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Incorporating Historical Investment Performance in Projecting Life Insurance Cash Values

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The projection of current investment experience in life insurance sales illustrations during the historically high interest rate environment of the 1980s in the U. S. has led to consumer dissatisfaction and lawsuits against life insurers and agents. As interest rates fell after 1985, insurers were unable to credit returns near the maximums illustrated earlier. New regulations still allow projections at essentially the latest current investment returns, along with showing guaranteed and intermediate values. The question raised in this article is: Can history help the financial planner determine a range of credible investment return assumptions for projecting cash values? Conclusions are based on the results of basing projections on historical investment experience.

I. INTRODUCTION

In recent years, U.S. life insurers have used sales illustrations to emphasize growth in cash values and death benefits. Rapid growth was fueled in the 1980s primarily by the compounding of relatively high current investment returns (i.e., essentially what an insurer was earning on a certain portfolio at the time of the sale.) Current experience continues to be extrapolated over the potential life of policies, often up to the insured's age 100. The tremendous effect of compound interest at relatively high rates over extensive periods is well known in financial sectors but may not be appreciated by non-financially-sophisticated consumers. In the context of cash value projections, insufficient attention has been given by actuaries, agents, and insurer management to what history has to say about the volatility of market returns and the resulting likelihood of high current returns being maintained throughout the potential life of policies. Consequently, financial planners must be prepared to give objective advice on sales illustrations when they include unrealistic projections for their clients. In other instances, the planner may be the person presenting the original projection, for example, on a no-load life insurance product. (While mortality, expenses, and lapse rates also affect projections, this article is limited to the influence of investment returns alone.)

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The National Association of Insurance Commissioners (NAIC) recently promulgated a model life insurance sales illustration bill that, in the states where enacted into law, can be expected to make illustrations more sustainable (i.e., "self-supporting" in the language of the model) and understandable. Yet, essentially the latest current investment returns, including those developed through the investment generation method, can still be illustrated. The concern of this author is that in periods of relatively high investment returns current returns will be above even reasonably optimistic projections of long-run performance.

Between the end of War II and 1985 when non-equity investment returns followed an upwardly sloping trend, insurer performance exceeded consumer expectations created during typical sales interviews. In the post-1985 environment of lower returns on bonds, mortgages and other non-equity investments, it has become important to seek new ways to set client expectations that will result in long-run consumer satisfaction rather than the dissatisfaction being expressed in the 1990s. The illustration of returns consistent with historical experience deserves consideration.

The question raised in this article is: Is it feasible for a financial planner to use history in determining a range of credible investment return assumptions for life insurance sales illustrations? The scope of the article is limited to fixed-dollar products such as traditional participating whole life insurance and interest-sensitive policies with non-guaranteed elements.

After providing more background, a method of incorporating historical investment returns into the projection of a range of future returns is described. The remainder of the article presents the results of using historical returns to project ranges of future rates of return over 50 years. The article ends with conclusions.

II. BACKGROUND

Around 1980, life insurers were illustrating long-term universal life performance with investment assumptions as high as 14 percent, the current crediting rate for the insurers involved. The only other illustrated values, in some illustrations, were the much lower guarantees. Also, it was not uncommon to illustrate relatively low level premiums that required the continuation of double digit investment returns to keep the contract in force to age 100. The ex-post result has been contracts that, with 1990s performance, will terminate before the insured reaches age 70 or so unless substantial additional premiums are paid.

The author contends that the problem is caused primarily by two industry practices. The major problem is the use of short-term assumptions (i.e., "current investment returns") in long-term projections. The "investment generation method" further exaggerates the overstatements that can result from current investment assumptions. The second problem is the "black box" technique of marketing participating cash-value life insurance. The consumer is presented an illustration without any disclosure of underlying assumptions. Thus, assumptions that are unreasonable for the long run are not easily detectable even by financially sophisticated consumers. At least, universal life reveals gross investment returns. Of course, gross returns differ substantially from net returns (Pritchett, 1998).

