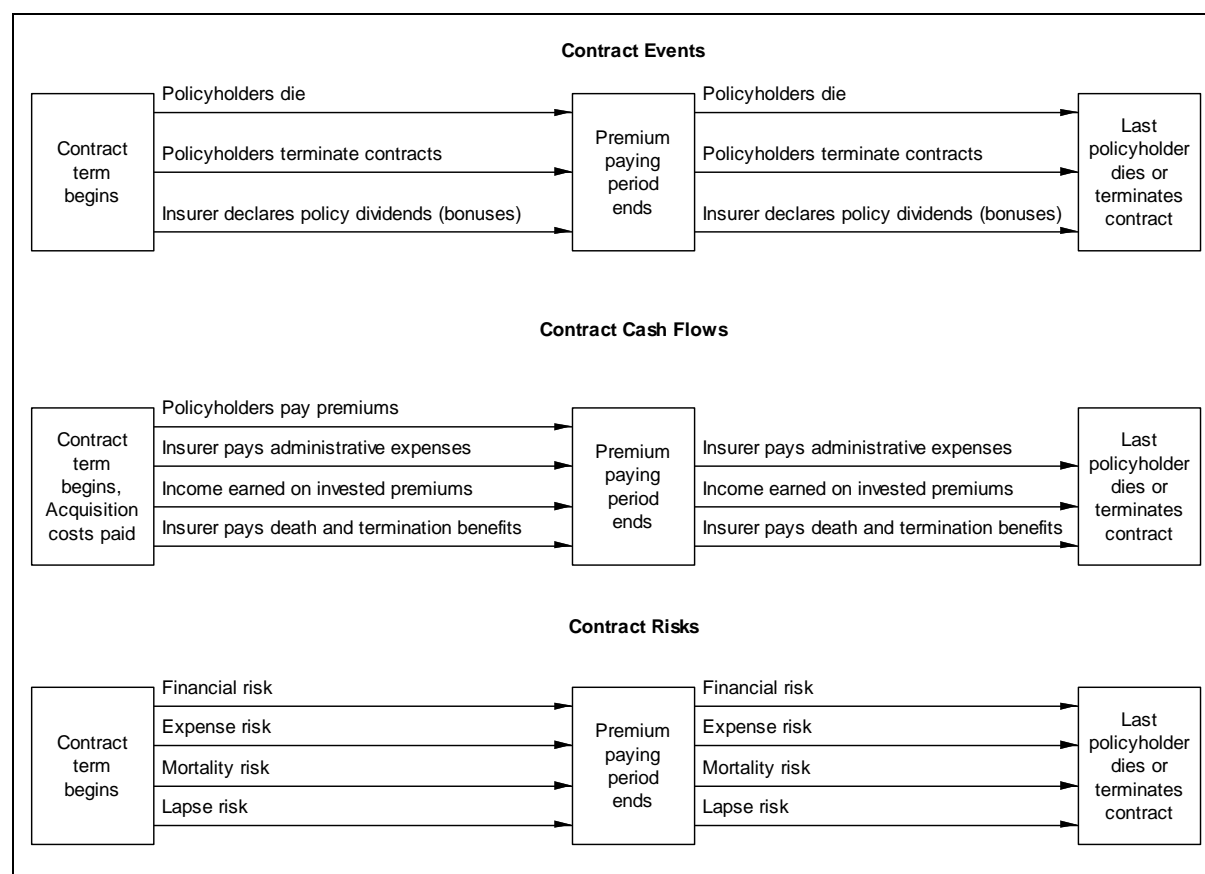


# Life Insurance

## The Life Insurance Cycle

- A40. Life insurance contracts cover mortality, including life insurance, annuity, disability, and pension contracts. These contracts usually provide for insurance coverage over a period of several years and may be financed through periodic premiums or a single payment on inception. Payments by the insurer on the death of a policyholder are usually fixed by the contract, although annuity and similar contracts may require payments over an extended period or until death. The insurer usually has no right to cancel these contracts during their term, although it may have the right to change the price of some elements of the contract.
- A41. Figure A4 shows the events, cash flows, and risks during the term of a group of **participating** or **with-profits** life insurance contracts. The figure depicts a contract that requires premiums for a fixed period. During that period, the insurer pays commissions and expenses and pays benefits if policyholders die. Many contracts also provide for payments if a policyholder terminates the contract, sometimes referred to as **nonforfeiture benefits**. The insurer's obligation to pay benefits continues beyond the end of the premium-paying period until the last policyholder in the group has died or terminated the contract.



