SURPLUS - CONCEPTS, MEASURES OF RETURN, AND IT'S DETERMINATION

Author: Russ Bingham

Mr. Bingham is Assistant Director of Corporate Research in ITT-Hartford's Actuarial Research department. His twenty years of insurance experience encompasses planning, financial analysis, and administration of underwriting support services. He presented ITT-Hartford's approach to measuring total return at the California Proposition 103 hearings.

He received his M.S. in mathematics from Rensselaer Polytechnic Institute and a MBA from Western New England College, and is an adjunct faculty member at the University of Hartford teaching business statistics.

He previously published "Discounted Return - Measuring Profit and Setting Targets" in the Casualty Actuarial Society's Annual 1990 Proceedings and "California Proposition 103 Hearing Testimony" in the Spring 1990 Forum of the Casualty Actuarial Society. He has spoken at several seminars on issues related to total return.

Abstract

Insurance is perhaps the industry most intensely scrutinized from a financial perspective, with an abundance of financial data prepared to satisfy the many and varied regulatory requirements imposed upon it. Yet this financial reporting produces some of the most controversial and contradictory financial conclusions depending upon the methodologies employed and the data used.

A good part of the difficulty is created by the nature of the insurance product itself, which requires payment by many for a product or service for which few benefit, and further for which the cost will not be known for some time in the future. It is this multi-year dimension which makes it most difficult to properly match revenue and expense, the first step in measuring profit, and which further makes it difficult to identify the amount of surplus needed to support the business being written. Both profit and surplus together are needed to measure the total rate of return.

This paper discusses the limitations of present calendar period oriented financial reporting, and introduces the concept of a calendar period balance sheet viewed as the sum of underlying accident period balance sheets. The multi-year dimension to surplus and its linkage to liabilities over time is demonstrated.

Measures of rates of return on surplus inherent in Internal Rate of Return and Net Present Value discounted cash flow models are discussed and the conditions under which the returns are equivalent are demonstrated. The importance of the balance sheet perspective, usually overlooked by cash flow models, is emphasized.

A methodology is presented which provides a means of determining a benchmark surplus requirement needed to control the probability of insolvency that can result from underwriting and investment volatility.

SURPLUS - CONCEPTS, MEASURES OF RETURN, AND ITS DETERMINATION

This paper discusses several conceptual and financial aspects pertaining to surplus. It is intended to provide both a fundamental understanding of the role of surplus in an insurance company and measurements of rate of return on surplus (Part I) as well as provide a methodology for the establishment of the proper amount of surplus (Part II). An overview summary of key observations and findings is provided at the beginning, in order to assist the reader in assimilating the material in the paper.

Part I of the paper discusses the purpose of surplus, followed by the introduction of the concept of a calendar period balance sheet viewed as the sum of underlying accident period balance sheets. This discussion demonstrates the multi-year dimension to surplus and its linkage to liabilities (primarily loss reserves) over time and exposes the meaninglessness of premium to surplus relationships.

Part I also discusses measures of rates of return on surplus inherent in Internal Rate of Return (IRR) and Net Present Value (NPV) discounted cash flow models and demonstrates the conditions under which the returns are equivalent by utilizing the liability-to-surplus relationship. This section of the paper also introduces the concepts of steady state and present-valued

income statements, cash flow statements, and balance sheets. The effects of business growth and the commitment of surplus based on premium are demonstrated.

Finally, in Part II, the annualized present-valued balance sheet is used as a basis for the volatility-adjusted funding approach to determine benchmark surplus requirements. Part II presents a methodology which determines the benchmark surplus requirement needed to control the probability of insolvency that can result from underwriting and investment volatility. This methodology is primarily based on a consideration of both the magnitude and variability in underwriting, underwriting cash flows, and interest rates. Leverage ratios are shown over an assumed range of these values.

Several pages of numerical exhibits are presented in the Appendix for the reader interested in working through examples in detail. These are not required reading for this article as key figures are repeated in the text when necessary.

Summary Overview

The following are key observations and findings which are presented and discussed in this paper:

1) Calendar period accounting does not provide sufficient information to measure the true profitability of a given underwriting period.
2) An accident year development of income statements, cash flow statements, and balance sheets, much like a traditional loss triangle, is required to truly measure profitability.
3) Surplus is committed to support the writings of a given accident year and must run-off over a period of future years as policyholder liabilities run-off.
4) Premium to surplus ratio is a convenient, but mostly irrelevant measure of leverage. A ratio of policyholder liabilities to surplus, (or, more simply, a ratio of reserves to surplus) is the appropriate measure of leverage.
5) Internal Rate of Return (IRR) and Net Present Value (NPV) cash flow models produce the identical measurements of return on surplus as long as the same rules are followed for the initial contribution and subsequent withdrawal of surplus.

6) Single period financial statements (income, cash flow, balance sheet) can be created which are representative of the multi-year flows of an accident year, and provide a transition to a simplified measurement of return. These are equivalent to financial statements that would exist under steady state business conditions.

7) Increasing rates of business growth will cause calendar returns on surplus to be increasingly lower than the true accident year rates of return when business is written at an underwriting loss.

8) Use of premium (via premium to surplus ratios) as a basis for controlling the flow of surplus for an accident year will, by itself, cause calendar rates of return to differ from the true rate of return.

9) It is possible to determine the amount of benchmark surplus necessary to provide a financial buffer for a line of business which satisfies a specified probability level of insolvency.

10) The amount of benchmark surplus needed for a line of business must recognize both the amount of financial exposure, which results from all cash flows, as well as the volatility which is expected in this financial exposure.

11) Benchmark surplus is neither SAP nor GAAP equity.

PART I - FUNDAMENTALS OF SURPLUS, CASH FLOW, AND RATE OF RETURN

Purpose of Surplus

Surplus exists in insurance for the same purpose as in other businesses: it serves as a financial buffer to guard against adverse business conditions during which operating losses occur. Surplus provides a cushion, at least temporarily, to cover losses and to permit business to continue to operate normally.

Insurance, however, is unique in that the major portion of its business costs (i.e. claim payments) are not known at the time the product is priced and sold. In fact these costs may not be known for several years. Complicating the uncertainty, many factors, such as social inflation and changing tort law, limit the ability to forecast these costs with a high degree of certainty. As a result, it is difficult to determine the proper level of surplus that is required to support insurance writings.

Benchmark Surplus

Benchmark surplus is that level of surplus that will provide the proper financial buffer for a line of business or business segment. The magnitude of the benchmark surplus for a line of business must be based on a consideration of the factors unique

to that line which introduce uncertainty (or volatility) in expected future results. It should also reflect the probable likelihood of the occurrence of those adverse conditions which would cause a drain on surplus.

The greater the amount of surplus, the less likely that the occurrence of adverse conditions will deplete the entire amount of a company's surplus. The concept of probability of occurrence of adverse conditions is integral to the establishment of a benchmark surplus. An amount of benchmark surplus is viewed hand-in-hand with a specified probability of insolvency.

Benchmark surplus is neither statutory surplus nor GAAP equity. Rather it is simply the amount of assets which should be available to financially support the operations of a line of business in order to control solvency and risk. Benchmark surplus is but a measure of a necessary financial cushion and it may or may not match a particular company's reported surplus. It does, however, reflect the realities that should be considered by a company in it's operating practices.

Calendar Year Reported Surplus as the Sum of Accident Period Surplus

Policyholder Surplus, as reported on insurance company balance sheets, is often misunderstood and misused. This results from a lack of understanding as to the composition of this calendar period item, which results from underlying current and previous accident year development activity. To understand this problem, which is somewhat unique to insurance, it helps to draw a parallel with manufacturing.

In manufacturing, a product or project is often evaluated as a unique entity with the product's revenues and expenses monitored throughout its life cycle. Management can thus make a final determination of the likely profit associated with this product. In this evaluation, capital investment in plant and equipment is linked to the product and management can easily estimate a return on this investment.

The insurance entity equivalent to the product is an exposure year (or accident year) book of business. An insurance company prices policies based on an estimate of all costs, both present and future, which relate to the period for which the policy applies. Unfortunately, companies generally monitor only the cost of claim payments (i.e. losses) by accident year (and occasionally policy year).

It is important to recognize that the usual calendar period accounting does not maintain adequate detail to properly value accident year profitability. Revenues subsequent to the accident year, primarily investment income, and subsequent costs other than claims, are not monitored for each originating accident period.

An ideal scenario would involve the complete segmentation of accounting records for each accident year: that is to say, income, cash flow, and balance sheet statements for each year. Under this segmentation of the accounting structure, surplus would be maintained for each accident year and it would run-off along with liabilities for that year. Under this structure the calculation of each accident year's return on investment would then be relatively simple.

Since most companies do not maintain this level of detail, we can only view a combined calendar balance sheet and recognize that it represents the sum of contributions from all current and previous accident years. Thus when one looks at a company's surplus, one must realize that it is in fact a composite of surplus amounts which are "dedicated" to these same current and previous accident years. Since surplus in most lines of business is multi-year dimensioned, to view it as a single number associated with a calendar year is incorrect. The familiar premium to surplus ratio has no basis in theory, although it has come to provide a convenient reference point. Certainly surplus is not established from calendar premium to surplus relationships.

Cash Flow Models

In order to understand the time dimension of surplus, it is helpful to review the so-called discounted cash flow models. As discussed later, it is possible to develop a present-value based balance sheet which provides a transition from the cash flows of multiple accident years to a calendar steady-state balance sheet. First, however, a very brief review of discounted cash flow models is in order.

