

EDUCATION AND EXAMINATION COMMITTEE  
OF THE  
SOCIETY OF ACTUARIES  
COURSE 8 INDIVIDUAL INSURANCE STUDY NOTE

**INDIVIDUAL INSURANCE CASE STUDY**

This case study will be used as a basis for examination questions. Be sure to answer the question asked by referring to the case study. For example, when asked for the advantages of a particular pricing approach used by a company referenced in the case study, your response should be limited to that company. Other advantages should not be listed, as they are extraneous to the question and will not result in additional credit. Further, if they conflict with the applicable advantages, no credit will be given.

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# Case Study for Course 8 Individual Insurance

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# Saturn Life

## Saturn Life at a Glance

Ownership Structure: Stock

Company Organization Date: 1975

Size:

- \$54 billion of life insurance in force (before reinsurance) as of 12/31/99
- \$285 million of life insurance premium (\$195 million retained after reinsurance) in 1999
- \$59 million of 1<sup>st</sup> year life insurance premium (\$41 million retained after reinsurance) in 1999
- \$320 million of annuity premium in 1999

Primary Distribution Channel: Non-agency building brokerage operation. A Brokerage General Agent, who is an independent contractor who can represent many companies, appoints brokers on behalf of the company. Saturn Life also contracts directly with some brokers without the use of a Brokerage General Agent.

Secondary Distribution Channel: Direct response, via mail, phone call centers and the Internet

Ratings: Saturn Life is generally rated in the second tier of ratings. Ratings have remained steady, with the rating agencies satisfied with the quality of management and the prospects for growth through the current and new distribution systems. Profitability has been satisfactory, though the rating agencies have raised concerns with some unfavorable unit expense trends. Asset quality is high, though much of the business is either reinsured or consists of variable life insurance or variable annuities.

Primary/Core Products:

- Term life insurance
- Variable universal life insurance
- Variable annuities

Secondary products:

- Universal life insurance
- Fixed deferred annuities

## **Saturn Life Marketing Information**

### Marketing Goals:

- Increase term life insurance market share from 1% to 2% over next 5 years. The measure used is total face amount in force
- Increase variable annuity and variable universal life assets under management 30% per year over next 5 years

### Marketing Strategies:

- Expand term insurance distribution channels
- Expand variable policy investment options available to policy owners.

### Competitive Strengths:

- Favorable name recognition within the marketplace and brokerage community.
- Reputation as a high quality, low cost insurance provider.

### Competitive Weaknesses:

- Expenses that are higher than average versus similar companies.
- Not known for investment expertise.

### Primary Markets:

- Affluent families
- Affluent pre-retired people

### Critical Success Factors:

- Controlling expenses in order to maintain competitiveness of its term life products.
- Establishing a strong market position with competitive investment product offerings.
- Growing distribution systems

### Risks:

- It may not have the critical mass needed to achieve its goals in the term life insurance marketplace. Expenses may be too high, not allowing a competitive enough product.
- It may not be able to maintain the allegiance of brokers to the extent needed to achieve its marketing goals
- Policy persistency has been worsening during the last three years. Further deterioration could begin to weaken profitability and cause increases in unit costs

## Saturn Life Distribution Channels

### Overview:

- The primary distribution channel is a non-agency building brokerage operation.
- Saturn Life has been focusing on developing its direct response distribution channels. 1999 was the first year that sales through this channel were material. Almost 10% of its term life insurance was sold via the telephone, with the initial contact coming from either mail, the phone or the Internet.

### Channel Structures:

- **Brokerage General Agents:** Independent contractors who represent many companies and appoint brokers on behalf of the company.
- **Brokers:** Saturn Life advertises heavily in the trade press, and is successful in contracting with brokers directly without the use of a General Agent. 25% of brokers placing business with the company are attracted through this approach.
- **Direct:** This channel centers on a phone-underwriting unit that receives leads from mail, phone and Internet requests. Saturn Life has developed strong advertising, communication and quote capabilities that can be launched efficiently and effectively, resulting in relatively predictable volumes of phone contacts for the underwriting staff to make

### Channel Compensation Structures:

The company pays the cost of contracting and licensing with the company as long as the broker sold one policy in the prior calendar year. Commissions are determined as a percentage of premium. If a general agent is involved in a sale, the general agent receives 20% of the total 1<sup>st</sup>-year commission, and the broker receives 80%. All renewal commissions are paid to the broker.

No commissions are paid for any sales made through direct distribution channels. The cost per sale in the direct market is currently being analyzed, but it is clear that costs vary significantly by the type of direct offering and by various demographic factors.

## Saturn Life Historical Sales Data – All Products

All Distribution Systems Combined					
	1995	1996	1997	1998	1999
1 <sup>st</sup> Year Life Premium before Reinsurance	\$35 mill	\$35 mill	\$44 mill	\$48 mill	\$59 mill
1 <sup>st</sup> Year Life Premium after Reinsurance	\$20 mill	\$20 mill	\$26 mill	\$30 mill	\$41 mill
Number of Life Insurance Policies Issued	48,000	46,000	53,000	54,000	55,000
Face Amount Sold (before reinsurance)	\$8.6 bill	\$8.6 bill	\$10.2 bill	\$10.7 bill	\$11.3 bill
Annuity Premium	\$225 mill	\$200 mill	\$261 mill	\$286 mill	\$320 mill

Brokerage Distribution					
	1995	1996	1997	1998	1999
1 <sup>st</sup> Year Life Premium before Reinsurance	\$35 mill	\$35 mill	\$43.6 mill	\$47 mill	\$56.9 mill
1 <sup>st</sup> Year Life Premium after Reinsurance	\$20 mill	\$20 mill	\$25.96 mill	\$29.9 mill	\$40.8 mill
Number of Life Insurance Policies Issued	48,000	46,000	52,230	52,100	51,150
Face Amount Sold (before reinsurance)	\$8.6 bill	\$8.6 bill	\$10.03 bill	\$10.28 bill	\$10.43 bill
Annuity Premium	\$225 mill	\$200 mill	\$261 mill	\$286 mill	\$320 mill
Channel Size	100 GAs, with 2800 brokers contracted by them.	100 GAs, with 2600 brokers contracted by them.	100 GAs, with 2400 brokers contracted by them.	100 GAs, with 2200 brokers contracted by them.	100 GAs, with 2000 brokers contracted by them.
	200 brokers contracted directly.	250 brokers contracted directly.	300 brokers contracted directly.	400 brokers contracted directly.	500 brokers contracted directly.

Direct Distribution					
	1995	1996	1997	1998	1999
1 <sup>st</sup> Year Life Premium before Reinsurance	0	0	\$0.4 mill	\$1.0 mill	\$2.1 mill
1 <sup>st</sup> Year Life Premium after Reinsurance	0	0	\$0.04 mill	\$0.1 mill	\$0.2 mill
Number of Life Insurance Policies Issued	0	0	770	1,900	3,850
Face Amount Sold (before reinsurance)	0	0	\$0.17 bill	\$0.42 bill	\$0.87 bill
Annuity Premium	0	0	0	0	0
Number of underwriters taking applications by phone	0	0	3	6	9

**Saturn Life Historical In Force Data – All Products**

<b>All Distribution Systems Combined</b>					
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
Total Life Premium before Reinsurance	\$121 mill	\$143 mill	\$187 mill	\$227 mill	\$285 mill
Total Life Premium after Reinsurance	\$69 mill	\$82 mill	\$116 mill	\$147 mill	\$195 mill
Number of Life Insurance Policies In Force at Year-End	165,000	184,000	220,000	250,000	272,000
Face Amount In Force at Year-End (before reinsurance)	\$29.2 bill	\$34.0 bill	\$41.3 bill	\$48.2 bill	\$53.9 bill
Annuity Account Value at Year-End	\$2.5 bill	\$2.7 bill	\$2.9 bill	\$3.0 bill	\$3.2 bill

## Saturn Life - Overall Financial Management Overview

### Corporate Cost of Capital

Saturn Life's corporate parent finances its operations in the equity and debt markets and allocates capital to Saturn Life through an internal required surplus mechanism. Shareholders demand an after-tax annual return on the investment of 18.00%. Saturn Life's parent leverages its capital structure by employing a significant amount of debt financing. Its after-tax cost of long-term debt financing is 5.50%. Given the current mix of equity (60%) and debt (40%), Saturn Life's after-tax cost of capital is 13.00%.

