UNIVERSAL LIFE CASH FLOW ANALYSIS - A CASE STUDY
Michael R. Tuohy: Tillinghast, Nelson & Warren, Inc.

STATEMENT OF ACTUARIAL OPINION
Statutory Annual Statement of the
Mismatch Life Insurance Company
For the Year Ended December 31, 1990

I, Ernie D. Spread, am Vice President and Actuary for Mismatch Life Insurance
Company in the state of Domicile, and am a member of the American Academy of
Actuaries and meet its qualifications to act as a Valuation Actuary. In a
letter to the NAIC Valuation Actuary Bureau dated July 4, 1990, I was
appointed by the Board of Directors of Mismatch Life Insurance Company to
write this Actuarial Opinion. A copy of the Board's resolution, dated July 4,
1990, was enclosed with the letter.

I have examined the actuarial assumptions and actuarial methods used in
determining policy reserves and related actuarial items, as listed below, as
shown in the Annual Statement of the Company, as prepared for filing with
state regulatory officials, as of December 31, 1990.

(i)	Aggregate Reserve for Life Policies and Contracts (Exhibit 8)	1,235,346
(ii)	Aggregate Reserve for Accident and Health Policies (Exhibit 9)	0
(iii)	Net Deferred and Uncollected Premiums (Page 2, Line 17)	0
(iv)	Policy and Contract Claims - Liability End of Current Year Incurred by Unreported (Exhibit 11, Part 1, Line 3)	0

I have considered the provisions of the Company's in-force policies and the
related administrative expenses. I have considered any reinsurance agreements
pertaining to the policies, the interest-crediting philosophy, the
characteristics of the Company's assets, and the investment policy adopted by
the Company as they might affect future insurance and investment cash flows
under the policies and invested assets. My examination included such tests
and calculations as I considered necessary to form the opinion stated below.

The unit expenses in the cash flow tests were based on a "going-concern" basis
for those contracts in force on the valuation date under consistent sets of
assumptions with reasonable margins for adverse deviations, for various paths
of future interest rates. Where appropriate, new considerations on lives
covered at the valuation date were considered, but no new lives were assumed
to be covered except for the above described unit expenses. Particular
attention was given to those provisions and characteristics that might cause
future insurance and investment cash flows to vary with changes in the level
of prevailing interest rates.

In other respects, my examination included such review of the actuarial
assumptions and methods, as well as such tests of the actuarial calculations,
as I considered necessary under the circumstances.

In making my examination, I have relied upon listings and summaries of policies in force and other associated data prepared by E.Z. Earnings, Controller. I relied on the stated investment policy of the Company, including listings and summaries of assets, as provided by Max M. Yield, Chief Investment Officer of the Company. I performed no verification as to the accuracy of these data.

In my opinion, as of December 31, 1990:

1. The policy reserves and other actuarial items shown herein:

    (i)   are computed in accordance with commonly accepted actuarial standards and consistently applied and are fairly stated in accordance with sound actuarial principles.

    (ii)   are based on actuarial assumptions which produce reserves at least as great as those called for in any policy or contract provision as to reserve basis and method and are in accordance with all other policy or contract provisions.

    (iii) meet the requirements of the insurance laws of the State of Domicile.

    (iv)   are computed on the basis of assumptions consistent with those used in computing the corresponding items in the Annual Statement of the Mismatch Life Insurance Company for the year ending December 31, 1989.

    (v)   include provision for all actuarial reserves and related actuarial statement items which ought to be established.

2. The anticipated investment cash flows arising from an allocation of assets equal to reserves and other liabilities, plus anticipated considerations to be received from the in-force policies make good and sufficient provision, according to presently accepted actuarial standards of practice, for the anticipated cash flows required by contractual obligations and the related expenses of the Company.

This opinion is updated annually as required by statute. The impact of unanticipated events subsequent to the date of this opinion is beyond the scope of the opinion. Events occurring between December 31, 1990 and the date the opinion was completed have been reviewed for materiality. No event materially impacting this opinion has occurred. The cash flow portion of this opinion should be viewed recognizing that the Company's future experience will not exactly follow all the assumptions used in the cash flow projection.

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Ernie D. Spread, M.A.A.A.

February 15, 1991

Projected excess interest credits were determined based upon current Company practice. The credited rate in each projection quarter is set as the portfolio average earnings rate for the previous quarter, net of investment expenses and provision for defaults, less 150 basis points, but not more than 50 basis points different than the "competition rate" (defined as the larger of the 2-year rolling average of 5-year Treasury bond yields less 50 basis points, or the current 5-year Treasury bond yield less 25 basis points).