In "Multi-Period Discounted Cash Flow Ratemaking Models in Property-Liability Insurance," [March, 1990 Journal of Risk and Insurance,] J. David Cummins provided a very good overview of the discounted cash flow models used in insurance ratemaking. Of importance to the discussion here, he contrasted the Internal Rate of Return model (IRR) as used by the National Council on Compensation Insurance with the Myers-Cohn Net Present Value (NPV) model used in Massachusetts.

While there are differences in the two approaches as applied, both involve recognition of insurance cash flows and surplus over time. One of the most significant attributes of both models is that surplus is a function of policyholder funds, with its release governed by reductions in policyholder liabilities over time. (Policyholder funds represent the net liabilities of the company which have not been settled at any point in time. These are predominantly loss reserves, and some cash flow models form a

linkage between loss reserves and surplus as a simplifying assumption.)

The paper notes a difference between the models: the National Council's IRR model assumes that surplus additions are required to cover an initial underwriting loss, whereas the NPV model does not require this. This difference, however, has to do only with the beginning surplus requirement, and not its subsequent release. These constraints governing the initial surplus in either of the models are unique to these two applications. They are not part of Internal Rate of Return and Net Present Value models generally. In fact, either model could operate under the opposite constraint. Given consistent determination of this initial surplus, measured rates of return become equivalent as discussed later.

Some financial proponents of IRR are not averse to defining arbitrary surplus withdrawal schedules whose sole apparent purpose is to maximize (or minimize) the IRR. This arbitrary withdrawal is improper since, by ignoring the linkage of surplus release to policyholder funds, it thereby ignores the fundamental purpose of insurance (policyholder) surplus: to act as a financial buffer against the adverse development of liabilities.

As described in this author's "Discounted Return - Measuring Profitability and Setting Targets," [November, 1990 Casualty Actuarial Society Annual Proceedings,] the Hartford uses a NPV approach structured to provide a calculation of total return. As

part of this approach, "annualized" balance sheets are developed on both a nominal and a discounted basis, which include surplus. It is the development of the balance sheet, from the cash flows, which provides the means for measuring returns. This aspect is too often overlooked in cash flow models. This will be explained in the next section followed by a demonstration of the equivalency of IRR and this NPV measurement of return.

Controlling the Flow of Surplus

It is useful to begin by introducing an example which will be used to demonstrate the concepts to be discussed. The Appendix presents an example involving a single accident year (which can be viewed as a single policy written on the first of the year) with a premium of $10,000, expense of $3,000, and ultimate loss of $8,000. The premium is received and the expenses are paid without delay, whereas claims are paid in 25% increments at the end of each of the current and three following years.

In addition, the example assumes the yield rate on investments to be 8%, before-tax, and the tax rate on underwriting and investment income to be 34%. For simplicity, the rate used for loss discounting under the 1986 Tax Reform Act is also 8%. The example assumes one half of premium to be unearned at the end of the first year for purposes of the premium offset provision of the tax law. In this example all cash flows are discounted to the beginning of each respective year. Traditional accounting

rules are followed to construct income statements and balance sheets. The schedule of exhibits in the Appendix relating to this example are as follows:

Page 1 - basic assumptions and calculations of reserves and payments.

Page 2 - nominal and discounted income statements and balance sheets for the single accident year over its four years of activity.

Page 3 - Page 2 accumulated across successive accident years, reaching steady state after four years.

Page 4 - relationship of policyholder and shareholder funds.

Page 5 - shareholder flows, nominal and discounted steady state income with IRR and NPV, and respective rates of return.

Page 6 - accident year contribution to calendar year income and return on surplus (ROS).

Page 7 - accident year contribution to calendar year shareholder flows and IRR.

Page 8 - annualized nominal and discounted balance sheet and income statement summary.

Underwriting and investment are assumed to remain constant over time. With no growth in the level of business, it takes four years to reach a steady state condition, after which all items remain the same as shown on Page 3.

In the example, the writing of the policy required an initial capital contribution by the shareholder. Subsequently the

shareholder receives payments (i.e. return of capital) consisting of three components: 1) the return of invested capital, 2) the investment income on the invested capital while held by the company, and 3) the insurance operating earnings, which is the sum of the underwriting income and the investment income on the policyholder funds.

The release of funds to the shareholder is governed by maintaining a constant 4-to-1 ratio of policyholder funds to shareholder funds over time. For simplification in this example, policyholder funds are assumed to consist of loss reserves only, and do not include either the tax law timing items or retained earnings. (Retained earnings are, in effect, undistributed operating earnings which must be included in shareholder flows at some point, and are considered separate from surplus).

The release of funds to the shareholder is thus a payout policy of 1) withdrawing investment income on capital as it is earned (i.e. annually) and 2) withdrawing the initial capital contribution and operating income as a function of loss payout. This is demonstrated on Page 4 of the Appendix for both the single accident year and steady state.

Under this return of capital rule, the initial surplus contributed for the accident year is $2,000, based on the 4 to 1 reserve to surplus ratio, followed by declines to $1,500, $1,000, and $500 in years two through four since the loss reserve is $8,000, $6,000, $4,000, and $2,000, respectively, for these

years. At steady state the reserve is $20,000 and the surplus $5,000. The calendar premium to surplus ratio at steady state is 2 to 1.

The itemized shareholder flows are shown on the upper section of Page 5. Capital is withdrawn at the rate of 25%, or $500, per year matching the loss payout pattern. The shareholder receives the investment income on the contributed capital and the operating earnings in a manner that maintains the relationship to reserves.

This pattern of surplus flows results in various equivalent measurements of rates of return on surplus, the subject of the next section.

Rates of Return on Surplus

On page 5 of the Appendix, an internal rate of return (IRR) calculation is shown for "Operating Earnings", "Contributed Capital", and "Net Shareholder". This is shown in Table I-1.

The IRR for operating earnings and contributed capital are both 5.3%, since these flows earn 8% before-tax, or 5.3%, after-tax. The shareholder receives a net IRR of 10.4%, based on the initial capital contribution of $2,000 followed by withdrawals of $708, $656, $604, and $552 in years one through four. The IRR measures the return to the shareholder from both operating earnings and

investment income on surplus. It should be noted that the annual return on invested capital is also 10.4% in every year. A parallel IRR workup at steady state is also shown on Page 5.

TABLE I-1
SINGLE ACCIDENT YEAR SHAREHOLDER FLOWS

	BEGIN	YEAR 1	YEAR 2	YEAR 3	YEAR 4	IRR
Operating Earnings		102	77	51	26	5.3%
Contributed Surplus:						
Investment Income		106	79	53	26	
Capital Withdrawal	-2000	500	500	500	500	5.3%
Net Contributed Surp.	-2000	708	656	604	552	10.4%
Annual Return		10.4%	10.4%	10.4%	10.4%	

The bottom of page 5 displays a nominal steady state calculation of return on surplus derived from the steady state balance sheet and income statements. This is summarized in Table I-2 below.

TABLE I-2
STEADY STATE RETURN CALCULATION

	Nominal Basis	Discounted to Begin of Accident Yr	Discounted to End of Accident Yr
Beginning Surplus	5000	4517	4755
Underwriting Income	-660	-660	-695
Investment Income (or Credit)	916	891	938
Investment Income on Surplus	264	238	251
Total Net Income	520	469	494
Return on Beginning Surplus	10.4%	10.4%	10.4%

Note that the "Total Net Income Income" of $520 is 10.4% of the $5,000 "Beginning Surplus". The calculation of discounted return is shown to the right and reflects the steady state figures on a basis discounted to both the beginning and the end of the initial

accident year. When valued at the end of the accident year, the "Total Return" of $494 is 10.4% of the $4,755 "Beginning Surplus".

What this demonstrates is that all three measures of return - the IRR, the steady state nominal calendar period, and the discounted return - are equivalent. This equivalence holds under the assumption that underwriting and investment are fixed, there is no growth in business level, AND policyholder and shareholder flows are linked over time.

Page 6 shows for the example calendar and accident period "Net Income", "Beginning Contributed Surplus", and "ROS" over an accumulation of eight successive accident years, including subsequent run-off after the last year, in a format similar to a loss development triangle. The "ROS" section at the bottom shows the relationship between calendar and accident period returns over the period. Initially, calendar returns are lower, due to the underwriting losses from the up-front payout of expenses. At steady state both calendar and accident returns are equal. During run-off the presence of investment income without underwriting losses causes the calendar returns to exceed the accident return. Note that the overall cumulative calendar period total return is 10.4%, however, matching the accident period discounted return.

Page 7 demonstrates this same equivalence but from the shareholder perspective by using the same calendar and accident period format to set forth shareholder flows and return.

Transition From Multi-year To Single Period - Steady State and Present Value Implied Balance Sheets and Income Statements

The NPV measurement of return ratios the present value of all income streams - both underwriting and investment - to the present value of surplus committed. In effect, the process creates a balance sheet which represents the annualized present value sum of individual future calendar period balance sheets. The balance sheets for future years are discounted to the present and summed. This annualized equivalent balance sheet provides the vehicle through which a rate of return can be calculated.

