

The Financial Basis for No Lapse Universal Life Insurance

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Abstract

Universal Life Insurance was developed during the early 1980's. With calculated premiums based on historically high current interest rates and reduced mortality cost assumptions, Universal Life Insurance offered significantly lower premiums relative to Traditional Cash Value Insurance. However, as interest rates fell back to long-term historical averages, the original premium was insufficient leading Universal Life Insurance policies to lapse. Disgruntled policy owners sued insurers in multiple class action lawsuits and individual litigation claiming the insurance companies had used unrealistic projections of future interest rates in their illustrations.

No Lapse Universal Life Insurance was created in the mid 1990's in response to policyholder concerns. This paper identifies the financial basis for No Lapse Universal Life Insurance and suggests the current interest rate and reduced mortality cost assumptions used for the original Universal Life Insurance product are effectively the same. However, No Lapse Universal Insurance may be seen as a mirror image of the original Universal Life Insurance product which may explain the disparate description of No Lapse Universal Life Insurance as both permanent term and whole life insurance. Where the original UL product used the reduced assumptions for non-guaranteed projected values, the NLUL uses the reduced assumptions for a shadow account providing the no lapse guarantee.

Introduction

The No-Lapse Universal Life (NLUL) product offered in the mid 1990's is a fundamental change from the original Universal Life (UL) developed during the early 1980's, yet the financial basis remains the same. Assumption of higher credited interest rates and lower mortality charges provides significantly lower UL and NLUL premiums compared to traditional Whole Life 'Cash Value' insurance products.

The fundamental change but same financial basis may explain the disparate description of NLUL as a 'Whole Life product in disguise' (Nisbet, 1997) and as a 'Term to 100 contract' (Pinkans, 2002). Examining the financial basis of NLUL is provided in four steps. First, a

spreadsheet model - Applied Life Insurance Illustrator used for the analysis is described. Second, the financial basis for the original UL product is identified. Third, the financial difficulties with the original UL product are discussed. Fourth, the financial basis of NLUL will be considered. A final section provides a summary of the findings.

Applied Life Insurance Illustrator

The Applied Life Insurance Illustrator, the Excel¹ spreadsheet for considering the financial basis for NLUL as well as UL, simultaneously creates life insurance policy values for traditional, participating, interest-sensitive whole life, as well as universal life insurance policies (Jones, Lange and Simkins, 2003). The Applied Life Insurance Illustrator provides comparative life insurance policy value determination methods, policy premium strategies, impact of cash value factors, and insurer policy designs. The spreadsheet requires minimal data input, yet accommodates interest rate scenario pricing (Carr and French, 1989), IRS Code 26 Section 7702 requirements, varying surrender charges, premium fees, and expenses; current and guaranteed cost of insurance; multiple CSO tables; modal premiums; and premium contingent valuations including reduced or vanishing premium strategies (Lange, Himes and Jones, 2003).

Exhibit 1: Applied Life Insurance Illustrator – Input and Output includes policy base information [Cell Reference]:

Death Benefit [B2]	= \$300,000
Gender [C2]	= Male
Age [D2]	= 30
Rate Class [F2]	= Standard
Guaranteed Interest Rate [D5]	= 4.0%
Current Interest Rate [J5]	= 11.0%
Policy Expense [N2]	= \$50.00
Policy Premium Fee [N5]	= 7.5%
CSO Table [C5]	= 1958

¹ Excel is a registered trademark of the Microsoft Corporation.

Other DATA inputs such as PUA Dividend Option [H5], Mortality Cost Adjustment [Q5] and Expense Dividend [P5] are beyond the scope of the present paper, but reflect the flexibility of Applied Life Insurance Illustrator. The beginning CSO table is the 1958 table as the original UL policy was generally based on the 1958 CSO Table, but quickly changed to the 1980 CSO Table. Similarly the NLUL product was based on the 1980 CSO Table, but changed to the 2001 CSO table.

Exhibit 1: Applied Life Insurance Illustrator – Input and Output [Column, Cell Reference] includes premium and valuation information for Traditional, Participating, and Interest-Sensitive whole life, and [C] insurance is added for guaranteed whole life and the annual dividend [G] for participating whole life. All premium and valuation data are automatically calculated, given the policyholder and policy input assumptions. Universal life insurance requires the Guideline Premium [P2] be entered as the beginning universal life premium [M2].

The life insurance policies are ordered by the underlying actuarial valuation method (see Black & Skipper, 2000; Bowers, Gerber, Hickman, Jones and Nesbitt, 1997; Jordan, 1991). The Prospective premium determination and policy valuation method used for Traditional and Participating whole life (see application example, Lange and Jones, 2004). The Retrospective method used for Interest-Sensitive whole life and Universal Life (see application example, Lange and Simkins, 2003, 2001). Supporting worksheets are listed along the bottom of the Exhibits.

Exhibit 2: Applied Life Insurance Illustrator – Assumptions contains the base information including, Interest Rate Scenario [AB], 1958 CSO [AE], 1980 CSO Male [AF] and Female [AG], 2001 CSO Male [AH] and Female [AI], Adjusted Current % COI -Cost of Insurance for Male [AJ] and Female [AK], IRS Code 26 Section 7702 minimum death benefit or cash corridor requirements [AO], and Surrender Charge [AR]. The Current Mortality Charge for the standard rate class is set to 60%, preferred 30% and smoker 150% of the guaranteed rate. The standard rate class reflects the median percentage rate 60% from Gold (1993, 1994) to age 60, then equal to age, for example age 62 equals 62%, 71 equals 71%, and so on, analogous to select and ultimate mortality probabilities.

UL Financial Basis

Life insurance premiums for UL and other interest sensitive products are subject to a guideline maximum premium as defined by the IRS Code Title 26, Chapter 79, Section 7702. The guideline maximum premium is based on the prospective method for premium and cash value determination, or at issue, the present value of expected premiums is equal to the present value of the expected death benefits.

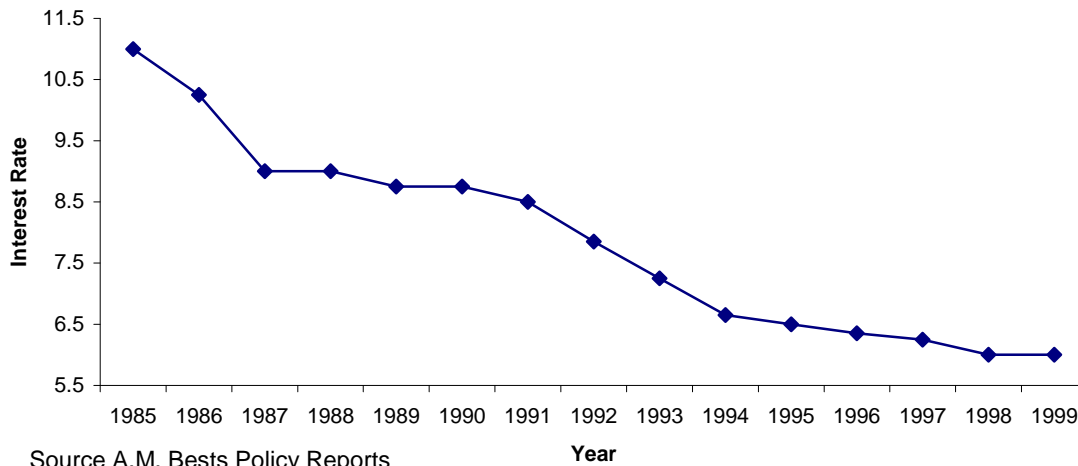
Referring to Exhibit 1: Applied Life Insurance Illustrator - Input and Output, the original UL premium [M2] is the Guideline Premium [P2] = \$3,721.96. Given the assumptions of higher interest rates and lower mortality charges however results in almost bizarre Projected UL cash values [P] and death benefits [Q], with \$1,077,877 and \$1,293,452 respectively at age 65. By age 80, the cash values and death benefits are approximately \$5 million on a \$300,000 face value policy.

The UL planned premium calculation uses the retrospective method in which projected cash values and death benefits are based on current interest rates and mortality charges. The use of current interest rates higher than the guaranteed interest rate, and current mortality charges less than the guaranteed mortality charges in determining the UL planned premium results in a lower premium than the traditional whole life level premium. The minimum UL periodic premium would be just sufficient to continue the policy to the next premium payment, paying the cost of insurance and expenses, or financially equivalent to a term insurance premium.

Exhibit 3: Applied Life Insurance Illustrator – Universal Life demonstrates the significant premium reduction given an assumed 11% current interest rate and current mortality charges, UL Planned Premium [M2], \$898.08, versus the Whole Life Annualized Premium [G2], \$3,384.10. The UL planned premium is calculated by selecting a cash value at a specific age and solving for the required premium using the Excel Data – What-if Analysis – Goal Seek Tool. For example, setting the cash value at age 80 [P33] to \$300,000, the face value of the policy, by changing the UL Planned Premium [M2] results in an \$898.08 planned premium. The cash values and death benefits are impressive even with this significantly reduced premium, as the policy is effectively endowed at age 80, and provides \$500,000 or more by age 85. By age 90, the cash value and death benefits are over \$800,000.

