backed up by recent experience as well as reasonably expected trends. Further, assumptions should be developed independently of value calculations to reduce the possibility of manipulation.

Finally, assumptions revisions not under the control of management are considered "midnight changes" as described in Chapter One. These revisions should be separated out and not included in value added by future new business.

## COMPLETE ANALYSIS OF TOTAL CHANGE IN FUTURE NEW BUSINESS VALUE

Change in future new business value from 1/1/91 to 1/1/92 is the sum of the pieces presented above: expected change, change due to current number of agents and change due to assumption revisions. Table 5-11 reconciles 1/1/91 new business value to 1/1/92 new business value.

Table 5-11:

TOTAL CHANGE IN FUTURE NEW BUSINESS VALUE

| | CUR YEAR NEW BUS VAL | FUT YEARS NEW BUS VAL | TOTAL NEW BUS VAL |
|---|---|---|---|
| 1/1/91 FUTURE NEW BUSINESS VALUE | $ 6,632,637 | $25,504,621 | $32,137,258 |
| EXPECTED CHANGE | 775,647 | 2,381,402 | 3,157,049 |
| FIELD FORCE VARIANCE | (99,577) | (120,380) | (219,957) |
| CHANGE DUE TO ASSUMPTION REVISION | (1,438,534) | (5,215,263) | (6,653,797) |
| TOTAL CHANGE | $ (762,464) | $(2,954,241) | $(3,716,705) |
| 1/1/92 FUTURE NEW BUSINESS VALUE | $ 5,870,173 | $22,550,380 | $28,420,553 |

Analyzing change in value this way allows for better understanding of how value is added, or in this case, subtracted. The expected change is due to projection of assumptions in place. The change due to field force variance is a direct result of the previous year's experience. Finally, change due to assumption revision is due to revisions based on recent experience and current management decisions such as the development of a new product.

Presenting the components of future new business value added helps management better understand the ramifications of their decisions. Decisions made during the pricing and planning processes directly affect change in future new business value. Analysis of change in future new business value allows a clearer view of the effects of such decisions.

Under traditional value-added reporting, future new business only added in force value through current year sales. By including the value of future new business, the impact of management decisions is felt more quickly. New business now adds in force value by expected sales in the current year plus variances. Future new business value is added by expected changes due to assumptions already in place, field force variance and in assumption revisions. Such assumption revisions are the result of management actions or failure to achieve goals made in the pricing and planning processes.

Monitoring assumptions in the reporting process improves and validates assumptions used in pricing and planning. Including the value of future new business allows direct recognition in value of management decisions made in pricing and planning. The link between pricing, planning and reporting is complete.

## SUMMARY

Value-added financial reporting provides a natural link between pricing, planning and reporting so that management can understand the impact of their decisions more accurately and quickly. Identical assumptions and a common "language" are used throughout. Valuing future new business strengthens this link as much management effort is directed towards producing new business.

Assumptions needed to value future new business include the number of years of production, total production amount, sales mix, cash flow projections and a hurdle rate. Total production is best projected through the use of recruiting, agent retention and productivity per agent assumptions. Careful consideration should be given to assumption selection as they can have a major impact on value added. Company experience should be used whenever possible. Finally, annual variance analysis will help detect assumptions in need of revision.

Value is added by new business in two ways, the value added by new business actually sold during the year and the change in future new business value. The total value added by new business sold during the year is the sum of projected value added and any variances from that projection. The actual change in future new business value is due to expected change in future new business value, field force variance and change in value due to assumption revisions.

Further research could incorporate use of multiple economic scenarios stochastically generated. New business production could vary with the relationship of credited interest rates and competitor rates. The range of results could be analyzed by examining the median value. Additionally, various percentiles might be examined with an objective of minimizing the magnitude and frequency of detrimental scenarios.

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# APPENDIX A

## PRODUCTION PROJECTION

$$\text{TotalProduction}(t) = \sum_{y=1}^{5} \text{ProductionPerAgent}(y,t) \times \text{NumberOfAgents}(y,t)$$

where:

y is the calendar year of service for an agent. A value of y equal to 5 includes all agents in calendar year of service 5 or greater.

ProductionPerAgent(y,t) is the assumed production in year t per agent in calendar year of service y.

$$\text{NumberOfAgents}(y,t) = \begin{cases} \text{Recruits}(t) & \text{for } y=1 \\ \text{NumberOfAgents}(y-1,t-1) \times \text{Retention}(y-1,t-1) & \text{for } y=2,3,4 \\ \text{NumberOfAgents}(4,t-1) \times \text{Retention}(4,t-1) & \text{for } y=5 \\ \quad + \text{NumberOfAgents}(5,t-1) \times \text{Retention}(5,t-1) & \end{cases}$$

Recruits(t) is the expected number of recruits at the beginning of year t.

Retention(y,t) is the probability an agent in calendar year of service y, under contract at the beginning of year t, will still be under contract at the beginning of year t+1. All turnover is assumed at the end of the year for simplicity.

TABLE A-1
PRODUCTION PROJECTION - NUMBER ONE
LEVEL PRODUCTION

| | ************ CALENDAR YEAR OF SERVICE ************** | | | | | |
|---|---|---|---|---|---|---|
| | RECRUITS | SECOND | THIRD | FOURTH | FIFTH + | TOTAL |
| 1991 | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 494,400 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,826,086 |
| 1992 | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 494,400 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,826,086 |
| 1993 | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 494,400 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,826,086 |
| 1994 | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 494,400 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,826,086 |
| 1995 | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 494,400 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,826,086 |
| 1996 | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 494,400 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,826,086 |
| 1997 | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 494,400 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,826,086 |
| 1998 | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 494,400 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,826,086 |
| 1999 | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 494,400 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,826,086 |
| 2000 | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 494,400 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,826,086 |
| 2001 | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 494,400 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,826,086 |

TABLE A-2
PRODUCTION PROJECTION TWO
AUGMENTED RECRUITING

| | ************ CALENDAR YEAR OF SERVICE | | | | | TOTAL |
|---|---|---|---|---|---|---|
| | RECRUITS | SECOND | THIRD | FOURTH | FIFTH + | |
| **1991** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 450 | 266 | 133 | 85 | 395 | 1,329 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 636,300 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,967,486 |
| **1992** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 450 | 342 | 133 | 85 | 395 | 1,405 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 636,300 | 1,088,586 | 457,653 | 301,495 | 1,725,360 | 4,209,394 |
| **1993** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 450 | 342 | 171 | 85 | 395 | 1,443 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 636,300 | 1,088,586 | 588,411 | 301,495 | 1,725,360 | 4,340,152 |
| **1994** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 450 | 342 | 171 | 109 | 395 | 1,467 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 636,300 | 1,088,586 | 588,411 | 386,623 | 1,725,360 | 4,425,280 |
| **1995** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 450 | 342 | 171 | 109 | 412 | 1,484 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 636,300 | 1,088,586 | 588,411 | 386,623 | 1,799,616 | 4,499,536 |
| **1996** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 450 | 342 | 171 | 109 | 427 | 1,499 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 636,300 | 1,088,586 | 588,411 | 386,623 | 1,865,136 | 4,565,056 |
| **1997** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 450 | 342 | 171 | 109 | 439 | 1,511 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 636,300 | 1,088,586 | 588,411 | 386,623 | 1,917,552 | 4,617,472 |
| **1998** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 450 | 342 | 171 | 109 | 449 | 1,521 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 636,300 | 1,088,586 | 588,411 | 386,623 | 1,961,232 | 4,661,152 |
| **1999** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 450 | 342 | 171 | 109 | 458 | 1,530 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 636,300 | 1,088,586 | 588,411 | 386,623 | 2,000,544 | 4,700,464 |
| **2000** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 450 | 342 | 171 | 109 | 465 | 1,537 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 636,300 | 1,088,586 | 588,411 | 386,623 | 2,031,120 | 4,731,040 |
| **2001** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 450 | 342 | 171 | 109 | 471 | 1,543 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 636,300 | 1,088,586 | 588,411 | 386,623 | 2,057,328 | 4,757,248 |

TABLE A-3
PRODUCTION PROJECTION THREE
IMPROVED RETENTION

| | | ************* CALENDAR YEAR OF SERVICE ************* | | | | | |
|---|---|---|---|---|---|---|---|
| | | RECRUITS | SECOND | THIRD | FOURTH | FIFTH + | TOTAL |
| 1991 | | | | | | | |
| | RETENTION | 77.00% | 51.00% | 65.00% | 73.00% | 85.50% | |
| | AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| | PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| | TOT PROD | 494,900 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,826,086 |
| 1992 | | | | | | | |
| | RETENTION | 78.00% | 52.00% | 66.00% | 74.00% | 86.50% | |
| | AGENTS | 350 | 270 | 136 | 86 | 400 | 1,242 |
| | PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| | TOT PROD | 494,900 | 859,410 | 467,976 | 305,042 | 1,747,200 | 3,874,528 |
| 1993 | | | | | | | |
| | RETENTION | 79.00% | 53.00% | 67.00% | 75.00% | 87.50% | |
| | AGENTS | 350 | 273 | 140 | 90 | 410 | 1,263 |
| | PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| | TOT PROD | 494,900 | 868,959 | 481,740 | 319,230 | 1,790,880 | 3,955,709 |
| 1994 | | | | | | | |
| | RETENTION | 80.00% | 54.00% | 68.00% | 76.00% | 88.50% | |
| | AGENTS | 350 | 277 | 145 | 94 | 426 | 1,292 |
| | PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| | TOT PROD | 494,900 | 881,691 | 498,945 | 333,418 | 1,860,768 | 4,069,722 |
| 1995 | | | | | | | |
| | RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| | AGENTS | 350 | 280 | 150 | 99 | 448 | 1,327 |
| | PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| | TOT PROD | 494,900 | 891,240 | 516,150 | 351,153 | 1,956,864 | 4,210,307 |
| 1996 | | | | | | | |
| | RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| | AGENTS | 350 | 284 | 154 | 104 | 477 | 1,369 |
| | PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| | TOT PROD | 494,900 | 903,972 | 529,914 | 368,888 | 2,083,536 | 4,381,210 |
| 1997 | | | | | | | |
| | RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| | AGENTS | 350 | 284 | 156 | 106 | 507 | 1,403 |
| | PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| | TOT PROD | 494,900 | 903,972 | 536,796 | 375,982 | 2,214,576 | 4,526,226 |
| 1998 | | | | | | | |
| | RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| | AGENTS | 350 | 284 | 156 | 108 | 535 | 1,433 |
| | PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| | TOT PROD | 494,900 | 903,972 | 536,796 | 383,076 | 2,336,880 | 4,655,624 |
| 1999 | | | | | | | |
| | RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| | AGENTS | 350 | 284 | 156 | 108 | 562 | 1,460 |
| | PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| | TOT PROD | 494,900 | 903,972 | 536,796 | 383,076 | 2,454,816 | 4,773,560 |
| 2000 | | | | | | | |
| | RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| | AGENTS | 350 | 284 | 156 | 108 | 586 | 1,484 |
| | PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| | TOT PROD | 494,900 | 903,972 | 536,796 | 383,076 | 2,559,648 | 4,878,392 |
| 2001 | | | | | | | |
| | RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| | AGENTS | 350 | 284 | 156 | 108 | 608 | 1,506 |
| | PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| | TOT PROD | 494,900 | 903,972 | 536,796 | 383,076 | 2,655,744 | 4,974,488 |

TABLE A-4
PRODUCTION PROJECTION FOUR
INCREASED PRODUCTIVITY

| | ************ CALENDAR YEAR OF SERVICE *************** | | | | | |
|---|---|---|---|---|---|---|
| | RECRUITS | SECOND | THIRD | FOURTH | FIFTH + | TOTAL |
| **1991** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 494,400 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,826,086 |
| **1992** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,471 | 3,310 | 3,579 | 3,689 | 4,543 | |
| TOT PROD | 514,696 | 880,545 | 475,959 | 313,555 | 1,794,374 | 3,979,129 |
| **1993** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,529 | 3,443 | 3,722 | 3,836 | 4,724 | |
| TOT PROD | 535,284 | 915,767 | 494,997 | 326,097 | 1,866,149 | 4,138,295 |
| **1994** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,591 | 3,580 | 3,871 | 3,990 | 4,913 | |
| TOT PROD | 556,695 | 952,398 | 514,797 | 339,141 | 1,940,795 | 4,303,826 |
| **1995** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,654 | 3,724 | 4,025 | 4,149 | 5,110 | |
| TOT PROD | 578,963 | 990,494 | 535,389 | 352,707 | 2,018,427 | 4,475,979 |
| **1996** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,720 | 3,873 | 4,187 | 4,315 | 5,314 | |
| TOT PROD | 602,122 | 1,030,113 | 556,805 | 366,815 | 2,099,164 | 4,655,019 |
| **1997** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,789 | 4,028 | 4,354 | 4,488 | 5,527 | |
| TOT PROD | 626,206 | 1,071,318 | 579,077 | 381,487 | 2,183,131 | 4,841,219 |
| **1998** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,861 | 4,189 | 4,528 | 4,668 | 5,748 | |
| TOT PROD | 651,255 | 1,114,170 | 602,240 | 396,747 | 2,270,456 | 5,034,868 |
| **1999** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 1,935 | 4,356 | 4,709 | 4,854 | 5,978 | |
| TOT PROD | 677,305 | 1,158,737 | 626,330 | 412,617 | 2,361,274 | 5,236,263 |
| **2000** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 2,013 | 4,530 | 4,898 | 5,048 | 6,217 | |
| TOT PROD | 704,397 | 1,205,087 | 651,383 | 429,121 | 2,455,725 | 5,445,713 |
| **2001** | | | | | | |
| RETENTION | 76.00% | 50.00% | 64.00% | 72.00% | 84.50% | |
| AGENTS | 350 | 266 | 133 | 85 | 395 | 1,229 |
| PROD/AGT | 2,093 | 4,712 | 5,094 | 5,250 | 6,466 | |
| TOT PROD | 732,573 | 1,253,290 | 677,438 | 446,286 | 2,553,954 | 5,663,542 |