Returning to the example in the Appendix, Page 8 demonstrates the components of both an ongoing, steady state nominal balance sheet and a discounted income and balance sheet. (The exhibit displays discounted values at both the beginning and the end of the accident year). This is summarized in Table I-3 following. For example, the ongoing, steady state loss reserves are $20,000 on a nominal basis and $19,022 discounted (valued at the end of the accident year). The nominal total balance sheet consists of net liabilities of $18,707 and surplus of $5,000. The surplus commitment of $2,000, $1,500, $1,000, and $500 for years one through four, respectively, equates to an ongoing commitment at steady state of $5,000.

The corresponding discounted values are net liabilities funded of $17,765 and surplus of $4,755. This means that we need to set aside the equivalent of this amount today to fund future liabilities and provide the desired surplus support throughout the four year period.

The NPV investment income credit is $938 on the $17,765 policyholder related assets and $251 on the $4,755 in surplus assets. This means that the net funding requirement (i.e. assets committed), once this business is written, is $17,765.

TABLE I-3
ANNUALIZED NOMINAL AND DISCOUNTED
BALANCE SHEET AND INCOME SUMMARY:
Funding of Liabilities Through Committed Assets and Surplus

	BALANCE SHEET			INVESTMENT INCOME		
COMMITTED ASSETS = LIABILITIES	Nominal	Discounted Begin Year	Discounted End Year	Nominal	Discounted Begin Year	Discounted End Year
Net Policyholder Funds	20000	18060	19022	1056	954	1004
Net PH Liabilities (Incl Tax Timing Items)	18707	16874	17765	988	891	938
Net PH Liabilities (Incl Retained Earnings)	17342	15627	16452	916	825	869
Contributed Surplus	5000	4517	4755	264	238	251
CALCULATION OF RETURN:						
Underwriting Income				-660	-660	-695
Operating Income				256	231	243
Total Net Income				520	469	494
Return on Surplus				10.4%	10.4%	10.4%

The surplus commitment is $4,755 in present value terms. These can be thought of as the one year, annualized asset commitment that equates to the actual commitment of assets over the four

year period. The level of this asset commitment is a function of both the magnitude of the cash flow balances and the amount of time over which these cash flows and balances exist.

In short, the funding commitment is the present-valued balance sheet asset commitment dictated by cash flows. This asset commitment also represents the asset earnings base upon which the credit for future investment income is based. The annualized investment income figure is the same as the present value of the investment income stream derived from the investment of assets over the period of years, each discounted to the accident period.

The steady state present-valued balance sheet viewpoint provides a means by which transactions over several years can be translated to a single calendar period measurement. In particular, the surplus commitment over multiple calendar years sums to a single period value against which returns are calculated.

The ability to employ a single period basis is a key to simplifying discounted cash flow models and providing a single return on surplus measurement. While this measurement will equal the IRR under certain conditions, this NPV cash flow approach provides added flexibility not inherent in the IRR. For example, the approach supports the determination of the traditional Operating Return on Premium (ROP) preferred by many in ratemaking. Page 8 of the Appendix shows the calculation: the ROP turns out to be 2.3% in this example.

In addition, the approach has the virtue and flexibility of separately dealing with individual cash flows, as opposed to only net shareholder flows as with the IRR. Risks associated with the component cash flows, for example, can be reflected by adjusting their respective discount rates (even though the example has used a single rate for convenience.) This contrasts with the single fixed rate assumed in the typical IRR calculation.

When surplus relates to policyholder funds as in the example, it automatically responds to both the magnitude of the flows and the time frame over which flows occur. Equally important, however, is that the the annualized present valued balance sheet provides a framework for incorporating assumptions on volatility. Benchmark surplus should not only reflect the magnitude of insurance liabilities, as measured by committed assets, but also the variability that can result from the deviations in underwriting and investment results from their expected values. Part II discusses this in more detail.

Two particular effects on measured rates of return hold special interest: business growth, and an alternative capital withdrawal policy which does <u>not</u> maintain the relationship between policyholder and shareholder funds.

The Effect of Business Growth on Rate of Return

Page 6A of the Appendix is used to demonstrate the effect of a 10% annual accident/exposure year rate of growth in business. In this modification of the example, each successive accident year premium grows by 10%, while the underwriting and investment assumptions remain unchanged. The example maintains surplus at the same policyholder to shareholder (reserves to surplus) ratio of 4 to 1.

As in the earlier version of the example, each individual accident year has the identical 10.4% return on surplus. The calendar returns are lower than before, however. On an ongoing basis, calendar returns lag behind the accident returns since the newest accident year's higher initial underwriting loss has a larger impact on the calendar returns than before. This loss offsets more heavily the previous accident year's positive investment income contributions. The calendar return now reaches 9.1% in years four through eight, rather than the previous 10.4% realized without growth.

Since this example eventually allows the business to run off the books, the total return does reach 10.4% after all flows are completed. But if accident year business continued at the 10% growth rate, the calendar returns would show a permanent shortfall of 1.3%. This gap becomes greater with higher rates of growth, longer loss payouts, or higher interest rates.

For example, Table I-4 demonstrates the calendar return shortfall under alternative business growth scenarios (0%, 10%, 25%, and 40%), average loss payouts ranging from 1 to 4 years, and interest rates of 8% and 10%, before-tax. The calendar returns which would result under some of these scenarios fall significantly below the underlying 15% accident year ultimate return.

In all cases, the table assumes the following: accident period ultimate return on surplus (ROS) is 15%, the expense ratio is 30.0, and the ratio of policyholder to shareholder funds is 4 to 1.

TABLE I-4
CALENDAR ROS AND BUSINESS GROWTH

Interest Rate on Investment Before-Tax	Loss Ratio	Combined Ratio	Avg Yrs. Loss Payout	Calendar ROS % Rate of Business Growth 0%	10%	25%	40%
8%	72.6	102.6	1	15.0	15.0	15.0	15.0
"	75.4	105.4	2	15.0	14.5	13.8	13.3
"	78.1	108.1	3	15.0	14.0	12.7	11.5
"	80.6	110.6	4	15.0	13.6	11.6	9.8
10%	74.2	104.2	1	15.0	15.0	15.0	15.0
"	78.8	108.8	2	15.0	14.2	13.2	12.3
"	83.4	113.4	3	15.0	13.5	11.4	9.6
"	88.0	118.0	4	15.0	12.8	9.7	6.9

The Effect of Independent Surplus Withdrawal

In order for the IRR, nominal steady state, and discounted return measures to be equal, it is necessary to maintain the linkage of shareholder and policyholder funds. To demonstrate what happens when the linkage is not maintained, pages 5B and 6B provide an example under which the entire surplus is withdrawn at the end of the accident year. That is, the full $5,000 is provided at the beginning of each accident year and returned to the shareholder at the end of the year. This is equivalent to setting surplus as a function of premium using a premium to surplus ratio of 2 to 1.

Operating Earnings are distributed to the shareholder in the amount of calendar net income.

The calculated IRR is 9.5%, the nominal steady state return 11.1%, and the discounted return is 10.1%. The degree to which the three return measures will differ is affected by many factors, including leverage, loss payout, and interest rates.

In the insurance industry, actual withdrawal of capital is often a function of income or it may be designed to maintain a stable calendar year dividend payout. Certainly, historical withdrawals seldom have reflected any linkage to accident year policyholder funds and a run-off of surplus in parallel with these liabilities.

The examples in the Appendix are intended to show the conditions under which the IRR, calendar period, and discounted accident period returns are equal and when they differ. If growth occurs, or underwriting and investment conditions change, or capital is withdrawn without regard to a linkage with liabilities, then these measurements of return will differ.

It should be clear that rate of return measurements which are based on published calendar financial statements may not properly reflect current (i.e. accident year) profitability. Such calendar measures will likely be very poor proxies in lines of business which take many years to settle. The reported income statement, cash flow statement, and balance sheet are a composite of several current and prior accident years. While such calendar measures are unavoidable, the true performance picture can only be ascertained through a return measure which recognizes policyholder and shareholder flows for a given accident year, over all subsequent periods during which cash flows occur.

PART II - DETERMINING BENCHMARK SURPLUS
THE VOLATILITY-ADJUSTED FUNDING APPROACH

Overview

Determining the "proper" surplus required to support an insurance line of business is a difficult task. Traditionally, premium/surplus leverage has been viewed from a judgemental perspective as to what constitutes a safe operating level for the financial protection of policyholders. The following discussion sets forth an analytical framework and method for determining a benchmark surplus. The method provides a structure within which judgement and knowledge are used to provide assumptions on the magnitude and volatility of underwriting and investment cash flows. The method then develops the appropriate benchmark surplus and finally translates this into policyholder funds/surplus and premium/surplus leverage statistics.

The following section first discusses the purpose of surplus. It then presents the concepts of funding and volatility along with a methodology which utilizes funding and volatility as the foundation to determine surplus needs. The determination of the amount of assets required to fund the liabilities of a line of business and the volatility in this measure jointly produce the required level of surplus.

Table II presents suggested benchmark leverage ratios, both policyholder and premium to surplus. Average loss payment lag and amount of loss, both their value and variability, are the key parameters in constructing this table. Variability in factors other than loss payment lag and amount also need to be evaluated but are not presented here for the sake of simplicity, since their effect is generally much less than the loss-related parameters.

The method can be utilized to determine benchmark leverage standards by line of business which reflect that lines's particular characteristics. These standards and an operating return figure can produce a return on surplus for measuring an insurance company's profitability by line of business and across lines of business.

