Report of the
Task Force to Recommend
Morbidity Standards for
Valuation of Credit Disability

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Acknowledgements

Executive Summary

Policy reserves for single premium Credit Disability Insurance are currently based upon gross unearned premiums. The Task Force has developed a recommendation to adjust the 85CIDA for use as a morbidity standard for these reserves. The Task Force built its analysis based upon the paper "A Credit Disability Morbidity Table", and the statistical methods used by the Individual Subcommittee of the SoA's Task Force to Recommend Morbidity Standards for the Valuation of Group and Individual Disability.

We recommend that the 85CIDA be used as a morbidity reserve standard with incidence rates increased 12%. The resulting policy reserves will be approximately 72% of current unearned premium reserves, but will have a margin of approximately 44% over aggregate experience reserves. To avoid discontinuity between plans using different elimination periods, we recommend that the 14 day elimination period tables be used for both 14 day and 30 day plans.

The study used data provided by 17 contributing companies on single premium policies issued in 1997 to develop an exposure base. These companies wrote in excess of 70% of all Credit Disability premium in 1997. Premium and claim experience was drawn from the NAIC's Credit Insurance Experience Exhibit for these 17 companies as well as for four non-contributing companies. Based upon each company's unique distribution of insureds by age and term of insurance, we could develop an expected claim cost for each plan of insurance written by that company using the 85CIDA. We were able to develop a single actual claim cost for each company by using its distribution of insurance by term and its distribution of premium by state. We first developed a single rate by weighting the prima facie premium rates in each state by the premium volume of that company in that state. By multiplying the single rate by the prima facie loss ratio, we obtained a claim cost.

This claim cost was compared to the expected claim cost developed from the 85CIDA to develop actual to expected ratios. A statistical analysis of these ratios showed that the chosen adjustment factor would develop reserves greater than the experience morbidity reserves 85% of the companies would establish. Beyond looking at the number of companies covered by this standard, we also determined that 94% of the premium volume for the contributing companies would be covered.

The Task Force did not study the effect of interest or mortality discounting in this report. Based upon the relatively short duration of credit insurance contracts, interest discounting would not have a significant effect. We recommend that interest discounting be allowed in a new standard. The benefit paid upon death is refund of premium, therefore, we recommend that no mortality discount be incorporated.

The Task Force did not have termination from claim experience readily available, thus, we do not make a recommendation to change claim reserve standards.

We have included Appendix 2 that discusses the difference between a morbidity reserve standard and an unearned premium reserve standard and why the former should be allowed. This appendix also analyzes amounts recoverable upon refund and the actual lapse experience of the Credit Insurance Industry. Reference is made to the requirement to evaluate reserves relative to the refund liability and to establish excess amounts if needed.

Introduction

In 1997, the Consumer Credit Insurance Association (CCIA) decided to address the excessive reserves being required for Credit Disability Insurance. A committee was appointed to study the issue, and one result was the paper "A Credit Disability Morbidity Table". After a peer review by the Society of Actuaries, a presentation was made to the NAIC in March 2000. The paper was published in NewsDirect, the newsletter of the Society of Actuaries' Non-Traditional Marketing section in June 2000. The NAIC asked the Society of Actuaries to address this issue as follows:

> "The NAIC Health Insurance Reserves Model Regulation references specific morbidity tables as the basis for calculating minimum statutory disability insurance reserves. The NAIC Accident and Health Working Group (A&HWG) of the Life and Health Actuarial Task Force is requesting the assistance of the Society to review the current morbidity valuation standards for credit disability insurance in light of the recent peer review by the Society of a proposal by the Actuarial Committee of the Consumer Credit Insurance Association (CCIA), and as appropriate, to recommend revised disability morbidity tables."

The SoA created the Task Force to Recommend Morbidity Standards for Valuation of Credit Disability ("Task Force") to respond to these issues and assigned it the following initial goals:

> "The charge of this Task Force will be to develop a table to serve as an appropriate basis for a valuation standard for credit disability to recommend to the NAIC. The work of the Task Force will build upon the work already completed by Steve Ostlund, Bob Butler, and Christopher Hause ("A Credit Disability Morbidity Table"), and will include reviewing the statistical methods used in establishing the margins for the individual disability valuation standard (per the work of the individual subcommittee of the SoA's Task Force to Recommend Morbidity Standards for Valuation of Group and Individual Disability, chaired by Bob Meilander) to develop appropriate margins for credit."

Scope

At the first meeting of the Task Force, the group defined the intended scope for its work, based on the background knowledge and experience of the participants. That scope was defined by the following considerations:

- We should not extend our scope to the point that it jeopardized a timely recommendation.
- Our work should build upon the data and concepts from the paper "A Credit Disability Morbidity Table".
- Credit Disability insurance volume was approximately 10% the size of Individual Disability Income volume.
- We should not pursue disabled life reserve recommendations at this time because claim termination data is not currently available for analysis.
- We should mirror the work performed by the individual subcommittee of the SoA's Task Force to Recommend Morbidity Standards for Valuation of Group and Individual Disability (IDI) where appropriate.

- Any recommended table should have, not only 85% of companies covered, but also 85% of the premium volume covered.

As a result of these considerations we defined our task as one of determining a simple modification of the 85CIDA that reflected current experience and provided appropriate margins.

Experience Data

The Task Force was fortunate in that it was working with data already collected by the CCIA. We used that data and evaluated it in light of our charge to develop appropriate margins. We were then able to proceed in an expeditious manner to develop a margin recommendation. The paper "A Credit Disability Morbidity Table" is available from the SoA through John A. Luff.