TABLE A-5
PRODUCTION PROJECTION FIVE
IMPROVED RECRUITING, RETENTION AND PRODUCTIVITY

| | | ************* CALENDAR | YEAR OF | SERVICE | ************* | |
|---|---|---|---|---|---|---|
| | RECRUITS | SECOND | THIRD | FOURTH | FIFTH + | TOTAL |
| **1991** | | | | | | |
| RETENTION | 77.00% | 51.00% | 65.00% | 73.00% | 85.50% | |
| AGENTS | 450 | 266 | 133 | 85 | 395 | 1,329 |
| PROD/AGT | 1,414 | 3,183 | 3,441 | 3,547 | 4,368 | |
| TOT PROD | 636,300 | 846,678 | 457,653 | 301,495 | 1,725,360 | 3,967,486 |
| **1992** | | | | | | |
| RETENTION | 78.00% | 52.00% | 66.00% | 74.00% | 86.50% | |
| AGENTS | 450 | 347 | 136 | 86 | 400 | 1,419 |
| PROD/AGT | 1,471 | 3,310 | 3,579 | 3,689 | 4,543 | |
| TOT PROD | 661,752 | 1,148,681 | 486,695 | 317,244 | 1,817,088 | 4,431,460 |
| **1993** | | | | | | |
| RETENTION | 79.00% | 53.00% | 67.00% | 75.00% | 87.50% | |
| AGENTS | 450 | 351 | 180 | 90 | 410 | 1,481 |
| PROD/AGT | 1,529 | 3,443 | 3,722 | 3,836 | 4,724 | |
| TOT PROD | 688,222 | 1,208,399 | 669,921 | 345,279 | 1,937,016 | 4,848,838 |
| **1994** | | | | | | |
| RETENTION | 80.00% | 54.00% | 68.00% | 76.00% | 88.50% | |
| AGENTS | 450 | 356 | 186 | 121 | 426 | 1,539 |
| PROD/AGT | 1,591 | 3,580 | 3,871 | 3,990 | 4,913 | |
| TOT PROD | 715,751 | 1,274,637 | 719,942 | 482,777 | 2,093,111 | 5,286,219 |
| **1995** | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 360 | 192 | 126 | 469 | 1,597 |
| PROD/AGT | 1,654 | 3,724 | 4,025 | 4,149 | 5,110 | |
| TOT PROD | 744,381 | 1,340,518 | 772,893 | 522,836 | 2,396,563 | 5,777,190 |
| **1996** | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 198 | 132 | 517 | 1,662 |
| PROD/AGT | 1,720 | 3,873 | 4,187 | 4,315 | 5,314 | |
| TOT PROD | 774,156 | 1,413,501 | 828,928 | 569,642 | 2,747,514 | 6,333,740 |
| **1997** | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 137 | 564 | 1,717 |
| PROD/AGT | 1,789 | 4,028 | 4,354 | 4,488 | 5,527 | |
| TOT PROD | 805,122 | 1,470,041 | 875,147 | 614,868 | 3,117,179 | 6,882,357 |
| **1998** | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 139 | 610 | 1,765 |
| PROD/AGT | 1,861 | 4,189 | 4,528 | 4,668 | 5,748 | |
| TOT PROD | 837,327 | 1,528,843 | 910,152 | 648,798 | 3,506,274 | 7,431,394 |
| **1999** | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 139 | 653 | 1,808 |
| PROD/AGT | 1,935 | 4,356 | 4,709 | 4,854 | 5,978 | |
| TOT PROD | 870,820 | 1,589,997 | 946,558 | 674,750 | 3,903,575 | 7,985,700 |
| **2000** | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 139 | 691 | 1,846 |
| PROD/AGT | 2,013 | 4,530 | 4,898 | 5,048 | 6,217 | |
| TOT PROD | 905,653 | 1,653,597 | 984,421 | 701,740 | 4,295,965 | 8,541,376 |
| **2001** | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 139 | 725 | 1,880 |
| PROD/AGT | 2,093 | 4,712 | 5,094 | 5,250 | 6,466 | |
| TOT PROD | 941,879 | 1,719,740 | 1,023,798 | 729,809 | 4,687,638 | 9,102,864 |

TABLE A-6
PRODUCTION PROJECTION SIX
PRODUCTION PROJECTION FIVE WITH ACTUAL 1991 VALUES

| | ************* CALENDAR YEAR OF SERVICE ************* | | | | | |
|---|---|---|---|---|---|---|
| | RECRUITS | SECOND | THIRD | FOURTH | FIFTH + | TOTAL |
| **1991** | | | | | | |
| RETENTION | 80.00% | 53.00% | 66.00% | 72.00% | 84.50% | |
| AGENTS | 400 | 266 | 133 | 85 | 395 | 1,279 |
| PROD/AGT | 1,508 | 3,056 | 3,499 | 3,645 | 4,650 | |
| TOT PROD | 603,200 | 812,896 | 465,367 | 309,825 | 1,836,750 | 4,028,038 |
| **1992** | | | | | | |
| RETENTION | 78.00% | 52.00% | 66.00% | 74.00% | 86.50% | |
| AGENTS | 450 | 320 | 141 | 88 | 401 | 1,400 |
| PROD/AGT | 1,471 | 3,310 | 3,579 | 3,689 | 4,543 | |
| TOT PROD | 661,752 | 1,059,302 | 504,588 | 324,621 | 1,821,631 | 4,371,895 |
| **1993** | | | | | | |
| RETENTION | 79.00% | 53.00% | 67.00% | 75.00% | 87.50% | |
| AGENTS | 450 | 351 | 166 | 93 | 412 | 1,472 |
| PROD/AGT | 1,529 | 3,443 | 3,722 | 3,836 | 4,724 | |
| TOT PROD | 688,222 | 1,208,399 | 617,816 | 356,788 | 1,946,465 | 4,817,691 |
| **1994** | | | | | | |
| RETENTION | 80.00% | 54.00% | 68.00% | 76.00% | 88.50% | |
| AGENTS | 450 | 356 | 186 | 111 | 430 | 1,533 |
| PROD/AGT | 1,591 | 3,580 | 3,871 | 3,990 | 4,913 | |
| TOT PROD | 715,751 | 1,274,637 | 719,942 | 442,878 | 2,112,765 | 5,265,973 |
| **1995** | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 360 | 192 | 126 | 465 | 1,593 |
| PROD/AGT | 1,654 | 3,724 | 4,025 | 4,149 | 5,110 | |
| TOT PROD | 744,381 | 1,340,518 | 772,893 | 522,836 | 2,376,123 | 5,756,750 |
| **1996** | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 198 | 132 | 513 | 1,658 |
| PROD/AGT | 1,720 | 3,873 | 4,187 | 4,315 | 5,314 | |
| TOT PROD | 774,156 | 1,413,501 | 828,928 | 569,642 | 2,726,256 | 6,312,483 |
| **1997** | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 137 | 561 | 1,714 |
| PROD/AGT | 1,789 | 4,028 | 4,354 | 4,488 | 5,527 | |
| TOT PROD | 805,122 | 1,470,041 | 875,147 | 614,868 | 3,100,598 | 6,865,777 |
| **1998** | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 139 | 608 | 1,763 |
| PROD/AGT | 1,861 | 4,189 | 4,528 | 4,668 | 5,748 | |
| TOT PROD | 837,327 | 1,528,843 | 910,152 | 648,798 | 3,494,778 | 7,419,898 |
| **1999** | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 139 | 651 | 1,806 |
| PROD/AGT | 1,935 | 4,356 | 4,709 | 4,854 | 5,978 | |
| TOT PROD | 870,820 | 1,589,997 | 946,558 | 674,750 | 3,891,619 | 7,973,744 |
| **2000** | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 139 | 690 | 1,845 |
| PROD/AGT | 2,013 | 4,530 | 4,898 | 5,048 | 6,217 | |
| TOT PROD | 905,653 | 1,653,597 | 984,421 | 701,740 | 4,289,748 | 8,535,158 |
| **2001** | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 139 | 725 | 1,880 |
| PROD/AGT | 2,093 | 4,712 | 5,094 | 5,250 | 6,466 | |
| TOT PROD | 941,879 | 1,719,740 | 1,023,798 | 729,809 | 4,687,638 | 9,102,864 |

TABLE A-7
PRODUCTION PROJECTION SEVEN
PRODUCTION PROJECTION FIVE WITH ACTUAL 1991 VALUES AND REVISED PRODUCTIVITY

| | ************* CALENDAR YEAR OF SERVICE ************* | | | | | |
|---|---|---|---|---|---|---|
| | RECRUITS | SECOND | THIRD | FOURTH | FIFTH + | TOTAL |
| 1991 | | | | | | |
| RETENTION | 80.00% | 53.00% | 66.00% | 72.00% | 86.00% | |
| AGENTS | 400 | 266 | 133 | 85 | 395 | 1,279 |
| PROD/AGT | 1,508 | 3,056 | 3,499 | 3,645 | 4,650 | |
| TOT PROD | 603,200 | 812,896 | 465,367 | 309,825 | 1,836,750 | 4,028,038 |
| 1992 | | | | | | |
| RETENTION | 78.00% | 52.00% | 66.00% | 74.00% | 86.50% | |
| AGENTS | 450 | 320 | 141 | 88 | 401 | 1,400 |
| PROD/AGT | 1,576 | 3,194 | 3,656 | 3,809 | 4,859 | |
| TOT PROD | 709,137 | 1,021,926 | 515,560 | 335,194 | 1,948,559 | 4,530,377 |
| 1993 | | | | | | |
| RETENTION | 79.00% | 53.00% | 67.00% | 75.00% | 87.50% | |
| AGENTS | 450 | 351 | 166 | 93 | 412 | 1,472 |
| PROD/AGT | 1,647 | 3,337 | 3,821 | 3,980 | 5,078 | |
| TOT PROD | 741,038 | 1,171,367 | 634,285 | 370,180 | 2,092,101 | 5,008,982 |
| 1994 | | | | | | |
| RETENTION | 80.00% | 54.00% | 68.00% | 76.00% | 88.50% | |
| AGENTS | 450 | 356 | 186 | 111 | 430 | 1,533 |
| PROD/AGT | 1,721 | 3,487 | 3,993 | 4,160 | 5,306 | |
| TOT PROD | 774,395 | 1,241,516 | 742,687 | 461,710 | 2,281,762 | 5,502,070 |
| 1995 | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 360 | 192 | 126 | 465 | 1,593 |
| PROD/AGT | 1,798 | 3,644 | 4,173 | 4,347 | 5,545 | |
| TOT PROD | 809,243 | 1,311,961 | 801,144 | 547,688 | 2,578,523 | 6,048,559 |
| 1996 | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 198 | 132 | 513 | 1,658 |
| PROD/AGT | 1,879 | 3,808 | 4,360 | 4,542 | 5,795 | |
| TOT PROD | 845,659 | 1,390,041 | 863,357 | 599,588 | 2,972,705 | 6,671,350 |
| 1997 | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 137 | 561 | 1,714 |
| PROD/AGT | 1,964 | 3,980 | 4,557 | 4,747 | 6,056 | |
| TOT PROD | 883,714 | 1,452,593 | 915,878 | 650,303 | 3,397,141 | 7,299,629 |
| 1998 | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 139 | 608 | 1,763 |
| PROD/AGT | 2,052 | 4,159 | 4,762 | 4,960 | 6,328 | |
| TOT PROD | 923,481 | 1,517,960 | 957,093 | 689,487 | 3,847,429 | 7,935,449 |
| 1999 | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 139 | 651 | 1,806 |
| PROD/AGT | 2,145 | 4,346 | 4,976 | 5,184 | 6,613 | |
| TOT PROD | 965,037 | 1,586,268 | 1,000,162 | 720,514 | 4,304,912 | 8,576,894 |
| 2000 | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 139 | 690 | 1,845 |
| PROD/AGT | 2,241 | 4,542 | 5,200 | 5,417 | 6,910 | |
| TOT PROD | 1,008,464 | 1,657,650 | 1,045,169 | 752,938 | 4,768,136 | 9,232,357 |
| 2001 | | | | | | |
| RETENTION | 81.00% | 55.00% | 69.00% | 77.00% | 89.50% | |
| AGENTS | 450 | 365 | 201 | 139 | 725 | 1,880 |
| PROD/AGT | 2,342 | 4,746 | 5,434 | 5,661 | 7,221 | |
| TOT PROD | 1,053,845 | 1,732,244 | 1,092,202 | 786,820 | 5,235,448 | 9,900,559 |

# APPENDIX B

## PRESENT VALUE OF PROFIT PER UNIT ISSUED

Two simplistic cells were selected to demonstrate the value of future new business: an ART−10 issued to a 35 year old male nonsmoker and a nonparticipating whole life issued to a 35 year old male nonsmoker. Simplistic formulas for present value of profits per unit follow.

p(x,t) = 1 − qd(x,t) − qw(x,t)

D(x,0) = 1

D(x,t) = D(x,t−1) x p(x,t) / (1+j(t))

expenses(x,t) = exppol(x,t)/avgsize(x) + expprem(x,t) x premium(x,t)

polben(x,t) = DB(x,t) x qd(x,t) x i(t) / delta(t) + CV(x,t) x qw(x,t)

profit(x,t) = ((V(x,t−1) + premium(x,t) − expenses(x,t)) x (1+i(t)) − polben(x,t) )/ p(x,t) − V(x,t)

$$\text{PVProfit}(x) = \sum_{t=1}^{T} D(x,t) \times \text{profit}(x,t)$$

where:

qd(x,t) is the probability that a unit entering policy year t will die during the year.

qw(x,t) is the probability that a unit entering policy year t will lapse at the end of the year.

i(t) is the interest rate earned in policy year t.

delta(t) is the force of interest during policy year t, equal to ln(1+i(t)).

j(t) is the hurdle rate for policy year t used for discounting profits.

avgsize(x) is the average number of units per policy.

exppol(x,t) is the expense per policy for policy year t.

expprem(x,t) is the expense per dollar of premium collected in policy year t.

DB(x,t) is the death benefit per unit payable to those who die in policy year t.

CV(x,t) is the cash value per unit payable to those who lapse at the end of policy year t.

V(x,t) is the reserve per unit in force at the end of policy year t.

TABLE B-1

PRESENT VALUE OF PROFIT PER UNIT - TEN YEAR RENEWABLE TERM

| | |
|---|---|
| x | 35 |
| avgsize(x) | 150.000 |
| i(t) | 0.09 |
| delta(t) | 0.08618 |
| j(t) | 0.10 |

| t | 1000qd(x,t) | qw(x,t) | p(x,t) | D(x,t) | Prem(x,t) | DB(x,t) | V(x,t) | CV(x,t) | exppol(x,t) | expprem(x,t) | expenses(x,t) | polben(x,t) | profit(x,t | pvprofit(x,t) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 1.00000 | 1.00000 | | | | | | | | | | |
| 1 | 0.63 | 0.20 | 0.79937 | 0.72670 | 1.45 | 1000 | 0 | 0 | 125 | 0.75 | 1.92083 | 0.65793 | -1.46507 | -1.06467 |
| 2 | 0.76 | 0.20 | 0.79924 | 0.52801 | 1.55 | 1000 | 0 | 0 | 10 | 0.09 | 0.20617 | 0.79369 | 0.83966 | 0.44335 |
| 3 | 0.99 | 0.20 | 0.79901 | 0.38353 | 1.66 | 1000 | 0 | 0 | 10 | 0.09 | 0.21607 | 1.03388 | 0.67584 | 0.25921 |
| 4 | 1.14 | 0.20 | 0.79886 | 0.27853 | 1.78 | 1000 | 0 | 0 | 10 | 0.09 | 0.22687 | 1.19053 | 0.62888 | 0.17516 |
| 5 | 1.28 | 0.20 | 0.79872 | 0.20225 | 1.92 | 1000 | 0 | 0 | 10 | 0.09 | 0.23947 | 1.33674 | 0.61980 | 0.12535 |
| 6 | 1.40 | 0.20 | 0.79860 | 0.14683 | 2.09 | 1000 | 0 | 0 | 10 | 0.09 | 0.25477 | 1.46206 | 0.67411 | 0.09898 |
| 7 | 1.58 | 0.20 | 0.79842 | 0.10657 | 2.29 | 1000 | 0 | 0 | 10 | 0.09 | 0.27277 | 1.65003 | 0.68729 | 0.07325 |
| 8 | 1.78 | 0.20 | 0.79822 | 0.07734 | 2.53 | 1000 | 0 | 0 | 10 | 0.09 | 0.29437 | 1.85890 | 0.72404 | 0.05599 |
| 9 | 2.01 | 0.20 | 0.79799 | 0.05610 | 2.78 | 1000 | 0 | 0 | 10 | 0.09 | 0.31687 | 2.09909 | 0.73399 | 0.04118 |
| 10 | 2.24 | 0.20 | 0.79776 | 0.04069 | 3.04 | 1000 | 0 | 0 | 10 | 0.09 | 0.34027 | 2.33929 | 0.75639 | 0.03078 |
| SUM | | | | | | | | | | | | | | 0.23858 |