A current investment return can be defined generally as the annual rate of investment return being realized currently by an insurer. Insurers have flexibility in determining the rate of return in several important ways. For example, the base of the ratio varies among insurers (e.g., interest-bearing liabilities plus surplus versus total admitted assets); performance of the entire general account portfolio is utilized by some compared to performance of a segregated portion of the portfolio being used by others; investment expenses are allocated differently; realized capital gains and losses are added to investment income by some each year while others use various smoothing techniques; forecasted trends in investment performance, if acknowledged at all, are recognized with different degrees of optimism or pessimism; and what competitors are paying is matched to different degrees (Miller, 1996).

The traditional approach in determining policyowner dividends for participating business is to determine the current net rate of return for the entire general account. A general account being an undivided investment account that supports an insurer's guaranteed, fixed-dollar products such as ordinary life insurance, universal life insurance, and fixed-dollar annuities. Then, this "average portfolio rate" is used, along with other actuarial factors, to calculate the current dividend scale. The current dividend scale is used to determine the maximum values shown in sales illustrations. Insurers usually use their best judgement in setting a dividend scale that can remain unchanged for several years. The length of time over which the average reflects historical returns is influenced by asset maturities, portfolio turnover, policy lapse rates, growth in sales and reserves, and other factors. For a typical insurer the average is likely to be weighted by returns on relatively recently purchased assets. Yet, several years of history are recognized.

Thirty seven percent of life insurers responding to a recent survey reported using the investment generation method (also called the "investment year" and "new money" methods), or some modification thereof, in determining dividend or other crediting rates for at least some plans. The predominant use is with universal and other interest-sensitive contracts. The method segregates policies into different cells (i.e., generations) associated with assets purchased during specific years (i.e., generations). A different rate of return is credited on funds associated with each year assets are generated by a policy. Portfolio turnover and new purchases cause a policy's return associated with a particular year to change over time. The major problem is that new contracts may be accompanied by sales illustrations where the maximum values reflect investment returns for new investments alone. Historical returns, for anything more than a few months or a year, may have been ignored in the past. Essentially peak returns were compounded over the entire potential life of a policy. New regulation and guidelines requiring consideration of approximately two years of experience represent little change.

Relative to the portfolio method, the investment generation method allows higher illustrated returns when returns are following an upward trend. Likewise, the portfolio method tends to be favored when rates trend downward. With both the portfolio and investment generation methods in the 1980s, agents of some insurers were allowed to adjust assumptions, sometimes illustrating returns greater than current insurer experience (Miller, 1996).

The Life Insurance Illustrations Model Regulation passed by the NAIC in December 1995 changes, but only modestly in the author's opinion, the way in which current investment returns are used in illustrations. For example, the "currently payable scale" is defined as "...a scale of non-guaranteed elements in effect for a policy form as of the preparation date of the illustration or declared to become effective within the next ninety-five (95) days." Further, the:

> Disciplined current scale means a scale of non-guaranteed elements constituting a limit on illustrations currently being illustrated by an insurer that is reasonably based on actual **recent historical experience**, as certified annually by an illustration actuary designated by the insurer. Further guidance in determining the disciplined current scale as contained in standards established by the Actuarial Standards Board may be relied upon if the standards: (1) Are consistent with all provisions of this regulation; (2) Limit a disciplined current scale to reflect only actions that have already been taken or events that have already occurred; (3) Do not permit a disciplined current scale to include any projected trends of improvements in experience or any assumed improvements in experience beyond the illustration date...(emphasis added) (NAIC, 1996, p. 582-2).

Also, an

> Illustrated scale means a scale of non-guaranteed elements currently being illustrated that is not more favorable to the policy owner than the lesser of: (1) the disciplined current scale or (2) the currently payable scale (NAIC, 1996, p. 582-2).