The Hartford has integrated this approach into it's total return methodology. This methodology also uses the concept of discounted operating return, and the principles of asset/liability matching, and the assumption of "risk free" Treasury investment policies, to further manage solvency risk and protect policyholder funds. An earlier paper "Discounted Return - Measuring Profitability and Setting Targets," [November, 1990 Casualty Actuarial Society Annual Proceedings] presented this methodology.

Risk and the Need for Surplus

Insolvency is the ultimate business risk. In an in insurance company, the sources of this risk are the insurance operations and investment activities. Insurance risk has two dimensions, since it arises from both the activities of underwriting and the investing of underwriting cash flows. However, insurance risk is principally a function of underwriting, provided underwriting cash flows are invested at a "risk free" rate and the maturities of the investments match the duration of the liabilites. This restriction essentially isolates total operating income from the affects of investment policy and market volatility.

Investment risk, on the other hand, is a function of company investment policy concerning types of investments and maturities, which gives rise to yield and default risks and related volatility.

Solvency risk is the exposure of surplus to both insurance (underwriting) and investment risk. The magnitude and volatility of underwriting losses along with fluctuating investment results with their associated probabilities are key determinants of this risk.

An important aspect of the management of solvency risk lies in determining the proper minimum level of surplus. Surplus should be a function of two factors:

1) The degree and magnitude of financial exposure. This essentially is the amount and length of time over which funds are committed to pay the liabilities of a respective line of business. It is the funding requirement.

2) The volatility in the funding requirement. The variability in underwriting and investment create the risk that increased surplus may be required to maintain a low probability of insolvency in the face of increased volatility.

In Summary, the surplus associated with a line of business is a buffer whose minimum size is determined by both the magnitude and volatility of financial exposure inherent in the line in order to insure an acceptably low probability of ruin.

Determining Benchmark Surplus

The method developed begins with a determination of funding requirements by line of business. Funding is the amount of assets that are needed to pay the liabilities at a particular level of business volume. Specifically, it is the present value equivalent in assets required to meet the liabilities inherent in all expected future cash flows. It is based on the magnitude of the cash flows and the length of time that it takes to settle them, summed across all flows after discounting to present value.

The five basic insurance cash flow components considered are: premium receipts, loss and expense payments, and prepayment of Federal taxes due to both loss discounting and the 20% unearned premium offset. These latter two components are creations of the 1986 Tax Reform Act.

Summing the required funding across all lines of business results in the total invested assets that must be committed by a company to support all writings.

This funding provides a beginning point to establish leverage, as it provides a measure of the liability-based asset commitment when writing a line of business. The Attachments provide formulas for approximating this funding level. Exact determination of funding requires the development of multi-period balance sheets for the full period during which cash flows occur.

The next step is to set surplus initially for each line of business in direct proportion to the line's funding requirements (i.e. money at risk). If the timing and magnitude of future operating flows were known with a high degree of certainty, a line would require only a small amount of surplus. However, most insurance flows are in the future and are uncertain as to timing and magnitude, and financial volatility can be expected. (In this regard insurance differs substantially from banking and other financial services.) This means that a line will require a larger buffer to make provision for adverse future operating

flows as uncertainty increases. The degree of this cushion clearly differs among lines of business.

Further adjustment, then, is necessary to recognize the financial volatility that exists in each line of business. Characteristics such as catastrophes which introduce much of this volatility, must be reflected in the methodology employed to determine a final benchmark leverage.

As can be seen, the formula for funding involves several parameters which are subject to variability. It is the handling of the variability associated with these parameters which is the key to determination of benchmark surplus. The parameters upon which funding is based are:

- premium amount and timing of collection
- expense amount and timing of payment
- loss amount and timing of payment
- tax law loss discount factor and timing
- proportion of premium unearned at year end
- market interest rate
- tax rate

Model Simulation

The dominant factors in terms of variability typically are the magnitude of loss amounts and the timing of loss payments. The

variability in all other factors, for most lines of business, has relatively minor affect by comparison. Paid loss retrospectively rated business is a notable exception, where the longer time period over which premium flows occur, becomes a consideration. A simulation model was developed to measure the volatility in total funding in the absence of an analytical algorithm which could directly quantify it.

Table II presents a range of suggested benchmark leverage ratios (both policyholder funds and premium in ratio to surplus) as a function of loss payment date and amount of loss, taking into account both their value and variability, corresponding to a 1% probability of insolvency. This table was developed by the simulation model utilizing the funding formula with iterative options on loss payout (1, 2, 3, and 4 years), loss ratio (75 and 80), variability of payout (5, and 10% of payment date), and variability of loss ratio (5, and 10% of loss ratio).

The figures in the table assume an expense ratio of 30.0, interest rate before tax of 8%, tax law discount rate of 8%, and assume that there is no delay in premium collection or expense payment.

The variability measures for the loss payment date and amount of loss are the respective standard deviations in those parameters. Since we are dealing with book of business averages, the normal distribution was assumed for simplicity of simulation. The total variability in funding was calculated from the simulated

results. A Z value of 2.33 from the normal probability curve was used to determine the amount of surplus required to cover this probability based maximum funding requirement. In other words, required surplus is calculated as Z times the standard deviation of funding, derived through simulation.

TABLE II
SUGGESTED BENCHMARK LEVERAGE RATIOS
(Based on 1% Probability of Insolvency)

AVERAGE LOSS PAYMENT YEARS	LOSS RATIO	VARIABILITY OF 5% & 10% IN AVG LOSS PAYMENT DATE	VARIABILITY OF 5% & 10% IN LOSS RATIO	SUGGESTED LEVERAGE RATIOS TO SURPLUS	
				Policyholder Funds	Premium
1	75.0	.05	3.75	5.8	8.2
			7.5	3.8	5.3
		.10	3.75	3.6	5.2
			7.5	3.0	4.3
2	75.0	.10	3.75	6.5	4.6
			7.5	3.9	2.8
		.20	3.75	4.0	2.8
			7.5	3.2	2.3
3	80.0	.15	4.0	6.3	2.8
			8.0	3.9	1.7
		.30	4.0	4.1	1.8
			8.0	3.2	1.4
4	80.0	.20	4.0	6.6	2.2
			8.0	3.7	1.3
		.40	4.0	4.0	1.3
			8.0	3.2	1.1

Table II as presented only demonstrates approximate possible leverage ratios. To more accurately determine the required benchmark, the simulation should be performed with all parameters specified more precisely: the expense ratio, interest rate, and timing of premium and expense flows for the line of business in question. In addition, the variability (i.e. standard deviation)

of a line of business's average payout and loss ratio, must be provided based on historical experience and judgement as to business expectations.

Policyholder funds in ratio to surplus is the more meaningful leverage statistic, although the premium to surplus ratio is the traditional leverage statistic. As the figures in this table demonstrate, the premium to surplus ratio covers a more extreme range, because surplus itself does not directly relate to premium. Premium, for example, does not capture the dynamics of a long tail line of business and it's generally greater need for surplus.

The policyholder funds to surplus ratio provides a more meaningful measure of leverage, since surplus does relate to policyholder liabilities. The variability in this statistic in the table is a function of the variability levels simulated. If the variability were the same in all cases, the policyholder funds to surplus leverage statistic would remain constant, regardless of the magnitude of loss or the length of its payout.

Surplus Run-off

Expressing required surplus in relation to premium via a premium/surplus ratio is a convenience. Use of this ratio must not hide the fact that, whereas the premium flows generally span a single year, the requirements for surplus exist throughout the

entire run-off period for the policy cash flows, however long that may be. In other words, the need for benchmark surplus remains beyond the year that the business is written.

It is suggested that surplus committed to support business be allowed to run off in proportion to the reduction in funding over time. In much the same way that funding is the present valued assets corresponding to future cash flows, which declines over time, required surplus should be viewed as the related present valued assets which run off in a parallel fashion. Since loss reserves are typically the primary component of this liability funding requirement, in simpler terms this says that surplus should run off as loss reserves decline to zero.

The convenience and simplicity of premium/surplus ratios encourages its widespread use. Unfortunately, it also leads to its misuse as a means of surplus allocation. A reserve to surplus ratio would be a far more meaningful leverage statistic than premium to surplus and it would provide a more intuitive means to allocate surplus.

The method demonstrated here using average payment dates is intended to provide an estimate of normal initial surplus requirements. Insurance programs having an atypical cash flow pattern may require a more detailed cash flow model to estimate the surplus requirements over time.

Other Comments

For a multi-line insurer, the independent determination of required surplus for each line of business will produce a total across all lines greater than necessary, since any line may draw on the surplus of other lines in an emergency. A multi-line insurer could, in effect, write at a higher overall leverage. To what degree this is the case depends on several factors including the correlation in exposure to loss among lines being written.

Selected References

1. Cummins, J. David, "Multi-Period Discounted Cash Flow Models in Property-Liability Insurance," Journal of Risk and Insurance, March, 1990.

2. Bingham, Russell E., "Discounted Return - Measuring Profit and Setting Targets," Casualty Actuarial Society Annual Proceedings, November, 1990.

3. Bunner, Bruce and Wasserman, David, "The Dynamics of Risk and Return Under California's Proposition 103," Underwriter's Report, June 15, 1989.