TABLE 8-2

PRESENT VALUE OF PROFIT PER UNIT - TEN YEAR RENEWABLE TERM

| | |
|---|---|
| x | 35 |
| avgsize(x) | 150.000 |
| i(t) | 0.09 |
| delta(t) | 0.08618 |
| j(t) | 0.12 |

| t | 1000qd(x,t) | qw(x,t) | p(x,t) | D(x,t) | Prem(x,t) | DB(x,t) | V(x,t) | CV(x,t) | exppol(x,t) | expprem(x,t) | expenses(x,t) | polben(x,t) | profit(x,t | pvprofit(x,t) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 1.00000 | 1.00000 | | | | | | | | | | |
| 1 | 0.63 | 0.20 | 0.79937 | 0.71372 | 1.45 | 1000 | 0 | 0 | 125 | 0.75 | 1.92083 | 0.65793 | -1.46507 | -1.04566 |
| 2 | 0.76 | 0.20 | 0.79924 | 0.50932 | 1.55 | 1000 | 0 | 0 | 10 | 0.09 | 0.20617 | 0.79369 | 0.83966 | 0.42765 |
| 3 | 0.99 | 0.20 | 0.79901 | 0.36335 | 1.66 | 1000 | 0 | 0 | 10 | 0.09 | 0.21607 | 1.03388 | 0.67584 | 0.24557 |
| 4 | 1.14 | 0.20 | 0.79886 | 0.25916 | 1.78 | 1000 | 0 | 0 | 10 | 0.09 | 0.22687 | 1.19053 | 0.62888 | 0.16298 |
| 5 | 1.28 | 0.20 | 0.79872 | 0.18482 | 1.92 | 1000 | 0 | 0 | 10 | 0.09 | 0.23947 | 1.33674 | 0.61980 | 0.11455 |
| 6 | 1.40 | 0.20 | 0.79860 | 0.13178 | 2.09 | 1000 | 0 | 0 | 10 | 0.09 | 0.25477 | 1.46206 | 0.67411 | 0.08884 |
| 7 | 1.58 | 0.20 | 0.79842 | 0.09395 | 2.29 | 1000 | 0 | 0 | 10 | 0.09 | 0.27277 | 1.65003 | 0.68729 | 0.06457 |
| 8 | 1.78 | 0.20 | 0.79822 | 0.06695 | 2.53 | 1000 | 0 | 0 | 10 | 0.09 | 0.29437 | 1.85890 | 0.72404 | 0.04848 |
| 9 | 2.01 | 0.20 | 0.79799 | 0.04770 | 2.78 | 1000 | 0 | 0 | 10 | 0.09 | 0.31687 | 2.09909 | 0.73399 | 0.03501 |
| 10 | 2.24 | 0.20 | 0.79776 | 0.03398 | 3.04 | 1000 | 0 | 0 | 10 | 0.09 | 0.34027 | 2.33929 | 0.75639 | 0.02570 |
| SUM | | | | | | | | | | | | | | 0.16770 |

TABLE 8-3

PRESENT VALUE OF PROFIT PER UNIT - TEN YEAR RENEWABLE TERM

| | |
|---|---|
| x | 35 |
| avgsize(x) | 150.000 |
| i(t) | 0.09 |
| delta(t) | 0.08618 |
| j(t) | 0.15 |

| t | 1000qd(x,t) | qw(x,t) | p(x,t) | D(x,t) | Prem(x,t) | DB(x,t) | V(x,t) | CV(x,t) | exppol(x,t) | expprem(x,t) | expenses(x,t) | polben(x,t) | profit(x,t | pvprofit(x,t) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 1.00000 | 1.00000 | | | | | | | | | | |
| 1 | 0.63 | 0.20 | 0.79937 | 0.69510 | 1.45 | 1000 | 0 | 0 | 125 | 0.75 | 1.92083 | 0.65793 | -1.46507 | -1.01838 |
| 2 | 0.76 | 0.20 | 0.79924 | 0.48309 | 1.55 | 1000 | 0 | 0 | 10 | 0.09 | 0.20617 | 0.79369 | 0.83966 | 0.40563 |
| 3 | 0.99 | 0.20 | 0.79901 | 0.33565 | 1.66 | 1000 | 0 | 0 | 10 | 0.09 | 0.21607 | 1.03388 | 0.67584 | 0.22684 |
| 4 | 1.14 | 0.20 | 0.79886 | 0.23316 | 1.78 | 1000 | 0 | 0 | 10 | 0.09 | 0.22687 | 1.19053 | 0.62888 | 0.14663 |
| 5 | 1.28 | 0.20 | 0.79872 | 0.16194 | 1.92 | 1000 | 0 | 0 | 10 | 0.09 | 0.23947 | 1.33674 | 0.61980 | 0.10037 |
| 6 | 1.40 | 0.20 | 0.79860 | 0.11246 | 2.09 | 1000 | 0 | 0 | 10 | 0.09 | 0.25477 | 1.46206 | 0.67411 | 0.07581 |
| 7 | 1.58 | 0.20 | 0.79842 | 0.07808 | 2.29 | 1000 | 0 | 0 | 10 | 0.09 | 0.27277 | 1.65003 | 0.68729 | 0.05366 |
| 8 | 1.78 | 0.20 | 0.79822 | 0.05419 | 2.53 | 1000 | 0 | 0 | 10 | 0.09 | 0.29437 | 1.85890 | 0.72404 | 0.03924 |
| 9 | 2.01 | 0.20 | 0.79799 | 0.03760 | 2.78 | 1000 | 0 | 0 | 10 | 0.09 | 0.31687 | 2.09909 | 0.73399 | 0.02760 |
| 10 | 2.24 | 0.20 | 0.79776 | 0.02609 | 3.04 | 1000 | 0 | 0 | 10 | 0.09 | 0.34027 | 2.33929 | 0.75639 | 0.01973 |
| SUM | | | | | | | | | | | | | | 0,07714 |

TABLE B-4

PRESENT VALUE OF PROFIT PER UNIT - NONPAR WHOLE LIFE

| | |
|---|---|
| x | 35 |
| avgsize(x) | 50.000 |
| i(t) | 0.09 |
| delta(t) | 0.08618 |
| j(t) | 0.10 |

| t | 1000qd(x,t) | qw(x,t) | p(x,t) | D(x,t) | Prem(x,t) | DB(x,t) | V(x,t) | CV(x,t) | exppol(x,t) | expprem(x,t) | expenses(x,t) | polben(x,t) | profit(x,t) | pvprofit(x,t) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 1.00000 | 1.00000 | | | | | | | | | | |
| 1 | 0.63 | 0.20 | 0.79937 | 0.72670 | 12.15 | 1000 | 0.00 | 0.00 | 100 | 1.40 | 19.01000 | 0.65793 | -10.17717 | -7.39575 |
| 2 | 0.76 | 0.15 | 0.84924 | 0.56104 | 12.15 | 1000 | 11.07 | 0.00 | 15 | 0.10 | 1.51500 | 0.79369 | 1.64544 | 0.92316 |
| 3 | 0.99 | 0.10 | 0.89901 | 0.45853 | 12.15 | 1000 | 22.50 | 8.47 | 15 | 0.10 | 1.51500 | 1.88088 | 1.72394 | 0.79047 |
| 4 | 1.14 | 0.10 | 0.89886 | 0.37468 | 12.15 | 1000 | 34.27 | 20.17 | 15 | 0.10 | 1.51500 | 3.20753 | 2.34262 | 0.87774 |
| 5 | 1.28 | 0.10 | 0.89872 | 0.30612 | 12.15 | 1000 | 46.40 | 32.23 | 15 | 0.10 | 1.51500 | 4.55974 | 2.98881 | 0.91494 |
| 6 | 1.40 | 0.10 | 0.89860 | 0.25007 | 12.15 | 1000 | 58.87 | 44.63 | 15 | 0.10 | 1.51500 | 5.92506 | 3.71969 | 0.93020 |
| 7 | 1.58 | 0.10 | 0.89842 | 0.20425 | 12.15 | 1000 | 71.72 | 57.40 | 15 | 0.10 | 1.51500 | 7.39003 | 4.38073 | 0.89475 |
| 8 | 1.78 | 0.10 | 0.89822 | 0.16678 | 12.15 | 1000 | 84.93 | 70.53 | 15 | 0.10 | 1.51500 | 8.91190 | 5.08698 | 0.84841 |
| 9 | 2.01 | 0.10 | 0.89799 | 0.13615 | 12.15 | 1000 | 98.51 | 84.03 | 15 | 0.10 | 1.51500 | 10.50209 | 5.79378 | 0.78884 |
| 10 | 2.24 | 0.10 | 0.89776 | 0.11112 | 12.15 | 1000 | 112.46 | 97.90 | 15 | 0.10 | 1.51500 | 12.12929 | 6.54593 | 0.72738 |
| 11 | 2.53 | 0.10 | 0.89747 | 0.09066 | 12.15 | 1000 | 126.79 | 112.14 | 15 | 0.02 | 0.54300 | 13.85614 | 8.45339 | 0.76639 |
| 12 | 2.80 | 0.10 | 0.89720 | 0.07395 | 12.15 | 1000 | 141.49 | 126.76 | 15 | 0.02 | 0.54300 | 15.60011 | 9.25969 | 0.68472 |
| 13 | 3.13 | 0.10 | 0.89687 | 0.06029 | 12.15 | 1000 | 156.58 | 141.76 | 15 | 0.02 | 0.54300 | 17.44474 | 10.03388 | 0.60495 |
| 14 | 3.52 | 0.10 | 0.89648 | 0.04914 | 12.15 | 1000 | 172.06 | 157.15 | 15 | 0.02 | 0.54300 | 19.39103 | 10.80276 | 0.53081 |
| 15 | 3.94 | 0.10 | 0.89606 | 0.04003 | 12.15 | 1000 | 187.92 | 172.92 | 15 | 0.02 | 0.54300 | 21.40664 | 11.60948 | 0.46468 |
| 16 | 4.45 | 0.10 | 0.89555 | 0.03259 | 12.15 | 1000 | 204.17 | 189.07 | 15 | 0.02 | 0.54300 | 23.55425 | 12.37869 | 0.40338 |
| 17 | 4.92 | 0.10 | 0.89508 | 0.02652 | 12.15 | 1000 | 220.77 | 205.58 | 15 | 0.02 | 0.54300 | 25.69608 | 13.28824 | 0.35235 |
| 18 | 5.44 | 0.10 | 0.89456 | 0.02156 | 12.15 | 1000 | 237.71 | 222.42 | 15 | 0.02 | 0.54300 | 27.92313 | 14.22145 | 0.30667 |
| 19 | 6.00 | 0.10 | 0.89400 | 0.01753 | 12.15 | 1000 | 254.96 | 239.56 | 15 | 0.02 | 0.54300 | 30.22195 | 15.21178 | 0.26660 |
| 20 | 6.61 | 0.10 | 0.89339 | 0.01423 | 12.15 | 1000 | 272.50 | 257.00 | 15 | 0.02 | 0.54300 | 32.60299 | 16.23732 | 0.23112 |
| 21 | 7.27 | 0.10 | 0.89273 | 0.01155 | 12.15 | 1000 | 290.31 | 274.71 | 15 | 0.02 | 0.54300 | 35.06325 | 17.30079 | 0.19986 |
| 22 | 8.01 | 0.10 | 0.89199 | 0.00937 | 12.15 | 1000 | 308.38 | 292.68 | 15 | 0.02 | 0.54300 | 37.63305 | 18.36860 | 0.17207 |
| 23 | 8.82 | 0.10 | 0.89118 | 0.00759 | 12.15 | 1000 | 326.73 | 310.91 | 15 | 0.02 | 0.54300 | 40.30195 | 19.42215 | 0.14740 |
| 24 | 9.73 | 0.10 | 0.89027 | 0.00614 | 12.15 | 1000 | 345.33 | 329.41 | 15 | 0.02 | 0.54300 | 43.10229 | 20.49727 | 0.12590 |
| 25 | 10.75 | 0.10 | 0.88925 | 0.00497 | 12.15 | 1000 | 364.16 | 348.13 | 15 | 0.02 | 0.54300 | 46.03950 | 21.58285 | 0.10717 |
| 26 | 11.89 | 0.10 | 0.88811 | 0.00401 | 12.15 | 1000 | 383.17 | 367.03 | 15 | 0.02 | 0.54300 | 49.12003 | 22.70990 | 0.09104 |
| 27 | 13.17 | 0.10 | 0.88683 | 0.00323 | 12.15 | 1000 | 402.35 | 386.10 | 15 | 0.02 | 0.54300 | 52.36377 | 23.82318 | 0.07700 |
| 28 | 14.57 | 0.10 | 0.88543 | 0.00260 | 12.15 | 1000 | 421.63 | 405.27 | 15 | 0.02 | 0.54300 | 55.74283 | 25.01209 | 0.06507 |
| 29 | 16.07 | 0.10 | 0.88393 | 0.00209 | 12.15 | 1000 | 440.96 | 424.48 | 15 | 0.02 | 0.54300 | 59.23032 | 26.26932 | 0.05492 |
| 30 | 17.71 | 0.10 | 0.88229 | 0.00168 | 12.15 | 1000 | 460.28 | 443.68 | 15 | 0.02 | 0.54300 | 62.86301 | 27.58116 | 0.04625 |
| SUM | | | | | | | | | | | | | | 5.99848 |