Table 1
Contributing Companies and Their Gross Written Premium
Based on Credit Insurance Experience Exhibit

Company	1997 Single Premium Written (000)	% of Total
American Bankers Insurance Group	124,228	12.9%
American General Finance Company	104,918	10.9%
American Security Insurance Group	204,581	21.2%
American United Life	13,196	1.4%
Associates Financial Services	66,780	6.9%
Beneficial Finance	60,892	6.3%
Central States Health & Life	33,301	3.5%
Cherokee National Life	12,326	1.3%
CUNA Mutual Group	45,213	4.7%
Lyndon Life	17,925	1.9%
North Central	37,164	3.9%
Plateau Group, Inc.	10,942	1.1%
Protective Insurance Group	70,628	7.3%
Resource Dealer Group	101,758	10.6%
Trans-City Life	5,132	0.5%
Universal Underwriters Group	53,835	5.6%
Total	962,819	100.0%

In addition to the companies listed above, we obtained public information on the following companies:

Table 1a
Additional Companies Included in Analysis
(in addition to those listed above)

	1997 Single Premium Written (000)
American Heritage	63,564
American National	80,958
JMIC LIC	55,197
Life Investors	50,808

Methodology

From A/T Claim Ratios to Policy Reserves

Since policy reserves represent the difference between future premiums and future benefits, the transition is straightforward. We are working with a single premium product; the policy reserve is equal to future benefits. Thus, as we worked with actual to expected claim costs, we were also working with actual to expected policy reserves.

Each company writing credit disability insurance is required to file the Credit Insurance Experience Exhibit annually. Data from this exhibit is released each year by the NAIC. We used this data to identify prima facie loss ratios for each company in the study for each of the years 1992 to 1996 for each of the five elimination plans common in the credit disability insurance industry. These were the 7 day retroactive elimination plan, the 14 day elimination plan, the 14 day retroactive elimination plan, the 30 day elimination plan and the 30 day retroactive elimination plan. We only analyzed single premium data because we are developing a policy reserve recommendation, so did not consider monthly premium experience. We developed a table of prima facie rates by state, by plan, by duration to develop a single average rate for each company each year for each plan. When multiplied by the loss ratio this rate then produces a claim cost, i.e. claims divided by coverage. In this case coverage is per $100 Initial Insured Indebtedness. Based upon each company's distribution of business issued by age and term, we could then develop expected claim costs from the 1985 CIDA. By comparing actual claim costs to expected claim costs, we obtained actual to expected ratios. The process used for each company parallels the process initially developed in the paper "A Credit Disability Morbidity Table". A detailed explanation of the process we used is contained in Appendix 4.

Having developed actual to expected ratios for each company, we could work with the distribution by company and develop an appropriate margin. However, when we examined these ratios, we discovered an anomaly in the results. The ratios for the 30 day plans were significantly higher than for the 7 day plans and 14 day plans. We recognize several potential explanations for this. The credit union market tends to have higher claims and uses primarily 30 day plans. In addition, many companies will reduce the level of benefits as an underwriting tool for cases with poor experience by changing plans. These explanations were partially confirmed by examination of the companies in the sample. Companies writing significant credit union business had higher overall ratios. The 14 and 30 day elimination plans had higher ratios than the respective retro plans, exhibiting the underwriting result mentioned.

We then decided to develop actual to expected ratios for the 30 day plans based upon the 14 day tables of the 85 CIDA. This provided much more consistent results. Appendix 5 contains an addendum to the paper that addresses this change.

Margins

Purpose

The fundamental premise of a minimum valuation table for statutory accounting is that of solvency. Since this report is recommending a change to the category of reserves labeled contract reserves, the issue of "solvency" here relates to the level of security insureds have that a company will have enough money to pay them over the period for which benefit payments are guaranteed. The product is a single premium product so solvency is measured under the circumstances that no future revenue sources are available to fund the claim obligations.

Margins are needed in a valuation table so that application of that table will establish a minimum reserve that not only covers the most likely runoff of claim payment obligations, but also covers a level of moderately adverse variation that is not altogether unlikely to occur. Furthermore, since all companies will be subject to the same valuation standard, margins are needed to provide assurance that the standard table will provide enough reserve to cover the needs of companies with experience that adversely deviates from that underlying the standard table.

As described in other sections of this report, the analysis performed to reach our recommendation was based on a collection of data that represented **actual** experience of each of those companies, i.e., not a collection of companies' conservative estimate of their experience. To develop a margin recommendation, we looked at the distribution of actual to expected results, and chose a margin that would result in an acceptable distribution within this sample.

Margin Objectives

As noted before, we relied upon the procedures developed by the IDI subcommittee to evaluate appropriate margins. As noted in their report:

> "…one purpose of a margin is to cover a level of unfavorable variation within a company that is not altogether unlikely to occur. There is little accepted precedence in actuarial literature, particularly regulatory actuarial literature, that quantifies what this level is. We know that it is not meant to cover the remotest of adverse variation one could ever conceive (no company would be in business), nor is it to cover the remote predictable variations (protection from "remote predictable variations" is a role for surplus).

> Likewise, there is no published information on dealing with the second purpose for margins, variation in experience by company, in the construction of a valuation table. These variations can be and are substantial for both disability income and life insurance. It seems that the construction of the table should reflect these differences."

The IDI subcommittee developed three criteria for margin development, only one of which applied to our study. We then added two others specific to our study. These three criteria are:

> 1. The resultant reserve, for a typically profiled company, is to be greater than the experience based estimate of the reserve liability for 85% of companies in our sample.

> 2. The resultant reserve is to be greater than the experience based estimate of the reserve liability for 85% of the volume of business in our sample

> 3. The resultant margins should apply by plan of business as well as in total.