**Figure A4 - Life Insurance Cycle, Events and Cash Flows**

- A42. The period over which premiums are paid varies among life insurance contracts. Some insurance contracts require premium payments during the entire term of the contract, in which case the centre box moves to the extreme right. Other contracts require a single premium on inception, in which case the centre box moves to the extreme left.
- A43. **Risk** is used in Figure A4 to describe the possibility that actual experience will vary from the assumptions made by the insurer in setting the amount of premium. As in Figure A1, the risk is that those expectations will prove to have been faulty.
- (a) **Financial Risk** refers to the possibility that the insurer will not earn as much as expected from investing premiums during the period from receipt to payment of benefits.
  - (b) **Expense Risk** refers to the possibility that expenses of servicing the contracts may exceed the amounts expected in setting the premiums.
  - (c) **Mortality Risk** refers to the possibility that policyholders may die sooner than expected
  - (d) **Lapse Risk** refers to the possibility that policyholders may terminate contracts sooner than expected or with greater frequency.
- A44. An annuity contract presents a different cycle of events and risks. An **immediate annuity** begins with a single payment, followed by a series of payments to the policyholder or a designated recipient known as an annuitant. The payments may extend over a fixed period or may extend for the life of the annuitant. A **deferred annuity** begins with a single payment or series of payments over an accumulation period. At the end of that period, the policyholder has the right to convert the contract to an immediate annuity. An insurer faces mortality risk in both annuities and other life insurance. However, the events that may prove adverse to the insurer are opposite. In annuities, deaths that occur **later** than expected have an adverse financial effect on the insurer. In other life insurance, deaths that occur **earlier** than expected have an adverse financial effect on the insurer.

## Accounting for Life Insurance

- A45. Many accountants and financial statement users look on life insurance accounting as an enigma. The variety of life insurance accounting models can be daunting. They necessarily require complex computations and assumptions in order to account for contracts that may extend 50 years into the future. However, all life insurance accounting models attempt to address the same problems and use the same information to do so. Every insurance accounting model must account for the following inflows and outflows:
- (a) the insurer will receive premium payments from policyholders. Those payments usually will extend over several years, but occasionally take the form of a single premium on inception;

- (b) the insurer will make payments to policyholders at some unknown date in the future. Those payments will be made on the death of policyholders or, in some cases, on termination of the contract;
- (c) the insurer may make payments to salespeople and others on the initiation of contracts, and will make payments over the life of the contracts for administration and expenses like premium taxes; and
- (d) between the time it receives premiums and the time it makes payments to policyholders, the insurer will invest amounts received. In many cases, the insurer could not make the promised payments to policyholders without the earnings on those investments.