TABLE B-5

PRESENT VALUE OF PROFIT PER UNIT - NONPAR WHOLE LIFE

| | |
|---|---|
| x | 35 |
| avgsize(x) | 50.000 |
| i(t) | 0.09 |
| delta(t) | 0.08618 |
| j(t) | 0.12 |

| t | 1000qd(x,t) | qw(x,t) | p(x,t) | B(x,t) | Prem(x,t) | DB(x,t) | V(x,t) | CV(x,t) | exppol(x,t) | expprem(x,t) | expenses(x,t) | polben(x,t) | profit(x,t) | pvprofit(x,t) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 1.00000 | 1.00000 | | | | | | | | | | |
| 1 | 0.63 | 0.20 | 0.79937 | 0.71372 | 12.15 | 1000 | 0.00 | 0.00 | 100 | 1.40 | 19.01000 | 0.65793 | -10.17717 | -7.26368 |
| 2 | 0.76 | 0.15 | 0.84926 | 0.54118 | 12.15 | 1000 | 11.07 | 0.00 | 15 | 0.10 | 1.51500 | 0.79369 | 1.64544 | 0.89048 |
| 3 | 0.99 | 0.10 | 0.89901 | 0.43440 | 12.15 | 1000 | 22.50 | 8.47 | 15 | 0.10 | 1.51500 | 1.88088 | 1.72394 | 0.74888 |
| 4 | 1.14 | 0.10 | 0.89886 | 0.34863 | 12.15 | 1000 | 34.27 | 20.17 | 15 | 0.10 | 1.51500 | 3.20753 | 2.34262 | 0.81670 |
| 5 | 1.28 | 0.10 | 0.89872 | 0.27975 | 12.15 | 1000 | 46.40 | 32.23 | 15 | 0.10 | 1.51500 | 4.55974 | 2.98881 | 0.83612 |
| 6 | 1.40 | 0.10 | 0.89860 | 0.22445 | 12.15 | 1000 | 58.87 | 44.63 | 15 | 0.10 | 1.51500 | 5.92506 | 3.71969 | 0.83488 |
| 7 | 1.58 | 0.10 | 0.89842 | 0.18004 | 12.15 | 1000 | 71.72 | 57.40 | 15 | 0.10 | 1.51500 | 7.39003 | 4.38073 | 0.78872 |
| 8 | 1.78 | 0.10 | 0.89822 | 0.14439 | 12.15 | 1000 | 84.93 | 70.53 | 15 | 0.10 | 1.51500 | 8.91190 | 5.08698 | 0.73452 |
| 9 | 2.01 | 0.10 | 0.89799 | 0.11577 | 12.15 | 1000 | 98.51 | 84.03 | 15 | 0.10 | 1.51500 | 10.50209 | 5.79378 | 0.67075 |
| 10 | 2.24 | 0.10 | 0.89776 | 0.09280 | 12.15 | 1000 | 112.46 | 97.90 | 15 | 0.10 | 1.51500 | 12.12929 | 6.54593 | 0.60745 |
| 11 | 2.53 | 0.10 | 0.89747 | 0.07436 | 12.15 | 1000 | 126.79 | 112.14 | 15 | 0.02 | 0.54300 | 13.85614 | 8.45339 | 0.62860 |
| 12 | 2.80 | 0.10 | 0.89720 | 0.05957 | 12.15 | 1000 | 141.49 | 126.76 | 15 | 0.02 | 0.54300 | 15.60011 | 9.25969 | 0.55158 |
| 13 | 3.13 | 0.10 | 0.89687 | 0.04770 | 12.15 | 1000 | 156.58 | 141.76 | 15 | 0.02 | 0.54300 | 17.44474 | 10.03388 | 0.47862 |
| 14 | 3.52 | 0.10 | 0.89648 | 0.03818 | 12.15 | 1000 | 172.06 | 157.15 | 15 | 0.02 | 0.54300 | 19.39103 | 10.80276 | 0.41246 |
| 15 | 3.94 | 0.10 | 0.89606 | 0.03055 | 12.15 | 1000 | 187.92 | 172.92 | 15 | 0.02 | 0.54300 | 21.40664 | 11.60948 | 0.35463 |
| 16 | 4.45 | 0.10 | 0.89555 | 0.02443 | 12.15 | 1000 | 204.17 | 189.07 | 15 | 0.02 | 0.54300 | 23.55425 | 12.37869 | 0.30235 |
| 17 | 4.92 | 0.10 | 0.89508 | 0.01952 | 12.15 | 1000 | 220.77 | 205.58 | 15 | 0.02 | 0.54300 | 25.69608 | 13.28824 | 0.25939 |
| 18 | 5.44 | 0.10 | 0.89456 | 0.01559 | 12.15 | 1000 | 237.71 | 222.42 | 15 | 0.02 | 0.54300 | 27.92313 | 14.22145 | 0.22173 |
| 19 | 6.00 | 0.10 | 0.89400 | 0.01244 | 12.15 | 1000 | 254.96 | 239.56 | 15 | 0.02 | 0.54300 | 30.22195 | 15.21178 | 0.18931 |
| 20 | 6.61 | 0.10 | 0.89339 | 0.00993 | 12.15 | 1000 | 272.50 | 257.00 | 15 | 0.02 | 0.54300 | 32.60299 | 16.23732 | 0.16119 |
| 21 | 7.27 | 0.10 | 0.89273 | 0.00791 | 12.15 | 1000 | 290.31 | 274.71 | 15 | 0.02 | 0.54300 | 35.06325 | 17.30079 | 0.13689 |
| 22 | 8.01 | 0.10 | 0.89199 | 0.00630 | 12.15 | 1000 | 308.38 | 292.68 | 15 | 0.02 | 0.54300 | 37.63305 | 18.36860 | 0.11575 |
| 23 | 8.82 | 0.10 | 0.89118 | 0.00501 | 12.15 | 1000 | 326.73 | 310.91 | 15 | 0.02 | 0.54300 | 40.30195 | 19.42215 | 0.09739 |
| 24 | 9.73 | 0.10 | 0.89027 | 0.00399 | 12.15 | 1000 | 345.33 | 329.41 | 15 | 0.02 | 0.54300 | 43.10229 | 20.49727 | 0.08170 |
| 25 | 10.75 | 0.10 | 0.88925 | 0.00316 | 12.15 | 1000 | 364.16 | 348.13 | 15 | 0.02 | 0.54300 | 46.03950 | 21.58285 | 0.06830 |
| 26 | 11.89 | 0.10 | 0.88811 | 0.00251 | 12.15 | 1000 | 383.17 | 367.03 | 15 | 0.02 | 0.54300 | 49.12003 | 22.70990 | 0.05699 |
| 27 | 13.17 | 0.10 | 0.88683 | 0.00199 | 12.15 | 1000 | 402.35 | 386.10 | 15 | 0.02 | 0.54300 | 52.36377 | 23.82318 | 0.04734 |
| 28 | 14.57 | 0.10 | 0.88543 | 0.00157 | 12.15 | 1000 | 421.63 | 405.27 | 15 | 0.02 | 0.54300 | 55.74283 | 25.01209 | 0.03929 |
| 29 | 16.07 | 0.10 | 0.88393 | 0.00124 | 12.15 | 1000 | 440.96 | 424.48 | 15 | 0.02 | 0.54300 | 59.23032 | 26.26932 | 0.03257 |
| 30 | 17.71 | 0.10 | 0.88229 | 0.00098 | 12.15 | 1000 | 460.28 | 443.68 | 15 | 0.02 | 0.54300 | 62.86301 | 27.58116 | 0.02694 |
| SUM | | | | | | | | | | | | | | 3.92782 |

TABLE B-6
PRESENT VALUE OF PROFIT PER UNIT - NONPAR WHOLE LIFE

| | |
|---|---|
| x | 35 |
| avgsize(x) | 50.000 |
| i(t) | 0.09 |
| delta(t) | 0.08618 |
| j(t) | 0.15 |

| t | 1000qd(x,t) | qw(x,t) | p(x,t) | D(x,t) | Prem(x,t) | DB(x,t) | V(x,t) | CV(x,t) | exppol(x,t) | expprem(x,t) | expenses(x,t) | polben(x,t) | profit(x,t) | pvprofit(x,t) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 1.00000 | 1.00000 | | | | | | | | | | |
| 1 | 0.63 | 0.20 | 0.79937 | 0.69510 | 12.15 | 1000 | 0.00 | 0.00 | 100 | 1.40 | 19.01000 | 0.65793 | -10.17717 | -7.07420 |
| 2 | 0.76 | 0.15 | 0.84924 | 0.51331 | 12.15 | 1000 | 11.07 | 0.00 | 15 | 0.10 | 1.51500 | 0.79369 | 1.64544 | 0.84463 |
| 3 | 0.99 | 0.10 | 0.89901 | 0.40128 | 12.15 | 1000 | 22.50 | 8.47 | 15 | 0.10 | 1.51500 | 1.88088 | 1.72394 | 0.69179 |
| 4 | 1.14 | 0.10 | 0.89886 | 0.31365 | 12.15 | 1000 | 34.27 | 20.17 | 15 | 0.10 | 1.51500 | 3.20753 | 2.34262 | 0.73476 |
| 5 | 1.28 | 0.10 | 0.89872 | 0.24512 | 12.15 | 1000 | 46.40 | 32.23 | 15 | 0.10 | 1.51500 | 4.55974 | 2.98881 | 0.73260 |
| 6 | 1.40 | 0.10 | 0.89860 | 0.19153 | 12.15 | 1000 | 58.87 | 44.63 | 15 | 0.10 | 1.51500 | 5.92506 | 3.71969 | 0.71243 |
| 7 | 1.58 | 0.10 | 0.89842 | 0.14963 | 12.15 | 1000 | 71.72 | 57.40 | 15 | 0.10 | 1.51500 | 7.39003 | 4.38073 | 0.65549 |
| 8 | 1.78 | 0.10 | 0.89822 | 0.11687 | 12.15 | 1000 | 84.93 | 70.53 | 15 | 0.10 | 1.51500 | 8.91190 | 5.08698 | 0.59452 |
| 9 | 2.01 | 0.10 | 0.89799 | 0.09126 | 12.15 | 1000 | 98.51 | 84.03 | 15 | 0.10 | 1.51500 | 10.50209 | 5.79378 | 0.52874 |
| 10 | 2.24 | 0.10 | 0.89776 | 0.07124 | 12.15 | 1000 | 112.46 | 97.90 | 15 | 0.10 | 1.51500 | 12.12929 | 6.54593 | 0.46635 |
| 11 | 2.53 | 0.10 | 0.89747 | 0.05560 | 12.15 | 1000 | 126.79 | 112.14 | 15 | 0.02 | 0.54300 | 13.85614 | 8.45339 | 0.47000 |
| 12 | 2.80 | 0.10 | 0.89720 | 0.04338 | 12.15 | 1000 | 141.49 | 126.76 | 15 | 0.02 | 0.54300 | 15.60011 | 9.25969 | 0.40165 |
| 13 | 3.13 | 0.10 | 0.89687 | 0.03383 | 12.15 | 1000 | 156.58 | 141.76 | 15 | 0.02 | 0.54300 | 17.44474 | 10.03388 | 0.33943 |
| 14 | 3.52 | 0.10 | 0.89648 | 0.02637 | 12.15 | 1000 | 172.06 | 157.15 | 15 | 0.02 | 0.54300 | 19.39103 | 10.80276 | 0.28488 |
| 15 | 3.94 | 0.10 | 0.89606 | 0.02055 | 12.15 | 1000 | 187.92 | 172.92 | 15 | 0.02 | 0.54300 | 21.40664 | 11.60948 | 0.23855 |
| 16 | 4.45 | 0.10 | 0.89555 | 0.01600 | 12.15 | 1000 | 204.17 | 189.07 | 15 | 0.02 | 0.54300 | 23.55425 | 12.37869 | 0.19808 |
| 17 | 4.92 | 0.10 | 0.89508 | 0.01245 | 12.15 | 1000 | 220.77 | 205.58 | 15 | 0.02 | 0.54300 | 25.69608 | 13.28824 | 0.16550 |
| 18 | 5.44 | 0.10 | 0.89456 | 0.00969 | 12.15 | 1000 | 237.71 | 222.42 | 15 | 0.02 | 0.54300 | 27.92313 | 14.22145 | 0.13778 |
| 19 | 6.00 | 0.10 | 0.89400 | 0.00753 | 12.15 | 1000 | 254.96 | 239.56 | 15 | 0.02 | 0.54300 | 30.22195 | 15.21178 | 0.11457 |
| 20 | 6.61 | 0.10 | 0.89339 | 0.00585 | 12.15 | 1000 | 272.50 | 257.00 | 15 | 0.02 | 0.54300 | 32.60299 | 16.23732 | 0.09500 |
| 21 | 7.27 | 0.10 | 0.89273 | 0.00454 | 12.15 | 1000 | 290.31 | 274.71 | 15 | 0.02 | 0.54300 | 35.06325 | 17.30079 | 0.07858 |
| 22 | 8.01 | 0.10 | 0.89199 | 0.00352 | 12.15 | 1000 | 308.38 | 292.68 | 15 | 0.02 | 0.54300 | 37.63305 | 18.36860 | 0.06471 |
| 23 | 8.82 | 0.10 | 0.89118 | 0.00273 | 12.15 | 1000 | 326.73 | 310.91 | 15 | 0.02 | 0.54300 | 40.30195 | 19.42215 | 0.05302 |
| 24 | 9.73 | 0.10 | 0.89027 | 0.00211 | 12.15 | 1000 | 345.33 | 329.41 | 15 | 0.02 | 0.54300 | 43.10229 | 20.49727 | 0.04332 |
| 25 | 10.75 | 0.10 | 0.88925 | 0.00163 | 12.15 | 1000 | 364.16 | 348.13 | 15 | 0.02 | 0.54300 | 46.03950 | 21.58285 | 0.03527 |
| 26 | 11.89 | 0.10 | 0.88811 | 0.00126 | 12.15 | 1000 | 383.17 | 367.03 | 15 | 0.02 | 0.54300 | 49.12003 | 22.70990 | 0.02866 |
| 27 | 13.17 | 0.10 | 0.88683 | 0.00097 | 12.15 | 1000 | 402.35 | 386.10 | 15 | 0.02 | 0.54300 | 52.36377 | 23.82318 | 0.02319 |
| 28 | 14.57 | 0.10 | 0.88543 | 0.00075 | 12.15 | 1000 | 421.63 | 405.27 | 15 | 0.02 | 0.54300 | 55.74283 | 25.01209 | 0.01874 |
| 29 | 16.07 | 0.10 | 0.88393 | 0.00058 | 12.15 | 1000 | 440.96 | 424.48 | 15 | 0.02 | 0.54300 | 59.23032 | 26.26932 | 0.01513 |
| 30 | 17.71 | 0.10 | 0.88229 | 0.00044 | 12.15 | 1000 | 460.28 | 443.68 | 15 | 0.02 | 0.54300 | 62.86301 | 27.58116 | 0.01219 |
| SUM | | | | | | | | | | | | | | 1.70537 |

# APPENDIX C

## TOTAL VALUE CALCULATION

$$\text{TOTAL VALUE} = \sum_{n=1}^{N} \sum_{c=1}^{C} \text{Vol}(n) \times \text{Mix}(n,c) \times \text{PVPUnit}(c,h) \,/\, (1+h)^{n-1}$$

where:

Vol(n) is the total units to be issued in year n.

Mix(n,c) is the percent of business issued to cell c in year n.

PVPUnit(c,h) is the present value of profit per unit at hurdle rate h for cell c.

h is the hurdle rate.