ATTACHMENT 1

ANNUALIZED NOMINAL (Future Value) AND DISCOUNTED (Present Valu

BALANCE SHEET AND INVESTMENT INCOME FORMULAS

Approximation Formulas

			BALANCE SHEET		INVESTMENT INCO	
COMMITTED ASSETS	Initial Reported Amount	YRS PAY LAG	NOMINAL	DISCOUNTED Beginning of Period	NOMINAL	DISCOUN Beginni of Peri
Premium	P	Np	-NpP	-PD<Np>/R	-RNpP	-PD<Np>
Expense	E	Ne	NeE	ED<Ne>/R	RNeE	ED<Ne>
Loss	L	Nl	NlL	LD<Nl>/R	RNlL	LD<Nl>
Net Policyholder Funds			Sum 1	Sum 2		
Tax Law Timing Items : Loss Discounting			ZL/R	KL/R	ZL	KL
UPR Offset			-.2TPU	-.2TPUD<1>/R	-.2RTPU	-.2TPUI
Net Timing Items			Sum 3	Sum 4		
Net Funding (including Taxes)			Sum 5= (Sum 1 + Sum 3)	Sum 6= (Sum 2 + Sum 4)		
Contributed Surplus			(Sum 1)/M	(Sum 2)/M		

Discount amount factor, D<N> = {1-1/(1+R)^N}

R = Interest rate, applicable to cash flows, after tax

T = Corporate tax rate, presently 34%

Loss discount nominal investment income factor approximately equal to

Z = -RT{(Nl+1)/2}{1-1/(1+Rt)^Nl} , where Rt = tax law discount rat

K = Loss discount investment credit factor from Attachment 3

M = Policyholder Liability / Shareholder Surplus leverage Multiple

ATTACHMENT 2
GENERAL DEFINITIONS AND FORMULAS

Underwriting Income = (P-E-L) (1-T)

Where P= Premium, E= Expense, L= Loss, T= Tax Rate

Nominal Basis

Operating Return = Underwriting Income
+ Investment Income on Insurance Liabilities

Total Return = Operating Return
+ Investment Income on Surplus

Discounted Basis

Operating Return = Underwriting Income
+ Investment Income Credit on Insurance Float

Investment Income Credit (IIC) = Present value of Investment Income on All Cash Flows related to the Accident Period

Premium	IIC =	-(1-Dp) P
Expense	IIC =	(1-De) E
Loss	IIC =	(1-Dl) L
UPR Tax	IIC =	-(1-Du) (.2T) P U
Disc Tax	IIC :	See Attachment 2 for formula

Where D= 1/(1+R)^N i.e. Discount Factor
R= rate for calculating discount, after tax
Rb= tax law discount rate before tax
N= average payment date for Premium, Expense, or Loss, respectively
for Du, N = 1, UPR tax recovery payment date
U= Annual Premium year end Unearned factor (i.e. Unearned Premium/Premium)

All dollar figures and discount factors are After Tax except discount factor for Loss Discounting using Rb, the tax law discount rate.

ATTACHMENT 3

LOSS DISCOUNTING INVESTMENT INCOME CREDIT FACTOR

(Factor times Loss for $ Impact)

Approximation Formula

1) Actual and Law Rates and Payouts Same

$$- \{ (Db-Da) + T(1-Db) \}$$

Where D= 1/(1+R)^N, i.e. Discount Factor
R= rate for calculating discount
N= payment date
b= before tax
a= after tax
T= tax rate
Da= 1/(1+Ra)^N
Ra= (1-T)Rb

2) Actual and Law Rates Different, Payouts Same

$$- \{ (Dr'b-Da) + T(1-Dr'b) \}$$
$$+ (Dr'b-Da)(Ra-R'a)/(Ra-R'b) \qquad \text{(Rate Adjustment)}$$

Where ' signifies using law rate

3) Actual and Law Rates and Payouts Different

$$- \{ (Dn'r'b-Dn'a) + T(1-Dn'r'b) \}$$
$$+ (Dn'r'b-Dn'a)(Ra-R'a)/(Ra-R'b) \qquad \text{(Rate Adjustment)}$$
$$+ TDa [(1-Dn"r'b) - (Dn"r'b-Dn"a)R'b/(Ra-R'b)] \qquad \text{(Date Adjustment)}$$

Where ' signifies using law rate or payment date
n"= n'-n i.e. difference in payment date

Effect of different Rates is greater than Payout differences and Formula 2) is sufficiently accurate for most applications.

Lower case letters are subscripts and not numeric values.

An approximate formula to the above is

$$- T \{ (1-Dmra) \times (1-Dn'r'b) \}, \text{ where } m = (n+1)/2$$
$$= - T \{(1-1/(1+Ra)^m) \times (1-1/(1+R'b)^n')\}$$

years. At steady state the reserve is $20,000 and the surplus $5,000. The calendar premium to surplus ratio at steady state is 2 to 1.

The itemized shareholder flows are shown on the upper section of Page 5. Capital is withdrawn at the rate of 25%, or $500, per year matching the loss payout pattern. The shareholder receives the investment income on the contributed capital and the operating earnings in a manner that maintains the relationship to reserves.

This pattern of surplus flows results in various equivalent measurements of rates of return on surplus, the subject of the next section.

Rates of Return on Surplus

On page 5 of the Appendix, an internal rate of return (IRR) calculation is shown for "Operating Earnings", "Contributed Capital", and "Net Shareholder". This is shown in Table I-1.

The IRR for operating earnings and contributed capital are both 5.3%, since these flows earn 8% before-tax, or 5.3%, after-tax. The shareholder receives a net IRR of 10.4%, based on the initial capital contribution of $2,000 followed by withdrawals of $708, $656, $604, and $552 in years one through four. The IRR measures the return to the shareholder from both operating earnings and

BASELINE - 4 YEAR PAYOUT (25% PER YEAR) AT 4/1 RESERVE/SURPLUS RATIO

EARNED PREMIUM	10000
EXPENSE RATIO	30.00
LOSS RATIO	80.00
UNDERWRITING TAX RATE	34
INVESTMENT YIELD BT	5.28
INVESTMENT YIELD AT	5.28
TAX LAW DISCOUNT RATE	8.00

	TOTAL	1	2	3	4	5
LOSS PAYMENT SCHED ACTUAL	100.0	25.0	25.0	25.0	25.0	0.0
LOSS PAYMENT SCHED LAW	100.0	25.0	25.0	25.0	25.0	0.0
LOSS PAYOUT BY LAW	8000	2000	2000	2000	2000	0
DISCOUNTED AT RATE OF	8.00	1852	1715	1588	1470	0
BEGINNING RESERVE BEFORE DISCOUNT		8000	6000	4000	2000	0

Tax Law Timing Items (Before Tax)		1	2	3	4	5
BEGINNING LOSS DISCOUNT	1376	1376				
SCHEDULED RECOVERY	-1376	-530	-412	-285	-148	0
BEGIN UPR SUBJECT TO TAX	1000	1000	0	0	0	0
SCHEDULED RECOVERY	-1000	-1000				

Reserves and Payments		1	2	3	4	5
BEGINNING NOMINAL LOSS RESERVE		8000	6000	4000	2000	0
LOSS PAYMENTS		2000	2000	2000	2000	0
BEGIN LOSS DISCOUNT TAX RESERVE		-468	-288	-147	-50	0
LOSS DISCOUNT TAX RECOVERY		180	140	97	50	0
BEGINNING UPR TAX RESERVE		-340	0	0	0	0
UPR TAX RECOVERY		340				

Shareholder Capital Flows	BEGIN	1	2	3	4	5
FROM OPERATING EARNINGS (1)		102	77	51	26	0
FROM INVESTMENT INCOME ON CONTRIBUTED CAPITAL		106	79	53	26	0
CAPITAL WITHDRAWAL	-2000	500	500	500	500	-0
CONTRIBUTED CAPITAL (2)	-2000	606	579	553	526	-0
NET CAPITAL FLOWS	-2000	708	656	604	552	-0

(1) OPER EARNINGS WITHDRAWAL: CONSTANT CALENDAR ROS (AT)
(2) CONTR SURPLUS WITHDRAWAL: PROPORTION TO RESERVES PLUS INV INCOME

BASELINE - 4 YEAR PAYOUT (25% PER YEAR) AT 4/1 RESERVE/SURPLUS RATIO

INCOME STATEMENT	TOTAL	1	2	3	4	5
NOMINAL INCOME BEFORE TAX (BT)						
Nominal Underwriting	-1000	-1000	0	0	0	0
Investment Income						
Loss Reserve	1600	640	480	320	160	0
Loss Disc Tax Reserve	-76	-37	-23	-12	-4	0
UPR Tax Reserve	-27	-27	0	0	0	0
Retained Earnings	-109	-53	-33	-17	-6	0
Surplus	400	160	120	80	40	0
TOTAL INCOME BEFORE TAX	787	-317	544	371	190	0
NOMINAL INCOME AFTER TAX (AT)						
Nominal Underwriting	-660	-660	0	0	0	0
Investment Income						
Loss Reserve	1056	422	317	211	106	0
Loss Disc Tax Reserve	-50	-25	-15	-8	-3	0
UPR Tax Reserve	-18	-18	0	0	0	0
Retained Earnings	-72	-35	-22	-11	-4	0
Surplus	264	106	79	53	26	0
TOTAL INCOME AFTER TAX	520	-209	359	245	125	0
DISCOUNTED INCOME AFTER TAX						
Nominal Underwriting	-660	-660	0	0	0	0
Investment Income						
Loss Reserve	954	401	286	181	86	0
Loss Disc Tax Res	-46	-23	-14	-7	-2	0
UPR Tax Reserve	-17	-17	0	0	0	0
Retained Earnings	-66	-33	-20	-10	-3	0
Surplus	238	100	71	45	21	0
TOTAL INCOME AFTER TAX	404	-232	324	210	102	0
TOTAL INC (Ex Ret Earns)	469	-199	344	220	105	0