As was the case with the IDI subcommittee, our goals are expressed in terms of the margin in the *reserves,* or claim costs, produced by the morbidity table and not those in the table itself. Consequently, the use of reserves and claim costs drove our selection of a margin methodology.

Establishing the Margin

Since, as previously noted, our target objective called for margins to be measured relative to individual company experience by plan, the first step in establishing the margin was to determine actual to expected claims by plan by company.

Unlike the IDI study, we only need to adjust one factor in each table to create a valuation table. With an active life reserve it is possible to adjust the incidence rate to accomplish an appropriate load. With the disabled life reserve studied by the IDI, each termination rate needed potential adjustment. A discussion of how our margin development process differed from that employed by the IDI subcommittee is contained in Appendix 3.

We looked at the distribution of actual to expected ratios and chose a ratio that exceeded the actual to expected ratios of 85% of the contributing companies. The factor 1.12 covered 85% of the companies for the 14 day elimination plan. This factor was higher than the factor for any other plan. We chose to use the one factor, so that claim costs would not be inconsistent between plans. It is inappropriate to have a standard that says the claim costs are lower for a plan that provides greater benefits. Obviously, a plan that provides benefits beginning on the fourteenth day should be more expensive than a plan providing benefits beginning on the thirtieth day. The number of companies not covered by 1.12 for each plan is illustrated below.

Plan	7r	14r	30r	14e	30e	Aggregate
Number of Companies	1	1	2	2	2	1

The premium volume for these companies in these plans over the five years was $157 million compared to $2,811 million for all the sampled companies, less than 6%, indicating that our margin recommendation meets the 85% of premium volume goal as well the number of companies goal.

In reviewing the information on the size of the margins in the loaded table it is important to keep the following considerations in mind:

> *1.* We are not measuring the recommended loaded (for margins) table against the exact experience for a company. We were able to identify the unique distribution of business by age and term for each of the 17 studied companies. For the additional

four companies, we used the aggregate distribution by age and term from the studied companies. In developing expected claims we also used the distribution by gender and occupation from the paper. We were able to obtain the unique distribution by gender and occupation for one company, and incorporated this additional information into our analysis. Thus, we have made some assumptions about the companies' distribution of business in constructing the expected claim costs. In addition, to develop actual claim costs, we used the distribution of business by state and term to develop a single rate for each company for each plan and each year. Applying the loss ratio to this rate developed a claim cost. We deemed the error with these assumptions to be relatively insignificant.

2. We did not explicitly consider the effect of interest in our margin recommendation. Unlike individual disability income insurance, the duration of credit disability insurance is relatively short. Most credit disability insurance is written for terms of 5 years or less so that the difference between valuation interest rates and experience interest rates will have only a minimal effect on reserves. Most individual disability income insurance is written "to age 65". We do feel that interest discounting should be allowed in this new standard.

3. We did not explicitly consider the impact of mortality in our margin recommendation. The premium is refunded upon the death of the insured, so no reserve discount should be allowed. This benefit can be incorporated in the valuation actuary's test of the comparison of this reserve to the liability required for refund of the premium.

4. We developed actual to expected values based upon the 85CIDA. We did not use the 85CIDC because we are evaluating policy reserves. The IDI subcommittee specifically recommended that the 85CIDA continue to be used for policy reserves.

Study of Impact

To study the potential impact of this recommendation on the level of reserves held by companies, the committee compared the aggregate actual to expected ratio of .782 developed in the study to the nationwide loss ratio. The actual to expected ratio implies that actual claims experienced by the industry would be 78.2% of those claims that would be anticipated if claims mirrored 85CIDA experience. The nationwide prima facie credit disability loss ratio is approximately 50%. Thus approximately one half current unearned premium reserves is required to satisfy claims. We can then assert that 78.2 % of the 85CIDA represents 50% of current gross unearned premium reserves. That is, claims equal both 50% of unearned premiums, and 78.2% of the 85CIDA. If the recommended factor of 1.12 is adopted, then the morbidity reserve would be approximately 72% of current gross unearned premium reserves, ((1.12 / .782) = (.72 / .50)). Thus, if adopted, we anticipate that 28% of current unearned premium reserves could be released. Even so, the margin implicit in our recommendation would still be 44% of expected results, ((.72 / .50) = 1.44). As previously noted, the valuation actuary would also need to conduct a refund liability test. Thus the impact could be smaller.

Recommendations

All members of the Task Force, collectively and individually, endorse the findings in this report. No adverse opinions have been excluded. As a result of our work, the Task Force makes the following recommendations:

- A new morbidity standard for valuation of policy reserves should be adopted based on the tables developed by this Task Force. These tables are developed from the 85CIDA tables with incidence rates increased by 12%. For 7 Day plans, the 7 Day table should be used. For all other plans, the 14 Day tables should be used.
- It is uncommon for an insurance company to maintain information on its credit insurance certificate holders relative to gender and occupation. Where a company has specific demographic information on its insureds, this information should be used in valuing its liabilities. In the absence of such additional information, the company should rely upon the industry demographic data developed in the paper.
- In the long term, a continuing credit disability study should be undertaken by the Society of Actuaries in order to monitor experience under this standard.
- Appropriate revision should be made to the Health Insurance Reserves Model Regulation and Statements of Statutory Accounting Principles to enable this change. Drafting notes will be required since many states do not specifically address credit insurance reserves in their laws or regulations.
- Appropriate revision should be made to Actuarial Standards of Practice to enable this change.
- No change should be made in claim reserve standards at this time.