### Profit Measures & Targets

To meet its cost of capital and create value for its shareholders, Saturn Life's parent requires Saturn Life to achieve an after-tax return on equity of 15% in aggregate. In turn, Saturn Life has developed the following profit targets for its products. While some individual product profit targets have not been met, the aggregate target of 15% has generally been achieved.

Product	After Tax Return on Equity
Term Life	15.0%
Variable Universal Life	12.5%
Variable Annuities	20.0%
Other Products	15.0%

### Internal Pricing Standards

Saturn Life traditionally reviews the adequacy of its pricing on an annual basis. This would include reviewing the adequacy of fixed account interest spreads, emerging mortality experience, actual versus expected expenses, a cost/benefit analysis of existing or proposed reinsurance, and sales by product and pricing cell. The competitive nature of the term life market necessitates a semi-annual review of this product. In addition, the company's Appointed Actuary conducts a peer review of this product assessment to gain further familiarity with the issues facing the company's product lines.

### Experience Analyses

Saturn Life's Appointed Actuary annually reviews the emerging mortality and persistency experience for the company's life and annuity products in conjunction with the actuarial analyses that support Saturn Life's financial reporting. Recent experience is summarized below:

Calendar Year	<u>Actual to Expected Mortality &amp; Lapse Ratios by Product</u>					
	<u>Term Life</u>		<u>Variable UL</u>		<u>Deferred Annuities</u>	
	<u>Mortality</u>	<u>Lapse</u>	<u>Mortality</u>	<u>Lapse</u>	<u>Mortality</u>	<u>Lapse</u>
1995	100%	100%	100%	100%	100%	105%
1996	98%	105%	99%	95%	100%	106%
1997	102%	110%	98%	95%	100%	107%
1998	99%	120%	99%	95%	97%	109%
1999	104%	120%	96%	95%	95%	112%



Saturn Life's product management actuary establishes credited interest rates for the fixed account investment options in its VUL and Variable Annuity products following periodic reviews of emerging investment results. Recent investment performance is summarized below:

Calendar Year	Gross	Investment	Default	Net	Actual	
	Investment				Expenses	Losses
	Yield			Rate	VUL	VA
1995	8.00%	0.10%	0.30%	7.60%	5.85%	6.10%
1996	7.75%	0.10%	0.30%	7.35%	5.60%	5.85%
1997	7.50%	0.10%	0.30%	7.10%	5.35%	5.60%
1998	7.25%	0.15%	0.25%	6.85%	5.10%	5.35%
1999	7.25%	0.15%	0.25%	6.85%	5.10%	5.35%

### Reinsurance

Throughout its history Saturn Life has made extensive use of reinsurance in managing its life insurance product portfolios. Saturn Life reinsures 100% of its VUL net amount at risk in excess of its retention (currently \$500,000) on a yearly renewable term basis to a pool of 4 reinsurers, split evenly. Reinsurance premium rates are a percentage of the underlying cost of insurance on each product. To reduce mortality volatility and mitigate high first year underwriting and issue expenses, Saturn Life coinsures 90% of its term products to a pool of 5 reinsurers on a quota share basis. Each reinsurer assumes 18% of Saturn Life's new business and provides a reinsurance allowance equal to 100% of the reinsured premium. While the renewal reinsurance allowance varies by pool member, the average renewal allowance across all pool members and term products is 23%.

## Saturn Life Product Overview

The products of Saturn Life currently consist primarily of variable universal life (VUL), variable annuities and a line of term life insurance products. Company management is satisfied with the growth of these core lines of business, though there is a perception that the growth of new term premium should be accelerating faster. VUL and term have been sold for several years, but the variable annuity was first sold in 1997.

Other smaller lines of business include:

1. a very small block of whole life, which is no longer being sold;
2. a small block of universal life which is available for sale, and growing, but is not actively being marketed; and
3. a declining block of fixed annuity business, which is still available but has experienced sales decreases of about 65% over the last five years.

Annual Sales for Term Life Insurance					
	1995	1996	1997	1998	1999
1 <sup>st</sup> Year Premium (before reinsurance)	\$17.0 mill	\$17.1 mill	\$19.9 mill	\$20.1 mill	\$20.8 mill
1 <sup>st</sup> Year Premium (after reinsurance)	\$1.7 mill	\$1.7 mill	\$2.0 mill	\$2.0 mill	\$2.1 mill
Policies Issued	35,542	34,008	38,508	37,992	38,500
New Face Amount (before reinsurance)	\$7.1 bill	\$7.2 bill	\$8.3 bill	\$8.4 bill	\$8.7 bill
In Force Data for Term Life Insurance					
	12/31/1995	12/31/1996	12/31/1997	12/31/1998	12/31/1999
Total Premium (before reinsurance)	\$58.2 mill	\$67.6 mill	\$78.8 mill	\$89.3 mill	\$99.8 mill
Total Premium (after reinsurance)	\$5.8 mill	\$6.8 mill	\$7.9 mill	\$8.9 mill	\$10.0 mill
Policies In Force	121,320	134,060	152,672	169,161	184,728
Face Amount In Force (before reinsurance)	\$24.3 bill	\$28.2 bill	\$32.8 bill	\$37.2 bill	\$41.6 bill

Annual Sales for Variable Universal Life Insurance					
	1995	1996	1997	1998	1999
New Premium	\$16.4 mill	\$15.6 mill	\$21.2 mill	\$24.0 mill	\$33.6 mill
New Policies	11,168	9,985	12,386	12,975	13,326
New Face Amount	\$1.40 bill	\$1.35 bill	\$1.8 bill	\$2.08 bill	\$2.33 bill
Inforce Data for Variable Universal Life Insurance					
	12/31/1995	12/31/1996	12/31/1997	12/31/1998	12/31/1999
Annual Total Premium	\$46.8 mill	\$55.2 mill	\$83.2 mill	\$106.4 mill	\$146.4 mill
Policies In Force	31,870	37,000	44,500	52,000	59,500
Face Amount In Force	\$3.6 bill	\$4.8 bill	\$6.4 bill	\$8.2 bill	\$10.1 bill

<b>Annual Sales for Variable Annuities</b>					
	1995	1996	1997	1998	1999
Premium	\$0	\$0	\$161 mill	\$206 mill	\$240 mill
Number of New Annuity Policies	0	0	10,063	11,444	12,000
<b>In Force Data for Variable Annuities</b>					
	12/31/1995	12/31/1996	12/31/1997	12/31/1998	12/31/1999
Account Value	0	0	\$162 mill	\$375 mill	\$624 mill

## **Saturn Life --Term Life Insurance**

### Overview

The term portfolio of Saturn Life consists of eight products:

- Annually renewable term
- 3-year renewable term
- 5-year level term
- 10-year level term
- 15-year level term
- 20-year level term
- Term-to-65
- Term-to-100

None of the plans have cash values, and all except the term-to-65 and term-to-100 plans have relatively liberal renewability and conversion features. A variety of riders are available on all the term plans:

- Waiver of premium
- Guaranteed purchase option
- Accidental death benefit rider

Sales are weighted heavily toward the 20-year level term plan, though sales of all plans, except the ART plan, have been increasing

### Product Features

The annually renewable term plan has the lowest initial premium. In most cases, the premium for a specific face amount increases each year. It is renewable to age 95.

The 3-year term plan has level premiums payable, and guaranteed, for three years. After three years, the policy owner can renew for another three-year period, during which the premium is level, and guaranteed not to increase. Like the ART plan, it also can be renewed through age 95.