BALANCE SHEET	1	2	3	4	5
NOMINAL BEGINNING ASSETS	8532	6795	4638	2376	0
LIABILITIES					
Loss Reserve	8000	6000	4000	2000	0
Disc Tax Reserve	-468	-288	-147	-50	-0
UPR Tax Reserve	-340	0	0	0	0
SURPLUS					
Retained Earnings	-660	-417	-214	-73	-0
Contributed	2000	1500	1000	500	-0
Liabilities + Surplus	8532	6795	4638	2376	-0
DISCOUNTED BEGINNING ASSETS	8104	6131	3975	1934	0
LIABILITIES					
Loss Reserve	7599	5413	3428	1628	0
Tax Reserve	-444	-259	-126	-41	-0
UPR Tax Reserve	-323	0	0	0	0
SURPLUS					
Retained Earnings	-627	-377	-184	-60	-0
Contributed	1900	1353	857	407	-0
Liabilities + Surplus	8104	6131	3975	1934	-0

BASELINE - 4 YEAR PAYOUT (25% PER YEAR) AT 4/1 RESERVE/SURPLUS RATIO

STEADY STATE BASIS NUMBER YEARS = 4 APPENDIX: PAGE

INCOME STATEMENT	1	2	3	4	5
NOMINAL INCOME AFTER TAX					
Underwriting	-660	-660	-660	-660	-660
Investment Income					
Reserves	422	739	950	1056	1056
Loss Disc Tax Reserve	-25	-40	-48	-50	-50
UPR Tax Reserve	-18	-18	-18	-18	-18
Retained Earnings	-35	-57	-68	-72	-72
Surplus	106	185	238	264	264
TOTAL INCOME AFTER TAX	-209	149	394	520	520
DISCOUNTED INCOME AFTER TAX					
Nominal Underwriting	-660	-660	-660	-660	-660
Investment Income					
Loss Reserve	401	687	868	954	954
Loss Disc Tax Reserve	-23	-37	-44	-46	-46
UPR Tax Reserve	-17	-17	-17	-17	-17
Retained Earnings	-33	-53	-63	-66	-66
Surplus	100	172	217	238	238
TOTAL INCOME AFTER TAX	-232	92	301	404	404
TOTAL INC (Excl Ret Earns)	-199	145	364	469	469

BALANCE SHEET	1	2	3	4	5
NOMINAL BEGINNING ASSETS	8532	15327	19965	22342	22342
LIABILITIES					
Loss Reserve	8000	14000	18000	20000	20000
Disc Tax Reserve	-468	-755	-903	-953	-953
UPR Tax Reserve	-340	-340	-340	-340	-340
SURPLUS					
Retained Earnings	-660	-1077	-1292	-1365	-1365
Contributed	2000	3500	4500	5000	5000
Liabilities + Surplus	8532	15327	19965	22342	22342
DISCOUNTED BEGINNING ASSETS	8104	14235	18210	20144	20144
LIABILITIES					
Loss Reserve	7599	13012	16440	18068	18068
Tax Reserve	-444	-704	-830	-871	-871
UPR Tax Reserve	-323	-323	-323	-323	-323
SURPLUS					
Retained Earnings	-627	-1003	-1187	-1247	-1247
Contributed	1900	3253	4110	4517	4517
Liabilities + Surplus	8104	14235	18210	20144	20144
DISC BEG. ASSETS-END YR VALUATION	8532	14987	19171	21207	21207
LIABILITIES					
Loss Reserve	8000	13699	17308	19022	19022
Tax Reserve	-468	-741	-874	-917	-917
UPR Tax Reserve	-340	-340	-340	-340	-340
SURPLUS					
Retained Earnings	-660	-1056	-1250	-1313	-1313
Contributed	2000	3425	4327	4755	4755
Liabilities + Surplus	8532	14987	19171	21207	21207

BASELINE - 4 YEAR PAYOUT (25% PER YEAR) AT 4/1 RESERVE/SURPLUS RATIO

POLICYHOLDER / SHAREHOLDER FUNDS	1	2	3	4	5
NOMINAL BEGINNING					
Policyholder Funds	8000	6000	4000	2000	0
Shareholder Funds	2000	1500	1000	500	-0
Ratio PH /SH Funds	4.00	4.00	4.00	4.00	4.00
DISCOUNTED BEGINNING					
Policyholder Funds	7599	5413	3428	1628	0
Shareholder Funds	1900	1353	857	407	-0
Ratio PH /SH Funds	4.00	4.00	4.00	4.00	4.00
DISCOUNTED BEGINNING (END YEAR VALUATION)					
Policyholder Funds	8000	5699	3609	1714	0
Shareholder Funds	2000	1425	902	428	-0
Ratio PH /SH Funds	4.00	4.00	4.00	4.00	4.00
STEADY STATE BASIS NUMBER YEARS =	4				
NOMINAL BEGINNING					
Policyholder Funds	8000	14000	18000	20000	20000
Shareholder Funds	2000	3500	4500	5000	5000
Ratio PH /SH Funds	4.00	4.00	4.00	4.00	4.00
DISCOUNTED BEGINNING					
Policyholder Funds	7599	13012	16440	18068	18068
Shareholder Funds	1900	3253	4110	4517	4517
Ratio PH /SH Funds	4.00	4.00	4.00	4.00	4.00
DISCOUNTED BEGINNING (END YEAR VALUATION)					
Policyholder Funds	8000	13699	17308	19022	19022
Shareholder Funds	2000	3425	4327	4755	4755
Ratio PH /SH Funds	4.00	4.00	4.00	4.00	4.00

BASELINE - 4 YEAR PAYOUT (25% PER YEAR) AT 4/1 RESERVE/SURPLUS RATIO

RATE OF RETURN TO SHAREHOLDER (INCOME "DISTRIBUTED" / BEGINNING SURPLUS)

SINGLE ACCIDENT YEAR

SHAREHOLDER FLOWS	BEGIN	1	2	3	4	IRR
Operating Earnings (1)	-231	102	77	51	26	5.3%
Contributed Surplus Account						
Investment Income		106	79	53	26	
Capital Withdrawal	-2000	500	500	500	500	
Contributed Capital (2)	-2000	606	579	553	526	5.3%
Net Shareholder	-2000	708	656	604	552	10.4%
						******
Return (Operating & Inv Inc)		10.4%	10.4%	10.4%	10.4%	

(1) OPER EARNINGS WITHDRAWAL: CONSTANT CALENDAR ROS (AT)
(2) CONTR SURPLUS WITHDRAWAL: PROPORTION TO RESERVES PLUS INV INCOME

STEADY STATE BASIS

SHAREHOLDER FLOWS	BEGIN	1	2	3	4	5	6	7	8	9	10	11	IRR
Operating Earnings (1)		102	179	230	256	256	256	256	256	153	77	26	
Contributed Surplus Account													
Investment Income		106	185	238	264	264	264	264	264	158	79	26	
Capital Withdrawal	-2000	-1500	-1000	-500	0	0	0	0	2000	1500	1000	500	
Contributed Capital (2)	-2000	-1394	-815	-262	264	264	264	264	2264	1658	1079	526	5.3%
Net Shareholder	-2000	-1292	-636	-32	520	520	520	520	2520	1812	1156	552	10.4%
													******
Return (Operating & Inv Inc)		10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	

(1) OPERATING EARNINGS WITHDRAWAL: CONSTANT CALENDAR ROS (AT)
(2) CONTRIBUTED SURPLUS WITHDRAWAL: PROPORTION TO RESERVES PLUS INV INCOME

STEADY STATE BASIS

NOMINAL	Nominal $	% of Surplus	DISCOUNTED Adjusted for disc lag of	VALUATION AT BEGINNING OF YEAR Discounted 0 $	% of Surplus	VALUATION AT END OF YEAR Discounted $	% of Surplus
Beginning Surplus	5000		Beginning Surplus	4517		4755	
Underwriting Income	-660		Underwriting Income	-660		-695	
Investment Income	916		Investment Income Credit	891		938	
Oper Inc Incl Ret Earns	256	5.1%	Discounted Oper Income	231	5.1%	243	5.1%
Investment Income on Surplus	264	5.3%	Investment Income on Surplus	238	5.3%	251	5.3%
Total Net Income	520	10.4%	Total Return	469	10.4%	494	10.4%
		******			******		******

BASELINE - 4 YEAR PAYOUT (25% PER YEAR) AT 4/1 RESERVE/SURPLUS RATIO

ACCIDENT YEAR DEVELOPMENT AND CONTRIBUTION TO CALENDAR YEAR

NET INCOME

ACCIDENT YEAR	PRES VALUE AT YEAR END	1	2	3	4	5	6	7	8	9	10	11	TOTAL	ACC YEAR COMPOUND GROWTH
1	494	-209	359	245	125	0	0	0	0	0	0	0	520	0.0%
2	494		-209	359	245	125	0	0	0	0	0	0	520	0.0%
3	494			-209	359	245	125	0	0	0	0	0	520	0.0%
4	494				-209	359	245	125	0	0	0	0	520	0.0%
5	494					-209	359	245	125	0	0	0	520	0.0%
6	494						-209	359	245	125	0	0	520	0.0%
7	494							-209	359	245	125	0	520	0.0%
8	494								-209	359	245	125	520	0.0%
9	0									0	0	0	0	0.0%
10	0										0	0	0	0.0%
11	0											0	0	0.0%
CALENDAR YEAR		-209	149	394	520	520	520	520	520	729	370	125	4157	