TABLE C-1

**TOTAL VALUE CALCULATION - PRODUCTION PROJECTION ONE BEGINNING 1/1/91**

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07714 |

| PRODUCTION TOTALS | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
| 1 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 2 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 3 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 4 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 5 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 6 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 7 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 8 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 9 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 10 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |

| TOTAL PRESENT VALUE OF PROFITS AT 10% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $9,180,280 | $547,697 | $9,727,977 | $9,727,977 | $9,727,977 |
| 2 | 9,180,280 | 547,697 | 9,727,977 | 8,843,615 | |
| 3 | 9,180,280 | 547,697 | 9,727,977 | 8,039,650 | 26,611,242 |
| 4 | 9,180,280 | 547,697 | 9,727,977 | 7,308,773 | |
| 5 | 9,180,280 | 547,697 | 9,727,977 | 6,644,339 | 40,564,354 |
| 6 | 9,180,280 | 547,697 | 9,727,977 | 6,040,308 | |
| 7 | 9,180,280 | 547,697 | 9,727,977 | 5,491,189 | |
| 8 | 9,180,280 | 547,697 | 9,727,977 | 4,991,990 | |
| 9 | 9,180,280 | 547,697 | 9,727,977 | 4,538,173 | |
| 10 | 9,180,280 | 547,697 | 9,727,977 | 4,125,612 | 65,751,626 |

| TOTAL PRESENT VALUE OF PROFITS AT 12% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $6,011,271 | $384,981 | $6,396,252 | $6,396,252 | $6,396,252 |
| 2 | 6,011,271 | 384,981 | 6,396,252 | 5,710,939 | |
| 3 | 6,011,271 | 384,981 | 6,396,252 | 5,099,053 | 17,206,243 |
| 4 | 6,011,271 | 384,981 | 6,396,252 | 4,552,726 | |
| 5 | 6,011,271 | 384,981 | 6,396,252 | 4,064,934 | 25,823,902 |
| 6 | 6,011,271 | 384,981 | 6,396,252 | 3,629,405 | |
| 7 | 6,011,271 | 384,981 | 6,396,252 | 3,240,540 | |
| 8 | 6,011,271 | 384,981 | 6,396,252 | 2,893,339 | |
| 9 | 6,011,271 | 384,981 | 6,396,252 | 2,583,339 | |
| 10 | 6,011,271 | 384,981 | 6,396,252 | 2,306,552 | 40,477,078 |

| TOTAL PRESENT VALUE OF PROFITS AT 15% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $2,609,957 | $177,087 | $2,787,043 | $2,787,043 | $2,787,043 |
| 2 | 2,609,957 | 177,087 | 2,787,043 | 2,423,516 | |
| 3 | 2,609,957 | 177,087 | 2,787,043 | 2,107,405 | 7,317,965 |
| 4 | 2,609,957 | 177,087 | 2,787,043 | 1,832,526 | |
| 5 | 2,609,957 | 177,087 | 2,787,043 | 1,593,501 | 10,743,992 |
| 6 | 2,609,957 | 177,087 | 2,787,043 | 1,385,653 | |
| 7 | 2,609,957 | 177,087 | 2,787,043 | 1,204,916 | |
| 8 | 2,609,957 | 177,087 | 2,787,043 | 1,047,753 | |
| 9 | 2,609,957 | 177,087 | 2,787,043 | 911,089 | |
| 10 | 2,609,957 | 177,087 | 2,787,043 | 792,252 | 16,085,655 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.

TABLE C-2

**TOTAL VALUE CALCULATION - PRODUCTION PROJECTION ONE BEGINNING 1/1/91**

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07716 |

PRODUCTION TOTALS

| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
|---|---|---|---|---|---|
| 1 | 3,826,086 | 100% | 0% | 3,826,086 | 0 |
| 2 | 3,826,086 | 100% | 0% | 3,826,086 | 0 |
| 3 | 3,826,086 | 100% | 0% | 3,826,086 | 0 |
| 4 | 3,826,086 | 100% | 0% | 3,826,086 | 0 |
| 5 | 3,826,086 | 100% | 0% | 3,826,086 | 0 |
| 6 | 3,826,086 | 100% | 0% | 3,826,086 | 0 |
| 7 | 3,826,086 | 100% | 0% | 3,826,086 | 0 |
| 8 | 3,826,086 | 100% | 0% | 3,826,086 | 0 |
| 9 | 3,826,086 | 100% | 0% | 3,826,086 | 0 |
| 10 | 3,826,086 | 100% | 0% | 3,826,086 | 0 |

TOTAL PRESENT VALUE OF PROFITS AT 10%

| ISSUE YEAR | AT ISSUE CELL #1 | CELL #2 | TOTAL | AT START OF PROJ. | ACCUMULATED TOTAL |
|---|---|---|---|---|---|
| 1 | $22,950,700 | $0 | $22,950,700 | $22,950,700 | $22,950,700 |
| 2 | 22,950,700 | 0 | 22,950,700 | 20,864,273 | |
| 3 | 22,950,700 | 0 | 22,950,700 | 18,967,521 | 62,782,494 |
| 4 | 22,950,700 | 0 | 22,950,700 | 17,243,201 | |
| 5 | 22,950,700 | 0 | 22,950,700 | 15,675,637 | 95,701,332 |
| 6 | 22,950,700 | 0 | 22,950,700 | 14,250,579 | |
| 7 | 22,950,700 | 0 | 22,950,700 | 12,955,072 | |
| 8 | 22,950,700 | 0 | 22,950,700 | 11,777,338 | |
| 9 | 22,950,700 | 0 | 22,950,700 | 10,706,671 | |
| 10 | 22,950,700 | 0 | 22,950,700 | 9,733,337 | 155,124,330 |

TOTAL PRESENT VALUE OF PROFITS AT 12%

| ISSUE YEAR | AT ISSUE CELL #1 | CELL #2 | TOTAL | AT START OF PROJ. | ACCUMULATED TOTAL |
|---|---|---|---|---|---|
| 1 | $15,028,177 | $0 | $15,028,177 | $15,028,177 | $15,028,177 |
| 2 | 15,028,177 | 0 | 15,028,177 | 13,418,015 | |
| 3 | 15,028,177 | 0 | 15,028,177 | 11,980,371 | 40,426,563 |
| 4 | 15,028,177 | 0 | 15,028,177 | 10,696,760 | |
| 5 | 15,028,177 | 0 | 15,028,177 | 9,550,678 | 60,674,001 |
| 6 | 15,028,177 | 0 | 15,028,177 | 8,527,391 | |
| 7 | 15,028,177 | 0 | 15,028,177 | 7,613,742 | |
| 8 | 15,028,177 | 0 | 15,028,177 | 6,797,984 | |
| 9 | 15,028,177 | 0 | 15,028,177 | 6,069,629 | |
| 10 | 15,028,177 | 0 | 15,028,177 | 5,419,311 | 95,102,059 |

TOTAL PRESENT VALUE OF PROFITS AT 15%

| ISSUE YEAR | AT ISSUE CELL #1 | CELL #2 | TOTAL | AT START OF PROJ. | ACCUMULATED TOTAL |
|---|---|---|---|---|---|
| 1 | $6,524,892 | $0 | $6,524,892 | $6,524,892 | $6,524,892 |
| 2 | 6,524,892 | 0 | 6,524,892 | 5,673,819 | |
| 3 | 6,524,892 | 0 | 6,524,892 | 4,933,756 | 17,132,468 |
| 4 | 6,524,892 | 0 | 6,524,892 | 4,290,223 | |
| 5 | 6,524,892 | 0 | 6,524,892 | 3,730,628 | 25,153,319 |
| 6 | 6,524,892 | 0 | 6,524,892 | 3,244,025 | |
| 7 | 6,524,892 | 0 | 6,524,892 | 2,820,891 | |
| 8 | 6,524,892 | 0 | 6,524,892 | 2,452,949 | |
| 9 | 6,524,892 | 0 | 6,524,892 | 2,132,999 | |
| 10 | 6,524,892 | 0 | 6,524,892 | 1,854,782 | 37,658,963 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.

TABLE C-3

**TOTAL VALUE CALCULATION - PRODUCTION PROJECTION ONE BEGINNING 1/1/91**

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07714 |

| PRODUCTION TOTALS | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
| 1 | 3,826,086 | 0% | 100% | 0 | 3,826,086 |
| 2 | 3,826,086 | 0% | 100% | 0 | 3,826,086 |
| 3 | 3,826,086 | 0% | 100% | 0 | 3,826,086 |
| 4 | 3,826,086 | 0% | 100% | 0 | 3,826,086 |
| 5 | 3,826,086 | 0% | 100% | 0 | 3,826,086 |
| 6 | 3,826,086 | 0% | 100% | 0 | 3,826,086 |
| 7 | 3,826,086 | 0% | 100% | 0 | 3,826,086 |
| 8 | 3,826,086 | 0% | 100% | 0 | 3,826,086 |
| 9 | 3,826,086 | 0% | 100% | 0 | 3,826,086 |
| 10 | 3,826,086 | 0% | 100% | 0 | 3,826,086 |

| TOTAL PRESENT VALUE OF PROFITS AT 10% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $0 | $912,828 | $912,828 | $912,828 | $912,828 |
| 2 | 0 | 912,828 | 912,828 | 829,843 | |
| 3 | 0 | 912,828 | 912,828 | 754,403 | 2,497,074 |
| 4 | 0 | 912,828 | 912,828 | 685,821 | |
| 5 | 0 | 912,828 | 912,828 | 623,474 | 3,806,368 |
| 6 | 0 | 912,828 | 912,828 | 566,794 | |
| 7 | 0 | 912,828 | 912,828 | 515,267 | |
| 8 | 0 | 912,828 | 912,828 | 468,425 | |
| 9 | 0 | 912,828 | 912,828 | 425,841 | |
| 10 | 0 | 912,828 | 912,828 | 387,128 | 6,169,823 |

| TOTAL PRESENT VALUE OF PROFITS AT 12% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $0 | $641,635 | $641,635 | $641,635 | $641,635 |
| 2 | 0 | 641,635 | 641,635 | 572,888 | |
| 3 | 0 | 641,635 | 641,635 | 511,507 | 1,726,030 |
| 4 | 0 | 641,635 | 641,635 | 456,703 | |
| 5 | 0 | 641,635 | 641,635 | 407,770 | 2,590,503 |
| 6 | 0 | 641,635 | 641,635 | 364,081 | |
| 7 | 0 | 641,635 | 641,635 | 325,072 | |
| 8 | 0 | 641,635 | 641,635 | 290,243 | |
| 9 | 0 | 641,635 | 641,635 | 259,145 | |
| 10 | 0 | 641,635 | 641,635 | 231,380 | 4,060,424 |

| TOTAL PRESENT VALUE OF PROFITS AT 15% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $0 | $295,144 | $295,144 | $295,144 | $295,144 |
| 2 | 0 | 295,144 | 295,144 | 256,647 | |
| 3 | 0 | 295,144 | 295,144 | 223,171 | 774,963 |
| 4 | 0 | 295,144 | 295,144 | 194,062 | |
| 5 | 0 | 295,144 | 295,144 | 168,750 | 1,137,775 |
| 6 | 0 | 295,144 | 295,144 | 146,739 | |
| 7 | 0 | 295,144 | 295,144 | 127,599 | |
| 8 | 0 | 295,144 | 295,144 | 110,956 | |
| 9 | 0 | 295,144 | 295,144 | 96,483 | |
| 10 | 0 | 295,144 | 295,144 | 83,898 | 1,703,450 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.

TABLE C-4

**TOTAL VALUE CALCULATION - PRODUCTION PROJECTION TWO BEGINNING 1/1/91**

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07714 |

| PRODUCTION TOTALS | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
| 1 | 3,967,486 | 40% | 60% | 1,586,994 | 2,380,492 |
| 2 | 4,209,394 | 40% | 60% | 1,683,758 | 2,525,636 |
| 3 | 4,340,152 | 40% | 60% | 1,736,061 | 2,604,091 |
| 4 | 4,425,280 | 40% | 60% | 1,770,112 | 2,655,168 |
| 5 | 4,499,536 | 40% | 60% | 1,799,814 | 2,699,722 |
| 6 | 4,565,056 | 40% | 60% | 1,826,022 | 2,739,034 |
| 7 | 4,617,472 | 40% | 60% | 1,846,989 | 2,770,483 |
| 8 | 4,661,152 | 40% | 60% | 1,864,461 | 2,796,691 |
| 9 | 4,700,464 | 40% | 60% | 1,880,186 | 2,820,278 |
| 10 | 4,731,040 | 40% | 60% | 1,892,416 | 2,838,624 |

| TOTAL PRESENT VALUE OF PROFITS AT 10% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $9,519,554 | $567,938 | $10,087,492 | $10,087,492 | $10,087,492 |
| 2 | 10,099,986 | 602,566 | 10,702,553 | 9,729,593 | |
| 3 | 10,413,726 | 621,284 | 11,035,010 | 9,119,843 | 28,936,928 |
| 4 | 10,617,981 | 633,470 | 11,251,451 | 8,453,382 | |
| 5 | 10,796,151 | 644,100 | 11,440,250 | 7,813,845 | 45,204,155 |
| 6 | 10,953,359 | 653,479 | 11,606,837 | 7,206,933 | |
| 7 | 11,079,125 | 660,982 | 11,740,107 | 6,626,984 | |
| 8 | 11,183,931 | 667,235 | 11,851,165 | 6,081,522 | |
| 9 | 11,278,256 | 672,862 | 11,951,118 | 5,575,285 | |
| 10 | 11,351,620 | 677,239 | 12,028,858 | 5,101,410 | 75,796,289 |

| TOTAL PRESENT VALUE OF PROFITS AT 12% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $6,233,428 | $399,208 | $6,632,637 | $6,632,637 | $6,632,637 |
| 2 | 6,613,497 | 423,549 | 7,037,046 | 6,283,077 | |
| 3 | 6,818,934 | 436,706 | 7,255,640 | 5,784,152 | 18,699,866 |
| 4 | 6,952,681 | 445,272 | 7,397,953 | 5,265,717 | |
| 5 | 7,069,347 | 452,743 | 7,522,090 | 4,780,424 | 28,746,007 |
| 6 | 7,172,287 | 459,336 | 7,631,623 | 4,330,388 | |
| 7 | 7,254,640 | 464,610 | 7,719,250 | 3,910,812 | |
| 8 | 7,323,266 | 469,005 | 7,792,272 | 3,524,828 | |
| 9 | 7,385,031 | 472,961 | 7,857,991 | 3,173,711 | |
| 10 | 7,433,069 | 476,037 | 7,909,107 | 2,852,103 | 46,537,849 |

| TOTAL PRESENT VALUE OF PROFITS AT 15% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $2,706,413 | $183,631 | $2,890,044 | $2,890,044 | $2,890,044 |
| 2 | 2,871,430 | 194,828 | 3,066,257 | 2,666,311 | |
| 3 | 2,960,626 | 200,880 | 3,161,506 | 2,390,552 | 7,946,907 |
| 4 | 3,018,696 | 204,820 | 3,223,516 | 2,119,514 | |
| 5 | 3,069,349 | 208,257 | 3,277,606 | 1,873,982 | 11,940,403 |
| 6 | 3,114,044 | 211,289 | 3,325,333 | 1,653,278 | |
| 7 | 3,149,799 | 213,715 | 3,363,514 | 1,454,140 | |
| 8 | 3,179,596 | 215,737 | 3,395,332 | 1,276,431 | |
| 9 | 3,206,412 | 217,556 | 3,423,968 | 1,119,301 | |
| 10 | 3,227,269 | 218,971 | 3,446,241 | 979,637 | 18,423,190 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.