The 5 and 10-year level term plans have level premiums that are guaranteed for the term of the contract. After the guarantee period, the policy owner can:

1. Renew the coverage at ART rates, through age 95,
2. Convert the term coverage to any cash value life insurance plan then offered by Saturn Life,
3. Attempt to be re-underwritten, and receive a new policy, or
4. Simply let the coverage end.

The 15 and 20-year plans have level premiums guaranteed for 10-years, and Saturn Life expects that those level premiums will also continue for the term of coverage. After 15 or 20 years, depending on the plan, the owner will have the same choices available to them as listed above for the 5 and 10-year plans.

The term-to-65 and term-to-100 plans are level premium plans, with premiums that are not guaranteed, but which are expected to remain level for the term of the product. These products are not renewable, but they do have conversion options at every fifth policy anniversary.

### Investment Policy

The investments that are backing the term insurance line of business are not segregated from the rest of the general account assets of the company. The assets backing the line of business are shown in the term insurance balance sheet.

### Underwriting Policy

All the term policies have premiums that vary by tobacco use. Saturn Life has moved toward preferred underwriting classifications; its standard class has been broken into three separate preferred classifications. Substandard percentage and flat extra ratings are available on all plans.

Underwriting guidelines are relatively aggressive, and the policy states that no exceptions are to be made to underwriting policies. The company takes the position that the underwriting is competitive, and that making exceptions to already competitive posture is inappropriate.

The company works with its primary reinsurers annually to assure its underwriting rules are appropriate for the mortality assumed in pricing.

### Reinsurance

To reduce mortality volatility and mitigate high first year underwriting and issue expenses, Saturn Life coinsures 90% of its term products to a pool of 5 reinsurers on a quota share basis. Each reinsurer assumes 18% of Saturn Life's new business and provides a reinsurance allowance equal to 100% of the reinsured premium. While the renewal reinsurance allowance varies by pool member, the average renewal allowance across all pool members and term products is 23%.

### Pricing

Key pricing assumptions are as follows:

- Mortality: Recent reinsurer experience.
- Lapse: Recent Saturn Life term life insurance experience (17% first year declining to 7% in year 6 and after)
- Expenses: 175% of first year premium  
\$25 in all policy years
- Average Size: Recent experience with adjustment for planned changes in marketing
- Mix of Business: Recent term life insurance mix of business.

The key pricing measure is the internal rate of return on distributable earnings, for one year of planned sales. This internal rate of return for the most up-to-date pricing assumptions is 9.15%. The company also reviews profit margin and the pattern of profitability for acceptability.

Saturn Life projects earnings and return on equity (ROE) with a pricing methodology that includes income-based reserves and a deferral of acquisition expenses. ROEs are projected to decrease versus the levels experienced in recent years.

Balance sheets are projected into coming years. These balance sheets are atypical relative to most lines of business because of the high percentage (90%) of term sales that are reinsured. Virtually all assets are deferred acquisition expenses, resulting in a high level of capital and surplus invested in the line of business, relative to the liabilities.

## Saturn Life

### Term Insurance Pricing Projection\*\*

- One Year of Expected Sales
- Current Pricing Assumptions
- Solvency-Based Reserves
- No Deferral of Acquisition Expenses

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<b>Revenues</b>										
Total Premium (net of reinsurance)	2,152,800	1,786,122	1,535,330	1,365,702	1,228,355	1,129,259	1,049,313	974,879	905,567	841,019
Net Investment Income	-	168,831	287,644	379,324	447,501	503,158	545,996	572,334	583,680	581,515
Expense Allowance on ReinsCeded	19,375,200	3,697,273	3,178,133	2,827,004	2,542,694	2,337,565	2,172,078	2,017,999	1,874,524	1,740,909
<b>Total Revenues</b>	<b>21,528,000</b>	<b>5,652,226</b>	<b>5,001,106</b>	<b>4,572,031</b>	<b>4,218,550</b>	<b>3,969,981</b>	<b>3,767,387</b>	<b>3,565,212</b>	<b>3,363,772</b>	<b>3,163,442</b>
<b>Benefits</b>										
Death Benefits	292,422	306,394	308,761	324,013	344,835	373,879	409,385	445,845	482,856	520,030
Policy Reserve Increase	2,110,390	1,485,161	1,146,003	852,211	695,705	535,478	329,233	141,824	(27,068)	(177,876)
<b>Total Benefits</b>	<b>2,402,812</b>	<b>1,791,555</b>	<b>1,454,764</b>	<b>1,176,224</b>	<b>1,040,540</b>	<b>909,356</b>	<b>738,619</b>	<b>587,669</b>	<b>455,788</b>	<b>342,154</b>
<b>Operating Expenses</b>										
Acquisition	37,674,000	0	0	0	0	0	0	0	0	0
Maintenance	975,000	808,932	695,349	618,525	556,320	511,440	475,232	411,521	410,130	380,896
<b>Total Operating Expenses</b>	<b>38,649,000</b>	<b>808,932</b>	<b>695,349</b>	<b>618,525</b>	<b>556,320</b>	<b>511,440</b>	<b>475,232</b>	<b>411,521</b>	<b>410,130</b>	<b>380,896</b>
<b>Pre-Tax Book Profits</b>	<b>(19,523,812)</b>	<b>3,051,739</b>	<b>2,850,994</b>	<b>2,777,283</b>	<b>2,621,690</b>	<b>2,549,186</b>	<b>2,553,536</b>	<b>2,536,022</b>	<b>2,497,854</b>	<b>2,440,392</b>
Income Taxes	(6,833,334)	1,068,109	997,848	972,049	917,591	892,215	893,738	887,608	874,249	854,137
<b>After-Tax Book Profits</b>	<b>(12,690,478)</b>	<b>1,983,630</b>	<b>1,853,146</b>	<b>1,805,234</b>	<b>1,704,098</b>	<b>1,656,971</b>	<b>1,659,799</b>	<b>1,648,415</b>	<b>1,623,605</b>	<b>1,586,255</b>
<b>Increase in Required Capital (net of investment income on required capital)</b>	<b>1,427,987</b>	<b>20,850</b>	<b>(36,100)</b>	<b>1,824</b>	<b>12,638</b>	<b>33,010</b>	<b>40,963</b>	<b>26,929</b>	<b>12,681</b>	<b>(1,729)</b>
<b>Distributable Earnings</b>	<b>(14,118,465)</b>	<b>1,962,781</b>	<b>1,889,246</b>	<b>1,803,409</b>	<b>1,691,461</b>	<b>1,623,961</b>	<b>1,618,836</b>	<b>1,621,486</b>	<b>1,610,924</b>	<b>1,587,984</b>

The ROI on 1 Year of Sales is 9.15%

\*\*Only the first 10 years of a 20-year pricing horizon are printed here.