Appendix 1

Actual to Expected Ratios by Company
Using 85CIDA as the Base

Plan	Comp A	Comp B	Comp D	Comp F	Comp G	Comp H
7 Day Retro	57.9	76.1	-	81.4	53.9	78.4
14 Day Retro	57.9	82.6	51.8	81.6	78.1	86.6
30 Day Retro	64.9	88.9	-	97.9	97.1	77.8
14 Day Elim	-	-	-	-	-	-
30 Day Elim	-	80.0	-	71.0	-	96.5
Total	59.2	81.0	51.8	81.8	64.7	85.9

Plan	Comp I	Comp J	Comp K	Comp L	Comp M	Comp N
7 Day Retro	78.5	60.5	-	79.8	73.2	-
14 Day Retro	86.9	78.7	86.4	90.3	63.5	91.0
30 Day Retro	-	52.1	100.7	86.1	70.8	-
14 Day Elim	107.8	-	105.9	-	81.6	96.4
30 Day Elim	-	-	113.2	-	117.5	-
Total	87.4	71.2	106.7	86.3	64.8	91.3

Plan	Comp O	Comp P	Comp Q	Comp R	Comp S	SubTot
7 Day Retro	67.9	78.2	114.8	63.3	62.2	67.0
14 Day Retro	71.8	71.2	113.2	72.4	80.3	78.6
30 Day Retro	-	65.5	127.7	95.3	204.6	87.6
14 Day Elim	61.9	71.0	132.4	111.5	113.1	100.4
30 Day Elim	-	60.9	102.5	79.9	47.7	101.0
Total	69.8	71.8	115.1	71.7	73.4	78.1

Plan	Comp W	Comp X	Comp Y	Comp Z		Total
7 Day Retro	57.0	74.5	57.2	78.7		67.7
14 Day Retro	80.8	81.7	67.4	88.0		79.0
30 Day Retro	104.1	94.2	55.9	109.4		87.9
14 Day Elim	105.1	105.4	-	-		101.6
30 Day Elim	83.5	85.5	-	44.6		99.2
Total	84.6	79.6	62.2	84.6		78.2

Appendix 2
Credit Disability Refund Liability

Overview

We are developing a morbidity table that will be the valuation standard for credit disability policy reserves. This method will replace the unearned premium reserve standard, much like mortality reserves replace unearned premium reserves for credit life insurance. SSAP 59 will need to be revised to allow the credit morbidity reserve to replace the unearned premium reserve. For credit life insurance there is a secondary test that will automatically apply to credit disability. It reads, "In addition, for all credit contracts in aggregate, if the premium refund liability exceeds the aggregate recorded reserve, an additional liability shall be established. This premium refund (excess) liability may include consideration of commissions, premium tax, and other expenses recoverable."

Some actuaries have compared the refund liability to ordinary life insurance where the company holds the greater of the policy reserve or the cash surrender value. The cash value of an individual ordinary life policy is a contractual policy benefit. It is based on an established mortality table and the age and duration of the policyholder. The refund liability of a credit disability certificate is not a policy benefit. It is a premium refund and the commission, service fee expenses and taxes are contractually recoverable. Thus, the refund liability should recognize these recoverables. A reserve standard that requires the company to set up, at the minimum, the full unearned premium reserve without an offset for commissions, expenses and taxes that are recoverable results in a grossly redundant reserve.

While the responsibility for compliance with the revised SSAP will lie with the individual company, it is desirable that the morbidity standard generally satisfy the premium refund liability without establishment of additional reserves. The table would be less effective as a reserve standard if additional reserves were routinely established to satisfy the premium refund liability requirement. The following study demonstrates that, in aggregate, the industry-wide morbidity reserve will satisfy this requirement. This study in no way is intended to relieve an individual company actuary from independent verification of reserve adequacy relative to premium refund liability.

Refund Liability Study

A study was run to determine the aggregate net refund liability for credit disability insurance. The same calendar year period that is the basis for the credit disability morbidity table was selected, 1992 through 1996. Credit insurance companies prepare the Credit Insurance Experience Exhibit (CIEE) as part of their annual statement. Diskettes containing the state experience are provided to the NAIC and formatted and distributed by CreditRe Corporation. This data was analyzed to determine net refund liability.

For the total credit insurance industry the net advance commission and service fee component as a percentage of net written premiums for single premium credit disability insurance was:

Year	Net Written Premium	Commissions & Service Fees
1992	$1,367,121,827	32%
1993	1,467,697,037	34%
1994	1,846,558,346	35%
1995	1,823,715,665	35%
1996	1,652,581,639	34%

Lapse Study

Then an aggregate lapse study based on the credit disability single premium experience of the industry was developed. Only the 5 plans were studied; 7 day retroactive elimination period, 14 day retroactive elimination period, 14 day elimination period, 30 day retroactive elimination and 30 day elimination period. The premium refunded each month was assumed to be taken from the prior month's unearned premium reserve. The unearned premium reserve was assumed to grow linearly throughout the year. A level monthly lapse rate was determined for each plan and year with totals by plan and for the total book of business. The results by plan and all plans combined are:

Plan	Monthly Lapse Rate
7 day retro	2.2%
14 day elim	2.3%
14 day retro	2.0%
30 day elim	1.4%
30 day retro	1.7%
All 5 plans	2.0%

Model Refunds

For each plan a model was created to determine the amount of initial premium that will be refunded over the life of a certificate, assuming the above level monthly lapse rates. The new business distribution of in force by the initial term in months came from the original new business study. The prima facie rate per $100 of initial insured indebtedness by term is the weighted prima facie rates for the five year period which also came from the original study. The unearned premium reserve is computed as the mean of the pro rata and rule of 78 methods. If n equals original term in months and t = remaining term in months then;

pro rata unearned premium reserve factor $= t / n$

rule of "78" unearned premium reserve factor $= [t * (t + 1)] / [n * (n + 1)]$

Premiums were assumed to be refunded based on the mean unearned premium reserve method which also approximates refunding on rule of anticipation. For the entire study the premium refunded equals 31.4% of the original premium issued. The following details the results of the individual plan models.