BEGINNING CONTRIBUTED SURPLUS

ACCIDENT YEAR	PRES VALUE AT YEAR END	1	2	3	4	5	6	7	8	9	10	11	TOTAL	ACC YEAR COMPOUND GROWTH
1	4755	2000	1500	1000	500	-0	0	0	0	0	0	0	5000	0.0%
2	4755		2000	1500	1000	500	-0	0	0	0	0	0	5000	0.0%
3	4755			2000	1500	1000	500	-0	0	0	0	0	5000	0.0%
4	4755				2000	1500	1000	500	-0	0	0	0	5000	0.0%
5	4755					2000	1500	1000	500	-0	0	0	5000	0.0%
6	4755						2000	1500	1000	500	-0	0	5000	0.0%
7	4755							2000	1500	1000	500	-0	5000	0.0%
8	4755								2000	1500	1000	500	5000	0.0%
9	0									0	0	0	0	0.0%
10	0										0	0	0	0.0%
11	0											0	0	0.0%
CALENDAR YEAR		*2000*	*3500*	*4500*	*5000*	*5000*	*5000*	*5000*	*5000*	*3000*	*1500*	*500*	*40000*	

ROS (NET INCOME / BEGINNING PERIOD CONTRIBUTED SURPLUS)

ACCIDENT YEAR	PRES VALUE AT YEAR END	1	2	3	4	5	6	7	8	9	10	11	TOTAL
1	10.4%	-10.5%	23.9%	24.5%	25.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.4%
2	10.4%		-10.5%	23.9%	24.5%	25.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.4%
3	10.4%			-10.5%	23.9%	24.5%	25.1%	0.0%	0.0%	0.0%	0.0%	0.0%	10.4%
4	10.4%				-10.5%	23.9%	24.5%	25.1%	0.0%	0.0%	0.0%	0.0%	10.4%
5	10.4%					-10.5%	23.9%	24.5%	25.1%	0.0%	0.0%	0.0%	10.4%
6	10.4%						-10.5%	23.9%	24.5%	25.1%	0.0%	0.0%	10.4%
7	10.4%							-10.5%	23.9%	24.5%	25.1%	0.0%	10.4%
8	10.4%								-10.5%	23.9%	24.5%	25.1%	10.4%
9	0.0%									0.0%	0.0%	0.0%	0.0%
10	0.0%										0.0%	0.0%	0.0%
11	0.0%											0.0%	0.0%
CALENDAR YEAR		-10.5%	4.3%	8.8%	10.4%	10.4%	10.4%	10.4%	10.4%	24.3%	24.7%	25.1%	10.4%

BASELINE - 4 YEAR PAYOUT (25% PER YEAR) AT 4/1 RESERVE/SURPLUS RATIO

SHAREHOLDER FLOWS FROM CAPITAL (CONRIBUTION) OR WITHDRAWAL

ACCIDENT YEAR	BEGIN	1	2	3	4	5	6	7	8	9	10	11	TOTAL	ACC YEAR COMPOUND GROWTH
1	-2000	500	500	500	500	-0	0	0	0	0	0	0	0	0.0
2		-2000	500	500	500	500	-0	0	0	0	0	0	0	0.0
3			-2000	500	500	500	500	-0	0	0	0	0	0	0.0
4				-2000	500	500	500	500	-0	0	0	0	0	0.0
5					-2000	500	500	500	500	-0	0	0	0	0.0
6						-2000	500	500	500	500	-0	0	0	0.0
7							-2000	500	500	500	500	-0	0	0.0
8								-2000	500	500	500	500	0	0.0
9									0	0	0	0	0	0.0
10										0	0	0	0	0.0
11											0	0	0	0.0
CALENDAR YEAR	-2000	-1500	-1000	-500	0	0	0	0	2000	1500	1000	500	0	

NET SHAREHOLDER FLOWS

ACCIDENT YEAR	BEGIN	1	2	3	4	5	6	7	8	9	10	11	TOTAL	ACC YEAR COMPOUND GROWTH
1	-2000	708	656	604	552	-0	0	0	0	0	0	0	520	0.0
2		-2000	708	656	604	552	-0	0	0	0	0	0	520	0.0
3			-2000	708	656	604	552	-0	0	0	0	0	520	0.0
4				-2000	708	656	604	552	-0	0	0	0	520	0.0
5					-2000	708	656	604	552	-0	0	0	520	0.0
6						-2000	708	656	604	552	-0	0	520	0.0
7							-2000	708	656	604	552	-0	520	0.0
8								-2000	708	656	604	552	520	0.0
9									0	0	0	0	0	0.0
10										0	0	0	0	0.0
11											0	0	0	0.0
CALENDAR YEAR	-2000	-1292	-636	-32	520	520	520	520	2520	1812	1156	552		

SHAREHOLDER RETURN (OPERATING & INVESTMENT INCOME / BEGINNING PERIOD CAPITAL CONTRIBUTION)

ACCIDENT YEAR	1	2	3	4	5	6	7	8	9	10	11	IRR
1	10.4%	10.4%	10.4%	10.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.4%
2		10.4%	10.4%	10.4%	10.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.4%
3			10.4%	10.4%	10.4%	10.4%	0.0%	0.0%	0.0%	0.0%	0.0%	10.4%
4				10.4%	10.4%	10.4%	10.4%	0.0%	0.0%	0.0%	0.0%	10.4%
5					10.4%	10.4%	10.4%	10.4%	0.0%	0.0%	0.0%	10.4%
6						10.4%	10.4%	10.4%	10.4%	0.0%	0.0%	10.4%
7							10.4%	10.4%	10.4%	10.4%	0.0%	10.4%
8								10.4%	10.4%	10.4%	10.4%	10.4%
9									0.0%	0.0%	0.0%	0.0%
10										0.0%	0.0%	0.0%
11											0.0%	0.0%
CALENDAR YEAR	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%

ANNUALIZED NOMINAL AND DISCOUNTED
BALANCE SHEET AND INVESTMENT INCOME

5.3% Discount Rate
5.3% Earnings Rate
8.0% Tax Law Discount

COMMITTED ASSETS = LIABILITIES	Initial Reportd Amount	DISCNTD Begin Period	Average Timing of Cash Flow	BALANCE SHEET NOMINAL	BALANCE SHEET DISCOUNTED Begin Period	BALANCE SHEET DISCOUNTED End Period	INVESTMENT INCOME NOMINAL	INVESTMENT INCOME DISCOUNTED Begin Period	INVESTMENT INCOME DISCOUNTED End Period	DURATION Begin Period	DURATION End Period
Premium	10000	10000	0.00	0	0	0	0	0	0	0.00	0.00
Loss & Loss Expense	8000	7046	2.50	20000	18068	19022	1056	954	1004	1.97	0.97
Underwriting Expense	3000	3000	0.00	0	0	0	0	0	0	0.00	0.00
Net Policyholder Funds				20000	18068	19022	1056	954	1004		
Tax Timing Items											
Tax Loss Discounting	-468	-422	2.04	-953	-871	-917	-50	-46	-48	1.75	0.75
Tax Unearned Premium	-340	-323	1.00	-340	-323	-340	-18	-17	-18	1.00	0.00
Net Liabilities (Including Timing Items)				18707	16874	17765	988	891	938	2.00	1.00
Retained Earnings				-1365	-1247	-1313	-72	-66	-69		
Net Liabilities (Including Retained Earnings)				17342	15627	16452	916	825	869		
Contributed Surplus	2000	1762	2.50	5000	4517	4755	264	238	251	1.97	0.97
CALCULATION OF RETURN											
Premium				* 11069	10000	10528				1.97	0.97
Underwriting Income							-660	-660	-695	0.00	-1.00
Operating Income							256	231	243	1.97	0.97
Operating Return on Premium (ROP)							2.3%	2.3%	2.3%		
Operating Return on Net Liabilities (ROL)							1.5%	1.5%	1.5%		
Total Net Income							520	469	494	1.97	0.97
Total Return on Surplus (ROS)							10.4%	10.4%	10.4%		

* Nominal Valued at Date of Average Total Timing

LEVERAGE RATIOS (to Shareholder Contributed Surplus)

Net Policyholder Funds / Surplus	4.00	4.00	4.00
Net Liabilities (Incl Timing Items) / Surplus	3.74	3.74	3.74
Net Liabilities (Incl Retained Earnings) / Surplus	3.47	3.46	3.46
Premium / Surplus	2.21	2.21	2.21
Conventional NOMINAL Reported Premium / Surplus	2.00	na	na