## Saturn Life

### Term Insurance Income Statement

- Includes all years of issue
- Uses deferral of acquisition expenses and income-based reserves

	Actual Results					Corporate Projections		
	1995	1996	1997	1998	1999	2000	2001	2002
<b>Revenues</b>								
Total Premium (net of reinsurance)	\$5,823,339	\$6,756,610	\$7,877,850	\$8,931,693	\$9,975,293	\$11,000,582	\$12,010,608	\$13,009,144
Net Investment Income	155,617	233,952	314,474	403,323	496,426	591,092	685,934	779,841
Expense Allowance on Reinsurance Ceded	23,876,338	25,861,431	30,074,287	32,392,957	35,056,326	37,690,109	40,300,612	42,895,648
Total Revenues	29,855,294	32,851,993	38,266,611	41,727,973	45,528,045	49,281,783	52,997,154	56,684,633
<b>Benefits</b>								
Death Benefits	1,025,315	1,300,025	1,632,858	2,001,690	2,415,157	2,870,212	3,368,717	3,912,219
Policy Reserve Increase	979,183	1,006,531	1,110,614	1,163,783	1,183,329	1,185,526	1,173,832	1,149,893
Total Benefits	2,004,498	2,306,556	2,743,471	3,165,473	3,598,486	4,055,738	4,542,549	5,062,112
<b>Operating Expenses</b>								
Acquisition (deferrable)	29,853,600	29,988,000	34,765,500	35,112,000	36,382,500	37,674,000	38,896,500	40,320,000
Maintenance	2,847,964	3,311,519	3,847,016	4,329,889	4,790,639	5,227,380	5,642,003	6,036,817
Total Operating Expenses	32,701,564	33,299,519	38,612,516	39,441,889	41,173,139	42,901,380	44,628,503	46,356,817
Increase in Deferred Acquisition Costs	5,695,897	5,135,492	5,943,406	5,349,963	5,047,956	4,763,839	4,498,398	4,250,430
Pre-Tax Book Profits	845,129	2,381,410	2,854,030	4,470,574	5,804,376	7,088,503	8,324,500	9,516,134
Income Taxes	(1,697,769)	(963,929)	(1,081,282)	(307,786)	264,747	813,632	1,339,136	1,842,996
After-Tax Book Profits	2,542,898	3,345,339	3,935,312	4,778,360	5,539,629	6,274,870	6,985,364	7,673,137
Increase in Required Capital*	1,075,739	1,133,146	1,331,227	1,394,551	1,476,923	1,530,879	1,577,770	1,616,648
Distributable Earnings	\$1,467,159	\$2,212,193	\$2,604,085	\$3,383,809	\$4,062,707	\$4,743,991	\$5,407,594	\$6,056,489
Return on Equity	8.9%	9.8%	9.8%	10.3%	10.6%	10.8%	11.0%	11.1%

\* The increase in required capital is net of the investment income earned on the required capital.

**Saturn Life**

**Term Insurance Balance Sheet**

- Includes All Years of Issue
- Uses deferral of acquisition expenses and income-based reserves

	Actual Results					Corporate Projections		
	1995	1996	1997	1998	1999	2000	2001	2002
<u>Assets</u>								
Total Invested Assets	\$1,000,000	\$1,100,000	\$1,300,000	1,500,000	\$1,700,000	\$1,900,000	\$2,100,000	\$2,500,000
Deferred Policy Acquisition Costs	<u>\$31,082,259</u>	<u>\$36,217,751</u>	<u>\$42,161,158</u>	<u>\$47,511,121</u>	<u>\$52,559,076</u>	<u>\$57,322,915</u>	<u>\$61,821,313</u>	<u>\$66,071,743</u>
Total Assets	\$32,982,259	\$37,317,751	\$43,461,158	\$49,011,121	\$54,259,076	\$59,222,915	\$63,921,313	\$68,571,743
<u>Liabilities and Surplus</u>								
<u>Liabilities</u>								
Policy Reserves	\$2,924,396	\$3,930,927	\$5,051,541	\$6,205,323	\$7,388,657	\$8,574,178	\$9,748,011	\$10,897,904
Total Liabilities	\$2,924,396	\$3,930,927	\$5,051,541	\$6,205,323	\$7,388,657	\$8,574,178	\$9,748,011	\$10,897,904
<u>Capital and Surplus</u>								
Required (Target) Surplus	\$5,438,891	\$6,932,528	\$8,717,041	\$10,666,236	\$12,809,239	\$15,126,707	\$17,620,756	\$20,292,620
Unassigned Capital and Surplus	<u>\$24,618,971</u>	<u>\$26,454,296</u>	<u>\$29,692,576</u>	<u>\$32,139,562</u>	<u>\$34,061,180</u>	<u>\$35,522,030</u>	<u>\$36,552,546</u>	<u>\$37,381,219</u>
Total Capital and Surplus	\$30,057,862	\$33,386,824	\$38,409,617	\$42,805,798	\$46,870,419	\$50,648,737	\$54,173,302	\$57,673,839
Total Liabilities Capital and Surplus	\$32,982,258	\$37,317,751	\$43,461,158	\$49,011,121	\$54,259,076	\$59,222,915	\$63,921,313	\$68,571,743



# Mercury Life

## Mercury Life at a Glance

Ownership Type:	Mutual
Company Organization Date:	1900
Size:	\$78.8 billion of life face amount in force as of 12/31/99 \$1,167 million in total life insurance premium in 1999 \$147 million of annuity premium in 1999 \$98.9 million of 1 <sup>st</sup> year life insurance premium in 1999
Primary Distribution Channel:	Agency building operation. Agency managers, who are employees of the company, manage the agencies.
Secondary Distribution Channel:	The company is planning to move into bank distribution of some of its products. In 2000, the company plans to determine a way for the agency manager and nearby agents to benefit in some way when the company has a relationship with a bank in their geographic area.
Ratings:	The ratings for Mercury Life are in the highest tier of ratings. The company has successfully achieved growth while converting from a company focused on participating whole life insurance, to one growing its universal life insurance line of business. The company has a high quality distribution system that is well compensated and managed.
Primary/Core Products:	<ul style="list-style-type: none"><li>• Par whole life</li><li>• Universal life</li><li>• Fixed deferred annuities</li></ul>
Secondary products:	<ul style="list-style-type: none"><li>• Single premium immediate annuities</li><li>• Investment products</li><li>• Term life insurance</li><li>• Disability income insurance</li><li>• Long-term care insurance</li></ul>

## Mercury Life Marketing Information

### Marketing Goals:

- Improve productivity of its career agency distribution system 5% per year.
- Increase the number of products owned by its customers from an average of 1.50 to an average of 2.00.

### Marketing Strategies:

- Position its career agency force as the best available in the country.
- Use advertising, phone support, and Internet advertising and quotes to provide improved sales leads for the career agency sales force.

### Competitive Strengths:

- Highly productive, well-trained, field staff.
- Excellent brand value and name recognition in the marketplace.
- Strong financial strength.

### Competitive Weaknesses:

- Relatively poor name recognition in the younger market.
- Cannot compete on price-alone basis with the no and low-load products.

### Primary Markets:

- Affluent and very wealthy
- Pre-retired and retired

### Critical Success Factors:

- Continuing to improve productivity of the career agency system
- Developing its bank distribution channel in a manner accepted by its career agency system.

### Risks:

- The career agency system, which the company is relying upon heavily, could become uncompetitive with the distribution systems that other competitors are developing
- The distribution system and sales system is heavily reliant on complex, expensive technology, and little backup exists should problems occur.
- The company has chosen to focus on selling mutual funds and non-variable insurance and annuity products. A strong move of insurance and annuity buyers into the variable products marketplace could hurt prospects for the company's continued growth.

## Mercury Life Distribution Channel

### Overview:

Mercury Life relies on its strong, well-trained career agency system. It plans to develop the ability to sell insurance and annuities through banks by 2001.

### Channel Structure:

The agency managers are employees of the company and are accountable for the hiring, training, motivation and conduct of the agents.

### Channel Compensation Structure:

The agents receive commission income that is a percentage of premiums. The agency manager receives an override equal to 10% of the commissions the agents receive. The agency manager also receives compensation on bonuses that are based on the number of new agents that are hired, and the percentage of agents that sell above a minimum level. Mercury Life management has been discouraged by recent increases in the percentage of agents selling below the minimum levels.