The 11% current interest rate was the 1985 UL interest rate, Figure 1: UL Median Credited Interest Rates below (*Best's Policy Reports – 2000*). The 11% current rate reflected the early 1980's interest rate experience as shown in Figure 2: Life Insurance Industry 1985 Median

Figure 1. UL Median Credited Interest Rates



UL Illustrated Rate and Historical AAA Bond Yields 1919-1984 & 1985-2007. The AAA Bond Yield hit its highest point of 15.49 percent in September 1981. Just after reaching its highest point, the rate fell by over 2.5 percent in the next twelve months. AAA Bond yields were relatively flat for most of 1983, varying within a 100 basis point range and averaging 12.04 percent. As shown in Figure 2, 1984 was a period of increased AAA Bond Yield variation, rising from 12.20 percent in January, peaking at 13.55 percent in June, and declining to 12.13 percent by December.

Including a 1.5% spread on investments returns required an actuarial projection of 12.5% for the policy to perform as illustrated to maturity, up to 95 years.

Mortality charges contribute to the UL financial basis in two ways. First, the use of the current mortality assumptions as a percentage of the guaranteed cost of insurance, CSO Table, 60% to age 60, and so on discussed above. Second, though the original UL policies often were based on the 1958 CSO Table, the 1980 CSO Table reduced rates were completely adopted by the late 1980's. Referring to Table 1: 1958, 1980 CSO Table Cost of Insurance /\$1,000, this reduced the male cost of insurance at age 50 from \$8.32 per \$1,000 of death benefits to \$6.71.

The comparative female cost of insurance was \$4.96 (note: the 1958 CSO Table used a three year offset for females).

A yearly listing of cost of insurance rates is shown in Exhibit 4a: Applied Life Insurance Illustrator – 1958, 1980, 2001 CSO Tables [Age 30-67] and Exhibit 4b: Applied Life Insurance Illustrator – 1958, 1980, 2001 CSO Tables [Age 68-103]. The 2001 CSO Table goes out to age 120 creating a significant decline in cost of insurance rates between the ages of 95 and 100, the 1958 and 1980 maturity age.

Table 1: 1958, 1980 CSO Table Cost of Insurance /\$1,000

Age	1958 CSO Annual	1980 CSO Male Annual	1980 CSO Female Annual
40	3.53	3.02	2.42
50	8.32	6.71	4.96
60	20.34	16.08	9.47
70	49.79	39.51	22.11
80	109.98	98.84	65.99
90	228.14	221.77	190.75

UL Financial Difficulties

The use of the current interest rate in determining UL planned premiums ignored the financial effect from expected future interest rates and disregarded the underlying financial basis of life insurance policy valuation. First, annual premium payments are expected future cash flows, which prevents the application of immunization strategies. Second, UL (Type A) is a decreasing term insurance policy. The amount of insurance at risk is equal to the death benefit minus the policy accumulation value. If interest rates decrease, less interest is earned and the accumulated cash value is less. This requires a greater amount of insurance to be purchased and thus a higher mortality charge, leading to reduced cash values, further decreases interest earnings and so on.

The decline in market interest rates, Figure 2: Life Insurance Industry 1985 Median UL Illustrated Rate and Historical AAA Bond Yields 1919-1984 & 1985-2007, resulted in a

corresponding decline in UL interest rates, Figure 1: UL Median Credited Interest Rates above. Casual review of Figure 2 would suggest there is little historical support for projecting a 12.5 percent return on investments in 1985. Life insurance policy illustrations based on current interest rates project the current interest rate for the life of the policy, up to 95 years for a new born. Interest rates were clearly high by historical standards during the early 1980's. The average AAA Bond Yield from 1919 to 1984 was 5.34 percent. Since 1919, interest rates never reached 12.5 percent until March of 1980, when that month's average was 12.96 percent. Monthly rates stayed above 12.5 percent for 34 of the next 58 months, through December 1984. During this time period, the median monthly average was 12.73 percent.

Exhibit 5: Applied Life Insurance Illustrator – Yearly Rates demonstrates the financial impact on UL cash values with the decline in interest rates. Instead of a UL policy with \$87,926 in cash value at age 65, Exhibit 3: Applied Life Insurance Illustrator – Universal Life, the policy Lapses. To avoid having the policy lapse prior to maturity policyholders were required to significantly increase premiums (Lange, Himes, Jones, 2003). Recall the UL premium had been reduced from \$3,384.10 to \$898.09 based on the interest rate and mortality cost assumptions.

Failure of life insurance policies to perform as illustrated resulted in sizable class action litigations against insurers, with some settlements, including MetLife, of over \$1 billion in estimated policyholder benefits (Scism, 1998; Lohse, 1999). MetLife's position however was "MetLife contends this lawsuit is about Policy and Annuity owners' disappointed expectations resulting from economic changes over which neither MetLife nor its customers had any control" (MetLife Notice of Class Action). The MetLife statement raised the issue of whether the failure of life insurance illustrations to be realized is a question of "disappointed expectations," or unrealistic projections. The early 1980's interest rates were historically high, over twice the average historical level as noted. Thus the 1985 MetLife UL life insurance illustrations explicitly projected the continuation of the previous 5 years of high interest rates seen to maturity of the policy, 65 years for a 30 year old.

For example, the 1985 MetLife \$100,000 Universal Life policy illustration for a female age 35, based on a current interest rate of 11% and a \$1,000 per year policy premium, provided a \$150,794 cash value @age65 (*A.M. Best's Flitcraft Compend*, 1985). The decline in credited interest rates from the 1985 projection resulted in the 1985 illustrated financial results not being

realized. By 1994, the illustrated MetLife Universal Life cash value @age 65 for a 35 year-old female had fallen to \$56,692, based on an interest rate of 5.25 percent (A.M. Best's Flitcraft Compend, 1994). The UL policy expected cash value @age 65 had declined by approximately \$94,000² from the 1985 illustrations. So instead of a paid-up policy @age 65 with death benefits greater than \$150,000, the policyholder would need to pay higher premiums.³

NLUL Financial Basis

NLUL was created in the mid 1990's, indirectly or directly, in response to UL lapse problem detailed above. The No-Lapse Guarantee directly counteracted the financial problems with the original UL product and as a result re-established policyholder consideration and confidence in the NLUL advancement to UL (West, 1998; Stevick, 2008). In a study by Panko (2006), based on the percentage change from the first quarter 2005 to 2006 UL was "helped markedly by sales of no-Lapse UL" causing UL to prominently lead in annualized premiums, face amount and number of policies.

The NLUL financial basis is shown in Exhibit 6: Applied Life Insurance Illustrator – No Lapse Universal Life. Notice the UL – Guaranteed cash value [M] and death benefits [N] go to zero by age 70 causing the UL policy to Lapse based on the guaranteed interest rate of 4% [D5] and the 2001 CSO Table guaranteed cost of insurance [C5]. More importantly note the UL – Projected [P9] has had "Shadow Account" added above it [P8], and the cash value at age 100 [P41] equals \$1,000 and death benefit [Q41] is \$300,000. Based on the current interest rate of 7% [J5] and the 2001 CSO Table current cost of insurance [C5] the UL policy continues in-force to age 100.

The NLUL financial basis is the use of current interest rate and reduced mortality cost assumptions, ironically and perhaps disturbingly similar to the original UL financial basis. But there is a distinct difference between UL and NLUL at least with respect to the current interest rate. Rather than a projected interest rate based on a period of historically high interest rates, the NLUL current interest rate reflects a long term expected investment return, 7% versus 11%.

² The actual decline in accumulation values ($\$150,794 - \$56,692 = \$94,000$) is dependent on the interest credited in the intermediate years.

³ Though generally not the case with the A.M. Best sample premium values based on the \$1,000 premium, a sizable premium increase would be necessary to prevent the policy from lapsing [Lange, Himes & Jones, 2003].

The UL and NLUL current mortality cost assumptions are quite similar. The original 1980's UL assumed lower mortality cost than the 1958 CSO Table, and subsequently benefited from the 1980 CSO Table, the above Table 1: 1958, 1980 CSO Table Cost of Insurance /\$1,000. The NLUL assumed lower mortality cost than the 1980 CSO Table, and subsequently benefited from the 2001 CSO Table, see Table 2: 1980, 2001 CSO Table Cost of Insurance /\$1,000 below. For example, the cost of insurance per \$1,000 of death benefits for a male at age 60 declined from \$16.08 on the 1980 CSO Table to \$10.40 with the 2001 CSO Table. For a female at age 60, the decline was from \$9.47 on the 1980 CSO Table to \$8.34 with the 2001 CSO Table. Referring to Table 2 for additional ages reveals the degree, often sizeable, by which cost of insurance rates declined from the 1980 CSO to 2001 CSO Tables.