## TABLE C-5

## TOTAL VALUE CALCULATION - PRODUCTION PROJECTION THREE BEGINNING 1/1/91

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07714 |

| PRODUCTION TOTALS | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
| 1 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 2 | 3,874,528 | 40% | 60% | 1,549,811 | 2,324,717 |
| 3 | 3,955,709 | 40% | 60% | 1,582,284 | 2,373,425 |
| 4 | 4,069,722 | 40% | 60% | 1,627,889 | 2,441,833 |
| 5 | 4,210,307 | 40% | 60% | 1,684,123 | 2,526,184 |
| 6 | 4,381,210 | 40% | 60% | 1,752,484 | 2,628,726 |
| 7 | 4,526,226 | 40% | 60% | 1,810,490 | 2,715,736 |
| 8 | 4,655,624 | 40% | 60% | 1,862,250 | 2,793,374 |
| 9 | 4,773,560 | 40% | 60% | 1,909,424 | 2,864,136 |
| 10 | 4,878,392 | 40% | 60% | 1,951,357 | 2,927,035 |

| TOTAL PRESENT VALUE OF PROFITS AT 10% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $9,180,280 | $547,697 | $9,727,977 | $9,727,977 | $9,727,977 |
| 2 | 9,296,511 | 554,631 | 9,851,142 | 8,955,584 | |
| 3 | 9,491,297 | 566,252 | 10,057,548 | 8,312,023 | 26,995,584 |
| 4 | 9,764,858 | 582,573 | 10,347,431 | 7,774,178 | |
| 5 | 10,102,177 | 602,697 | 10,704,874 | 7,311,573 | 42,081,335 |
| 6 | 10,512,240 | 627,161 | 11,139,402 | 6,916,692 | |
| 7 | 10,860,190 | 647,920 | 11,508,111 | 6,496,028 | |
| 8 | 11,170,667 | 666,443 | 11,837,110 | 6,074,309 | |
| 9 | 11,453,642 | 683,326 | 12,136,967 | 5,661,985 | |
| 10 | 11,705,175 | 698,332 | 12,403,507 | 5,260,298 | 72,498,647 |

| TOTAL PRESENT VALUE OF PROFITS AT 12% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $6,011,271 | $384,981 | $6,396,252 | $6,396,252 | $6,396,252 |
| 2 | 6,087,379 | 389,855 | 6,477,234 | 5,783,245 | |
| 3 | 6,214,925 | 398,023 | 6,612,949 | 5,271,802 | 17,451,299 |
| 4 | 6,394,054 | 409,495 | 6,803,550 | 4,842,632 | |
| 5 | 6,614,931 | 423,641 | 7,038,572 | 4,473,140 | 26,767,071 |
| 6 | 6,883,442 | 440,837 | 7,324,279 | 4,155,993 | |
| 7 | 7,111,280 | 455,429 | 7,566,709 | 3,833,530 | |
| 8 | 7,314,581 | 468,449 | 7,783,030 | 3,520,648 | |
| 9 | 7,499,874 | 480,316 | 7,980,189 | 3,223,065 | |
| 10 | 7,664,578 | 490,864 | 8,155,442 | 2,940,934 | 44,441,240 |

| TOTAL PRESENT VALUE OF PROFITS AT 15% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $2,609,957 | $177,087 | $2,787,043 | $2,787,043 | $2,787,043 |
| 2 | 2,643,002 | 179,329 | 2,822,330 | 2,454,200 | |
| 3 | 2,698,379 | 183,086 | 2,881,465 | 2,178,802 | 7,420,045 |
| 4 | 2,776,153 | 188,363 | 2,964,516 | 1,949,217 | |
| 5 | 2,872,052 | 194,870 | 3,066,922 | 1,753,523 | 11,122,785 |
| 6 | 2,988,634 | 202,780 | 3,191,414 | 1,586,697 | |
| 7 | 3,087,556 | 209,492 | 3,297,048 | 1,425,405 | |
| 8 | 3,175,825 | 215,481 | 3,391,306 | 1,274,917 | |
| 9 | 3,256,274 | 220,939 | 3,477,214 | 1,136,707 | |
| 10 | 3,327,785 | 225,791 | 3,553,577 | 1,010,148 | 17,556,660 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.

## TABLE C-6

## TOTAL VALUE CALCULATION - PRODUCTION PROJECTION FOUR BEGINNING 1/1/91

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07716 |

| PRODUCTION TOTALS | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
| 1 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 2 | 3,979,129 | 40% | 60% | 1,591,652 | 2,387,477 |
| 3 | 4,138,295 | 40% | 60% | 1,655,318 | 2,482,977 |
| 4 | 4,303,826 | 40% | 60% | 1,721,530 | 2,582,296 |
| 5 | 4,475,979 | 40% | 60% | 1,790,392 | 2,685,587 |
| 6 | 4,655,019 | 40% | 60% | 1,862,008 | 2,793,011 |
| 7 | 4,841,219 | 40% | 60% | 1,936,488 | 2,904,731 |
| 8 | 5,034,868 | 40% | 60% | 2,013,947 | 3,020,921 |
| 9 | 5,236,263 | 40% | 60% | 2,094,505 | 3,141,758 |
| 10 | 5,445,713 | 40% | 60% | 2,178,285 | 3,267,428 |

| TOTAL PRESENT VALUE OF PROFITS AT 10% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $9,180,280 | $547,697 | $9,727,977 | $9,727,977 | $9,727,977 |
| 2 | 9,547,490 | 569,604 | 10,117,095 | 9,197,359 | |
| 3 | 9,929,392 | 592,389 | 10,521,781 | 8,695,686 | 27,621,022 |
| 4 | 10,326,566 | 616,084 | 10,942,650 | 8,221,375 | |
| 5 | 10,739,628 | 640,727 | 11,380,356 | 7,772,936 | 43,615,333 |
| 6 | 11,169,215 | 666,357 | 11,835,572 | 7,348,959 | |
| 7 | 11,615,982 | 693,011 | 12,308,993 | 6,948,106 | |
| 8 | 12,080,622 | 720,731 | 12,801,353 | 6,569,118 | |
| 9 | 12,563,848 | 749,561 | 13,313,408 | 6,210,803 | |
| 10 | 13,066,400 | 779,543 | 13,845,943 | 5,872,032 | 76,564,350 |

| TOTAL PRESENT VALUE OF PROFITS AT 12% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $6,011,271 | $384,981 | $6,396,252 | $6,396,252 | $6,396,252 |
| 2 | 6,251,721 | 400,380 | 6,652,101 | 5,939,376 | |
| 3 | 6,501,791 | 416,395 | 6,918,186 | 5,515,136 | 17,850,763 |
| 4 | 6,761,862 | 433,051 | 7,194,913 | 5,121,197 | |
| 5 | 7,032,336 | 450,373 | 7,482,709 | 4,755,397 | 27,727,357 |
| 6 | 7,313,631 | 468,388 | 7,782,019 | 4,415,726 | |
| 7 | 7,606,175 | 487,123 | 8,093,298 | 4,100,317 | |
| 8 | 7,910,422 | 506,608 | 8,417,031 | 3,807,437 | |
| 9 | 8,226,839 | 526,873 | 8,753,712 | 3,535,478 | |
| 10 | 8,555,912 | 547,948 | 9,103,860 | 3,282,943 | 46,869,258 |

| TOTAL PRESENT VALUE OF PROFITS AT 15% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $2,609,957 | $177,087 | $2,787,043 | $2,787,043 | $2,787,043 |
| 2 | 2,714,355 | 184,170 | 2,898,525 | 2,520,456 | |
| 3 | 2,822,930 | 191,537 | 3,014,467 | 2,279,370 | 7,586,870 |
| 4 | 2,935,846 | 199,198 | 3,135,045 | 2,061,343 | |
| 5 | 3,053,280 | 207,166 | 3,260,446 | 1,864,171 | 11,512,383 |
| 6 | 3,175,412 | 215,453 | 3,390,865 | 1,685,859 | |
| 7 | 3,302,428 | 224,071 | 3,526,499 | 1,524,603 | |
| 8 | 3,434,525 | 233,034 | 3,667,559 | 1,378,771 | |
| 9 | 3,571,906 | 242,355 | 3,814,262 | 1,246,889 | |
| 10 | 3,714,782 | 252,049 | 3,966,832 | 1,127,621 | 18,476,126 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.

TABLE C-7

**TOTAL VALUE CALCULATION - PRODUCTION PROJECTION FIVE BEGINNING 1/1/91**

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07714 |

| PRODUCTION TOTALS | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
| 1 | 3,967,486 | 40% | 60% | 1,586,994 | 2,380,492 |
| 2 | 4,431,460 | 40% | 60% | 1,772,584 | 2,658,876 |
| 3 | 4,848,838 | 40% | 60% | 1,939,535 | 2,909,303 |
| 4 | 5,286,219 | 40% | 60% | 2,114,488 | 3,171,731 |
| 5 | 5,777,190 | 40% | 60% | 2,310,876 | 3,466,314 |
| 6 | 6,333,740 | 40% | 60% | 2,533,496 | 3,800,244 |
| 7 | 6,882,357 | 40% | 60% | 2,752,943 | 4,129,414 |
| 8 | 7,431,394 | 40% | 60% | 2,972,558 | 4,458,836 |
| 9 | 7,985,700 | 40% | 60% | 3,194,280 | 4,791,420 |
| 10 | 8,541,376 | 40% | 60% | 3,416,550 | 5,124,826 |

| TOTAL PRESENT VALUE OF PROFITS AT 10% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $9,519,554 | $567,938 | $10,087,492 | $10,087,492 | $10,087,492 |
| 2 | 10,632,810 | 634,355 | 11,267,164 | 10,242,877 | |
| 3 | 11,634,263 | 694,101 | 12,328,365 | 10,188,731 | 30,519,100 |
| 4 | 12,683,712 | 756,712 | 13,440,423 | 10,097,989 | |
| 5 | 13,861,743 | 826,993 | 14,688,737 | 10,032,605 | 50,649,693 |
| 6 | 15,197,125 | 906,662 | 16,103,787 | 9,999,185 | |
| 7 | 16,513,472 | 985,196 | 17,498,668 | 9,877,542 | |
| 8 | 17,830,827 | 1,063,789 | 18,894,617 | 9,695,926 | |
| 9 | 19,160,825 | 1,143,137 | 20,303,962 | 9,471,948 | |
| 10 | 20,494,109 | 1,222,681 | 21,716,790 | 9,210,039 | 98,906,333 |

| TOTAL PRESENT VALUE OF PROFITS AT 12% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $6,233,428 | $399,208 | $6,632,637 | $6,632,637 | $6,632,637 |
| 2 | 6,962,391 | 445,894 | 7,408,284 | 6,614,540 | |
| 3 | 7,618,145 | 487,890 | 8,106,035 | 6,462,082 | 19,709,258 |
| 4 | 8,305,327 | 531,899 | 8,837,226 | 6,290,163 | |
| 5 | 9,076,705 | 581,301 | 9,658,006 | 6,137,837 | 32,137,258 |
| 6 | 9,951,116 | 637,301 | 10,588,417 | 6,008,152 | |
| 7 | 10,813,064 | 692,503 | 11,505,567 | 5,829,078 | |
| 8 | 11,675,671 | 747,747 | 12,423,418 | 5,619,723 | |
| 9 | 12,546,557 | 803,521 | 13,350,078 | 5,391,873 | |
| 10 | 13,419,595 | 859,433 | 14,279,028 | 5,149,161 | 60,135,265 |

| TOTAL PRESENT VALUE OF PROFITS AT 15% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $2,706,413 | $183,631 | $2,890,044 | $2,890,044 | $2,890,044 |
| 2 | 3,022,912 | 205,106 | 3,228,017 | 2,806,972 | |
| 3 | 3,307,625 | 224,424 | 3,532,049 | 2,670,736 | 8,367,752 |
| 4 | 3,605,984 | 244,667 | 3,850,651 | 2,531,866 | |
| 5 | 3,940,899 | 267,391 | 4,208,290 | 2,406,104 | 13,305,721 |
| 6 | 4,320,548 | 293,151 | 4,613,699 | 2,293,826 | |
| 7 | 4,694,786 | 318,543 | 5,013,329 | 2,167,401 | |
| 8 | 5,069,311 | 343,955 | 5,413,265 | 2,035,047 | |
| 9 | 5,447,429 | 369,610 | 5,817,039 | 1,901,601 | |
| 10 | 5,826,483 | 395,329 | 6,221,812 | 1,768,627 | 23,472,220 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.

TABLE C-8

**TOTAL VALUE CALCULATION - PRODUCTION PROJECTION ONE BEGINNING 1/1/92**

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07714 |

| PRODUCTION TOTALS | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
| 1 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 2 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 3 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 4 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 5 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 6 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 7 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 8 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 9 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |
| 10 | 3,826,086 | 40% | 60% | 1,530,434 | 2,295,652 |

| TOTAL PRESENT VALUE OF PROFITS AT 10% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $9,180,280 | $547,697 | $9,727,977 | $9,727,977 | $9,727,977 |
| 2 | 9,180,280 | 547,697 | 9,727,977 | 8,843,615 | |
| 3 | 9,180,280 | 547,697 | 9,727,977 | 8,039,650 | 26,611,242 |
| 4 | 9,180,280 | 547,697 | 9,727,977 | 7,308,773 | |
| 5 | 9,180,280 | 547,697 | 9,727,977 | 6,644,339 | 40,564,354 |
| 6 | 9,180,280 | 547,697 | 9,727,977 | 6,040,308 | |
| 7 | 9,180,280 | 547,697 | 9,727,977 | 5,491,189 | |
| 8 | 9,180,280 | 547,697 | 9,727,977 | 4,991,990 | |
| 9 | 9,180,280 | 547,697 | 9,727,977 | 4,538,173 | |
| 10 | 9,180,280 | 547,697 | 9,727,977 | 4,125,612 | 65,751,626 |

| TOTAL PRESENT VALUE OF PROFITS AT 12% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $6,011,271 | $384,981 | $6,396,252 | $6,396,252 | $6,396,252 |
| 2 | 6,011,271 | 384,981 | 6,396,252 | 5,710,939 | |
| 3 | 6,011,271 | 384,981 | 6,396,252 | 5,099,053 | 17,206,243 |
| 4 | 6,011,271 | 384,981 | 6,396,252 | 4,552,726 | |
| 5 | 6,011,271 | 384,981 | 6,396,252 | 4,064,934 | 25,823,902 |
| 6 | 6,011,271 | 384,981 | 6,396,252 | 3,629,405 | |
| 7 | 6,011,271 | 384,981 | 6,396,252 | 3,240,540 | |
| 8 | 6,011,271 | 384,981 | 6,396,252 | 2,893,339 | |
| 9 | 6,011,271 | 384,981 | 6,396,252 | 2,583,339 | |
| 10 | 6,011,271 | 384,981 | 6,396,252 | 2,306,552 | 40,477,078 |

| TOTAL PRESENT VALUE OF PROFITS AT 15% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $2,609,957 | $177,087 | $2,787,043 | $2,787,043 | $2,787,043 |
| 2 | 2,609,957 | 177,087 | 2,787,043 | 2,423,516 | |
| 3 | 2,609,957 | 177,087 | 2,787,043 | 2,107,405 | 7,317,965 |
| 4 | 2,609,957 | 177,087 | 2,787,043 | 1,832,526 | |
| 5 | 2,609,957 | 177,087 | 2,787,043 | 1,593,501 | 10,743,992 |
| 6 | 2,609,957 | 177,087 | 2,787,043 | 1,385,653 | |
| 7 | 2,609,957 | 177,087 | 2,787,043 | 1,204,916 | |
| 8 | 2,609,957 | 177,087 | 2,787,043 | 1,047,753 | |
| 9 | 2,609,957 | 177,087 | 2,787,043 | 911,089 | |
| 10 | 2,609,957 | 177,087 | 2,787,043 | 792,252 | 16,085,655 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.