Policy terminations from death were projected using the Company's current assumptions for product pricing, increased by 5% as a margin to cover reasonable deviations from expected assumptions. No future improvement of mortality was assumed.

The credited interest rate procedures result in little difference between credited interest rates and competitive interest rates. At the worst differential of credited rate being .50% less than the competitive rate, an extra .50% lapse rate was assumed. Policy loans and partial withdrawals are insignificant and assumed to be zero.

Maintenance expenses of $35 per policy in force were assumed, which is $2 per policy higher than current experience. Maintenance expenses were assumed to inflate at a rate equal to the current 3-year bond yield less 5%. Percentage of premium expenses were 5% for commissions and 2% for premium tax.

Federal income taxes were assumed payable on gains from operations at a rate of 36.8%. Credit was given for negative taxes.

PROJECTION OF INVESTMENT CASH FLOWS

After consultation with the Chief Investment Officer, the investment cash flows were projected as follows. The timing and amounts of coupon income and maturities were projected for the securities held on December 31, 1990 in support of the Universal Life reserves. It was assumed that these securities would be held until maturity or call. In the event of any negative cash flows, funds were assumed to be borrowed at the current 90-day rate plus 2.00%.

Investment cash flows, combined with the insurance cash flows, are used first to pay interest on borrowed funds and then to pay off any short-term borrowed balances outstanding. Any net positive cash flow is invested each quarter at the new money interest rate in order to maintain the following desired mix of in-force assets (in order of priority):

Asset	Call Protection	% Total
5-Year "A" Bond	5 years	50%
15-Year "A" Bond	5 years	50

Where market interest rates were less than average coupon rates on the bonds by at least 200 basis points, it was assumed that the bonds would be called if it were to the borrower's advantage to do so. A 2% call premium is applicable. It was assumed that the borrower would have a 1.35% refinancing cost.

Capital gains taxes were assumed payable at a rate of 28%. Investment expenses were assumed to be an annual rate of .12%. Defaults for "A" rated bonds were assumed to be an annual rate of .17%.

INTEREST SCENARIOS

The spot curve of U.S. Treasury yields as of December 31, 1990 was established. Projections were made under seven scenarios of future yields. These projected U.S. Treasury yields are summarized in Exhibit 2 for yearly anniversaries of the valuation date. The rates assumed at interim dates and intermediate years to maturity were calculated as linear interpolations of the given rates. U.S. Treasury yields were converted to "A" bond yields by assuming that the "A" bond yield equals the U.S. Treasury yield times a multiplier, plus a spread, as follows:

Maturity	90-Day	3-Year	10-Year	20-Year
Multiplier	1.024	1.033	1.049	1.058
Spread	.50%	.60%	.75%	.85%

Brief descriptions of the seven scenarios are:

Scenario 1: Rates remain level during the projection period.

2: Rates rise gradually for 10 years and then level off.

3: Rates rise gradually for 5 years and then fall to the original levels.

4: Rates rise sharply for 1 year and then level off.

5: Rates fall gradually for 10 years and then level off.

6: Rates fall gradually for 5 years and then rise to their original level.

7: Rates fall sharply for 1 year and then level off.

In Scenarios 3 and 4, the yield curve inverts and then returns to its original shape.

SUMMARY OF RESULTS

Total cash flows, including both insurance and investment cash flows, and allowing for reinvestment of net positive cash flows and borrowing to cover net negative cash flows, were projected to the end of a 20-year period. The market value of assets, based on the assumption that interest rates after such date would be frozen at the prevailing rate on that date, was then compared to policy reserves. Although significant cash flows under Universal Life contracts extend beyond 20 years, the results beyond 20 years are not included here. All scenarios covered in this memorandum generated higher present values of surplus when extended beyond 20 years.

ASSETS INCLUDED IN THIS MEMORANDUM

For the purposes of cash flow projections, invested assets of $1,235,346 were allocated to support Universal Life reserves as of December 31, 1990. A listing of these assets was provided by Max M. Yield, Chief Investment Officer. This listing includes par value, coupon and maturity date for each security, as well as the book and market values assigned to the security.