Any interest rate shown "shall not be greater than the earned interest rate underlying the disciplined current scale" (NAIC, 1996, p. 582-2). A statement similar to the following is placed in a narrative summary:

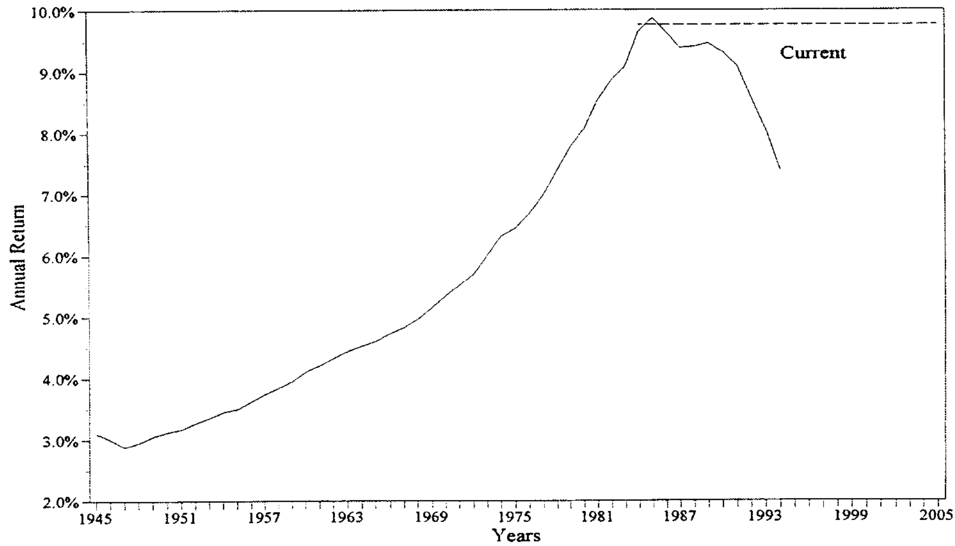
> This illustration assumes that the currently illustrated nonguaranteed elements will continue unchanged for all years shown. This is not likely to occur, and actual results may be more or less favorable than those shown (NAIC, 1996, p. 582-7).

The policyowner also signs a statement regarding the non-guaranteed nature of certain elements. Values are illustrated using (1) the insurer's illustrated scale, (2) guarantees, and (3) at 50 percent of illustrated dividends or the average of guaranteed and illustrated rates.

The guidelines developed by the Actuarial Standards Board essentially repeat the definitions quoted above and add the following one:

> Recent Historical Experience: Mortality, persistency, interest, and expense experience on an experience factor class that is current, determinable, and credible (Actuarial Standards Board, 1995, p. 2).

Further standards regarding investment returns specify that recent historical experience refers to rates being determined "on an entirely retrospective basis considering only assets to be supporting the block" (Actuarial Standards Board, 1995, p. 7). When an insurer has inadequate experience, it can use appropriate experience and trends from other similar classes of its business, experience of another company, or experience from other sources, preferably in that order. (The Securities and Exchange Commission recently started allowing mutual funds to show historical performance that pre-dates their formation as mutual funds. Funds are being allowed to publish the records of older "substantially similar" investment mechanisms (e.g., a separate account) that convert into mutual funds (McGough, 1997). Improving trends in returns cannot be projected to continue improving, however, significantly deteriorating trends or expected deteriorating trends, "...between the date of the historical experience and the effective date of the scale underlying the illustration...," should be recognized (Actuarial Standards Board, 1995, p. 101). The assumed investment rate is to be fixed for all illustrated durations. Either the portfolio average approach or the investment generation approach is acceptable. The recognition of realized and unrealized capital gains are not



Source: Various issues of the *Life Insurance Fact Book.*

Figure 1. Before-Tax Rate of Investment Income for U.S. Life Insurers: 1945-1994

constrained other than by needing to be consistent with the practice of each insurer (Actuarial Standards Board, 1995, pp. 7–10).

While the model illustration bill and accompanying actuarial standards vastly improve overall illustration practices, the author is of the opinion that regulations still allow placing too much emphasis on the extrapolation of current investment performance as produced by recent trends, whether up, down, or level. Allegedly, the recent experience requirement may only result in looking at approximately two years of past experience. If this materializes, insurer practice will continue to be in sharp contrast to practices in the U.S. securities industry that relies primarily on the disclosure of historical performance over various periods of time. Any prospective illustrations of securities use the same investment assumptions for competing instruments.