Plan	Initial Insurance in '000	Original Premium	Premium Refund Rate
7 day retro	4,054,834	196,490,276	32.0%
14 day retro	17,619,466	723,612,529	31.7%
30 day retro	459,415	17,296,318	28.9%
30 day elimination	1,596,763	44,571,123	25.6%
14 day elimination	645,356	23,005,494	31.8%
all five plans	24,375,834	1,004,975,739	31.4%

Results

Assuming premium taxes represent 2% of premium and commission and service fees of 34% are available to be charged back to producers, the net liability owed by the company on every dollar refunded is roughly $1.00 – ($0.34 + $0.02) or $0.64. It is apparent that the aggregate refund liability is less than the 72% of unearned premiums that we estimate would be held as a morbidity based reserve. This sufficiency is reinforced by the fact that not every contract results in a premium refund. Indeed, 68.6% of the premium is eventually earned. In practice, it is appropriate that each company establish the morbidity reserve, and then to identify if additional refund liability is required.

Appendix 3
Differences in Margin Development
Compared to Individual Disability Income Subcommittee Report

The IDI study had to deal with termination rates at each duration for each plan. Our study dealt with incidence rates for each plan. The IDI committee wanted the termination rate adjustment factors to be loaded by a factor that represented a constant proportion of the standard deviation of reserves produced by the experience of the 15 companies studied. This desire was driven by their goal that margins should be proportional to the variance around the mean experience of these companies. Once the IDI committee determined the standard deviation of reserves for each company, they translated the result to adjustments to termination rates. But these adjustments were an array of values, with the goal that they be proportional to variance of the company results. Our adjustment was a single factor to be applied to the incidence rate, and thus by definition would be proportional to the variance of company results.

The Task Force considered making an adjustment to the incidence rates by plan that would be a constant proportion of the standard deviation by plan, but the result would have caused discontinuity between plans. It was important that claim costs between plans exhibit obvious characteristics. A plan that provided greater benefits should have a higher claim cost. We could not recommend a set of adjustment factors that would cause a 14 day elimination period plan to have higher claim costs than a 14 day retroactive elimination period plan. Nor could the adjustment factors cause a 30 day plan to have higher claim costs than a 14 day plan.

Therefore, the Task Force was able to move directly from the evaluation of actual to expected ratios by company to determine a ratio that would cover 85% of the companies in the study. That factor could then be directly applied to the incidence rates for each plan. The array of actual to expected factors covering 85% of the companies by plan follows:

7 Day Retro	14 Day Retro	30 Day Retro	14 Day Elim	30 Day Elim	Aggregate
.798	.903	1.094	1.115	1.025	.913

Based upon the preceding, we chose to adjust incidence rates by the factor 1.12, i.e. increase incidence rates 12%. This also increases calculated reserves by 12%. This factor of 1.12 exceeds the factor for the 14 day elim plan, which developed the highest ratio in the study. It is interesting to note the size of the margin in terms of the standard deviation of the actual to expected ratio. The standard deviation is identified in the first row. The margin of 1.12 over the total experience of the studied companies, (found in Appendix 1), is shown in row two. For example, 1.12 - .677 is .443 and represents the total margin this factor develops for 7 day retro plans. That margin divided by the standard deviation is in the third row, that is the number of standard deviations the margin represents.

Plan	7 Day Retro	14 Day Retro	30 Day Retro	14 Day Elim	30 Day Elim	Aggregate
Std. Dev.	.143	.131	.349	.204	.234	.152
Margin	.443	.330	.241	.104	.128	.338
Ratio	3.10	2.51	0.69	0.51	0.55	2.23

The relationship for the plan determining the margin, 14 day elimination period, is 51% of the standard deviation. The IDI subcommittee, by comparison, used 40% of the standard deviation as its margin adjustment. In their study 40% of one standard deviation provided sufficient margin to cover 85% of the contributing companies. We are using a margin recommendation that is equal to over two standard deviations of the aggregate experience of the contributing companies, primarily because we have added an additional criterion. We wanted to cover 85% of the contributing companies, not only in aggregate, but also by plan.

We performed a Monte Carlo analysis of the inherent variance in the 85CIDA, and found the variance to be smaller than the variance between companies. The IDI committee obtained similar results in their study. This is consistent with expectations, as different companies market to different customers, and use different underwriting standards. We believe it is appropriate to develop valuation standards based upon variance among companies, rather than the theoretical variance of the underlying morbidity table.

Appendix 4
Detailed Methodology

We will show a sample calculation for one company in our study to demonstrate our methodology. We will show snapshots of the information at each stage in development. The result sheet for company M serves as a guide, as we see where the information came from for the various cells.