## Mercury Life Historical Sales Data – All Products

100% Career Agency Distribution					
	1995	1996	1997	1998	1999
1 <sup>st</sup> Year Life Premium	\$62 mill	\$71.5 mill	\$82.1 mill	\$90.9 mill	\$98.9 mill
Number of Life Insurance Policies Issued	65,260	65,563	69,986	70,915	73,233
Face Amount Sold	\$6.5 bill	\$7.0 bill	\$8.0 bill	\$8.5 bill	\$9.2 bill
Annuity Premium	\$245.2 mill	\$210.3 mill	\$144.1 mill	\$161.1 mill	\$146.8 mill
Channel Size	100 Agency Managers  2800 Agents	100 Agency Managers  3000 Agents	90 Agency Managers  10 Assistant Agency Managers  3200 Agents	80 Agency Managers  20 Assistant Agency Managers  3350 Agents	70 Agency Managers  35 Assistant Agency Managers  3500 Agents

## Mercury Life Historical In Force Data – All Products

100% Career Agency Distribution					
	1995	1996	1997	1998	1999
Total Life Premium	\$903 mill	\$934 mill	\$994 mill	\$1,065 mill	\$1,167 mill
Number of Life Insurance Policies In Force	782,208	732,563	710,628	705,265	721,002
Face Amount In Force	\$71.6 bill	\$72.3 bill	\$73.2 bill	\$74.3 bill	\$78.8 bill
Annuity Account Value	\$2.5 bill	\$2.8 bill	\$3.0 bill	\$3.1 bill	\$3.1 bill

## Mercury Life --Overall Product Financial Management Overview

### Corporate Cost of Capital

Mercury Life's philosophy has been to rely exclusively on accumulated par policyholder surplus to finance its operations. It allocates surplus to each product line through an internal required surplus mechanism. Mercury Life desires to provide its policyholders with a 10% after-tax return on surplus, after adjustment for required surplus.

### Profit Measures and Targets

Mercury Life has established a number of profit criteria against which it assesses performance. In addition to the 10% return requirement described above, each product within a product line must have accumulated profits that turn positive by year 10, and a profit margin (present value of profit divided by present value of premium) equal to at least 5%.

### Internal Pricing Standards

Mercury Life traditionally reviews the adequacy of its pricing on an annual basis. This would include reviewing the adequacy of fixed account interest spreads, emerging mortality experience, actual versus expected expenses, a cost/benefit analysis of existing or proposed reinsurance, and sales by product and pricing cell. In addition, the company's Appointed Actuary conducts a peer review of this product assessment to gain further familiarity with the issues facing the company's product lines.

### Experience Analyses

Mercury Life's Appointed Actuary annually reviews the emerging mortality and persistency experience for the company's life and annuity products in conjunction with the actuarial analyses that support Mercury Life's financial reporting. Recent experience is summarized below:

Actual to Expected Mortality and Lapse Ratios by Product								
Year	Universal Life		Par Whole Life		Single Premium Immediate Annuity		Fixed Deferred Annuity	
	Mortality	Lapse	Mortality	Lapse	Mortality	Lapse	Mortality	Lapse
1995	90%	100%	100%	100%	95%	N/A	95%	105%
1996	89%	100%	99%	101%	95%	N/A	95%	107%
1997	91%	105%	102%	103%	95%	N/A	95%	110%
1998	90%	100%	103%	103%	94%	N/A	94%	110%
1999	88%	105%	105%	104%	94%	N/A	96%	112%

Mercury Life's product management actuary establishes credited interest rates for the UL and fixed deferred annuity products following periodic reviews of emerging investment results. Recent investment performance is summarized below:

Calendar Year	Gross	Investment	Default	Net	Actual	
	Investment	Investment	Default	Earned	Credited Rate	
	Yield	Expenses	Losses	Rate	UL	Ann
1995	7.40%	0.15%	0.30%	6.95%	5.70%	5.95%
1996	7.30%	0.15%	0.30%	6.85%	5.60%	5.85%
1997	7.10%	0.15%	0.30%	6.65%	5.40%	5.65%
1998	7.00%	0.15%	0.25%	6.60%	5.35%	5.60%
1999	7.10%	0.15%	0.25%	6.70%	5.45%	5.70%

### Reinsurance

Mercury Life makes very limited use of reinsurance in managing its life insurance product portfolios. It reinsures all of its Par Whole Life and UL net amount at risk in excess of its retention (currently \$5,000,000) on a yearly renewable term basis to a pool of 4 reinsurers, split evenly.

## Mercury Life Product Overview

Mercury Life has three core products, and all have been available for several years. On the life insurance side, its block of universal life has grown to the size of its whole life block (as measured by total premium). Both products are relatively competitive, but the career agents perceive that the universal life product is more competitive than the whole life product. The average face amount for a UL sale has grown to nearly \$125,000, while the average size of a whole life sale is around \$100,000.

Sales of the fixed annuity have been declining significantly, and company management is concerned. A study is currently underway to assess causes of the trend, and identify options for improving deferred annuity sales.

Mercury Life initiated a marketing emphasis on single premium immediate annuity sales in 1999, and the number of sales grew from 64 in 1998 to 508 in 1999. Company management is extremely satisfied with the results, and expects that very strong growth will continue into 2000 and beyond.

Mercury Life sells a relatively small amount of term life insurance, and while it has not been a focus of the company, sales have more than doubled in the last 5 years.

Other non-core products that the career agents of Mercury Life sell include:

1. a disability income product (manufactured by Mercury Life);
2. a long-term care insurance product (available through brokerage outlets); and
3. a variety of investment products (available through brokerage outlets)

While sales of the disability income product have been slowly declining over the years, brokerage sales of the investment products and the long-term care insurance product have been increasing briskly.

<b>Annual Sales for Universal Life Insurance</b>					
	1995	1996	1997	1998	1999
New Premium	\$48 mill	\$55 mill	\$63 mill	\$70 mill	\$77 mill
New Policies	50,526	48,501	50,259	48,611	48,155
New Face Amount	\$5.1 bill	\$5.2 bill	\$5.8 bill	\$5.8 bill	\$5.9 bill
<b>Inforce Data for Universal Life Insurance</b>					
	12/31/1995	12/31/1996	12/31/1997	12/31/1998	12/31/1999
Annual Total Premium	\$335 mill	\$395 mill	\$440 mill	\$480 mill	\$565 mill
Policies	352,632	348,325	340,097	333,333	353,346
Face Amount	\$35.3 bill	\$37.6 bill	\$39.1 bill	\$40.0 bill	\$43.5 bill

<b>Annual Sales for Whole Life Insurance</b>					
	1995	1996	1997	1998	1999
New Premium	\$12.0 mill	\$14.0 mill	\$16.0 mill	\$17.0 mill	\$17.0 mill
New Policies	8,333	9,050	9,662	9,621	9,043
New Face Amount	\$0.7 bill	\$0.8 bill	\$0.9 bill	\$0.9 bill	\$0.9 bill
<b>Inforce Data for Whole Life Insurance</b>					
	12/31/1995	12/31/1996	12/31/1997	12/31/1998	12/31/1999
Annual Total Premium	\$555 mill	\$525 mill	\$520 mill	\$520 mill	\$520 mill
Policies	385,417	339,367	326,087	322,581	311,170
Face Amount	\$30.8 bill	\$28.8 bill	\$28.0 bill	\$27.3 bill	\$26.9 bill

<b>Annual Sales for Fixed Deferred Annuities</b>					
	1995	1996	1997	1998	1999
Total Premium for All Policies In Force	\$234 mill	\$204 mill	\$132 mill	\$156 mill	\$96 mill
Number of New Policies Issued	6,800	6,200	7,300	2,900	2,600
<b>In Force Data for Fixed Deferred Annuities</b>					
	12/31/1995	12/31/1996	12/31/1997	12/31/1998	12/31/1999
Account Value	\$2.5 bill	\$2.8 bill	\$3.0 bill	\$3.1 bill	\$3.1 bill
Number of Policies In Force	31,250	33,735	36,905	35,429	33,500

<b>Annual Sales for Single Premium Immediate Annuities</b>					
	1995	1996	1997	1998	1999
New Premium	\$11.2 mill	\$6.3 mill	\$12.1 mill	\$5.1 mill	\$50.8 mill
Number of New Policies Issued	124	79	134	64	508
<b>In Force Data for Single Premium Immediate Annuities</b>					
	12/31/1995	12/31/1996	12/31/1997	12/31/1998	12/31/1999
Policy Reserves	\$45 mill	\$49 mill	\$58 mill	\$59 mill	\$107 mill
Number of Policies In Force	1,000	1,030	1,120	1,130	1,570

## Mercury Life – Universal Life

### Overview

Mercury Life has been successful selling universal life since the mid-1980s. Initially, a product with surrender charges was sold, but in 1990 a front-end load was introduced, and sales have grown significantly since its development.