Table 2: 1980, 2001 CSO Table Cost of Insurance /\$1,000

Age	1980 CSO	2001 CSO	1980 CSO	2001 CSO
	Guaranteed Male Annual	Guaranteed Male Annual	Guaranteed Female Annual	Guaranteed Female Annual
40	3.02	1.72	2.42	1.34
50	6.71	3.91	4.96	3.24
60	16.08	10.40	9.47	8.34
70	39.51	26.94	22.11	18.63
80	98.84	74.02	65.99	46.43
90	221.77	194.28	190.75	124.22

The reduction in cost of insurance is the financial basis for one other distinctive change between the UL and NLUL, the change in maturity from age 95 to age 100. The 1958 CSO and the 1980 CSO Tables financially precluded a reduced policy premium which required UL ultimate cost of insurance rates for ages 96 to 98 at \$375 to \$650 per \$1,000 of death benefits. By definition, the \$1,000 cost of insurance per \$1,000 of death benefits was at CSO Table maturity. Referring to Table 3: 1980, 2001 CSO Table Cost of Insurance /\$1,000 – Age 95+, the 2001 CSO Table was extended to age 120 and the corresponding reduction in cost of insurance rates for ages 95 to 102 are obvious, allowing the NLUL to be extended to age 100 and older. For example, for a male (female) age 98, cost of insurance declined from \$657.98 to \$329.95 (\$655.85 to \$247.79) respectively.

Table 3: 1980, 2001 CSO Table Cost of Insurance /\$1,000 – Age 95+

Age	1980 CSO Guaranteed	2001 CSO Guaranteed	1980 CSO Guaranteed	2001 CSO Guaranteed
	Male Annual	Male Annual	Female Annual	Female Annual
95	329.96	276.12	317.32	203.48
96	384.55	292.95	375.74	225.69
97	480.20	310.86	474.97	240.07
98	657.98	329.95	655.85	247.79
99	1,000.00	350.32	1,000.00	263.98
100	0	369.76	0	285.02
101	0	386.96	0	307.89
102	0	405.25	0	333.06

Exhibit 6: Applied Life Insurance Illustrator – No Lapse Universal Life also demonstrates a very strict policyholder financial obligation for the “Shadow Account” and no-lapse guarantee, all premiums must be paid and on time, as the policy in-force standing is a function of the NLUL “Shadow Account”, not the guaranteed values. Flexible premium payments associated with the UL policy are not permitted as even the most minor deviation in premium payment history would cause the “Shadow Account” to go to zero.

The fact that the NLUL lapses based on guaranteed values by a traditional actuarial valuation method supports concerns about NLUL funding. Katt (2004) suggests the NLUL may be partially funded by increased policy lapse assumptions. Goldwasser (2005) notes the NLUL sensitivity to premium payment amounts and timing, even small changes in amount or delayed payments can impact the NLUL no-lapse guarantee. Stevick (2008) raises a somewhat counter concern to the above NLUL financial basis, the NLUL may have a lower credited interest rate and higher cost of insurance to support the no-lapse guarantee. A final concern about the appropriate reserves given the violation of traditional actuarial valuation methods is beyond the scope of the paper, but should be noted.

Summary

This paper examines the financial basis of No Lapse Universal Life (NLUL) insurance using the Applied Life Insurance Illustrator spreadsheet model. Overall, the lower mortality and higher interest rate assumptions used as the financial basis for NLUL are effectively the same as for the original Universal Life (UL) insurance product.

The reduction in mortality rates from the 1980 CSO to 2001 CSO tables support NLUL reduced premiums just as the decrease from the 1958 CSO to 1980 CSO tables provided lower premiums for the original UL product. The 2001 CSO expansion to age 120 from 100, also allows the reduced premium strategy to be extended to age 100 and beyond for NLUL.

However, No Lapse Universal Insurance may be seen as a mirror image of the original Universal Life Insurance product which may explain the disparate description of No Lapse Universal Life Insurance as both permanent term and whole life insurance. Where the original UL product used the reduced assumptions for non-guaranteed projected values, the NLUL uses the reduced assumptions for a shadow account providing the no lapse guarantee.

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Exhibit 1: Applied Life Insurance Illustrator – Input and Output

Applied Life Insurance Illustrator Financial Basis NLUL AFS 2010.xlsx - Microsoft Excel																		
DATA																		
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
1	DATA	Death Benefit	Gender	Age	Rate Class	Whole Life Annualized Premium	Premiums Payable # Years		Participating Vanishing # Premiums	Int. Sensitive Vanishing # Premiums		Universal Life Planned Premium	Policy Expense \$		Guideline Premium	CRVM Expense Load		
2		\$300,000	Male	30	Standard	\$3,721.96	65		65	65		\$3,721.96	\$50.00		\$3,721.96	\$357.93		
3																		
4		Premium Payment Mode	CSO Mortality Table	Guaranteed Interest Rate	Automatic Premium Loan	Policy Loan Interest Rate	Dividend Option		Current Interest Rate	Projected Interest Rate		Death Benefit	% Policy Premium Fee		Expense Dividend	Mortality Cost Adjustment		
5		Annual	1958	4.00%	No	7.5%	PUA		11.00%	Current		Level	7.50%		5%	0%		
6	OUTPUT																	
7		PROSPECTIVE METHOD							RETROSPECTIVE METHOD									
8																		
9		TRADITIONAL WHOLE LIFE - GUARANTEED				PARTICIPATING WHOLE LIFE			INTEREST SENSITIVE WHOLE LIFE		UNIVERSAL LIFE - GUARANTEED		UNIVERSAL LIFE - PROJECTED					
10	Age	Cash Value	Paid-Up	Death Benefit	Cash Value	Dividend	Death Benefit		Cash Value	Death Benefit		Cash Value	Death Benefit		Cash Value	Death Benefit		
11	31	\$ -	\$ -	\$ 300,000	\$ 260	\$ 260	\$ 301,117		\$ -	\$ 300,000		\$ -	\$ 300,000		\$ -	\$ 300,000		
12	32	\$ -	\$ -	\$ 300,000	\$ 752	\$ 484	\$ 303,125		\$ 355	\$ 300,000		\$ 294	\$ 300,000		\$ 355	\$ 300,000		
13	33	\$ 2,998	\$ 12,450	\$ 300,000	\$ 4,524	\$ 749	\$ 306,137		\$ 1,124	\$ 300,000		\$ 897	\$ 300,000		\$ 1,124	\$ 300,000		
14	34	\$ 6,104	\$ 24,543	\$ 300,000	\$ 8,706	\$ 1,025	\$ 310,126		\$ 1,583	\$ 300,000		\$ 1,218	\$ 300,000		\$ 1,583	\$ 300,000		
15	35	\$ 9,322	\$ 36,281	\$ 300,000	\$ 13,343	\$ 1,333	\$ 315,146		\$ 4,182	\$ 300,000		\$ 3,101	\$ 300,000		\$ 4,182	\$ 300,000		
16																		
17	40	\$ 27,065	\$ 89,532	\$ 300,000	\$ 45,099	\$ 3,459	\$ 357,774		\$ 27,904	\$ 300,000		\$ 16,857	\$ 300,000		\$ 27,904	\$ 300,000		
18																		
19	45	\$ 47,268	\$ 133,552	\$ 300,000	\$ 96,905	\$ 6,922	\$ 436,004		\$ 113,989	\$ 300,000		\$ 54,292	\$ 300,000		\$ 113,989	\$ 300,000		
20																		
21	50	\$ 69,705	\$ 169,484	\$ 300,000	\$ 180,199	\$ 12,461	\$ 561,000		\$ 211,321	\$ 390,943		\$ 77,010	\$ 300,000		\$ 211,321	\$ 390,943		
22																		
23	55	\$ 93,937	\$ 198,509	\$ 300,000	\$ 312,135	\$ 21,194	\$ 748,948		\$ 371,924	\$ 557,886		\$ 101,351	\$ 300,000		\$ 371,924	\$ 557,886		
24																		
25	60	\$ 119,375	\$ 221,796	\$ 300,000	\$ 517,938	\$ 34,765	\$ 1,022,802		\$ 638,009	\$ 829,411		\$ 126,681	\$ 300,000		\$ 638,008	\$ 829,411		
26																		
27	65	\$ 145,154	\$ 240,283	\$ 300,000	\$ 832,695	\$ 55,255	\$ 1,414,069		\$ 1,077,877	\$ 1,293,453		\$ 152,044	\$ 300,000		\$ 1,077,877	\$ 1,293,452		
28																		
29	70	\$ 170,116	\$ 254,715	\$ 300,000	\$ 1,303,833	\$ 85,904	\$ 1,967,264		\$ 1,799,175	\$ 2,069,051		\$ 176,152	\$ 300,000		\$ 1,799,174	\$ 2,069,050		
30																		
31	75	\$ 192,942	\$ 265,708	\$ 300,000	\$ 1,995,860	\$ 130,743	\$ 2,745,310		\$ 2,989,607	\$ 3,139,088		\$ 197,926	\$ 300,000		\$ 2,989,606	\$ 3,139,087		
32																		
33	80	\$ 214,138	\$ 274,478	\$ 300,000	\$ 3,007,950	\$ 196,376	\$ 3,835,863		\$ 4,983,316	\$ 5,232,482		\$ 217,597	\$ 300,000		\$ 4,983,314	\$ 5,232,480		
34																		
35	85	\$ 232,320	\$ 281,197	\$ 300,000	\$ 4,458,156	\$ 290,623	\$ 5,364,598		\$ 8,214,819	\$ 8,625,560		\$ 233,012	\$ 300,000		\$ 8,214,817	\$ 8,625,557		
36																		
37	90	\$ 248,386	\$ 286,986	\$ 300,000	\$ 6,539,432	\$ 425,508	\$ 7,504,805		\$ 13,352,885	\$ 14,020,529		\$ 242,575	\$ 300,000		\$ 13,352,880	\$ 14,020,524		
38																		
39	95	\$ 268,174	\$ 296,127	\$ 300,000	\$ 9,595,877	\$ 622,443	\$ 10,495,608		\$ 21,842,436	\$ 21,842,436		\$ 230,065	\$ 300,000		\$ 21,842,429	\$ 21,842,429		
40																		
41	100	\$ 288,462	\$ 300,000	\$ 300,000	#DIV/0!	#DIV/0!	#DIV/0!		\$ 37,150,394	\$ 37,150,394		Lapse	Lapse		\$ 37,150,383	\$ 37,150,383		
APLII TRADITIONAL WHOLE LIFE PARTICIPATING WHOLE LIFE INTEREST SENSITIVE WHOLE LIFE UNIVERSAL LIFE																		