TABLE C-9

**TOTAL VALUE CALCULATION - PRODUCTION PROJECTION TWO BEGINNING 1/1/92**

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07714 |

| PRODUCTION TOTALS | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
| 1 | 4,209,394 | 40% | 60% | 1,683,758 | 2,525,636 |
| 2 | 4,340,152 | 40% | 60% | 1,736,061 | 2,604,091 |
| 3 | 4,425,280 | 40% | 60% | 1,770,112 | 2,655,168 |
| 4 | 4,499,536 | 40% | 60% | 1,799,814 | 2,699,722 |
| 5 | 4,565,056 | 40% | 60% | 1,826,022 | 2,739,034 |
| 6 | 4,617,472 | 40% | 60% | 1,846,989 | 2,770,483 |
| 7 | 4,661,152 | 40% | 60% | 1,864,461 | 2,796,691 |
| 8 | 4,700,464 | 40% | 60% | 1,880,186 | 2,820,278 |
| 9 | 4,731,040 | 40% | 60% | 1,892,416 | 2,838,624 |
| 10 | 4,757,248 | 40% | 60% | 1,902,899 | 2,854,349 |

| TOTAL PRESENT VALUE OF PROFITS AT 10% | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | AT ISSUE CELL #1 | CELL #2 | TOTAL | AT START OF PROJ. | ACCUMULATED TOTAL |
| 1 | $10,099,986 | $602,566 | $10,702,553 | $10,702,553 | $10,702,553 |
| 2 | 10,413,726 | 621,284 | 11,035,010 | 10,031,827 | |
| 3 | 10,617,981 | 633,470 | 11,251,451 | 9,298,720 | 30,033,100 |
| 4 | 10,796,151 | 644,100 | 11,440,250 | 8,595,229 | |
| 5 | 10,953,359 | 653,479 | 11,606,837 | 7,927,626 | 46,555,956 |
| 6 | 11,079,125 | 660,982 | 11,740,107 | 7,289,683 | |
| 7 | 11,183,931 | 667,235 | 11,851,165 | 6,689,674 | |
| 8 | 11,278,256 | 672,862 | 11,951,118 | 6,132,813 | |
| 9 | 11,351,620 | 677,239 | 12,028,858 | 5,611,551 | |
| 10 | 11,414,503 | 680,991 | 12,095,493 | 5,129,670 | 77,409,347 |

| TOTAL PRESENT VALUE OF PROFITS AT 12% | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | AT ISSUE CELL #1 | CELL #2 | TOTAL | AT START OF PROJ. | ACCUMULATED TOTAL |
| 1 | $6,613,497 | $423,549 | $7,037,046 | $7,037,046 | $7,037,046 |
| 2 | 6,818,934 | 436,706 | 7,255,640 | 6,478,250 | |
| 3 | 6,952,681 | 445,272 | 7,397,953 | 5,897,603 | 19,412,899 |
| 4 | 7,069,347 | 452,743 | 7,522,090 | 5,354,075 | |
| 5 | 7,172,287 | 459,336 | 7,631,623 | 4,850,035 | 29,617,009 |
| 6 | 7,254,640 | 464,610 | 7,719,250 | 4,380,110 | |
| 7 | 7,323,266 | 469,005 | 7,792,272 | 3,947,807 | |
| 8 | 7,385,031 | 472,961 | 7,857,991 | 3,554,556 | |
| 9 | 7,433,069 | 476,037 | 7,909,107 | 3,194,356 | |
| 10 | 7,474,246 | 478,674 | 7,952,920 | 2,867,903 | 47,561,740 |

| TOTAL PRESENT VALUE OF PROFITS AT 15% | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | AT ISSUE CELL #1 | CELL #2 | TOTAL | AT START OF PROJ. | ACCUMULATED TOTAL |
| 1 | $2,871,430 | $194,828 | $3,066,257 | $3,066,257 | $3,066,257 |
| 2 | 2,960,626 | 200,880 | 3,161,506 | 2,749,135 | |
| 3 | 3,018,696 | 204,820 | 3,223,516 | 2,437,441 | 8,252,833 |
| 4 | 3,069,349 | 208,257 | 3,277,606 | 2,155,079 | |
| 5 | 3,114,044 | 211,289 | 3,325,333 | 1,901,270 | 12,309,182 |
| 6 | 3,149,799 | 213,715 | 3,363,514 | 1,672,261 | |
| 7 | 3,179,596 | 215,737 | 3,395,332 | 1,467,896 | |
| 8 | 3,206,412 | 217,556 | 3,423,968 | 1,287,197 | |
| 9 | 3,227,269 | 218,971 | 3,446,241 | 1,126,582 | |
| 10 | 3,245,147 | 220,184 | 3,465,332 | 985,064 | 18,868,182 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.

TABLE C-10

**TOTAL VALUE CALCULATION - PRODUCTION PROJECTION THREE BEGINNING 1/1/92**

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07714 |

| PRODUCTION TOTALS | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
| 1 | 3,874,528 | 40% | 60% | 1,549,811 | 2,324,717 |
| 2 | 3,955,709 | 40% | 60% | 1,582,284 | 2,373,425 |
| 3 | 4,069,722 | 40% | 60% | 1,627,889 | 2,441,833 |
| 4 | 4,210,307 | 40% | 60% | 1,684,123 | 2,526,184 |
| 5 | 4,381,210 | 40% | 60% | 1,752,484 | 2,628,726 |
| 6 | 4,526,226 | 40% | 60% | 1,810,490 | 2,715,736 |
| 7 | 4,655,624 | 40% | 60% | 1,862,250 | 2,793,374 |
| 8 | 4,773,560 | 40% | 60% | 1,909,424 | 2,864,136 |
| 9 | 4,878,392 | 40% | 60% | 1,951,357 | 2,927,035 |
| 10 | 4,974,488 | 40% | 60% | 1,989,795 | 2,984,693 |

| TOTAL PRESENT VALUE OF PROFITS AT 10% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $9,296,511 | $554,631 | $9,851,142 | $9,851,142 | $9,851,142 |
| 2 | 9,491,297 | 566,252 | 10,057,548 | 9,143,226 | |
| 3 | 9,764,858 | 582,573 | 10,347,431 | 8,551,596 | 27,545,964 |
| 4 | 10,102,177 | 602,697 | 10,704,874 | 8,042,730 | |
| 5 | 10,512,240 | 627,161 | 11,139,402 | 7,608,361 | 43,197,056 |
| 6 | 10,860,190 | 647,920 | 11,508,111 | 7,145,631 | |
| 7 | 11,170,667 | 666,443 | 11,837,110 | 6,681,740 | |
| 8 | 11,453,642 | 683,326 | 12,136,967 | 6,228,183 | |
| 9 | 11,705,175 | 698,332 | 12,403,507 | 5,786,327 | |
| 10 | 11,935,747 | 712,088 | 12,647,835 | 5,363,917 | 74,402,854 |

| TOTAL PRESENT VALUE OF PROFITS AT 12% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $6,087,379 | $389,855 | $6,477,234 | $6,477,234 | $6,477,234 |
| 2 | 6,214,925 | 398,023 | 6,612,949 | 5,904,418 | |
| 3 | 6,394,054 | 409,495 | 6,803,550 | 5,423,748 | 17,805,401 |
| 4 | 6,614,931 | 423,641 | 7,038,572 | 5,009,917 | |
| 5 | 6,883,442 | 440,837 | 7,324,279 | 4,654,712 | 27,470,029 |
| 6 | 7,111,280 | 455,429 | 7,566,709 | 4,293,554 | |
| 7 | 7,314,581 | 468,449 | 7,783,030 | 3,943,125 | |
| 8 | 7,499,874 | 480,316 | 7,980,189 | 3,609,832 | |
| 9 | 7,664,578 | 490,864 | 8,155,442 | 3,293,846 | |
| 10 | 7,815,557 | 500,533 | 8,316,090 | 2,998,866 | 45,609,253 |

| TOTAL PRESENT VALUE OF PROFITS AT 15% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $2,643,002 | $179,329 | $2,822,330 | $2,822,330 | $2,822,330 |
| 2 | 2,698,379 | 183,086 | 2,881,465 | 2,505,622 | |
| 3 | 2,776,153 | 188,363 | 2,964,516 | 2,241,600 | 7,569,552 |
| 4 | 2,872,052 | 194,870 | 3,066,922 | 2,016,551 | |
| 5 | 2,988,634 | 202,780 | 3,191,414 | 1,824,701 | 11,410,806 |
| 6 | 3,087,556 | 209,492 | 3,297,048 | 1,639,215 | |
| 7 | 3,175,825 | 215,481 | 3,391,306 | 1,466,155 | |
| 8 | 3,256,274 | 220,939 | 3,477,214 | 1,307,213 | |
| 9 | 3,327,785 | 225,791 | 3,553,577 | 1,161,671 | |
| 10 | 3,393,337 | 230,239 | 3,623,576 | 1,030,047 | 18,015,105 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.

TABLE C-11

**TOTAL VALUE CALCULATION - PRODUCTION PROJECTION FOUR BEGINNING 1/1/92**

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07714 |

| PRODUCTION TOTALS | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
| 1 | 3,979,129 | 40% | 60% | 1,591,652 | 2,387,477 |
| 2 | 4,138,295 | 40% | 60% | 1,655,318 | 2,482,977 |
| 3 | 4,303,826 | 40% | 60% | 1,721,530 | 2,582,296 |
| 4 | 4,475,979 | 40% | 60% | 1,790,392 | 2,685,587 |
| 5 | 4,655,019 | 40% | 60% | 1,862,008 | 2,793,011 |
| 6 | 4,841,219 | 40% | 60% | 1,936,488 | 2,904,731 |
| 7 | 5,034,868 | 40% | 60% | 2,013,947 | 3,020,921 |
| 8 | 5,236,263 | 40% | 60% | 2,094,505 | 3,141,758 |
| 9 | 5,445,713 | 40% | 60% | 2,178,285 | 3,267,428 |
| 10 | 5,663,542 | 40% | 60% | 2,265,417 | 3,398,125 |

| TOTAL PRESENT VALUE OF PROFITS AT 10% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $9,547,490 | $569,604 | $10,117,095 | $10,117,095 | $10,117,095 |
| 2 | 9,929,392 | 592,389 | 10,521,781 | 9,565,255 | |
| 3 | 10,326,566 | 616,084 | 10,942,650 | 9,043,512 | 28,725,862 |
| 4 | 10,739,628 | 640,727 | 11,380,356 | 8,550,230 | |
| 5 | 11,169,215 | 666,357 | 11,835,572 | 8,083,855 | 45,359,966 |
| 6 | 11,615,982 | 693,011 | 12,308,993 | 7,642,916 | |
| 7 | 12,080,622 | 720,731 | 12,801,353 | 7,226,030 | |
| 8 | 12,563,848 | 749,561 | 13,313,408 | 6,831,883 | |
| 9 | 13,066,400 | 779,543 | 13,845,943 | 6,459,235 | |
| 10 | 13,589,057 | 810,725 | 14,399,782 | 6,106,913 | 79,626,924 |

| TOTAL PRESENT VALUE OF PROFITS AT 12% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $6,251,721 | $400,380 | $6,652,101 | $6,652,101 | $6,652,101 |
| 2 | 6,501,791 | 416,395 | 6,918,186 | 6,176,952 | |
| 3 | 6,761,862 | 433,051 | 7,194,913 | 5,735,740 | 18,564,793 |
| 4 | 7,032,336 | 450,373 | 7,482,709 | 5,326,044 | |
| 5 | 7,313,631 | 468,388 | 7,782,019 | 4,945,614 | 28,836,451 |
| 6 | 7,606,175 | 487,123 | 8,093,298 | 4,592,355 | |
| 7 | 7,910,422 | 506,608 | 8,417,031 | 4,264,330 | |
| 8 | 8,226,839 | 526,873 | 8,753,712 | 3,959,735 | |
| 9 | 8,555,912 | 547,948 | 9,103,860 | 3,676,896 | |
| 10 | 8,898,149 | 569,866 | 9,468,015 | 3,414,261 | 48,744,028 |

| TOTAL PRESENT VALUE OF PROFITS AT 15% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $2,714,355 | $184,170 | $2,898,525 | $2,898,525 | $2,898,525 |
| 2 | 2,822,930 | 191,537 | 3,014,467 | 2,621,275 | |
| 3 | 2,935,846 | 199,198 | 3,135,045 | 2,370,544 | 7,890,344 |
| 4 | 3,053,280 | 207,166 | 3,260,446 | 2,143,796 | |
| 5 | 3,175,412 | 215,453 | 3,390,865 | 1,938,738 | 11,972,879 |
| 6 | 3,302,428 | 224,071 | 3,526,499 | 1,753,293 | |
| 7 | 3,434,525 | 233,034 | 3,667,559 | 1,585,587 | |
| 8 | 3,571,906 | 242,355 | 3,814,262 | 1,433,922 | |
| 9 | 3,714,782 | 252,049 | 3,966,832 | 1,296,764 | |
| 10 | 3,863,374 | 262,131 | 4,125,505 | 1,172,726 | 19,215,171 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.

## TABLE C-12

## TOTAL VALUE CALCULATION - PRODUCTION PROJECTION FIVE BEGINNING 1/1/92

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07714 |

| PRODUCTION TOTALS | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
| 1 | 4,431,460 | 40% | 60% | 1,772,584 | 2,658,876 |
| 2 | 4,848,838 | 40% | 60% | 1,939,535 | 2,909,303 |
| 3 | 5,286,219 | 40% | 60% | 2,114,488 | 3,171,731 |
| 4 | 5,777,190 | 40% | 60% | 2,310,876 | 3,466,314 |
| 5 | 6,333,740 | 40% | 60% | 2,533,496 | 3,800,244 |
| 6 | 6,882,357 | 40% | 60% | 2,752,943 | 4,129,414 |
| 7 | 7,431,394 | 40% | 60% | 2,972,558 | 4,458,836 |
| 8 | 7,985,700 | 40% | 60% | 3,194,280 | 4,791,420 |
| 9 | 8,541,376 | 40% | 60% | 3,416,550 | 5,124,826 |
| 10 | 9,102,864 | 40% | 60% | 3,641,146 | 5,461,718 |

| TOTAL PRESENT VALUE OF PROFITS AT 10% | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | AT ISSUE CELL #1 | CELL #2 | TOTAL | AT START OF PROJ. | ACCUMULATED TOTAL |
| 1 | $10,632,810 | $634,355 | $11,267,164 | $11,267,164 | $11,267,164 |
| 2 | 11,634,263 | 694,101 | 12,328,365 | 11,207,604 | |
| 3 | 12,683,712 | 756,712 | 13,440,423 | 11,107,788 | 33,582,556 |
| 4 | 13,861,743 | 826,993 | 14,688,737 | 11,035,865 | |
| 5 | 15,197,125 | 906,662 | 16,103,787 | 10,999,103 | 55,617,525 |
| 6 | 16,513,472 | 985,196 | 17,498,668 | 10,865,296 | |
| 7 | 17,830,827 | 1,063,789 | 18,894,617 | 10,665,518 | |
| 8 | 19,160,825 | 1,143,137 | 20,303,962 | 10,419,143 | |
| 9 | 20,494,109 | 1,222,681 | 21,716,790 | 10,131,063 | |
| 10 | 21,841,339 | 1,303,057 | 23,144,396 | 9,815,483 | 107,514,008 |

| TOTAL PRESENT VALUE OF PROFITS AT 12% | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | AT ISSUE CELL #1 | CELL #2 | TOTAL | AT START OF PROJ. | ACCUMULATED TOTAL |
| 1 | $6,962,391 | $445,894 | $7,408,284 | $7,408,284 | $7,408,284 |
| 2 | 7,618,145 | 487,890 | 8,106,035 | 7,237,531 | |
| 3 | 8,305,327 | 531,899 | 8,837,226 | 7,044,982 | 21,690,798 |
| 4 | 9,076,705 | 581,301 | 9,658,006 | 6,874,378 | |
| 5 | 9,951,116 | 637,301 | 10,588,417 | 6,729,131 | 35,294,307 |
| 6 | 10,813,064 | 692,503 | 11,505,567 | 6,528,567 | |
| 7 | 11,675,671 | 747,747 | 12,423,418 | 6,294,090 | |
| 8 | 12,546,557 | 803,521 | 13,350,078 | 6,038,897 | |
| 9 | 13,419,595 | 859,433 | 14,279,028 | 5,767,060 | |
| 10 | 14,301,765 | 915,930 | 15,217,695 | 5,487,653 | 65,410,575 |

| TOTAL PRESENT VALUE OF PROFITS AT 15% | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | AT ISSUE CELL #1 | CELL #2 | TOTAL | AT START OF PROJ. | ACCUMULATED TOTAL |
| 1 | $3,022,912 | $205,106 | $3,228,017 | $3,228,017 | $3,228,017 |
| 2 | 3,307,625 | 224,424 | 3,532,049 | 3,071,347 | |
| 3 | 3,605,984 | 244,667 | 3,850,651 | 2,911,645 | 9,211,009 |
| 4 | 3,940,899 | 267,391 | 4,208,290 | 2,767,019 | |
| 5 | 4,320,548 | 293,151 | 4,613,699 | 2,637,897 | 14,615,926 |
| 6 | 4,694,786 | 318,543 | 5,013,329 | 2,492,511 | |
| 7 | 5,069,311 | 343,955 | 5,413,265 | 2,340,304 | |
| 8 | 5,447,429 | 369,610 | 5,817,039 | 2,186,841 | |
| 9 | 5,826,483 | 395,329 | 6,221,812 | 2,033,921 | |
| 10 | 6,209,500 | 421,317 | 6,630,817 | 1,884,892 | 25,556,394 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.