Company M
Actual Versus Expected Claim Cost

Plan	Year	P.F. Earn. Premium	Incurred Losses	Loss Ratio	Weighted Rate	Actual Claims	Expected Claims	A to E Ratio
7 Retro	1992	862,130	419,144	48.6%	5.783	2.811	2.905	96.8%
	1993	974,204	507,846	52.1%	5.651	2.946	2.905	101.4%
	1994	1,362,015	522,299	38.3%	5.581	2.140	2.905	73.7%
	1995	1,922,900	721,410	37.5%	5.469	2.052	2.905	70.6%
	1996	2,172,265	612,854	28.2%	5.459	1.540	2.905	53.0%
	Total	7,293,514	2,783,553	38.2%	5.548	2.118	2.905	72.9%
14 Retro	1992	11,109,770	4,617,699	41.6%	4.244	1.764	2.663	66.2%
	1993	10,857,455	5,357,236	49.3%	4.205	2.075	2.663	77.9%
Break in display of worksheet								
30 Elim	1992	43,281	32,667	75.5%	3.184	2.403	2.164	111.1%
	1993	46,934	42,320	90.2%	3.133	2.825	2.164	130.5%
	1994	62,015	71,890	115.9%	3.176	3.681	2.164	170.1%
	1995	89,871	83,543	93.0%	3.064	2.848	2.164	131.6%
	1996	101,265	52,227	51.6%	2.918	1.505	2.164	69.5%
	Total	343,366	282,647	82.3%	3.066	2.523	2.164	116.6%
All		76,681,561	31,095,143	40.6%	4.296	1.742	2.682	65.0%

To evaluate a company we first went to the CIEE data for that company. As noted, we looked at each plan in each state for each of the 5 years 1992 to 1996. In the table above we note that premium and claims for 1996 for the 30 day elimination plan are 101,265 and 52,227 respectively. These numbers were taken from the sum of all the states for this plan, as shown in the next chart.

The weighted rate developed for this plan for 1996, 2.918, is found at the bottom of the next chart. This is the product sum of the previous two rows, the proportionate distribution by term for company M, and the weighted rate by term. The rate by term is weighted by each state's proportion of the earned premium for company M.

30e	1996		30 Day Elimination Period Rate Per $100 Initial Insured Indebtedness					
State	Prima Facie Earned Prem.	Incurred Losses	6	12	18	24	30	36
CA	29399	3874	0.81	1.50	1.99	2.45	2.87	3.28
CO	3865	5241	0.36	0.72	1.08	1.44	1.80	2.16
IA	29703	31005	0.35	0.69	1.03	1.37	1.72	2.06
IL	13816	10782	0.80	1.15	1.40	1.65	1.90	2.10
IN	160	0	0.75	1.15	1.30	1.50	1.75	2.05
KS	8616	2472	0.40	0.80	1.20	1.60	2.00	2.40
MT	67	0	0.41	0.77	1.13	1.49	1.85	2.16
NE	10087	665	0.75	0.75	1.05	1.05	1.30	1.30
OR	872	-1812	0.64	1.17	1.56	1.93	2.26	2.58
SD	369	0	0.36	0.72	1.08	1.44	1.80	2.16
WA	16	0	0.40	0.80	1.20	1.60	2.00	2.40
WI	119	0	0.69	1.18	1.50	1.69	1.82	1.93
WY	4176	0	0.40	0.80	1.20	1.60	2.00	2.40
Total	**101,265**	**52,227**	0.60	1.01	1.39	1.73	2.08	2.39
Distribution			0.2%	2.0%	1.9%	8.6%	4.2%	21.3%
Weighted Rate		2.918						

The rate by term was determined for each state and year in the study, and changed if a state changed rates during the period of the study. (The rates shown for California are a result of weighting the various class rates in their regulation by the distribution across all companies.) The distribution of business by term came from data submitted by each company on new business issued in 1997.

Company - M
Credit Disability Exposure By Age and Plan
Exposure Is Gross Insured Indebtedness Issued In 1997 (in ' 000)

30 Day Elimination Period

Term/Age	Age 22	Age 27	Age 32	Age 37	Age 42	Age 47	Age 52	Age 57	Age 62	Age 67	Total	
							Expected Claim Cost with aging				2.164	
6	12	10	1	7	1	3	3	-	4	-	41	0.2%
12	64	101	41	62	55	24	23	15	2	1	388	2.0%
18	68	48	64	58	41	29	30	19	12	-	369	1.9%
24	287	243	229	260	232	189	148	45	59	-	1,692	8.6%
30	128	129	100	126	134	107	63	41	5	-	833	4.2%
36	510	506	553	570	531	576	408	332	195	5	4,186	21.3%
48	492	341	430	431	525	365	325	242	165	-	3,316	16.9%
60	701	431	619	933	835	1,154	806	636	246	38	6,399	32.5%
72	82	31	-	7	99	45	164	87	34	-	549	2.8%
84	27	45	44	72	-	163	56	175	136	-	718	3.7%
96	-	-	42	9	68	42	7	72	18	-	258	1.3%
108	-	-	-	-	77	-	-	96	-	-	173	0.9%
120	-	-	34	75	73	189	148	190	32	-	741	3.8%
Total	2,371	1,885	2,157	2,610	2,671	2,886	2,181	1,950	908	44	19,663	100.0%

This table also displays the expected claim cost of 2.164. The table is set up identical to the claim cost tables developed in the paper. The claim cost from the paper at each age and term cell is weighted by the exposure for that cell to develop the expected claim cost of 2.164.

Returning to the first chart, all the data has been developed to calculate the actual to expected ratio. Claims divided by premium develop a loss ratio in the third column. The loss ratio multiplied by the weighted rate develops actual claims in the fifth column. Actual claims divided by expected claims develop the actual to expected ratio in the seventh column.

Appendix 5
A Credit Disability Morbidity Table
Addendum by Robert Butler, Christopher Hause and Steve Ostlund

The original paper compared actual credit disability experience to expected claim costs computed from composite gender and occupation tables derived from the 1985 Commissioner Individual Disability Table. Essentially there are 4 distinct tables based on 7, 14, 30 and 90 day elimination periods. The overall fit was good but these tables produced claims costs that were lower than actual experience for the 30 day plans. A committee of interested actuaries was formed to determine the proper loading to the base tables to create an appropriate valuation table. Variations in individual companies' experience were reviewed to select the loading. A number of companies had significant experience in the 30 day plans. We found it necessary to deal with the problem for the 30 day plans. A special loading to the 30 day table was considered but this was rejected since it could result in anomalies where a 30 day elimination period plan could cost more than an equivalent 14 or 7 day elimination period.