Exhibit 2: Applied Life Insurance Illustrator – Assumptions

Applied Life Insurance Illustrator Financial Basis NLUL AFS 2010.xlsx - Microsoft Excel																				
Home Insert Page Layout Formulas Data Review View Acrobat																				
AA1		ASSUMPTIONS																		
Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS
1		ASSUMPTIONS																		
2						1958 CSO	1980 CSO	1980 CSO	2001 CSO	2001 CSO	Adjusted	Adjusted								
3						Guaranteed	Guaranteed	Guaranteed	Guaranteed	Guaranteed	Current	Current			IRS 26 Sect. 7702					
4		Policy	Interest		Age	Annual	Male	Female	Male	Female	Male %COI	Female %COI			Age	Factor		Policy	Surrender	
5		Year	Rate				Annual	Annual	Annual	Annual								Year	Charge	
6					0	\$ 7.08	\$ 4.18	\$ 2.89	\$ 0.72	\$ 0.42	60.0%	60.0%			0	250%		1	100%	
7		1	11.00%		1	\$ 1.76	\$ 1.07	\$ 0.87	\$ 0.46	\$ 0.31	60.0%	60.0%			1	250%		2	95%	
8		2	10.25%		2	\$ 1.52	\$ 0.99	\$ 0.81	\$ 0.33	\$ 0.23	60.0%	60.0%			2	250%		3	90%	
9		4	9.00%		4	\$ 1.40	\$ 0.95	\$ 0.77	\$ 0.21	\$ 0.19	60.0%	60.0%			4	250%		5	80%	
10		5	9.00%		5	\$ 1.35	\$ 0.90	\$ 0.76	\$ 0.21	\$ 0.18	60.0%	60.0%			5	250%		6	75%	
11		6	8.75%		6	\$ 1.30	\$ 0.86	\$ 0.73	\$ 0.22	\$ 0.19	60.0%	60.0%			6	250%		7	70%	
12		7	8.75%		7	\$ 1.26	\$ 0.80	\$ 0.72	\$ 0.22	\$ 0.21	60.0%	60.0%			7	250%		8	65%	
13		8	8.50%		8	\$ 1.23	\$ 0.76	\$ 0.70	\$ 0.22	\$ 0.21	60.0%	60.0%			8	250%		9	60%	
14		9	7.85%		9	\$ 1.21	\$ 0.74	\$ 0.69	\$ 0.23	\$ 0.21	60.0%	60.0%			9	250%		10	50%	
15		10	7.25%		10	\$ 1.21	\$ 0.73	\$ 0.68	\$ 0.24	\$ 0.22	60.0%	60.0%			10	250%		11	40%	
16		11	6.65%		11	\$ 1.23	\$ 0.77	\$ 0.69	\$ 0.28	\$ 0.25	60.0%	60.0%			11	250%		12	30%	
17		12	6.50%		12	\$ 1.26	\$ 0.85	\$ 0.72	\$ 0.34	\$ 0.27	60.0%	60.0%			12	250%		13	20%	
18		13	6.35%		13	\$ 1.32	\$ 0.99	\$ 0.75	\$ 0.40	\$ 0.31	60.0%	60.0%			13	250%		14	10%	
19		14	6.25%		14	\$ 1.39	\$ 1.15	\$ 0.80	\$ 0.52	\$ 0.34	60.0%	60.0%			14	250%		15	0%	
20		15	6.00%		15	\$ 1.46	\$ 1.33	\$ 0.85	\$ 0.66	\$ 0.36	60.0%	60.0%			15	250%				
21		16	5.90%		16	\$ 1.54	\$ 1.51	\$ 0.90	\$ 0.78	\$ 0.39	60.0%	60.0%			16	250%				
22		17	5.80%		17	\$ 1.62	\$ 1.67	\$ 0.95	\$ 0.89	\$ 0.41	60.0%	60.0%			17	250%				
23		18	5.70%		18	\$ 1.69	\$ 1.78	\$ 0.98	\$ 0.95	\$ 0.44	60.0%	60.0%			18	250%				
24		19	5.60%		19	\$ 1.74	\$ 1.86	\$ 1.02	\$ 0.98	\$ 0.46	60.0%	60.0%			19	250%				
25		20	5.50%		20	\$ 1.79	\$ 1.90	\$ 1.05	\$ 1.00	\$ 0.47	60.0%	60.0%			20	250%				
26		21	5.40%		21	\$ 1.83	\$ 1.91	\$ 1.07	\$ 1.01	\$ 0.49	60.0%	60.0%			21	250%				
27		22	5.30%		22	\$ 1.86	\$ 1.89	\$ 1.09	\$ 1.02	\$ 0.50	60.0%	60.0%			22	250%				
28		23	5.20%		23	\$ 1.89	\$ 1.86	\$ 1.11	\$ 1.04	\$ 0.51	60.0%	60.0%			23	250%				
29		24	5.10%		24	\$ 1.91	\$ 1.82	\$ 1.14	\$ 1.06	\$ 0.53	60.0%	60.0%			24	250%				
30		25	5.00%		25	\$ 1.93	\$ 1.77	\$ 1.16	\$ 1.09	\$ 0.55	60.0%	60.0%			25	250%				
31		26	4.90%		26	\$ 1.96	\$ 1.73	\$ 1.19	\$ 1.14	\$ 0.58	60.0%	60.0%			26	250%				
32		27	4.80%		27	\$ 1.99	\$ 1.71	\$ 1.22	\$ 1.17	\$ 0.61	60.0%	60.0%			27	250%				
33		28	4.70%		28	\$ 2.03	\$ 1.70	\$ 1.26	\$ 1.16	\$ 0.64	60.0%	60.0%			28	250%				
34		29	4.60%		29	\$ 2.08	\$ 1.71	\$ 1.30	\$ 1.15	\$ 0.67	60.0%	60.0%			29	250%				
35		30	4.50%		30	\$ 2.13	\$ 1.73	\$ 1.35	\$ 1.14	\$ 0.70	60.0%	60.0%			30	250%				
36		31	4.50%		31	\$ 2.19	\$ 1.78	\$ 1.40	\$ 1.13	\$ 0.75	60.0%	60.0%			31	250%				
37		32	4.50%		32	\$ 2.25	\$ 1.83	\$ 1.45	\$ 1.14	\$ 0.79	60.0%	60.0%			32	250%				
38		33	4.50%		33	\$ 2.32	\$ 1.91	\$ 1.50	\$ 1.16	\$ 0.85	60.0%	60.0%			33	250%				
39		34	4.50%		34	\$ 2.40	\$ 2.00	\$ 1.58	\$ 1.19	\$ 0.92	60.0%	60.0%			34	250%				
40		35	4.50%		35	\$ 2.51	\$ 2.11	\$ 1.65	\$ 1.24	\$ 1.00	60.0%	60.0%			35	250%				
41		36	4.50%		36	\$ 2.64	\$ 2.24	\$ 1.76	\$ 1.31	\$ 1.07	60.0%	60.0%			36	250%				
		37	4.50%		37	\$ 2.80	\$ 2.40	\$ 1.89	\$ 1.39	\$ 1.14	60.0%	60.0%			37	250%				
APLII TRADITIONAL WHOLE LIFE PARTICIPATING WHOLE LIFE INTEREST SENSITIVE WHOLE LIFE UNIVERSAL LIFE																				