BASELINE - 4 YEAR PAYOUT (25% PER YEAR) AT 4/1 RESERVE/SURPLUS RATIO, 10% ANNUAL GROWTH

ACCIDENT YEAR DEVELOPMENT AND CONTRIBUTION TO CALENDAR YEAR

NET INCOME

ACCIDENT YEAR	PRES VALUE AT YEAR END	1	2	3	4	5	6	7	8	9	10	11	TOTAL	ACC YEAR COMPOUND GROWTH
1	494	-209	359	245	125	0	0	0	0	0	0	0	520	0.0%
2	544		-230	395	269	138	0	0	0	0	0	0	572	10.0%
3	598			-253	434	296	152	0	0	0	0	0	629	21.0%
4	658				-279	478	326	167	0	0	0	0	692	33.1%
5	724					-307	525	359	184	0	0	0	761	46.4%
6	796						-337	578	394	202	0	0	837	61.1%
7	876							-371	636	434	222	0	921	77.2%
8	963								-408	699	477	244	1013	94.9%
9	0									0	0	0	0	0.0%
10	0										0	0	0	0.0%
11	0											0	0	0.0%
CALENDAR YEAR		-209	128	386	550	605	666	732	805	1335	699	244	5943	

BEGINNING CONTRIBUTED SURPLUS

ACCIDENT YEAR	PRES VALUE AT YEAR END	1	2	3	4	5	6	7	8	9	10	11	TOTAL	ACC YEAR COMPOUND GROWTH
1	4755	2000	1500	1000	500	-0	0	0	0	0	0	0	5000	0.0%
2	5231		2200	1650	1100	550	-0	0	0	0	0	0	5500	10.0%
3	5754			2420	1815	1210	605	-0	0	0	0	0	6050	21.0%
4	6330				2662	1997	1331	666	-0	0	0	0	6655	33.1%
5	6962					2928	2196	1464	732	-0	0	0	7321	46.4%
6	7659						3221	2416	1611	805	-0	0	8053	61.1%
7	8425							3543	2657	1772	886	-0	8858	77.2%
8	9267								3897	2923	1949	974	9744	94.9%
9	0									0	0	0	0	0.0%
10	0										0	0	0	0.0%
11	0											0	0	0.0%
CALENDAR YEAR		2000	3700	5070	6077	6685	7353	8088	8897	5500	2834	974	57179	

ROS (NET INCOME / BEGINNING PERIOD CONTRIBUTED SURPLUS)

ACCIDENT YEAR	PRES VALUE AT YEAR END	1	2	3	4	5	6	7	8	9	10	11	TOTAL
1	10.4%	-10.5%	23.9%	24.5%	25.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.4%
2	10.4%		-10.5%	23.9%	24.5%	25.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.4%
3	10.4%			-10.5%	23.9%	24.5%	25.1%	0.0%	0.0%	0.0%	0.0%	0.0%	10.4%
4	10.4%				-10.5%	23.9%	24.5%	25.1%	0.0%	0.0%	0.0%	0.0%	10.4%
5	10.4%					-10.5%	23.9%	24.5%	25.1%	0.0%	0.0%	0.0%	10.4%
6	10.4%						-10.5%	23.9%	24.5%	25.1%	0.0%	0.0%	10.4%
7	10.4%							-10.5%	23.9%	24.5%	25.1%	0.0%	10.4%
8	10.4%								-10.5%	23.9%	24.5%	25.1%	10.4%
9	0.0%									0.0%	0.0%	0.0%	0.0%
10	0.0%										0.0%	0.0%	0.0%
11	0.0%											0.0%	0.0%
CALENDAR YEAR		-10.5%	3.5%	7.6%	9.1%	9.1%	9.1%	9.1%	9.1%	24.3%	24.7%	25.1%	10.4%

4 YEAR PAYOUT, WITHDRAW CAPITAL AFTER 1 YEAR PLUS CALENDAR INVESTMENT INCOME

RATE OF RETURN TO SHAREHOLDER (INCOME "DISTRIBUTED" / BEGINNING SURPLUS) APPENDIX:PAGE 5B

SINGLE ACCIDENT YEAR

SHAREHOLDER FLOWS	BEGIN	1	2	3	4	IRR
Operating Earnings (1)	-231	-315	302	203	103	5.3%
Contributed Surplus Account						
Investment Income		264	0	0	0	
Capital Withdrawal	-5000	5000	0	0	0	
Contributed Capital (2)	-5000	5264	0	0	0	5.3%
Net Shareholder	-5000	4949	302	203	103	9.5%
						******
Return (Operating & Inv Inc)		-1.0%	0.0%	0.0%	0.0%	

(1) OPER EARNINGS WITHDRAWAL: CALENDAR INCOME (U/W + INVESTMENT INCOME)
(2) CONTR SURPLUS WITHDRAWAL: AFTER 1 YEAR

STEADY STATE BASIS

SHAREHOLDER FLOWS	BEGIN	1	2	3	4	5	6	7	8	9	10	11	IRR
Operating Earnings (1)		-315	-13	190	293	293	293	293	293	608	306	103	
Contributed Surplus Account													
Investment Income		264	264	264	264	264	264	264	264	0	0	0	
Capital Withdrawal	-5000	0	0	0	0	0	0	0	5000	0	0	0	
Contributed Capital (2)	-5000	264	264	264	264	264	264	264	5264	0	0	0	5.3%
Net Shareholder	-5000	-51	251	454	557	557	557	557	5557	608	306	103	9.5%
													******
Return (Operating & Inv Inc)		-1.0%	5.0%	9.1%	11.1%	11.1%	11.1%	11.1%	11.1%	0.0%	0.0%	0.0%	

(1) OPERATING EARNINGS WITHDRAWAL: CALENDAR INCOME (U/W + INVESTMENT INCOME)
(2) CONTRIBUTED SURPLUS WITHDRAWAL: AFTER 1 YEAR

STEADY STATE BASIS

NOMINAL	Nominal $	% of Surplus	DISCOUNTED Adjusted for disc lag of	VALUATION AT BEGINNING OF YEAR Discounted 0 $	% of Surplus	VALUATION AT END OF YEAR Discounted $	% of Surplus
Beginning Surplus	5000		Beginning Surplus	4749		5000	
Underwriting Income	-660		Underwriting Income	-660		-695	
Investment Income	953		Investment Income Credit	891		938	
Oper Inc Incl Ret Earns	293	5.9%	Discounted Oper Income	231	4.9%	243	4.9%
Investment Income on Surplus	264	5.3%	Investment Income on Surplus	251	5.3%	264	5.3%
Total Net Income	557	11.1%	Total Return	482	10.1%	507	10.1%
		******			******		******

4 YEAR PAYOUT, WITHDRAW CAPITAL AFTER 1 YEAR PLUS CALENDAR INVESTMENT INCOME

ACCIDENT YEAR DEVELOPMENT AND CONTRIBUTION TO CALENDAR YEAR

NET INCOME

ACCIDENT YEAR	PRES VALUE AT YEAR END	1	2	3	4	5	6	7	8	9	10	11	TOTAL	ACC YEAR COMPOUND GROWTH
1	507	-51	302	203	103	0	0	0	0	0	0	0	557	0.0%
2	507		-51	302	203	103	0	0	0	0	0	0	557	0.0%
3	507			-51	302	203	103	0	0	0	0	0	557	0.0%
4	507				-51	302	203	103	0	0	0	0	557	0.0%
5	507					-51	302	203	103	0	0	0	557	0.0%
6	507						-51	302	203	103	0	0	557	0.0%
7	507							-51	302	203	103	0	557	0.0%
8	507								-51	302	203	103	557	0.0%
9	0									0	0	0	0	0.0%
10	0										0	0	0	0.0%
11	0											0	0	0.0%
CALENDAR YEAR		-51	251	454	557	557	557	557	557	608	306	103	4455	

BEGINNING CONTRIBUTED SURPLUS

ACCIDENT YEAR	PRES VALUE AT YEAR END	1	2	3	4	5	6	7	8	9	10	11	TOTAL	ACC YEAR COMPOUND GROWTH
1	5000	5000	0	0	0	0	0	0	0	0	0	0	5000	0.0%
2	5000		5000	0	0	0	0	0	0	0	0	0	5000	0.0%
3	5000			5000	0	0	0	0	0	0	0	0	5000	0.0%
4	5000				5000	0	0	0	0	0	0	0	5000	0.0%
5	5000					5000	0	0	0	0	0	0	5000	0.0%
6	5000						5000	0	0	0	0	0	5000	0.0%
7	5000							5000	0	0	0	0	5000	0.0%
8	5000								5000	0	0	0	5000	0.0%
9	0									0	0	0	0	0.0%
10	0										0	0	0	0.0%
11	0											0	0	0.0%
CALENDAR YEAR		5000	5000	5000	5000	5000	5000	5000	5000	0	0	0	40000	

ROS (NET INCOME / BEGINNING PERIOD CONTRIBUTED SURPLUS)

ACCIDENT YEAR	PRES VALUE AT YEAR END	1	2	3	4	5	6	7	8	9	10	11	TOTAL
1	10.1%	-1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.1%
2	10.1%		-1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.1%
3	10.1%			-1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.1%
4	10.1%				-1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.1%
5	10.1%					-1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.1%
6	10.1%						-1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.1%
7	10.1%							-1.0%	0.0%	0.0%	0.0%	0.0%	11.1%
8	10.1%								-1.0%	0.0%	0.0%	0.0%	11.1%
9	0.0%									0.0%	0.0%	0.0%	0.0%
10	0.0%										0.0%	0.0%	0.0%
11	0.0%											0.0%	0.0%
CALENDAR YEAR		-1.0%	5.0%	9.1%	11.1%	11.1%	11.1%	11.1%	11.1%	0.0%	0.0%	0.0%	11.1%