The absurdity of creating a current investment assumption by only looking back approximately two years when returns seem high, and then projecting this assumption into the future for all illustrated durations is illustrated in Figure 1. The rates of return plotted there use aggregates for the universe of U.S. life insurer general accounts as reported by the American Council of Life Insurance (ACLI). Had the figure gone back farther in time, the return for 1930 would have been 5.05 percent with a decreasing trend between than and the low of 2.88 percent shown for 1947 (ACLI, 1994, p. 74). In the figure, rates of 9.65 percent and 9.87 percent for 1984 and 1985, respectively, form the basis of a "current" hypothetical early 1986 projection (i.e., based on portfolio average rates for the industry.) The dashed line representing current returns is obviously well above subsequent industry performance to date. The use of investment generation rates for 1984 and 1985 would have produced projections that were even more inconsistent with long-run historical experience.

III. RESEARCH METHODS

Returns are forecasted for a hypothetical general account that uses an average portfolio rate of total returns for dividend allocations and other crediting (e.g., for a universal life contract) in projections. The simulation employs current market data in addition to historical performance for specific asset classes. Total returns include all capital gains and losses, and, therefore, increase the variability associated with the hypothetical general account forecast, relative to the net income returns used in practice by most insurers. (A group of U.S. life insurers is experimenting with total returns as the prime measure of investment performance for general accounts, viewing this as a potentially better measure of economic performance than the current net income approach (Burgess, et. al., 1994).

The simulations apply the arithmetic mean and standard deviation of the annual data to project expected compound annual returns over a 50-year time horizon (i.e., an assumed insurance policy holding period), using a lognormal distribution. The lognormal distribution has a random variable whose logarithm is normally distributed. Its use is consistent with the positive distribution of historical market returns for most assets and the inability of an insurer to lose more than its investment (i.e., returns cannot fall below negative 100 percent). Because the distribution is specified by the historical mean and standard deviation the necessary parameters are practically available. The theoretical distribution is positively skewed, and skewness increases as variance increases (For further discussion of the lognormal distribution see Aitchison & Brown, 1957, and Shimizu, 1988).

By separating inputs into a historical risk premium and a current risk-free rate, projected future risk/return relationships reflect what the market itself is currently forecasting. (Current market conditions are recognized through the current risk free rate that may differ substantially from the historical risk-free rate for an asset class (Lucas, 1995). The result is emphasis on current returns as a starting point in the projection of future mean returns. In addition to using the mean and standard deviation as inputs, a forecast for a portfolio requires estimation of the correlation of each asset in the portfolio with every other.

The first step in using the lognormal mode is calculation of the expected value (m) and standard deviation (s) of the natural logarithm (ln) of the portfolio's return relative. The arithmetic mean return (μ) and standard deviation (σ) of the portfolio are used as follows (Using Historical Data..., 1995):

$$m = \ln(1 + \mu) - \left(\frac{S^2}{S}\right)$$

and

$$s = \sqrt{\ln\left(1 + \left(\frac{\sigma}{1 + \mu}\right)^2\right)}$$

Ranges of simulated rates of return and the statistical confidence in the ranges are calculated by using z-scores to specify percentiles in the forecast. Thus, a 68 percent confidence level deviates one standard deviation on each side of the mean return. Likewise, the 5^{th} and 95^{th} percentiles would be the lower and upper bounds providing a 90 percent confidence level for future returns. The positive skewness of the lognormal distribution results in the mean (or expected value) being greater than the median. Further, one standard deviation on each side of the mean will differ from exactly 34 percent because the probabilities depend on the parameters of the distribution (Using Historical Data..., 1995).

The projections in this study were calculated by the **Portfolio Strategist** program developed and distributed by Ibbotson Associates Inc., Chicago, Illinois. The program produces efficient portfolios using the Markowitz technique. It also projects ranges of future returns. Only the projection part of the program is used in this study. The projections can be either for optimal or non-optimal portfolios. The forecasts in this article are for non-optimal portfolios specified by the author.