Instead we re-computed the cost for 30 day plans using the 14 day table and found the cost of the 30 day plans increased 30 to 35%. The 14 day incidence rate less the terminations from 14 days to 30 days left a number of disabled lives at 30 days duration that is greater than the 30 day incidence rates. We found this approach produced a more uniform set of costs by plan. In a sense we agreed to replace the 30 day basic table with a 14 day table. These new sets of tables are now the basis for the valuation table.

Following is a comparison of the overall costs of the 5 plans from the original paper to the new recommended basic tables.

Original Study

Plan	Prima Facie Premium Distribution	New Table Net Single Premiums Assuming		1992 - 1996 Experience Claim Cost	68 NAIC Net Single Premium
		No Aging	Aging		
7-day retroactive	16.2%	2.67	2.77	1.96	n/a
14-day retroactive	70.4%	2.40	2.52	2.10	2.26
14-day elimination	2.9%	1.97	2.06	2.35	2.00
30-day retroactive	5.7%	1.70	1.80	2.36	1.51
30-day elimination	4.8%	1.38	1.47	2.08	1.24
Total	100.0%	2.34	2.46	2.10	n/a

Revised (30 day costs based on 14 day table)

Plan	Prima Facie Premium Distribution	New Table Net Single Premiums Assuming		1992 - 1996 Experience Claim Cost	68 NAIC Net Single Premium
		No Aging	Aging		
7-day retroactive	16.2%	2.67	2.77	1.96	n/a
14-day retroactive	70.4%	2.40	2.52	2.10	2.26
14-day elimination	2.9%	1.97	2.06	2.35	2.00
30-day retroactive	5.7%	2.31	2.43	2.36	1.51
30-day elimination	4.8%	1.82	1.93	2.08	1.24
Total	100.0%	2.40	2.51	2.10	n/a

The actual to expected is now 83.7%, (2.10 / 2.51) as opposed to 85.4%. Although the overall change is small this does solve the problem of appropriate loading for several companies. A revised exhibit containing age specific claim costs for the 30 day plans based upon the 14 day tables follows:

Credit Disability Table Based On 1985 CIDA
Using 14 Day Incidence & Termination Rates
Basic Experience Table

Blending:	70.0% Male		30.0% Female	
Occupation Class	Class 1	Class 2	Class 3	Class 4
Male	26.8%	19.5%	29.1%	24.7%
Female	30.7%	40.8%	19.6%	8.8%

Single Premium Claim Cost Per $100 Initial Insured Indebtedness (30 Day Retroactive Period Plan)
Claim Cost Advanced 1 Age For Each Year of Coverage By Linear Interpolation

Duration In Months	Age 22	Age 27	Age 32	Age 37	Age 42	Age 47	Age 52	Age 57	Age 62	Age 67	Weighted Total	Term Weights
6	0.715	0.768	0.860	0.955	1.047	1.137	1.239	1.380	1.602	1.883	1.008	0.5%
12	0.949	1.025	1.153	1.292	1.432	1.580	1.754	2.000	2.400	2.924	1.390	2.6%
18	1.075	1.168	1.319	1.485	1.660	1.852	2.089	2.430	2.986	3.723	1.624	2.9%
24	1.161	1.268	1.438	1.627	1.833	2.067	2.363	2.797	3.501	4.434	1.806	6.4%
30	1.228	1.349	1.536	1.747	1.982	2.257	2.612	3.138	3.986	5.104	1.965	3.7%
36	1.284	1.418	1.621	1.853	2.117	2.433	2.847	3.468	4.458	5.752	2.112	14.5%
48	1.375	1.537	1.772	2.046	2.369	2.766	3.301	4.113	5.387	7.017	2.386	17.2%
60	1.452	1.642	1.909	2.226	2.606	3.087	3.746	4.756	6.311	8.256	2.647	43.5%
72	1.521	1.740	2.039	2.399	2.839	3.405	4.191	5.404	7.238	9.476	2.905	3.0%
84	1.588	1.834	2.167	2.570	3.072	3.725	4.643	6.062	8.169	10.678	3.163	2.8%
96	1.654	1.928	2.293	2.742	3.308	4.053	5.108	6.737	9.103	11.861	3.424	0.2%
108	1.721	2.022	2.422	2.917	3.548	4.388	5.589	7.428	10.037	13.025	3.692	0.1%
120	1.789	2.118	2.552	3.096	3.795	4.734	6.085	8.134	10.971	14.167	3.964	2.5%
Weighting	11.1%	12.5%	13.5%	14.8%	14.7%	13.3%	10.5%	6.8%	2.7%	0.2%	2.43	100.0%

Single Premium Claim Cost Per $100 Initial Insured Indebtedness (30 Day Retroactive Period Plan)
Attained Age Remains Constant Throughout Term Of Coverage