Exhibit 3: Applied Life Insurance Illustrator – Universal Life

Applied Life Insurance Illustrator Financial Basis NLUL AFS 2010.xlsx - Microsoft Excel																			
Home		Insert		Page Layout		Formulas		Data		Review		View		Acrobat					
M2		898.09154204816																	
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
1	DATA	Death Benefit	Gender	Age		Rate Class	Whole Life Annualized Premium	Premiums Payable # Years		Participating Vanishing # Premiums	Int. Sensitive Vanishing # Premiums		Universal Life Planned Premium	Policy Expense \$		Guideline Premium	CRVM Expense Load		
2		\$300,000	Male	30		Standard	\$3,384.10	65		65	65		\$898.09	\$50.00		\$3,384.10	\$331.53		
3																			
4		Premium Payment Mode	CSO Mortality Table	Guaranteed Interest Rate		Automatic Premium Loan	Policy Loan Interest Rate	Dividend Option		Current Interest Rate	Projected Interest Rate		Death Benefit	% Policy Premium Fee		Expense Dividend	Mortality Cost Adjustment		
5		Annual	1980	4.00%		No	7.5%	PUA		11.00%	Current		Level	7.50%		5%	0%		
6	OUTPUT																		
7		PROSPECTIVE METHOD								RETROSPECTIVE METHOD									
8																			
9		TRADITIONAL WHOLE LIFE - GUARANTEED					PARTICIPATING WHOLE LIFE				INTEREST SENSITIVE WHOLE LIFE			UNIVERSAL LIFE - GUARANTEED		UNIVERSAL LIFE - PROJECTED			
10	Age	Cash Value	Paid-Up	Death Benefit		Cash Value	Dividend	Death Benefit		Cash Value	Death Benefit		Cash Value	Death Benefit		Cash Value	Death Benefit		
11	31	\$ -	\$ -	\$ 300,000		\$ 212	\$ 212	\$ 300,979		\$ -	\$ 300,000		\$ -	\$ 300,000		\$ -	\$ 300,000		
12	32	\$ -	\$ -	\$ 300,000		\$ 635	\$ 417	\$ 302,844		\$ 326	\$ 300,000		\$ 28	\$ 300,000		\$ 57	\$ 300,000		
13	33	\$ 2,781	\$ 12,447	\$ 300,000		\$ 4,101	\$ 663	\$ 305,715		\$ 1,033	\$ 300,000		\$ 85	\$ 300,000		\$ 178	\$ 300,000		
14	34	\$ 5,664	\$ 24,522	\$ 300,000		\$ 7,948	\$ 919	\$ 309,564		\$ 1,454	\$ 300,000		\$ 111	\$ 300,000		\$ 249	\$ 300,000		
15	35	\$ 8,645	\$ 36,205	\$ 300,000		\$ 12,209	\$ 1,204	\$ 314,440		\$ 3,842	\$ 300,000		\$ 272	\$ 300,000		\$ 651	\$ 300,000		
16																			
17	40	\$ 25,010	\$ 88,836	\$ 300,000		\$ 41,338	\$ 3,156	\$ 356,147		\$ 25,591	\$ 300,000		\$ 1,051	\$ 300,000		\$ 4,064	\$ 300,000		
18																			
19	45	\$ 43,668	\$ 132,220	\$ 300,000		\$ 88,900	\$ 6,327	\$ 432,755		\$ 104,447	\$ 300,000		\$ 1,110	\$ 300,000		\$ 15,101	\$ 300,000		
20																			
21	50	\$ 64,575	\$ 167,780	\$ 300,000		\$ 165,653	\$ 11,391	\$ 554,906		\$ 193,824	\$ 358,575		Lapse	Lapse		\$ 25,052	\$ 300,000		
22																			
23	55	\$ 87,712	\$ 196,967	\$ 300,000		\$ 288,407	\$ 19,484	\$ 738,251		\$ 342,290	\$ 513,435		Lapse	Lapse		\$ 39,281	\$ 300,000		
24																			
25	60	\$ 112,440	\$ 220,514	\$ 300,000		\$ 481,489	\$ 32,148	\$ 1,005,296		\$ 589,089	\$ 765,816		Lapse	Lapse		\$ 59,397	\$ 300,000		
26																			
27	65	\$ 138,373	\$ 239,555	\$ 300,000		\$ 780,801	\$ 51,586	\$ 1,386,519		\$ 998,820	\$ 1,198,584		Lapse	Lapse		\$ 87,926	\$ 300,000		
28																			
29	70	\$ 164,369	\$ 254,639	\$ 300,000		\$ 1,235,370	\$ 81,020	\$ 1,925,238		\$ 1,674,302	\$ 1,925,448		Lapse	Lapse		\$ 128,057	\$ 300,000		
30																			
31	75	\$ 189,671	\$ 266,571	\$ 300,000		\$ 1,914,643	\$ 125,114	\$ 2,682,834		\$ 2,792,762	\$ 2,932,400		Lapse	Lapse		\$ 189,135	\$ 300,000		
32																			
33	80	\$ 212,074	\$ 275,466	\$ 300,000		\$ 2,902,838	\$ 189,236	\$ 3,746,598		\$ 4,662,189	\$ 4,895,298		Lapse	Lapse		\$ 300,000	\$ 315,000		
34																			
35	85	\$ 231,878	\$ 282,388	\$ 300,000		\$ 4,330,529	\$ 282,019	\$ 5,237,194		\$ 7,701,167	\$ 8,086,225		Lapse	Lapse		\$ 499,563	\$ 524,541		
36																			
37	90	\$ 248,240	\$ 287,957	\$ 300,000		\$ 6,357,793	\$ 413,787	\$ 7,326,439		\$ 12,532,775	\$ 13,159,414		Lapse	Lapse		\$ 816,967	\$ 857,816		
38																			
39	95	\$ 267,477	\$ 296,472	\$ 300,000		\$ 9,341,158	\$ 605,367	\$ 10,245,336		\$ 20,526,083	\$ 20,526,083		Lapse	Lapse		\$ 1,342,063	\$ 1,342,063		
40																			
41	100	\$ 288,462	\$ 300,000	\$ 300,000		#DIV/0!	#DIV/0!	#DIV/0!		\$ 34,903,167	\$ 34,903,167		Lapse	Lapse		\$ 2,282,085	\$ 2,282,085		
42																			

Ready

APLI TRADITIONAL WHOLE LIFE PARTICIPATING WHOLE LIFE INTEREST SENSITIVE WHOLE LIFE UNIVERSAL LIFE

67%

**Figure 2: Life Insurance Industry 1985 Median UL Illustrated Rate
And Historical AAA Bond Yields 1919-1984 & 1985-2007**

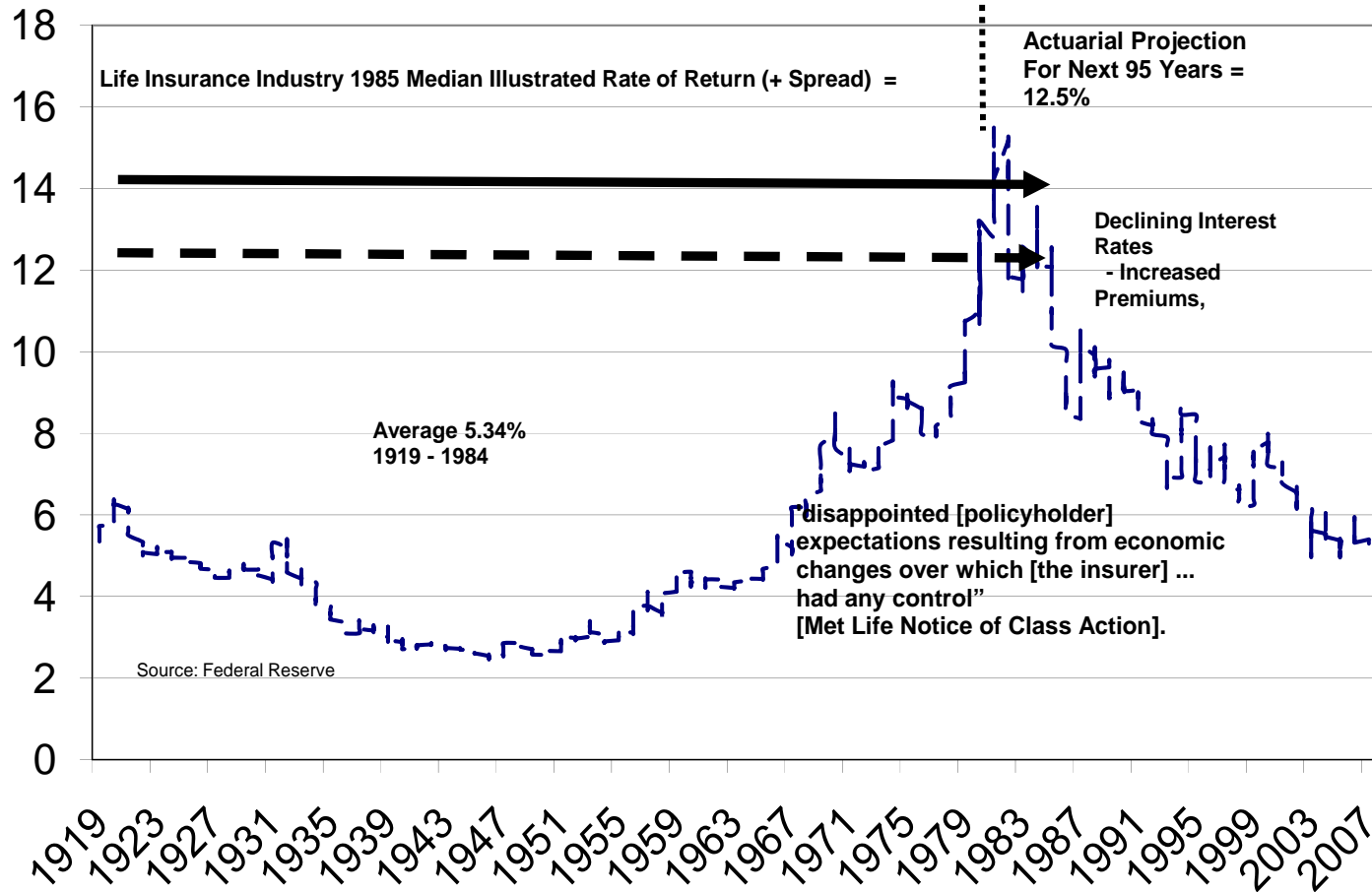


Exhibit 4a: Applied Life Insurance Illustrator – 1958, 1980, 2001 CSO Tables (AGE 30-66]