The hypothetical general account portfolio is constructed for this study by weighting certain assets classes (e.g., Lehman Brothers Corporate Bond Index and the Standard & Poor's 500 Average) as reflected in Ibbotson's Optimizer Inputs and using them as proxies for segments of an insurer's general account. Industry averages as of the end of 1993 are used to determine portfolio weights for the hypothetical general account. This is done by building the hypothetical portfolio from series of long-term government bonds, long-term corporate bonds, treasury bills, and so forth.

When an entire history (such as that for large company common stocks beginning in 1926) is relevant to projecting future returns, statistical parameters are based on the entire available history of returns. Other asset classes use shorter histories of monthly returns in the calculation of annualized expected values and standard deviations. For example bond and other fixed income markets experienced a structural change in the 1970s due to the U.S. Federal Reserve System trying to manage the money supply. Consequently, data for shorter historical periods are used for these portions of a portfolio.

An implicit assumption of the methodology is that future investment results can be forecasted by historical performance. The movement of financial markets is influenced by many factors, including economics, inflation, monetary and fiscal policy, politics, and global factors. The future will not be exactly like the past and the difference may not be foreseeable. Consequently, a mathematical model cannot forecast, for example, future structural changes in financial markets. John Maynard Keynes expressed this by saying that human behavior is not "homogeneous through time." Yet the past is probably the best guide we have to the future, especially in projecting the range of returns over the long run.

IV. RESULTS

At the end of 1993, general accounts for the universe of U.S. life insurers consisted of the following major asset classes and weights: (1) corporate bonds, 41.74 percent; (2) government securities, 25.17 percent; (3) mortgages, 14.76 percent; (4) policy loans, 5.09 percent; (5) corporate stocks, 5.07 percent; (6) real estate, 2.85 percent; and (7) miscellaneous assets, 5.32 percent. An approximation of the history for this "1993 industry portfolio" was created with total market returns for the proxies shown in Table 1. (The Ibbotson Associates Portfolio Strategist software allows the specifications of one-, five-, or 20-year holding periods for investments. In the absence of alternatives between five and 20 years, a 20-year period was specified for the simulations in the current study. The holding period influences the riskless rate that is used in separating the total return for a class of assets into riskless and risk premia components. The current yield for a zero coupon bond with a maturity matching the chosen holding period becomes the riskless rate.)

TABLE 1.
Proxies for Asset Segments Held by U.S. Life Insurers at the end of 1993

Portfolio Segment (s)	*Proxy*	*Weight %*
Corporate Bonds	Lehman Brothers Corporate Bonds	41.7
Government Securities	Lehman Brothers Government Bonds	25.2
Mortgages & Real Estate	Ibbotson Assoc. Business Real Estate	17.6
Corporate Stocks	Standard & Poor's 500	5.1
Policy Loans	90-day Treasury Bills	5.1
Miscellaneous Assets	30-day Treasury Bills	5.3

Note: For each proxy the measure of performance is total annual returns. Historical holding periods for the proxies are: Lehman Brothers Corporate and Government Bonds, 1973–1994; Business Real Estate, 1978–1994; S & P 500, 1926–1994; 90-day Treasury Bills, 1978–1994; and 30-day Treasury Bills, 1969–1994

Statistics for U.S. life insurers at the end of 1993 show that less than one percent of corporate securities (bonds and stocks) were invested in corporations of foreign countries. Private placements accounted for 23.1 percent of corporate bond holdings. All but 2.6 percent of the corporate bond holdings were classified as high or medium grade—NAIC classes 1, 2, and 3. Average distributions by maturity have been shortening in recent years with only 34.4 percent of corporate bonds held at the end of 1993 maturing in over 10 years (17.2 percent in more than 20 years). Government securities are of longer average maturity with 53.5 percent maturing in over ten years and 32 percent maturing in over 20 years. Foreign government and international agency securities accounted for 9.5 percent, and state and local issues made up 3.8 percent of all government securities. The remainder were U.S. federal agency and treasury issues.