I did not verify the calculation of these values or the records of securities held which formed the basis for these calculations. This listing provided the basis for the projections of investment income and asset maturities. The assets are summarized below:

"A" Rated Bonds

Statement Value	Coupon Rate	Maturity Date	Call Protection Until
$63,620	9.25%	6/91	1/91
85,856	9.25	6/92	1/92
113,652	9.25	6/93	1/93
151,330	9.25	6/94	1/94
203,215	9.25	6/95	1/95
8,030	9.75	6/99	1/90
39,531	9.75	6/00	1/91
63,620	9.75	6/01	1/92
85,239	9.75	6/02	1/93
111,181	9.75	6/03	1/94
142,682	9.75	6/04	1/95
167,389	9.75	6/05	1/96

1,235,346

PROJECTION OF INSURANCE CASH FLOWS

A model projection was prepared of the Universal Life contracts in force as of December 31, 1990. A description of the product and of the assumptions used for projections is given in Exhibit 1. For each year of issue, the in-force business was modeled into a single cell. The initial model reserves, premiums and face amount were validated to actual values. While the characteristics of each model cell would not necessarily generate the same values as the aggregate of all the policies in the cell for different projections, in my opinion, the differences are not material.

The projection of insurance cash flows took into account projected excess interest credits, policy terminations from death and surrenders, and maintenance expenses and commissions. It was assumed that level target premiums were received from all in-force policies. Premiums were assumed to be paid quarterly.

Projected excess interest credits were determined based upon current Company practice. The credited rate in each projection quarter is set as the portfolio average earnings rate for the previous quarter, net of investment expenses and provision for defaults, less 150 basis points, but not more than 50 basis points different than the "competition rate" (defined as the larger of the 2-year rolling average of 5-year Treasury bond yields less 50 basis points, or the current 5-year Treasury bond yield less 25 basis points).

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Exhibit 1

MISMATCH LIFE INSURANCE COMPANY - UNIVERSAL LIFE
SUMMARY OF MODEL CELL SPECIFICATIONS AND ASSUMPTIONS

Product Specifications

1. **Plan.** Policy Form UL-1981-90. Universal Life with level net amount at risk.

2. **Target Premiums.** Used as basis for first-year commissions and surrender charges, annual premium per unit.

Issue Age	Target Premium
35	$8.00

3. **Expense Loads.** 6% of premium, $36 per policy all years, assessed monthly.

4. **Surrender Charges.** 150% of target premium years 1-5, decreasing 15% of target premium each year, to zero in year 15.

5. **Cost of Insurance Charges.** Guaranteed rates equal to 1958 CSO age last birthday. Current rates per $1000 as of 12/31/90:

Attained Age	Annual Cost of Insurance
35	$1.58
40	2.36
45	3.16
50	5.14
55	6.99

6. **Interest Credited.** 4% guaranteed.

7. **Current Interest Crediting Strategy.** Portfolio average earnings rate for previous quarter less 1.50%, not more than .50% different from "competition rate". (Competition rate is larger of 2-year rolling average of 5-year Treasury bond yields less .50%, or current 5-year Treasury bond yield less .25%.)

8. **Investment Strategy.** Positive net cash flow invested each quarter to maintain desired mix of in-force assets (in order of priority):

Asset	% Total
5-Year "A" Bond	50%
15-Year "A" Bond	50

Exhibit 1
Page 2

Assumptions

1. __Model Plan.__ Issue age 35, male.

2. __Premiums.__ Target premium paid each year in force. Quarterly mode.

3. __Withdrawals.__ No loans or partial withdrawals, except for lapse.

4. __Lapse Rates.__ Base rates as follows:

    Policy Year 1 - 18%
                   2 - 12
                   3 - 8
                   4+— 5

    Addition to base rates due to competition rate (i') being higher than current rate (i) = $200(i' - i)^2$, e.g.:

i'-i	Additional Lapse
.50%	.5%

5. __Mortality.__ A percentage of the 1965-70 Select & Ultimate, Male table, as follows:

Duration	Percentage
1	62%
5	58
10	53
15	49
20	52

6. __Expenses.__

Maintenance:	$35 per policy
Commissions:	5% premiums
Premium Tax:	2% premiums
Inflation:	Maintenance expense inflated at rate equal to 3-year bond rate less 5%.

7. __Federal Income Tax.__ 36.8% on statutory gain from operations.