Applied Life Insurance Illustrator Financial Basis NLUL AFS 2010.xlsx - Microsoft Excel																				
Home Insert Page Layout Formulas Data Review View Acrobat																				
AE2 1958 CSO																				
Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS
1		ASSUMPTIONS																		
2						1958 CSO	1980 CSO	1980 CSO	2001 CSO	2001 CSO	Adjusted	Adjusted								
3						Guaranteed	Guaranteed	Guaranteed	Guaranteed	Guaranteed	Current	Current			IRS 26 Sect. 7702					
4			Policy	Interest		Age	Annual	Male	Female	Male	Female	Male	Female			Age	Factor		Policy	Surrender
			Year	Rate				Annual	Annual	Annual	Annual	Annual	%COI	%COI					Year	Charge
34			30	4.50%	30	\$ 2.13	\$ 1.73	\$ 1.35	\$ 1.14	\$ 0.70	60.0%	60.0%			30	250%				
35			31	4.50%	31	\$ 2.19	\$ 1.78	\$ 1.40	\$ 1.13	\$ 0.75	60.0%	60.0%			31	250%				
36			32	4.50%	32	\$ 2.25	\$ 1.83	\$ 1.45	\$ 1.14	\$ 0.79	60.0%	60.0%			32	250%				
37			33	4.50%	33	\$ 2.32	\$ 1.91	\$ 1.50	\$ 1.16	\$ 0.85	60.0%	60.0%			33	250%				
38			34	4.50%	34	\$ 2.40	\$ 2.00	\$ 1.58	\$ 1.19	\$ 0.92	60.0%	60.0%			34	250%				
39			35	4.50%	35	\$ 2.51	\$ 2.11	\$ 1.65	\$ 1.24	\$ 1.00	60.0%	60.0%			35	250%				
40			36	4.50%	36	\$ 2.64	\$ 2.24	\$ 1.76	\$ 1.31	\$ 1.07	60.0%	60.0%			36	250%				
41			37	4.50%	37	\$ 2.80	\$ 2.40	\$ 1.89	\$ 1.39	\$ 1.14	60.0%	60.0%			37	250%				
42			38	4.50%	38	\$ 3.01	\$ 2.58	\$ 2.04	\$ 1.49	\$ 1.20	60.0%	60.0%			38	250%				
43			39	4.50%	39	\$ 3.25	\$ 2.79	\$ 2.22	\$ 1.59	\$ 1.26	60.0%	60.0%			39	250%				
44			40	4.50%	40	\$ 3.53	\$ 3.02	\$ 2.42	\$ 1.72	\$ 1.34	60.0%	60.0%			40	250%				
45			41	4.50%	41	\$ 3.84	\$ 3.29	\$ 2.64	\$ 1.87	\$ 1.43	60.0%	60.0%			41	243%				
46			42	4.50%	42	\$ 4.17	\$ 3.56	\$ 2.87	\$ 2.05	\$ 1.53	60.0%	60.0%			42	236%				
47			43	4.50%	43	\$ 4.53	\$ 3.87	\$ 3.09	\$ 2.27	\$ 1.65	60.0%	60.0%			43	229%				
48			44	4.50%	44	\$ 4.92	\$ 4.19	\$ 3.32	\$ 2.52	\$ 1.79	60.0%	60.0%			44	222%				
49			45	4.50%	45	\$ 5.35	\$ 4.55	\$ 3.56	\$ 2.77	\$ 1.96	60.0%	60.0%			45	215%				
50			46	4.50%	46	\$ 5.83	\$ 4.92	\$ 3.80	\$ 3.03	\$ 2.16	60.0%	60.0%			46	209%				
51			47	4.50%	47	\$ 6.36	\$ 5.32	\$ 4.05	\$ 3.25	\$ 2.38	60.0%	60.0%			47	203%				
52			48	4.50%	48	\$ 6.95	\$ 5.74	\$ 4.33	\$ 3.42	\$ 2.64	60.0%	60.0%			48	197%				
53			49	4.50%	49	\$ 7.60	\$ 6.21	\$ 4.63	\$ 3.64	\$ 2.93	60.0%	60.0%			49	191%				
54			50	4.50%	50	\$ 8.32	\$ 6.71	\$ 4.96	\$ 3.91	\$ 3.24	60.0%	60.0%			50	185%				
55			51	4.50%	51	\$ 9.11	\$ 7.30	\$ 5.31	\$ 4.26	\$ 3.60	60.0%	60.0%			51	178%				
56			52	4.50%	52	\$ 9.96	\$ 7.96	\$ 5.70	\$ 4.70	\$ 3.99	60.0%	60.0%			52	171%				
57			53	4.50%	53	\$ 10.89	\$ 8.71	\$ 6.15	\$ 5.21	\$ 4.41	60.0%	60.0%			53	164%				
58			54	4.50%	54	\$ 11.90	\$ 9.56	\$ 6.61	\$ 5.83	\$ 4.86	60.0%	60.0%			54	157%				
59			55	4.50%	55	\$ 13.00	\$ 10.47	\$ 7.09	\$ 6.52	\$ 5.36	60.0%	60.0%			55	150%				
60			56	4.50%	56	\$ 14.21	\$ 11.46	\$ 7.57	\$ 7.26	\$ 5.91	60.0%	60.0%			56	146%				
61			57	4.50%	57	\$ 15.54	\$ 12.49	\$ 8.03	\$ 7.95	\$ 6.49	60.0%	60.0%			57	142%				
62			58	4.50%	58	\$ 17.00	\$ 13.59	\$ 8.47	\$ 8.63	\$ 7.09	60.0%	60.0%			58	138%				
63			59	4.50%	59	\$ 18.59	\$ 14.77	\$ 8.94	\$ 9.42	\$ 7.70	60.0%	60.0%			59	134%				
64			60	4.50%	60	\$ 20.34	\$ 16.08	\$ 9.47	\$ 10.40	\$ 8.34	60.0%	60.0%			60	130%				
65			61	4.50%	61	\$ 22.24	\$ 17.54	\$ 10.13	\$ 11.59	\$ 9.03	61.0%	61.0%			61	128%				
66			62	4.50%	62	\$ 24.31	\$ 19.19	\$ 10.96	\$ 12.98	\$ 9.76	62.0%	62.0%			62	126%				
67			63	4.50%	63	\$ 26.57	\$ 21.06	\$ 12.02	\$ 14.47	\$ 10.55	63.0%	63.0%			63	124%				
68			64	4.50%	64	\$ 29.04	\$ 23.14	\$ 13.25	\$ 16.04	\$ 11.40	64.0%	64.0%			64	122%				
69			65	4.50%	65	\$ 31.75	\$ 25.42	\$ 14.59	\$ 17.65	\$ 12.33	65.0%	65.0%			65	120%				
70			66	4.50%	66	\$ 34.74	\$ 27.85	\$ 16.00	\$ 19.27	\$ 13.35	66.0%	66.0%			66	119%				
APLII TRADITIONAL WHOLE LIFE PARTICIPATING WHOLE LIFE INTEREST SENSITIVE WHOLE LIFE UNIVERSAL LIFE																				
Ready 67%																				

Exhibit 4b: Applied Life Insurance Illustrator – 1958, 1980, 2001 CSO Tables (AGE 67-103]