Mortgages were distributed as follows: 91.7 percent commercial, 4.1 percent one-to-four family homes, and 4.1 percent farm mortgages. Properties located in the U.S. accounted for 98 percent of all mortgages. In the absence of a proxy for mortgages, they were combined with directly-owned real estate. The small portion of directly-owned real estate consists primarily of large apartment complexes, shopping centers, multi-purpose office buildings, and home and regional offices.

Common stocks accounted for 95.8 percent of all life insurer stock investments. This statistic applies to common stocks for general and separate accounts combined. Only 17.8

TABLE 2.
Distributions of Projected Compound Annual Returns Based on
Proxies of Asset Classes Held in General Accounts of U.S. Life Insurers at the end of 1993

	Period of In-Force Status						
Return Percentiles	*1 Year*	*5 Years*	*10 Years*	*20 Years*	*30 Years*	*40 Years*	*50 Years*
95th Per	18.84	12.13	10.60	9.53	9.06	8.78	8.59
75th Per	11.70	9.07	8.45	8.02	7.83	7.72	7.64
65th Per	9.65	8.17	7.82	7.58	7.47	7.40	7.36
50th Per	7.20	7.03	7.01	7.00	6.99	6.99	6.99
35th Per	4.38	5.81	6.15	6.40	6.50	6.57	6.61
25th Per	2.47	4.94	5.54	5.96	6.15	6.26	6.33
5th Per	−3.69	2.07	3.49	4.50	4.95	5.22	5.41

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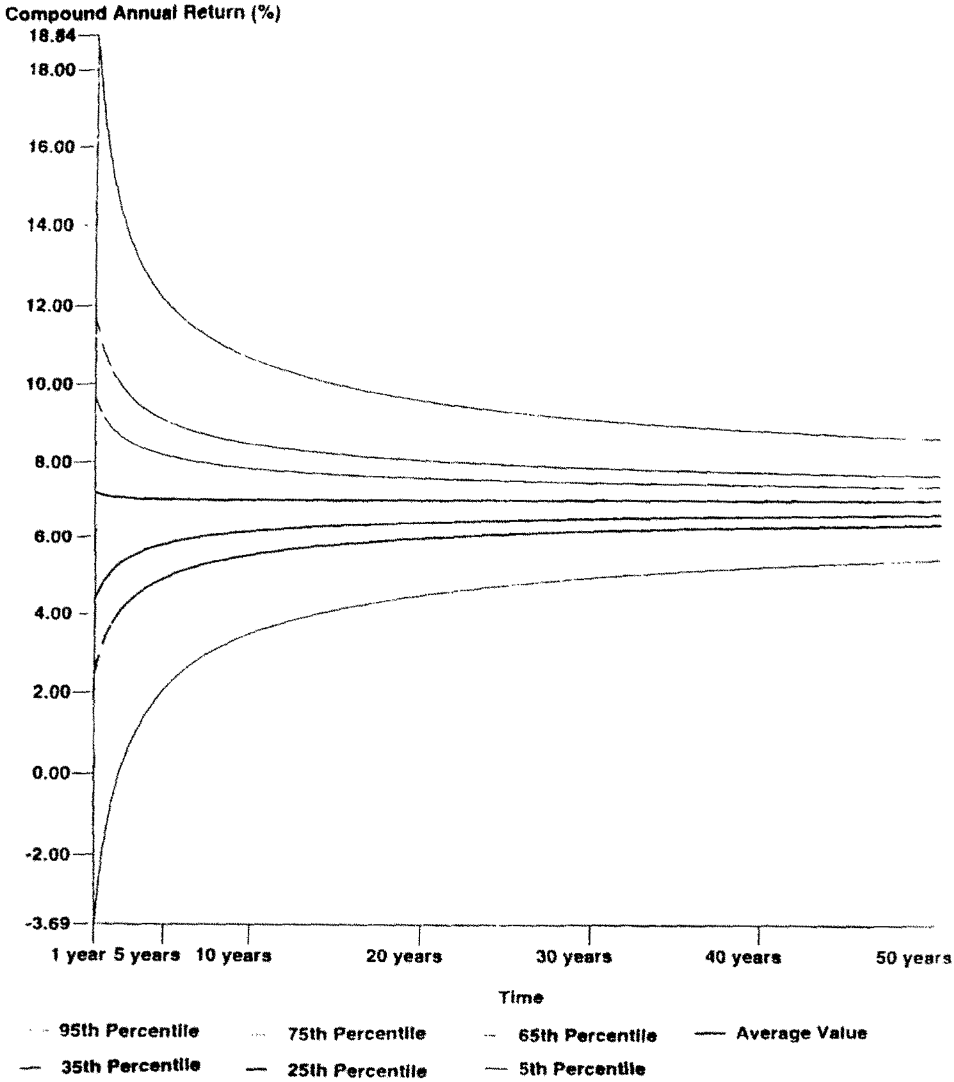