Duration In Months	Age 22	Age 27	Age 32	Age 37	Age 42	Age 47	Age 52	Age 57	Age 62	Age 67	Weighted Total	Term Weights
6	0.715	0.768	0.860	0.955	1.047	1.137	1.239	1.380	1.602	1.883	1.008	0.5%
12	0.949	1.025	1.153	1.292	1.432	1.580	1.754	2.000	2.400	2.924	1.390	2.6%
18	1.072	1.162	1.313	1.479	1.654	1.846	2.079	2.415	2.967	3.704	1.617	2.9%
24	1.154	1.255	1.424	1.613	1.819	2.050	2.338	2.757	3.448	4.382	1.789	6.4%
30	1.215	1.327	1.512	1.722	1.955	2.224	2.566	3.063	3.887	5.004	1.933	3.7%
36	1.265	1.387	1.587	1.816	2.077	2.383	2.775	3.349	4.299	5.593	2.063	14.5%
48	1.343	1.484	1.712	1.980	2.292	2.669	3.161	3.881	5.073	6.703	2.294	17.2%
60	1.404	1.563	1.818	2.122	2.485	2.931	3.519	4.380	5.799	7.745	2.502	43.5%
72	1.455	1.631	1.913	2.252	2.664	3.177	3.858	4.854	6.487	8.726	2.695	3.0%
84	1.499	1.693	2.000	2.374	2.833	3.411	4.182	5.307	7.142	9.651	2.878	2.8%
96	1.539	1.750	2.081	2.489	2.994	3.636	4.494	5.743	7.765	10.523	3.052	0.2%
108	1.576	1.803	2.159	2.599	3.150	3.854	4.796	6.162	8.357	11.345	3.219	0.1%
120	1.610	1.853	2.233	2.705	3.300	4.065	5.088	6.565	8.921	12.117	3.379	2.5%
Weighting	11.1%	12.5%	13.5%	14.8%	14.7%	13.3%	10.5%	6.8%	2.7%	0.2%	2.31	100.0%

Single Premium Claim Cost Per $100 Initial Insured Indebtedness (30 Day Elimination Period Plan)
Claim Cost Advanced 1 Age For Each Year of Coverage By Linear Interpolation

Duration In Months	Age 22	Age 27	Age 32	Age 37	Age 42	Age 47	Age 52	Age 57	Age 62	Age 67	Weighted Total	Term Weights
6	0.384	0.416	0.470	0.528	0.585	0.645	0.713	0.809	0.963	1.163	0.566	0.4%
12	0.585	0.638	0.725	0.822	0.925	1.038	1.372	1.372	1.696	2.131	0.904	2.3%
18	0.699	0.767	0.875	0.999	1.135	1.292	1.490	1.778	2.255	2.900	1.121	1.7%
24	0.778	0.859	0.986	1.132	1.299	1.497	1.753	2.132	2.756	3.596	1.294	5.3%
30	0.840	0.934	1.078	1.245	1.441	1.679	1.994	2.464	3.230	4.254	1.446	2.2%
36	0.893	0.999	1.158	1.347	1.572	1.851	2.224	2.786	3.693	4.893	1.587	15.0%
48	0.979	1.111	1.302	1.533	1.816	2.175	2.668	3.418	4.607	6.142	1.853	19.3%
60	1.052	1.210	1.432	1.706	2.048	2.490	3.105	4.050	5.518	7.368	2.108	43.0%
72	1.117	1.302	1.557	1.874	2.275	2.802	3.542	4.688	6.434	8.576	2.360	6.8%
84	1.180	1.391	1.678	2.040	2.503	3.117	3.987	5.337	7.353	9.767	2.612	0.9%
96	1.242	1.479	1.800	2.207	2.734	3.439	4.444	6.001	8.276	10.939	2.868	0.2%
108	1.305	1.569	1.924	2.378	2.970	3.770	4.917	6.682	9.200	12.091	3.129	0.1%
120	1.369	1.659	2.050	2.552	3.212	4.110	5.406	7.379	10.123	13.223	3.397	2.8%
Weighting	11.1%	12.5%	13.5%	14.8%	14.7%	13.3%	10.5%	6.8%	2.7%	0.2%	1.93	100.0%

Single Premium Claim Cost Per $100 Initial Insured Indebtedness (30 Day Elimination Period Plan)
Attained Age Remains Constant Throughout Term Of Coverage

Duration In Months	Age 22	Age 27	Age 32	Age 37	Age 42	Age 47	Age 52	Age 57	Age 62	Age 67	Weighted Total	Term Weights
6	0.384	0.416	0.470	0.528	0.585	0.645	0.713	0.809	0.963	1.163	0.566	0.4%
12	0.585	0.638	0.725	0.822	0.925	1.038	1.175	1.372	1.696	2.131	0.904	2.3%
18	0.696	0.763	0.871	0.995	1.132	1.287	1.483	1.768	2.242	2.887	1.116	1.7%
24	0.773	0.851	0.976	1.122	1.288	1.483	1.733	2.100	2.713	3.553	1.280	5.3%
30	0.831	0.919	1.060	1.226	1.420	1.653	1.956	2.401	3.145	4.168	1.421	2.2%
36	0.879	0.977	1.132	1.318	1.539	1.808	2.162	2.683	3.552	4.752	1.547	15.0%
48	0.954	1.071	1.254	1.478	1.750	2.091	2.543	3.210	4.321	5.856	1.774	19.3%
60	1.013	1.148	1.359	1.618	1.941	2.350	2.898	3.706	5.044	6.894	1.980	43.0%
72	1.063	1.215	1.452	1.747	2.118	2.594	3.235	4.178	5.730	7.873	2.172	6.8%
84	1.106	1.276	1.538	1.867	2.286	2.827	3.558	4.630	6.383	8.796	2.354	0.9%
96	1.145	1.332	1.619	1.982	2.447	3.052	3.870	5.065	7.005	9.667	2.527	0.2%
108	1.182	1.385	1.696	2.091	2.601	3.268	4.171	5.483	7.597	10.488	2.693	0.1%
120	1.216	1.435	1.769	2.197	2.752	3.479	4.462	5.886	8.160	11.260	2.853	2.8%
Weighting	11.1%	12.5%	13.5%	14.8%	14.7%	13.3%	10.5%	6.8%	2.7%	0.2%	1.82	100.0%