### Product Features

The universal life policy sold by Mercury Life is a typical universal life design. A specified amount is chosen at issue, and premiums are flexible within limits allowed by tax laws. Mercury Life sells policies with both level and increasing specified amounts.

A variety of riders are available:

- Accidental Death
- Guaranteed purchase
- Waiver of premium
- Terminal illness

There is a 5% of premium front-end load, and a flat dollar amount load that is charged during early policy durations. The amount and duration of this flat front-end load is a function of the age and smoking classification of the policy. There are no surrender charges.

### Investment Policy

Assets backing the universal life block of business are segregated from the rest of the assets of the company. Detailed liability models are analyzed annually, and the investment guidelines are adjusted as needed as a result of the duration of the liabilities.

### Underwriting Policy

Mercury Life uses a traditional variety of underwriting tools including attending physician statements, personal health interviews, paramedical exams, and blood tests. Mercury Life periodically attempts to review its underwriting criteria versus industry norms, but it hasn't made significant changes in more than a decade.

There are separate rates for smoking and non-smoking classes, and there is a full slate of sub-standard cost of insurance rates available. There are no preferred underwriting classes.

### Reinsurance

Mercury Life makes very limited use of reinsurance in managing its life insurance product portfolios. It reinsures all of its Par Whole Life and UL net amount at risk in excess of its retention (currently \$5,000,000) on a yearly renewable term basis to a pool of 4 reinsurers, split evenly.

### Pricing

Key pricing assumptions are as follows:

Mortality: Company experience from 1993-1998 for all of its permanent life insurance.

Lapse: Company UL lapse rates experienced during 1996-1997 (15% first year declining to 6% in year 5 and after)



Expenses: 200% of first year premium  
\$50 in all policy years

Average Size: Experience from 1996-1997.

Mix of Business: Experience from 1996-1997.

The key pricing measure is the internal rate of return on distributable earnings, for one year of planned sales. This internal rate of return for the most up-to-date pricing assumptions is 8.95%. The company also reviews profit margin and the pattern of profitability for acceptability

Mercury Life projects earnings and return on equity (ROE) with a pricing methodology that includes income-based reserves and a deferral of acquisition expenses. Balance sheets are also projected into coming years. There are no plans for a major change to the way that universal life block of business is being managed.

**Mercury Life**

**Universal Life Insurance Pricing Projection\*\***

- One Year of Expected Sales
- Current Pricing Assumptions
- Solvency-Based Reserves
- No Deferral of Acquisition Expenses

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<b>Revenues</b>										
Total Premium	84,500,000	74,304,906	67,560,272	62,096,224	57,686,932	54,158,583	51,377,941	48,729,390	46,206,007	43,801,275
Net Investment Income	-	4,730,042	8,771,616	12,356,965	15,625,011	18,689,642	21,651,662	24,355,566	26,802,745	28,995,466
Total Revenues	84,500,000	79,034,948	76,331,888	74,453,189	73,311,943	72,848,225	73,029,603	73,084,956	73,008,752	72,796,741
<b>Benefits</b>										
Death Benefits	4,238,000	4,339,422	4,555,901	4,811,980	5,164,090	5,593,332	6,127,215	6,685,672	7,263,940	7,857,275
Termination Benefits	7,473,000	10,076,659	12,491,960	13,684,705	13,893,495	13,283,561	14,945,334	16,450,578	17,800,712	18,997,668
Policy Reserve Increase	59,125,519	50,519,680	44,816,869	40,850,566	38,307,891	37,025,257	33,798,789	30,589,741	27,409,014	24,267,361
Total Benefits	70,836,519	64,935,761	61,864,730	59,347,251	57,365,476	55,902,150	54,871,338	53,725,991	52,473,666	51,122,304
<b>Operating Expenses</b>										
Acquisition	169,000,000	0	0	0	0	0	0	0	0	0
Maintenance	2,500,000	2,198,370	1,998,825	1,837,166	1,706,714	1,602,325	1,520,057	1,411,698	1,367,042	1,295,896
Total Operating Expenses	171,500,000	2,198,370	1,998,825	1,837,166	1,706,714	1,602,325	1,520,057	1,411,698	1,367,042	1,295,896
Pre-Tax Book Profits	(157,836,519)	11,840,817	12,468,334	13,268,772	14,239,753	15,343,751	16,638,208	17,917,266	19,168,044	20,378,541
Income Taxes	(55,242,782)	4,144,286	4,363,917	4,644,070	4,983,914	5,370,313	5,823,373	6,271,043	6,708,815	7,132,489
After-Tax Book Profits	(102,593,737)	7,696,531	8,104,417	8,624,702	9,255,840	9,973,438	10,814,835	11,646,223	12,459,229	13,246,052
Increase in Required Capital	2,688,364	215,216	219,230	252,044	288,291	321,540	354,741	349,846	343,118	334,624
Investment Income on Req Capital	147,463	158,654	170,054	183,160	198,152	214,872	233,318	251,510	269,352	286,753
Distributable Earnings	(105,282,102)	7,639,969	8,055,242	8,555,819	9,165,701	9,866,770	10,693,413	11,547,887	12,385,463	13,198,181

**The ROI on 1 Year of Sales is 8.95%**

**\*\*Only the first 10 years of a 20-year pricing Horizon are printed.**

**Mercury Life  
Universal Life Insurance Income Statement (Numbers are in 1000s)**

- Includes all years of issues
- Uses deferral of acquisition expenses and income-based reserves

	Actual Results				Corporate Projections			
	1995	1996	1997	1998	1999	2000	2001	2002
<b>Revenues</b>								
Mortality and Other Charges	\$132,000	\$150,000	\$170,000	\$192,000	\$216,000	\$242,000	\$270,000	\$300,000
Net Investment Income	\$74,000	\$91,000	\$110,000	\$130,000	\$152,000	\$176,000	\$202,000	\$240,000
Total Revenues	\$206,000	\$241,000	\$280,000	\$322,000	\$368,000	\$418,000	\$472,000	\$540,000
<b>Benefits</b>								
Interest Credited	\$65,000	\$80,000	\$96,000	\$114,000	\$133,000	\$153,000	\$175,000	\$200,000
Death Benefits	\$27,000	\$32,000	\$37,000	\$43,000	\$50,000	\$58,000	\$67,000	\$78,000
Total Benefits	\$92,000	\$112,000	\$133,000	\$157,000	\$183,000	\$211,000	\$242,000	\$278,000
<b>Operating Expenses</b>								
Acquisition (deferrable)	\$95,000	\$110,000	\$126,000	\$140,000	\$154,000	\$168,000	\$183,000	\$200,000
Maintenance	\$16,000	\$17,000	\$17,000	\$19,000	\$20,000	\$22,000	\$24,000	\$26,000
Total Operating Expenses	\$111,000	\$127,000	\$143,000	\$159,000	\$174,000	\$190,000	\$207,000	\$226,000
Increase in Deferred Acquisition Costs	\$32,000	\$36,000	\$41,000	\$44,000	\$47,000	\$50,000	\$52,000	\$54,000
<b>Pre-Tax Book Profits</b>	\$35,000	\$38,000	\$47,000	\$50,000	\$58,000	\$67,000	\$75,000	\$90,000
Income Taxes	\$1,000	\$1,000	\$1,000	\$2,000	\$4,000	\$6,000	\$8,000	\$13,000
After-Tax Book Profits	\$34,000	\$37,000	\$46,000	\$48,000	\$54,000	\$61,000	\$67,000	\$77,000
Increase in Required Capital	\$3,000	\$4,000	\$4,000	\$4,000	\$5,000	\$5,000	\$5,000	\$5,000
Investment Income on Required Capital	\$1,000	\$1,000	\$1,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Distributable Earnings	\$32,000	\$34,000	\$43,000	\$46,000	\$51,000	\$58,000	\$64,000	\$74,000
Return on Equity	9.6%	9.6%	9.6%	9.9%	10.2%	10.4%	10.5%	10.6%