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Figure 2. Distribution of Projected Compound Annual Returns Based on Proxies of Asset Classes Held in the General Accounts of U.S. Life Insurers at the End of 1993

percent of total common stock holdings were held in the general accounts of concern in this study.

Because outstanding policy loans reduce cash values and death benefits, they are highly secure. Miscellaneous assets consist primarily of due and deferred premiums (14.8 percent of this asset class), investment income due and accrued (20.5 percent), cash (0.5 percent), and real estate joint ventures (ACLI, 1994). The use of treasury bills as proxies for the latter two categories is further justified by the fact that 2.5 percent of securities in the "government bond" category were short-term treasury and short-term federal agency issues being held for liquidity.

The proxies do not perfectly represent the universe of general account investments or even those of a specific insurer: actual maturities and grades of bonds differ somewhat from those reflected in the Lehman Brothers indexes; the typical universal life insurer may hold shorter average maturities than the universe of insurers represented in ACLI data; net returns on policy loans may exceed those on 90-day treasury bills now that some policy loan rates are tied to an index of seasoned corporate bonds and some others are set at 8 percent; a small percentage of mortgage investments is not business related; the portion of mortgages without participation provisions may be more similar to bonds than to the commercial real estate proxy; and so forth. The purpose in this study is to demonstrate a technique for projecting returns rather than perfectly reproducing the history of actual industry holdings. Thus, some weakness in the proxies is of little concern. The preferred data inputs for a particular insurer using the technique would come from its own portfolio.

Projections for the hypothetical general account have a 50th percentile (median) current return of 7.20 percent and a standard deviation of 6.85. By the fifth year the median value decreases to 7.03 percent and levels off at 6.99 percent sometime between years 20 and 30 as current returns (1994 in this simulation) have less influence on projected rates over time. At the 90 percent confidence level, possible first-year returns range between −3.69 percent and 18.84 percent, while fifth year returns range between 2.07 percent and 12.13 percent. The fifth percentile returns of −3.69 and 2.07 percent should be of concern to insurers, however, consumers would be protected from actual performance below contractual guaranteed minimum returns (e.g., 4.5 percent). For a 50-year policy holding period and a 90 percent confidence level, the median of 6.99 percent is bordered by 5.41 and 8.59 percent. These results are shown in Table 2 and Figure 2.

The "trumpet graph" (see Figure 2) illustrates the rather rapid convergence of the percentile projections towards the median return over time. At any selected confidence level, the relationship between the maximum long-run return and the median return declines over time. Contrarily, the relationship between the lower value and the median is positive over time.

VI. DISCUSSION AND CONCLUSIONS

The U.S. life insurance industry has for many years provided sales illustrations to prospective buyers that project maximum cash values using current experience with respect to investment returns. The majority of insurers use an average portfolio rate of return as a crediting rate (minus a spread for profit) or in dividend scale determinations. Consequently, for insurers with a relatively long average maturity for securities, the current return may reasonably represent historical experience except in periods of extreme abnormal returns. In times, such as the 1980s, with several years of historically high investment returns, however, even the average portfolio rate can substantially exceed those returns that are likely to be attainable in the long run. The environment for this situation is enhanced by strong sales producing large amounts of reserves for relatively new contracts, lapse rates reducing the importance of older reserves, and turnover of existing investments. The possibility of current returns being out of synchronization with achievable long-run returns is greatly heightened by the use of the investment generation method of crediting interest rates. Yet new model legislation and actuarial standards fail to effectively solve this problem of potential misrepresentation. Thus, financial planners will continue to be challenged to bring reason to sales illustrations.