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Exhibit 2

MISMATCH LIFE INSURANCE COMPANY - UNIVERSAL LIFE
Scenarios

Date 12/31	#1 - Level				Date 12/31	#2 - Slow Up and Level			
	90-Day	3-Year	10-Year	20-Year		90-Day	3-Year	10-Year	20-Year
1990	6.00%	6.60%	7.30%	7.40%	1990	6.00%	6.60%	7.30%	7.40%
1991	6.00	6.60	7.30	7.40	1991	6.70	7.40	8.20	8.30
1992	6.00	6.60	7.30	7.40	1992	7.40	8.10	9.00	9.10
1993	6.00	6.60	7.30	7.40	1993	8.10	8.90	9.90	10.00
1994	6.00	6.60	7.30	7.40	1994	8.80	9.60	10.70	10.80
1995	6.00	6.60	7.30	7.40	1995	9.50	10.40	11.60	11.70
1996	6.00	6.60	7.30	7.40	1996	10.20	11.20	12.40	12.50
1997	6.00	6.60	7.30	7.40	1997	10.90	12.00	13.30	13.40
1998	6.00	6.60	7.30	7.40	1998	11.60	12.70	14.10	14.20
1999	6.00	6.60	7.30	7.40	1999	12.30	13.50	15.00	15.20
2000+	6.00	6.60	7.30	7.40	2000+	13.00	14.20	15.80	16.00

Date 12/31	#3 - Up, Then Down				Date 12/31	#4 - Sharp Up, then Level			
	90-Day	3-Year	10-Year	20-Year		90-Day	3-Year	10-Year	20-Year
1990	6.00%	6.60%	7.30%	7.40%	1990	6.00%	6.60%	7.30%	7.40%
1991	7.10	7.70	8.60	8.70	1991	11.70	10.50	10.60	10.50
1992	8.10	8.90	9.90	10.00	1992	12.70	10.90	10.60	10.40
1993	10.60	10.60	11.20	11.20	1993	12.70	10.90	10.60	10.40
1994	13.80	12.40	12.50	12.40	1994	11.70	10.50	10.60	10.50
1995	16.60	14.20	13.80	13.50	1995	8.70	9.50	10.60	10.70
1996	13.80	12.40	12.50	12.40	1996	8.70	9.50	10.60	10.70
1997	10.60	10.60	11.20	11.20	1997	8.70	9.50	10.60	10.70
1998	8.10	8.90	9.90	10.00	1998	8.70	9.50	10.60	10.70
1999	7.10	7.70	8.60	8.70	1999	8.70	9.50	10.60	10.70
2000+	6.00	6.60	7.30	7.40	2000+	8.70	9.50	10.60	10.70

Date 12/31	#5 - Slow Down, then Level				Date 12/31	#6 - Down, Then Up			
	90-Day	3-Year	10-Year	20-Year		90-Day	3-Year	10-Year	20-Year
1990	6.00%	6.60%	7.30%	7.40%	1990	6.00%	6.60%	7.30%	7.40%
1991	5.70	6.30	7.00	7.10	1991	5.60	6.10	6.80	6.90
1992	5.50	6.00	6.70	6.80	1992	5.20	5.70	6.30	6.40
1993	5.20	5.80	6.40	6.50	1993	4.80	5.20	5.80	5.90
1994	5.00	5.50	6.10	6.20	1994	4.30	4.80	5.30	5.40
1995	4.80	5.20	5.80	5.90	1995	3.90	4.30	4.80	4.80
1996	4.50	5.00	5.50	5.60	1996	4.30	4.80	5.30	5.40
1997	4.30	4.70	5.20	5.30	1997	4.80	5.20	5.80	5.90
1998	4.00	4.40	4.90	4.90	1998	5.20	5.70	6.30	6.40
1999	3.80	4.10	4.60	4.60	1999	5.60	6.10	6.80	6.90
2000+	3.50	3.90	4.30	4.30	2000+	6.00	6.60	7.30	7.40

Exhibit 2 - Scenarios Cont'd.
Page 2

Date 12/31	#7 - Sharp Down, then Level			
	90-Day	3-Year	10-Year	20-Year
1990	6.00%	6.60%	7.30%	7.40%
1991	4.50	5.00	5.50	5.60
1992	4.50	5.00	5.50	5.60
1993	4.50	5.00	5.50	5.60
1994	4.50	5.00	5.50	5.60
1995	4.50	5.00	5.50	5.60
1996	4.50	5.00	5.50	5.60
1997	4.50	5.00	5.50	5.60
1998	4.50	5.00	5.50	5.60
1999	4.50	5.00	5.50	5.60
2000+	4.50	5.00	5.50	5.60

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