**Mercury Life  
Universal Life Insurance Balance Sheet (Numbers are in 1000s)**

- Includes all years of issue
- Uses deferral of acquisition expenses and income-based reserves

	Actual Results					Corporate Projections		
	1995	1996	1997	1998	1999	2000	2001	2002
<b>Assets</b>								
<b>Invested Assets</b>								
Government Bonds	\$84,750	\$105,200	\$127,490	\$151,730	\$178,320	\$204,100	\$231,400	\$267,500
Corporate Bonds	339,000	420,800	509,960	606,920	713,280	816,400	925,600	1,070,000
High Yield Bonds	84,750	105,200	127,490	151,730	178,320	204,100	231,400	267,500
Collateralized Mortgages	42,375	52,600	63,475	75,865	89,160	102,050	115,700	133,750
Commercial Mortgage Backed Securities	84,750	105,200	127,490	151,730	178,320	204,100	231,400	267,500
Mortgages	84,750	105,200	127,490	151,730	178,320	204,100	231,400	267,500
Cash and Short Term Investments	42,375	52,600	63,475	75,865	89,160	102,050	115,700	133,750
Policy Loans	84,750	105,200	127,490	151,730	178,320	204,100	231,400	267,500
Total Invested Assets	\$847,500	\$1,052,000	\$1,274,900	\$1,517,300	\$1,783,200	\$2,041,000	\$2,314,000	\$2,675,000
Deferred Policy Acquisition Costs	\$353,000	\$389,000	\$430,000	\$474,000	\$521,000	\$571,000	\$623,000	\$577,000
Total Assets	\$1,200,500	\$1,441,000	\$1,704,900	\$1,991,300	\$2,304,200	\$2,612,000	\$2,937,000	\$3,252,000
<b>Liabilities and Surplus</b>								
<b>Liabilities</b>								
Policy Reserves	\$1,140,000	\$1,372,000	\$1,625,000	\$1,899,000	\$2,197,000	\$2,500,000	\$2,800,000	\$3,100,000
Total Liabilities	\$1,140,000	\$1,372,000	\$1,625,000	\$1,899,000	\$2,197,000	\$2,500,000	\$2,800,000	\$3,100,000
<b>Capital and Surplus</b>								
Required (Target) Surplus	\$20,500	\$24,000	\$27,900	\$32,300	\$37,200	\$42,000	\$47,000	\$52,000
Unassigned Capital and Surplus	\$40,000	\$45,000	\$52,000	\$60,000	\$70,000	\$80,000	\$90,000	\$100,000
Total Capital and Surplus	\$60,500	\$69,000	\$79,900	\$92,300	\$107,200	\$112,000	\$137,000	\$152,000
Total Liabilities Capital and Surplus	\$1,200,500	\$1,441,000	\$1,704,900	\$1,991,300	\$2,304,200	\$2,612,000	\$2,937,000	\$3,252,000

## **Mercury Life – Participating Whole Life**

### Overview

The par whole life portfolio of Mercury Life includes the following products:

- Ordinary life to age 100
- Ordinary life, payable to age 65
- 20-pay ordinary life
- Single premium life
- Joint ordinary life

A variety of riders are available on these plans:

- Waiver of premium
- Guaranteed purchase option
- Accidental death

Sales for all par whole life plans have been flat in recent history.

### Product Features

All plans pay annual dividends that reflect actual versus expected mortality, investment and expense experience, as well as other general business conditions. Dividends can be paid in cash, applied to pay premiums, or used to purchase paid-up additions.

All plans endow at age 100 and pay level annual premiums throughout the premium paying period. Coverage ends at age 100 of the older insured for joint policies.

Policy loans are permitted on all plans, in amounts up to the contract cash surrender value. Policyholders can choose an 8% loan interest rate or a variable loan rate at the time of purchase. Loan activity is reflected in dividends on a policy-by-policy basis.

Cash surrender options include cash, extended term insurance and reduced paid-up. Life income settlement options are also available upon surrender or withdrawal. Settlements are based on current rates, and subject to minimums specified in each contract.

### Investment Policy

The investments backing the participating whole life insurance line are included in the company's general account. The assets backing the line of business are shown in the par whole life insurance balance sheet.

### Underwriting Policy

Mercury Life uses a traditional variety of underwriting tools including attending physician statements, personal health interviews, paramedical exams, and blood tests. Mercury Life periodically attempts to review its underwriting criteria versus industry norms, but it hasn't made significant changes in more than a decade.

There are separate rates for smoking and non-smoking classes, and there is a full slate of sub-standard cost of insurance rates available. There are no preferred underwriting classes.

### Reinsurance

Mercury Life makes very limited use of reinsurance in managing its life insurance product portfolios. It reinsures all of its Par Whole Life and UL net amount at risk in excess of its retention (currently \$5,000,000) on a yearly renewable term basis to a pool of 4 reinsurers, split evenly.

## Mercury Life – Fixed Deferred Annuities

### Overview

The fixed deferred annuity portfolio of Mercury Life includes the following products:

- Flexible premium deferred annuities
- Single premium deferred annuity – 1-year interest guarantee
- Single premium deferred annuity – 3-year interest guarantee

Sales are heavily weighted toward the single premium products, though sales of all plans have been declining.

### Product Features

All of the deferred annuity products are back-end loaded, with a surrender charge that grades from 7% of the accumulated value in year 1, to 0% in years 8 and later. The surrender charge is waived upon death and maturity, and contract holders have the option to withdraw up to 10% of the accumulated value each year without penalty of the surrender charge.

The product pays a new money credited rate, with a minimum of 3% guaranteed through the contract. Rates are reset annually for the flexible premium and one-year single premium contracts, and every three years for the three-year contract. Additional interest is also credited to larger contracts, according to the following schedule:

Accumulated Value	Credited Rate
\$0 – \$24,999	base rate
\$25,000 – \$99,999	base rate + 0.25%
\$100,000 and higher	base rate + 0.50%

A market value adjustment is applied to the three-year single premium contract.

### Investment Policy

The investments backing the deferred annuity line are segregated from the rest of the general account assets of the company. The corresponding asset portfolio has a target duration of 3 years, and invests exclusively in bonds, mortgages and mortgage-backed securities. Roughly 5% of assets are held in cash equivalent investments.

### Underwriting Policy

No underwriting is done on this block of business.

### Reinsurance

The deferred annuities are fully retained by Mercury Life.

## **Mercury Life – Single Premium Immediate Annuities**

### Overview

The single premium immediate annuity portfolio of Mercury Life includes the following products:

- Life income annuity
- Joint life income annuity
- Life income annuity with period certain
- Joint life income annuity with period certain
- Specified period annuity

New emphasis on this product line has increased SPIA sales significantly in 1999, and sales are expected to grow steadily in the near future.

### Product Features

The life income and joint life annuities provide a guaranteed income for the life of the annuitant(s). A certain period may also be included on the life annuities to provide payments for the life of the annuitant or until the end of the certain period, whichever is later. The specified period annuities provide guaranteed income for a specified certain period, which may range from 2 to 30 years.

The joint annuities can pay a full benefit for the life of the both annuitants, can drop down to 2/3 of the original benefit after the first death, or can drop down to 1/2 of the original benefit after the first death.

Annuity rates are reviewed weekly to reflect current market conditions.

The guaranteed payments can only be commuted by death. In other words, there are no surrender values or rights.

Payment frequency can be monthly, quarterly, semi-annually or annually.

### Investment Policy

The investments backing the SPIA line are segregated from the rest of the general account assets of the company. The corresponding asset portfolio attempts to duration-match the annuity liability cash flows. Investments in this segregated portfolio are limited to bonds, mortgages and mortgage-backed securities.