A question of concern relevant to a projection like that presented above and its possible use in projecting cash values is: What would be the proper time period to identify the and range mid-point? One approach is for the planner to ask the client how long he or she expects to hold the policy being considered, ignoring the possibility of premature death. A conservative approach would specify the difference between an advanced age such as the client's life expectancy or age 100 and the client's age at the time of illustration (e.g., age 80 minus illustration age 30 equals a 50-year projection). Given the projection in this study, the issue becomes academic for periods beyond 20 years or so because over 90 percent of the reduction in maximum values occurs by the 20th year. One could argue that the problems in making forecasts of investment returns are such that projected values at some distant point (i.e., beyond 20 years) lack sufficient validity. Further, most cash value policies mature through surrender or death long before life expectancy for the typical consumer. Recent Life Insurance Marketing Research Association data show that the expected life of a whole life policy in the U.S. varies between eight and one-half years when issued at age 25 and 12.9 years for age 55 issues (Potasky et al., 1992).

Another issue surrounding any practical use of projections based on the methodology employed here concerns the proper statistical confidence level at which to identify the range of investment rates of return to use in illustrating cash values. In this article the primary discussion has been about the median long-run return and 90 percent confidence level rates. On the one hand, one can argue that there is only a 10 percent probability that long-run rates of return will be at either the maximum or minimum levels of the 90 percent confidence level. Thus, these rates are "highly unlikely" based on history. On the other hand, such extremes are possible and might be of interest to risk-taking and risk-averse clients. A conservative advisor, however, might want to select a lower confidence level, believing that the recognition of extreme levels of variation goes beyond what is proper.

A conservative approach is to argue that projections based on compound returns greater than the average return during a past period believed to reasonably represent the future is not credible. The problem with this approach is its reliance on only one moment of the distribution of historical returns. The method used in this study improves on the historical average approach by also recognizing the standard deviation of historical returns and confidence levels around the mean. To the extent the theoretical distributions employed in the current study of investment projections fit reality, they demonstrate that long-run returns converge over time to a relatively narrow range around the projected median return. Current returns during periods of historically high returns are likely to be well beyond what seem achievable in the long run. Thus, serious concern exists about the ethics and credibility of industry practices. The ethical financial planner will want to provide a perspective for evaluation of the guaranteed, current, and intermediate projections found in the typical current sales illustration.

Possible future cash values are related to risk. The consumer is better informed if measures of risk, as well as expected returns, are communicated in any financial transaction. A major value of the method illustrated in this study is the ability to present levels of pessimistic and optimistic returns around the median in a risk context. For example, the likelihood of the long-run cash value reaching the level illustrated at the maximum value for the 90 percent confidence level is an optimistic 10 percent, given a two-tailed test. The consumer who is a risk taker could dream about this high level of return, hopefully, still being fully informed that any return in this vicinity is unlikely to occur. With current life insurer marketing practices, the typical prospective client is given little information about the likelihood of illustrated returns, even when they have virtually no likelihood of materializing in the long run. Current returns are described simply as not likely to occur and actual results may be more or less favorable than those shown. The illustration of perhaps the guaranteed return, the projected median return for a portfolio like that backing the product, a pessimistic projection between the guaranteed and median rates, and one or two optimistic projections above the median, with accompanying confidence levels would provide helpful information to consumers. In any effort to improve communications, it is important to avoid overloading the consumer with information.

While no scientific methodology can exactly pinpoint future performance because of unknown future factors, perhaps it is reasonable to hypothesize that long-run returns will be similar to the distribution of past returns for selected periods of history. Any acceptance of this hypothesis, assuming normal or lognormal distributions, will result in a broad range of future short-run returns. However, the range of possible returns fitting a given level of statistical confidence will narrow as the investment horizon increases. It is projected rates of return for the long run that should be used as compound rates of return in projections of life insurance cash values.

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