Applied Life Insurance Illustrator Financial Basis NLUL AFS 2010.xlsx - Microsoft Excel																					
Home Insert Page Layout Formulas Data Review View Acrobat																					
AH2		2001 CSO																			
	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS
1			ASSUMPTIONS																		
2							1958 CSO	1980 CSO	1980 CSO	2001 CSO	2001 CSO	Adjusted	Adjusted								
3							Guaranteed	Guaranteed	Guaranteed	Guaranteed	Guaranteed	Current	Current			IRS 26 Sect. 7702					
4			Policy	Interest		Age	Annual	Male	Female	Male	Female	Male	Female						Policy	Surrender	
			Year	Rate				Annual	Annual	Annual	Annual	Male %COI	Female %COI			Age	Factor		Year	Charge	
71			67	4.50%		67	\$ 38.04	\$ 30.44	\$ 17.43	\$ 20.96	\$ 14.48	67.0%	67.0%			67	118%				
72			68	4.50%		68	\$ 41.68	\$ 33.19	\$ 18.84	\$ 22.74	\$ 15.71	68.0%	68.0%			68	117%				
73			69	4.50%		69	\$ 45.61	\$ 36.17	\$ 20.36	\$ 24.69	\$ 17.08	69.0%	69.0%			69	116%				
74			70	4.50%		70	\$ 49.79	\$ 39.51	\$ 22.11	\$ 26.94	\$ 18.63	70.0%	70.0%			70	115%				
75			71	4.50%		71	\$ 54.15	\$ 43.30	\$ 24.23	\$ 29.71	\$ 20.38	71.0%	71.0%			71	113%				
76			72	4.50%		72	\$ 58.65	\$ 47.65	\$ 26.87	\$ 32.94	\$ 22.29	72.0%	72.0%			72	111%				
77			73	4.50%		73	\$ 63.26	\$ 52.64	\$ 30.11	\$ 36.32	\$ 24.39	73.0%	73.0%			73	109%				
78			74	4.50%		74	\$ 68.12	\$ 58.19	\$ 33.93	\$ 39.96	\$ 26.68	74.0%	74.0%			74	107%				
79			75	4.50%		75	\$ 73.37	\$ 64.19	\$ 38.24	\$ 43.95	\$ 29.20	75.0%	75.0%			75	105%				
80			76	4.50%		76	\$ 79.18	\$ 70.63	\$ 42.97	\$ 48.44	\$ 31.95	76.0%	76.0%			76	105%				
81			77	4.50%		77	\$ 85.70	\$ 77.12	\$ 48.04	\$ 53.67	\$ 34.97	77.0%	77.0%			77	105%				
82			78	4.50%		78	\$ 93.06	\$ 83.90	\$ 53.45	\$ 59.72	\$ 38.28	78.0%	78.0%			78	105%				
83			79	4.50%		79	\$ 101.19	\$ 91.05	\$ 59.35	\$ 66.48	\$ 41.92	79.0%	79.0%			79	105%				
84			80	4.50%		80	\$ 109.98	\$ 98.84	\$ 65.99	\$ 74.02	\$ 46.43	80.0%	80.0%			80	105%				
85			81	4.50%		81	\$ 119.35	\$ 107.48	\$ 73.60	\$ 82.20	\$ 51.96	81.0%	81.0%			81	105%				
86			82	4.50%		82	\$ 129.17	\$ 117.25	\$ 82.40	\$ 90.82	\$ 57.80	82.0%	82.0%			82	105%				
87			83	4.50%		83	\$ 139.38	\$ 128.26	\$ 92.53	\$ 100.22	\$ 63.94	83.0%	83.0%			83	105%				
88			84	4.50%		84	\$ 150.01	\$ 140.25	\$ 103.81	\$ 110.69	\$ 70.74	84.0%	84.0%			84	105%				
89			85	4.50%		85	\$ 161.14	\$ 152.95	\$ 116.10	\$ 122.36	\$ 77.59	85.0%	85.0%			85	105%				
90			86	4.50%		86	\$ 172.82	\$ 166.09	\$ 129.29	\$ 135.17	\$ 85.68	86.0%	86.0%			86	105%				
91			87	4.50%		87	\$ 185.13	\$ 179.55	\$ 143.32	\$ 148.99	\$ 95.69	87.0%	87.0%			87	105%				
92			88	4.50%		88	\$ 198.25	\$ 193.27	\$ 158.18	\$ 163.66	\$ 106.25	88.0%	88.0%			88	105%				
93			89	4.50%		89	\$ 212.46	\$ 207.29	\$ 173.94	\$ 179.03	\$ 116.68	89.0%	89.0%			89	105%				
94			90	4.50%		90	\$ 228.14	\$ 221.77	\$ 190.75	\$ 194.28	\$ 124.22	90.0%	90.0%			90	105%				
95			91	4.50%		91	\$ 245.77	\$ 236.98	\$ 208.87	\$ 209.27	\$ 131.53	91.0%	91.0%			91	104%				
96			92	4.50%		92	\$ 265.93	\$ 253.45	\$ 228.81	\$ 224.94	\$ 143.72	92.0%	92.0%			92	103%				
97			93	4.50%		93	\$ 289.30	\$ 272.11	\$ 251.51	\$ 241.46	\$ 160.21	93.0%	93.0%			93	102%				
98			94	4.50%		94	\$ 316.66	\$ 295.90	\$ 279.31	\$ 258.86	\$ 180.90	94.0%	94.0%			94	101%				
99			95	4.50%		95	\$ 351.24	\$ 329.96	\$ 317.32	\$ 276.12	\$ 203.48	95.0%	95.0%			95	100%				
100			96	4.50%		96	\$ 400.56	\$ 384.55	\$ 375.74	\$ 292.95	\$ 225.69	96.0%	96.0%			96	100%				
101			97	4.50%		97	\$ 488.42	\$ 480.20	\$ 474.97	\$ 310.86	\$ 240.07	97.0%	97.0%			97	100%				
102			98	4.50%		98	\$ 688.15	\$ 657.98	\$ 655.85	\$ 329.95	\$ 247.79	98.0%	98.0%			98	100%				
103			99	4.50%		99	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ 350.32	\$ 263.98	99.0%	99.0%			99	100%				
104			100	4.50%		100				\$ 369.76	\$ 285.02	100.0%	100.0%			100	100%				
105			101	4.50%		101				\$ 386.96	\$ 307.89	100.0%	100.0%			101	100%				
106			102	4.50%		102				\$ 405.25	\$ 333.06	100.0%	100.0%			102	100%				
107			103	4.50%		103				\$ 424.70	\$ 360.71	100.0%	100.0%			103	100%				
APLII TRADITIONAL WHOLE LIFE PARTICIPATING WHOLE LIFE INTEREST SENSITIVE WHOLE LIFE UNIVERSAL LIFE																					
Ready																					

Exhibit 5: Applied Life Insurance Illustrator – Yearly Rates

Applied Life Insurance Illustrator Financial Basis NLUL AFS 2010.xlsx - Microsoft Excel																	
Home Insert Page Layout Formulas Data Review View Acrobat																	
P27 =IF(Q27="Lapse","Lapse",VLOOKUP(\$A27,'UNIVERSAL LIFE'!\$AB\$6:\$AN\$125,12))																	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	DATA	Death Benefit	Gender	Age		Rate Class	Whole Life Annualized Premium	Premiums Payable # Years	Participating Vanishing # Premiums	Int. Sensitive Vanishing # Premiums		Universal Life Planned Premium	Policy Expense \$		Guideline Premium	CRVM Expense Load	
2		\$300,000	Male	30		Standard	\$3,384.10	65	65	65		\$898.09	\$50.00		\$3,384.10	\$331.53	
3																	
4		Premium Payment Mode	CSO Mortality Table	Guaranteed Interest Rate		Automatic Premium Loan	Policy Loan Interest Rate	Dividend Option	Current Interest Rate	Projected Interest Rate		Death Benefit	% Policy Premium Fee		Expense Dividend	Mortality Cost Adjustment	
5		Annual	1980	4.00%		No	7.5%	PUA	11.00%	Yearly		Level	7.50%		5%	0%	
6	OUTPUT																
7		PROSPECTIVE METHOD							RETROSPECTIVE METHOD								
8																	
9		TRADITIONAL WHOLE LIFE - GUARANTEED				PARTICIPATING WHOLE LIFE			INTEREST SENSITIVE WHOLE LIFE			UNIVERSAL LIFE - GUARANTEED		UNIVERSAL LIFE - PROJECTED			
10	Age	Cash Value	Paid-Up	Death Benefit		Cash Value	Dividend	Death Benefit	Cash Value	Death Benefit		Cash Value	Death Benefit		Cash Value	Death Benefit	
11	31	\$ -	\$ -	\$ 300,000		\$ 212	\$ 212	\$ 300,979	\$ -	\$ 300,000		\$ -	\$ 300,000		\$ -	\$ 300,000	
12	32	\$ -	\$ -	\$ 300,000		\$ 614	\$ 395	\$ 302,747	\$ 324	\$ 300,000		\$ 28	\$ 300,000		\$ 56	\$ 300,000	
13	33	\$ 2,781	\$ 12,447	\$ 300,000		\$ 3,957	\$ 541	\$ 305,089	\$ 1,021	\$ 300,000		\$ 85	\$ 300,000		\$ 176	\$ 300,000	
14	34	\$ 5,664	\$ 24,522	\$ 300,000		\$ 7,600	\$ 720	\$ 308,105	\$ 1,415	\$ 300,000		\$ 111	\$ 300,000		\$ 241	\$ 300,000	
15	35	\$ 8,645	\$ 36,205	\$ 300,000		\$ 11,529	\$ 883	\$ 311,683	\$ 3,685	\$ 300,000		\$ 272	\$ 300,000		\$ 622	\$ 300,000	
16																	
17	40	\$ 25,010	\$ 88,836	\$ 300,000		\$ 35,086	\$ 1,294	\$ 334,646	\$ 22,262	\$ 300,000		\$ 1,051	\$ 300,000		\$ 3,498	\$ 300,000	
18																	
19	45	\$ 43,668	\$ 132,220	\$ 300,000		\$ 63,694	\$ 1,682	\$ 358,777	\$ 76,164	\$ 300,000		\$ 1,110	\$ 300,000		\$ 10,614	\$ 300,000	
20																	
21	50	\$ 64,575	\$ 167,780	\$ 300,000		\$ 97,871	\$ 1,990	\$ 383,968	\$ 114,996	\$ 300,000		Lapse	Lapse		\$ 13,374	\$ 300,000	
22																	
23	55	\$ 87,712	\$ 196,967	\$ 300,000		\$ 137,140	\$ 2,098	\$ 407,934	\$ 161,780	\$ 300,000		Lapse	Lapse		\$ 14,035	\$ 300,000	
24																	
25	60	\$ 112,440	\$ 220,514	\$ 300,000		\$ 179,671	\$ 2,068	\$ 428,486	\$ 216,675	\$ 300,000		Lapse	Lapse		\$ 10,128	\$ 300,000	
26																	
27	65	\$ 138,373	\$ 239,555	\$ 300,000		\$ 226,548	\$ 2,513	\$ 449,128	\$ 283,301	\$ 339,961		Lapse	Lapse		Lapse	Lapse	
28																	
29	70	\$ 164,369	\$ 254,639	\$ 300,000		\$ 277,030	\$ 2,915	\$ 470,962	\$ 364,230	\$ 418,864		Lapse	Lapse		Lapse	Lapse	
30																	
31	75	\$ 189,671	\$ 266,571	\$ 300,000		\$ 329,799	\$ 3,321	\$ 493,570	\$ 463,392	\$ 486,562		Lapse	Lapse		Lapse	Lapse	
32																	
33	80	\$ 212,074	\$ 275,466	\$ 300,000		\$ 381,069	\$ 3,538	\$ 516,465	\$ 587,041	\$ 616,393		Lapse	Lapse		Lapse	Lapse	
34																	
35	85	\$ 231,878	\$ 282,388	\$ 300,000		\$ 429,957	\$ 3,610	\$ 538,604	\$ 732,667	\$ 769,300		Lapse	Lapse		Lapse	Lapse	
36																	
37	90	\$ 248,240	\$ 287,957	\$ 300,000		\$ 473,656	\$ 3,429	\$ 559,245	\$ 897,739	\$ 942,626		Lapse	Lapse		Lapse	Lapse	
38																	
39	95	\$ 267,477	\$ 296,472	\$ 300,000		\$ 520,323	\$ 3,024	\$ 577,136	\$ 1,103,941	\$ 1,103,941		Lapse	Lapse		Lapse	Lapse	
40																	
41	100	\$ 288,462	\$ 300,000	\$ 300,000		#DIV/0!	#DIV/0!	#DIV/0!	\$ 1,388,261	\$ 1,388,261		Lapse	Lapse		Lapse	Lapse	
APLII TRADITIONAL WHOLE LIFE PARTICIPATING WHOLE LIFE INTEREST SENSITIVE WHOLE LIFE UNIVERSAL LIFE																	