### Underwriting Policy

The maximum single premium per contract is \$1,000,000, unless specifically approved by the company. Satisfactory proof of date of birth is required for each life contingent SPIA contract.

### Reinsurance

SPIA liabilities are fully retained by Mercury Life.

## Assumptions to use in Examination Questions

The following lapse rates, risk free rates of return, inflation rates and mortality rates should be used in examination questions, unless other assumptions are specifically identified within the exam question

These assumptions were not used in the determination of numbers within the case study. They are provided to potentially avoid needing to place such assumptions within exam questions themselves.

<b>Lapse Rates</b>		
<i>Duration</i>	<i>Life Insurance Lapse Rate</i>	<i>Annuity Lapse Rate</i>
1	15%	15%
2	12%	13%
3	9%	13%
4	9%	13%
5	7%	13%
6	7%	13%
7	7%	11%
8	7%	11%
9	7%	11%
10+	5%	9%

<b>Risk Free Rates of Return</b>							
	<i>Term to Maturity</i>						
<i>Date</i>	<i>3 Month</i>	<i>6 Month</i>	<i>1 Year</i>	<i>2 Year</i>	<i>5 Year</i>	<i>10 Year</i>	<i>30 Year</i>
12/31/95	5.1%	5.2%	5.2%	5.2%	5.4%	5.6%	6.0%
12/31/96	5.2%	5.3%	5.5%	5.9%	6.2%	6.4%	6.7%
12/31/97	5.3%	5.4%	5.5%	5.6%	5.7%	5.7%	5.9%
12/31/98	4.5%	4.5%	4.5%	4.5%	4.5%	4.7%	5.1%
12/31/99	5.6%	5.8%	5.9%	6.2%	6.3%	6.3%	6.4%

<b>Inflation Rates</b>	
<i>Year</i>	<i>Rate</i>
1995	2.6%
1996	3.3%
1997	1.7%
1998	1.6%
1999	2.4%



Death Rates per 1000 -- Annuities  
(1983a Table)

Male				Female			
Age	Rate	Age	Rate	Age	Rate	Age	Rate
15	0.44	65	12.85	15	0.19	65	7.34
16	0.45	66	14.20	16	0.20	66	8.09
17	0.46	67	15.72	17	0.21	67	8.89
18	0.47	68	17.41	18	0.23	68	9.73
19	0.49	69	19.30	19	0.24	69	10.65
20	0.51	70	21.37	20	0.26	70	11.70
21	0.53	71	23.65	21	0.28	71	12.91
22	0.55	72	26.13	22	0.29	72	14.32
23	0.57	73	28.84	23	0.31	73	15.98
24	0.60	74	31.79	24	0.33	74	17.91
25	0.62	75	35.05	25	0.35	75	20.13
26	0.65	76	38.63	26	0.37	76	22.65
27	0.68	77	42.59	27	0.39	77	25.51
28	0.70	78	46.95	28	0.41	78	28.72
29	0.73	79	51.76	29	0.42	79	32.33
30	0.76	80	57.03	30	0.44	80	36.40
31	0.79	81	62.79	31	0.46	81	40.98
32	0.81	82	69.08	32	0.48	82	46.12
33	0.84	83	75.91	33	0.50	83	51.89
34	0.88	84	83.23	34	0.52	84	58.34
35	0.92	85	90.99	35	0.55	85	64.42
36	0.97	86	99.12	36	0.57	86	73.49
37	1.03	87	107.58	37	0.61	87	82.32
38	1.11	88	116.32	38	0.65	88	92.02
39	1.22	89	125.39	39	0.69	89	102.49
40	1.34	90	134.89	40	0.74	90	113.61
41	1.49	91	144.87	41	0.80	91	125.23
42	1.67	92	155.43	42	0.87	92	137.22
43	1.89	93	166.63	43	0.94	93	149.46
44	2.13	94	178.54	44	1.03	94	161.83
45	2.40	95	191.21	45	1.12	95	174.23
46	2.69	96	204.72	46	1.23	96	186.54
47	3.01	97	219.12	47	1.36	97	198.65
48	3.34	98	234.74	48	1.50	98	211.10
49	3.69	99	251.89	49	1.66	99	224.45
50	4.06	100	270.91	50	1.83	100	239.22
51	4.43	101	292.11	51	2.02	101	255.95
52	4.81	102	315.83	52	2.22	102	275.20
53	5.20	103	342.38	53	2.43	103	297.50
54	5.59	104	372.09	54	2.65	104	323.39
55	5.99	105	405.28	55	2.89	105	353.41
56	6.41	106	442.28	56	3.15	106	388.11
57	6.84	107	483.41	57	3.43	107	428.02
58	7.39	108	528.99	58	3.74	108	473.69
59	7.78	109	579.35	59	4.08	109	525.66
60	8.34	110	634.81	60	4.47	110	584.46
61	8.98	111	695.70	61	4.91	111	650.65
62	9.74	112	762.34	62	5.41	112	724.75
63	10.63	113	835.06	63	5.99	113	807.32
64	11.66	114	914.17	64	6.63	114	898.89
		115	1000.00			115	1000.00

Death Rates per 1000 -- Life  
(1975-80 Ultimate Table)

Male				Female			
Age	Rate	Age	Rate	Age	Rate	Age	Rate
15	0.68	65	19.50	15	0.36	65	10.99
16	1.01	66	21.47	16	0.40	66	11.91
17	1.14	67	23.65	17	0.44	67	12.92
18	1.22	68	26.05	18	0.47	68	14.03
19	1.31	69	28.69	19	0.49	69	15.25
20	1.37	70	31.57	20	0.51	70	16.63
21	1.40	71	34.68	21	0.52	71	18.21
22	1.41	72	38.00	22	0.53	72	20.04
23	1.40	73	41.60	23	0.53	73	22.17
24	1.38	74	45.54	24	0.53	74	24.65
25	1.34	75	49.90	25	0.53	75	27.53
26	1.29	76	54.71	26	0.53	76	30.86
27	1.24	77	60.03	27	0.53	77	34.69
28	1.20	78	65.85	28	0.53	78	39.07
29	1.17	79	72.18	29	0.54	79	44.00
30	1.14	80	79.02	30	0.55	80	49.48
31	1.12	81	86.36	31	0.58	81	55.51
32	1.11	82	94.12	32	0.61	82	62.09
33	1.12	83	102.35	33	0.65	83	69.22
34	1.14	84	111.41	34	0.70	84	76.90
35	1.17	85	121.31	35	0.77	85	85.13
36	1.22	86	132.05	36	0.84	86	93.91
37	1.28	87	143.63	37	0.93	87	103.24
38	1.36	88	156.05	38	1.03	88	113.12
39	1.45	89	169.12	39	1.15	89	123.55
40	1.56	90	182.61	40	1.29	90	134.53
41	1.70	91	196.52	41	1.45	91	146.06
42	1.87	92	210.85	42	1.62	92	158.14
43	2.07	93	225.60	43	1.79	93	170.77
44	2.31	94	240.77	44	1.96	94	183.95
45	2.58	95	256.36	45	2.14	95	197.68
46	2.89	96	272.37	46	2.33	96	211.96
47	3.24	97	288.80	47	2.52	97	226.79
48	3.61	98	305.65	48	2.72	98	242.17
49	4.02	99	322.92	49	2.93	99	258.10
50	4.45	100	340.61	50	3.17	100	274.58
51	4.92	101		51	3.43	101	
52	5.44	102		52	3.71	102	
53	6.00	103		53	4.04	103	
54	6.61	104		54	4.40	104	
55	7.27	105		55	4.80	105	
56	8.01	106		56	5.23	106	
57	8.82	107		57	5.70	107	
58	9.73	108		58	6.22	108	
59	10.75	109		59	6.78	109	
60	11.89	110		60	7.37	110	
61	13.17	111		61	8.00	111	
62	14.57	112		62	8.67	112	
63	16.07	113		63	9.38	113	
64	17.71	114		64	10.15	114	
		115				115	