TABLE C-13

**TOTAL VALUE CALCULATION - PRODUCTION PROJECTION SIX BEGINNING 1/1/92**

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07714 |

| PRODUCTION TOTALS | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
| 1 | 4,371,895 | 40% | 60% | 1,748,758 | 2,623,137 |
| 2 | 4,817,691 | 40% | 60% | 1,927,076 | 2,890,615 |
| 3 | 5,265,973 | 40% | 60% | 2,106,389 | 3,159,584 |
| 4 | 5,756,750 | 40% | 60% | 2,302,700 | 3,454,050 |
| 5 | 6,312,483 | 40% | 60% | 2,524,993 | 3,787,490 |
| 6 | 6,865,777 | 40% | 60% | 2,746,311 | 4,119,466 |
| 7 | 7,419,898 | 40% | 60% | 2,967,959 | 4,451,939 |
| 8 | 7,973,744 | 40% | 60% | 3,189,498 | 4,784,246 |
| 9 | 8,535,158 | 40% | 60% | 3,414,063 | 5,121,095 |
| 10 | 9,102,864 | 40% | 60% | 3,641,146 | 5,461,718 |

| TOTAL PRESENT VALUE OF PROFITS AT 10% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $10,489,890 | $625,828 | $11,115,718 | $11,115,718 | $11,115,718 |
| 2 | 11,559,529 | 689,643 | 12,249,172 | 11,135,611 | |
| 3 | 12,635,133 | 753,814 | 13,388,947 | 11,065,245 | 33,316,574 |
| 4 | 13,812,700 | 824,067 | 14,636,767 | 10,996,820 | |
| 5 | 15,146,121 | 903,619 | 16,049,741 | 10,962,189 | 55,275,583 |
| 6 | 16,473,690 | 982,822 | 17,456,513 | 10,839,121 | |
| 7 | 17,803,244 | 1,062,144 | 18,865,387 | 10,649,019 | |
| 8 | 19,132,138 | 1,141,426 | 20,273,563 | 10,403,543 | |
| 9 | 20,479,190 | 1,221,791 | 21,700,981 | 10,123,668 | |
| 10 | 21,841,339 | 1,303,057 | 23,144,396 | 9,815,483 | 107,106,417 |

| TOTAL PRESENT VALUE OF PROFITS AT 12% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $6,868,807 | $439,900 | $7,308,707 | $7,308,707 | $7,308,707 |
| 2 | 7,569,209 | 484,756 | 8,053,965 | 7,191,040 | |
| 3 | 8,273,518 | 529,862 | 8,803,380 | 7,018,001 | 21,517,748 |
| 4 | 9,044,591 | 579,244 | 9,623,835 | 6,850,056 | |
| 5 | 9,917,719 | 635,162 | 10,552,881 | 6,706,547 | 35,074,350 |
| 6 | 10,787,014 | 690,834 | 11,477,849 | 6,512,840 | |
| 7 | 11,657,610 | 746,590 | 12,404,200 | 6,284,354 | |
| 8 | 12,527,772 | 802,318 | 13,330,091 | 6,029,856 | |
| 9 | 13,409,826 | 858,808 | 14,268,633 | 5,762,862 | |
| 10 | 14,301,765 | 915,930 | 15,217,695 | 5,487,653 | 65,151,914 |

| TOTAL PRESENT VALUE OF PROFITS AT 15% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $2,982,279 | $202,349 | $3,184,628 | $3,184,628 | $3,184,628 |
| 2 | 3,286,378 | 222,982 | 3,509,360 | 3,051,618 | |
| 3 | 3,592,173 | 243,730 | 3,835,903 | 2,900,494 | 9,136,740 |
| 4 | 3,926,955 | 266,445 | 4,193,401 | 2,757,229 | |
| 5 | 4,306,048 | 292,167 | 4,598,215 | 2,629,044 | 14,523,013 |
| 6 | 4,683,476 | 317,776 | 5,001,252 | 2,486,506 | |
| 7 | 5,061,469 | 343,423 | 5,404,891 | 2,336,684 | |
| 8 | 5,439,276 | 369,057 | 5,808,330 | 2,183,566 | |
| 9 | 5,822,241 | 395,041 | 6,217,282 | 2,032,441 | |
| 10 | 6,209,500 | 421,317 | 6,630,817 | 1,884,892 | 25,447,102 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.

TABLE C-14

**TOTAL VALUE CALCULATION - PRODUCTION PROJECTION SEVEN BEGINNING 1/1/92**

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07714 |

| PRODUCTION TOTALS | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
| 1 | 4,530,377 | 40% | 60% | 1,812,151 | 2,718,226 |
| 2 | 5,008,982 | 40% | 60% | 2,003,593 | 3,005,389 |
| 3 | 5,502,070 | 40% | 60% | 2,200,828 | 3,301,242 |
| 4 | 6,048,559 | 40% | 60% | 2,419,424 | 3,629,135 |
| 5 | 6,671,350 | 40% | 60% | 2,668,540 | 4,002,810 |
| 6 | 7,299,629 | 40% | 60% | 2,919,852 | 4,379,777 |
| 7 | 7,935,449 | 40% | 60% | 3,174,180 | 4,761,269 |
| 8 | 8,576,894 | 40% | 60% | 3,430,758 | 5,146,136 |
| 9 | 9,232,357 | 40% | 60% | 3,692,943 | 5,539,414 |
| 10 | 9,900,559 | 40% | 60% | 3,960,224 | 5,940,335 |

| TOTAL PRESENT VALUE OF PROFITS AT 10% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $10,870,150 | $648,514 | $11,518,665 | $11,518,665 | $11,518,665 |
| 2 | 12,018,511 | 717,026 | 12,735,537 | 11,577,761 | |
| 3 | 13,201,623 | 787,610 | 13,989,233 | 11,561,350 | 34,657,775 |
| 4 | 14,512,864 | 865,839 | 15,378,703 | 11,554,247 | |
| 5 | 16,007,184 | 954,990 | 16,962,174 | 11,585,393 | 57,797,416 |
| 6 | 17,514,671 | 1,044,927 | 18,559,599 | 11,526,051 | |
| 7 | 19,040,253 | 1,135,944 | 20,176,197 | 11,388,937 | |
| 8 | 20,579,331 | 1,227,765 | 21,807,096 | 11,190,488 | |
| 9 | 22,152,044 | 1,321,593 | 23,473,637 | 10,950,625 | |
| 10 | 23,755,322 | 1,417,245 | 25,172,567 | 10,675,626 | 113,527,143 |

| TOTAL PRESENT VALUE OF PROFITS AT 12% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $7,117,802 | $455,847 | $7,573,649 | $7,573,649 | $7,573,649 |
| 2 | 7,869,752 | 504,004 | 8,373,756 | 7,476,568 | |
| 3 | 8,644,456 | 553,618 | 9,198,075 | 7,332,649 | 22,382,865 |
| 4 | 9,503,060 | 608,606 | 10,111,666 | 7,197,284 | |
| 5 | 10,481,545 | 671,271 | 11,152,816 | 7,087,816 | 36,667,966 |
| 6 | 11,468,652 | 734,489 | 12,203,140 | 6,924,389 | |
| 7 | 12,467,606 | 798,465 | 13,266,071 | 6,721,004 | |
| 8 | 13,475,398 | 863,007 | 14,338,405 | 6,485,966 | |
| 9 | 14,505,215 | 928,960 | 15,434,174 | 6,233,604 | |
| 10 | 15,555,045 | 996,194 | 16,551,240 | 5,968,543 | 69,001,473 |

| TOTAL PRESENT VALUE OF PROFITS AT 15% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $3,090,388 | $209,684 | $3,300,072 | $3,300,072 | $3,300,072 |
| 2 | 3,416,867 | 231,836 | 3,648,703 | 3,172,785 | |
| 3 | 3,753,226 | 254,658 | 4,007,884 | 3,030,536 | 9,503,393 |
| 4 | 4,126,012 | 279,952 | 4,405,964 | 2,896,993 | |
| 5 | 4,550,848 | 308,777 | 4,859,625 | 2,778,506 | 15,178,892 |
| 6 | 4,979,427 | 337,856 | 5,317,283 | 2,643,630 | |
| 7 | 5,413,151 | 367,284 | 5,780,435 | 2,499,062 | |
| 8 | 5,850,711 | 396,973 | 6,247,684 | 2,348,736 | |
| 9 | 6,297,834 | 427,310 | 6,725,144 | 2,198,462 | |
| 10 | 6,753,647 | 458,237 | 7,211,884 | 2,050,068 | 26,918,828 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.

## TABLE C-15

## TOTAL VALUE CALCULATION - PRODUCTION PROJECTION SEVEN BEGINNING 1/1/92

| MODEL CELL | PRESENT VALUE OF PROFIT PER UNIT @ 10% | @ 12% | @ 15% |
|---|---|---|---|
| CELL #1 | $5.99848 | $3.92782 | $1.70537 |
| CELL #2 | 0.23858 | 0.16770 | 0.07714 |

| PRODUCTION TOTALS | | | | | |
|---|---|---|---|---|---|
| ISSUE YEAR | TOTAL UNITS | CELL #1 PCT. | CELL #2 PCT. | CELL #1 UNITS | CELL #2 UNITS |
| 1 | 4,530,377 | 30% | 70% | 1,359,113 | 3,171,264 |
| 2 | 5,008,982 | 30% | 70% | 1,502,695 | 3,506,287 |
| 3 | 5,502,070 | 30% | 70% | 1,650,621 | 3,851,449 |
| 4 | 6,048,559 | 30% | 70% | 1,814,568 | 4,233,991 |
| 5 | 6,671,350 | 30% | 70% | 2,001,405 | 4,669,945 |
| 6 | 7,299,629 | 30% | 70% | 2,189,889 | 5,109,740 |
| 7 | 7,935,449 | 30% | 70% | 2,380,635 | 5,554,814 |
| 8 | 8,576,894 | 30% | 70% | 2,573,068 | 6,003,826 |
| .9 | 9,232,357 | 30% | 70% | 2,769,707 | 6,462,650 |
| 10 | 9,900,559 | 30% | 70% | 2,970,168 | 6,930,391 |

| TOTAL PRESENT VALUE OF PROFITS AT 10% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $8,152,613 | $756,600 | $8,909,213 | $8,909,213 | $8,909,213 |
| 2 | 9,013,884 | 836,530 | 9,850,414 | 8,954,921 | |
| 3 | 9,901,217 | 918,879 | 10,820,096 | 8,942,228 | 26,806,362 |
| 4 | 10,884,648 | 1,010,146 | 11,894,794 | 8,936,735 | |
| 5 | 12,005,388 | 1,114,155 | 13,119,543 | 8,960,825 | 44,703,921 |
| 6 | 13,136,004 | 1,219,082 | 14,355,085 | 8,913,379 | |
| 7 | 14,280,190 | 1,325,268 | 15,605,457 | 8,808,874 | |
| 8 | 15,434,498 | 1,432,393 | 16,866,891 | 8,655,382 | |
| 9 | 16,614,033 | 1,541,859 | 18,155,892 | 8,469,857 | |
| 10 | 17,816,492 | 1,653,453 | 19,469,944 | 8,257,157 | 87,808,570 |

| TOTAL PRESENT VALUE OF PROFITS AT 12% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $5,338,352 | $531,821 | $5,870,173 | $5,870,173 | $5,870,173 |
| 2 | 5,902,314 | 588,004 | 6,490,318 | 5,794,927 | |
| 3 | 6,483,342 | 645,888 | 7,129,230 | 5,683,379 | 17,348,478 |
| 4 | 7,127,295 | 710,040 | 7,837,336 | 5,578,461 | |
| 5 | 7,861,159 | 783,150 | 8,644,308 | 5,493,614 | 28,420,553 |
| 6 | 8,601,489 | 856,903 | 9,458,392 | 5,366,946 | |
| 7 | 9,350,705 | 931,542 | 10,282,247 | 5,209,306 | |
| 8 | 10,106,549 | 1,006,842 | 11,113,390 | 5,027,133 | |
| 9 | 10,878,911 | 1,083,786 | 11,962,697 | 4,831,533 | |
| 10 | 11,666,284 | 1,162,227 | 12,828,511 | 4,626,090 | 53,481,561 |

| TOTAL PRESENT VALUE OF PROFITS AT 15% | | | | | |
|---|---|---|---|---|---|
| ISSUE | AT ISSUE | | | AT START | ACCUMULATED |
| YEAR | CELL #1 | CELL #2 | TOTAL | OF PROJ. | TOTAL |
| 1 | $2,317,791 | $244,631 | $2,562,422 | $2,562,422 | $2,562,422 |
| 2 | 2,562,650 | 270,475 | 2,833,125 | 2,463,587 | |
| 3 | 2,814,920 | 297,101 | 3,112,020 | 2,353,134 | 7,379,144 |
| 4 | 3,094,509 | 326,610 | 3,421,119 | 2,249,442 | |
| 5 | 3,413,136 | 360,240 | 3,773,376 | 2,157,440 | 11,786,025 |
| 6 | 3,734,570 | 394,165 | 4,128,736 | 2,052,711 | |
| 7 | 4,059,863 | 428,498 | 4,488,361 | 1,940,442 | |
| 8 | 4,388,033 | 463,135 | 4,851,168 | 1,823,734 | |
| 9 | 4,723,375 | 498,529 | 5,221,904 | 1,707,050 | |
| 10 | 5,065,235 | 534,610 | 5,599,845 | 1,591,826 | 20,901,788 |

NOTE: Cell #1 is a $50,000 nonparticipating whole life policy issued to a 35 year old male nonsmoker.
Cell #2 is a $150,000 ten-year annually renewable term policy issued to a 35 year old male nonsmoker.