Exhibit 6: Applied Life Insurance Illustrator – No Lapse Universal Life

Applied Life Insurance Illustrator Financial Basis NLUL AFS 2010.xlsx - Microsoft Excel																	
P7																	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	DATA	Death Benefit	Gender	Age	Rate Class	Whole Life Annualized Premium	Premiums Payable # Years		Participating Vanishing # Premiums	Int. Sensitive Vanishing # Premiums		Universal Life Planned Premium	Policy Expense \$		Guideline Premium	CRVM Expense Load	
2		\$300,000	Male	30	Standard	\$2,765.13	70		70	70		\$1,158.36	\$50.00		\$2,765.13	\$285.06	
3																	
4		Premium Payment Mode	CSO Mortality Table	Guaranteed Interest Rate	Automatic Premium Loan	Policy Loan Interest Rate	Dividend Option		Current Interest Rate	Projected Interest Rate		Death Benefit	% Policy Premium Fee		Expense Dividend	Mortality Cost Adjustment	
5		Annual	2001	4.00%	No	7.5%	PUA		7.00%	Current		Level	7.50%		5%	0%	
6	OUTPUT																
7		PROSPECTIVE METHOD							RETROSPECTIVE METHOD								
8																	
9		TRADITIONAL WHOLE LIFE - GUARANTEED				PARTICIPATING WHOLE LIFE			INTEREST SENSITIVE WHOLE LIFE			UNIVERSAL LIFE - GUARANTEED		UNIVERSAL LIFE - PROJECTED			
10	Age	Cash Value	Paid-Up	Death Benefit	Cash Value	Dividend	Death Benefit		Cash Value	Death Benefit		Cash Value	Death Benefit	Cash Value	Death Benefit	Cash Value	Death Benefit
11	31	\$ -	\$ -	\$ 300,000	\$ 135	\$ 135	\$ 300,735		\$ -	\$ 300,000		\$ -	\$ 300,000	\$ -	\$ 300,000	\$ -	\$ 300,000
12	32	\$ -	\$ -	\$ 300,000	\$ 345	\$ 206	\$ 301,822		\$ 256	\$ 300,000		\$ 73	\$ 300,000	\$ 92	\$ 300,000	\$ 92	\$ 300,000
13	33	\$ 2,353	\$ 12,417	\$ 300,000	\$ 3,008	\$ 298	\$ 303,341		\$ 796	\$ 300,000		\$ 224	\$ 300,000	\$ 284	\$ 300,000	\$ 284	\$ 300,000
14	34	\$ 4,799	\$ 24,470	\$ 300,000	\$ 5,860	\$ 382	\$ 305,223		\$ 1,100	\$ 300,000		\$ 304	\$ 300,000	\$ 392	\$ 300,000	\$ 392	\$ 300,000
15	35	\$ 7,341	\$ 36,153	\$ 300,000	\$ 8,913	\$ 475	\$ 307,481		\$ 2,848	\$ 300,000		\$ 774	\$ 300,000	\$ 1,015	\$ 300,000	\$ 1,015	\$ 300,000
16																	
17	40	\$ 21,466	\$ 88,883	\$ 300,000	\$ 27,622	\$ 1,057	\$ 324,629		\$ 17,023	\$ 300,000		\$ 4,103	\$ 300,000	\$ 5,983	\$ 300,000	\$ 5,983	\$ 300,000
18																	
19	45	\$ 37,936	\$ 132,481	\$ 300,000	\$ 53,372	\$ 1,888	\$ 352,142		\$ 61,345	\$ 300,000		\$ 12,445	\$ 300,000	\$ 20,999	\$ 300,000	\$ 20,999	\$ 300,000
20																	
21	50	\$ 56,672	\$ 167,982	\$ 300,000	\$ 88,199	\$ 2,970	\$ 390,465		\$ 98,978	\$ 300,000		\$ 15,859	\$ 300,000	\$ 32,638	\$ 300,000	\$ 32,638	\$ 300,000
22																	
23	55	\$ 78,137	\$ 197,405	\$ 300,000	\$ 135,464	\$ 4,507	\$ 440,438		\$ 151,329	\$ 300,000		\$ 17,667	\$ 300,000	\$ 47,706	\$ 300,000	\$ 47,706	\$ 300,000
24																	
25	60	\$ 101,561	\$ 220,975	\$ 300,000	\$ 197,970	\$ 6,525	\$ 503,815		\$ 224,541	\$ 300,000		\$ 14,940	\$ 300,000	\$ 66,403	\$ 300,000	\$ 66,403	\$ 300,000
26																	
27	65	\$ 126,572	\$ 239,853	\$ 300,000	\$ 279,060	\$ 9,076	\$ 581,625		\$ 327,069	\$ 392,482		\$ 3,208	\$ 300,000	\$ 88,876	\$ 300,000	\$ 88,876	\$ 300,000
28																	
29	70	\$ 152,161	\$ 254,715	\$ 300,000	\$ 381,210	\$ 12,112	\$ 674,456		\$ 468,452	\$ 538,720		Lapse	Lapse	\$ 114,542	\$ 300,000	\$ 114,542	\$ 300,000
30																	
31	75	\$ 178,410	\$ 266,745	\$ 300,000	\$ 508,809	\$ 15,904	\$ 783,800		\$ 664,419	\$ 697,640		Lapse	Lapse	\$ 143,082	\$ 300,000	\$ 143,082	\$ 300,000
32																	
33	80	\$ 203,724	\$ 276,144	\$ 300,000	\$ 662,988	\$ 20,430	\$ 911,794		\$ 938,197	\$ 985,106		Lapse	Lapse	\$ 172,309	\$ 300,000	\$ 172,309	\$ 300,000
34																	
35	85	\$ 225,925	\$ 283,067	\$ 300,000	\$ 841,336	\$ 25,546	\$ 1,060,796		\$ 1,308,356	\$ 1,373,773		Lapse	Lapse	\$ 198,138	\$ 300,000	\$ 198,138	\$ 300,000
36																	
37	90	\$ 243,598	\$ 287,932	\$ 300,000	\$ 1,040,195	\$ 31,126	\$ 1,233,146		\$ 1,795,334	\$ 1,885,101		Lapse	Lapse	\$ 214,349	\$ 300,000	\$ 214,349	\$ 300,000
38																	
39	95	\$ 256,363	\$ 291,437	\$ 300,000	\$ 1,257,692	\$ 37,033	\$ 1,431,326		\$ 2,468,907	\$ 2,468,907		Lapse	Lapse	\$ 200,927	\$ 300,000	\$ 200,927	\$ 300,000
40																	
41	100	\$ 268,584	\$ 297,140	\$ 300,000	\$ 1,502,000	\$ 43,718	\$ 1,658,788		\$ 3,495,810	\$ 3,495,810		Lapse	Lapse	\$ 1,000	\$ 300,000	\$ 1,000	\$ 300,000
APLII / TRADITIONAL WHOLE LIFE / PARTICIPATING WHOLE LIFE / INTEREST SENSITIVE WHOLE LIFE / UNIVERSAL LIFE																	