- A46. This Appendix uses a standard set of illustrations to show the types of accounting models that accountants and actuaries have developed to report activity from long-duration insurance contracts. Illustrations A16-A50 build on a portfolio or “book” of 10,000 similar life insurance contracts. All 10,000 were sold to 35-year-old nonsmokers. All contracts have an initial death benefit of \$100,000 and an annual premium of 1,400. Premiums are received and related expenses (including commissions, underwriting, and premium taxes) are paid on the first day of each year. Benefits and the costs of processing benefit claims are paid on the last day of each year. A declining surrender charge is assessed against policyholders who terminate contracts during the first 9 years of the contract.
- A47. Some of the assumptions and conventions in this section are significant simplifications of real world events and contract features. For example, policyholders typically pay premiums, terminate contracts, and die throughout the year. Similarly, some may find that the contracts issued in their jurisdiction differ from the contracts illustrated here. Both criticisms are accurate and unavoidable. The illustrations were chosen to portray complex accounting models to those who are familiar with accounting and financial reporting but unfamiliar with the particular problems of accounting for life insurance.
- A48. The contracts used in these illustrations are **universal life** contracts. For purposes of illustration, the policyholder pays a fixed premium and the contract provides guaranteed termination and death benefits. The insurer may credit policyholders with an interest rate higher than the guarantee; a 6 percent rate is assumed. The higher credited rate results in higher payments to policyholders who terminate their contracts and, in later years, higher payments on the death of policyholders. While universal life contracts are not sold in all jurisdictions, using this form of contract allows a single contract design to be used in illustrating a wide range of accounting models. **Participating** or **With-Profits** contracts are illustrated in Illustrations A39-A44.
- A49. Illustration A16 shows the insurer’s expectations about the accumulations in an individual contract over a 50 year period. The illustration also shows the insurer’s expectations about policy lapses and deaths during that period.

Individual Policy Data				Behavior of the Book of Policies			
<u>Year</u>	<u>Policy Pays on Death</u>	<u>Policy Accumulated Value</u>	<u>Net Death Benefit</u>	<u>Beginning Policyholders</u>	<u>Surrenders</u>	<u>Deaths</u>	<u>Ending Policyholders</u>
1	100,000	1,049	98,951	10,000	2,000	4	7,996
2	100,000	2,146	97,854	7,996	960	4	7,032
3	100,000	3,296	96,704	7,032	563	4	6,465
4	100,000	4,507	95,493	6,465	388	4	6,073
5	100,000	5,783	94,217	6,073	364	4	5,705
6	100,000	7,130	92,870	5,705	342	5	5,358
7	100,000	8,541	91,459	5,358	321	5	5,032
8	100,000	10,022	89,978	5,032	302	5	4,725
9	100,000	11,580	88,420	4,725	284	5	4,436
10	100,000	13,218	86,782	4,436	266	6	4,164
11	100,000	14,946	85,054	4,164	250	6	3,908
12	100,000	16,769	83,231	3,908	234	6	3,668
13	100,000	18,685	81,315	3,668	220	6	3,442
14	100,000	20,704	79,296	3,442	207	7	3,228
15	100,000	22,833	77,167	3,228	194	7	3,027
16	100,000	25,082	74,918	3,027	182	7	2,838
17	100,000	27,461	72,539	2,838	170	7	2,661
18	100,000	29,978	70,022	2,661	160	8	2,493
19	100,000	32,641	67,359	2,493	150	8	2,335
20	100,000	35,453	64,547	2,335	140	8	2,187
21	100,000	38,421	61,579	2,187	131	8	2,048
22	100,000	41,547	58,453	2,048	123	9	1,916
23	100,000	44,841	55,159	1,916	115	9	1,792
24	100,000	48,315	51,685	1,792	108	9	1,675
25	100,000	51,982	48,018	1,675	101	9	1,565
26	100,000	55,855	44,145	1,565	94	10	1,461
27	100,000	59,952	40,048	1,461	88	10	1,363
28	100,000	64,295	35,705	1,363	82	10	1,271
29	100,000	68,906	31,094	1,271	76	11	1,184
30	100,000	73,813	26,187	1,184	71	11	1,102
31	100,000	79,048	20,952	1,102	66	11	1,025
32	101,577	84,648	16,929	1,025	62	12	951
33	107,843	90,625	17,218	951	57	12	882
34	114,366	96,920	17,446	882	53	12	817
35	121,154	103,550	17,604	817	49	12	756
36	128,218	110,533	17,685	756	45	13	698
37	135,569	117,886	17,683	698	42	13	643
38	141,965	125,633	16,332	643	39	13	591
39	148,560	133,838	14,722	591	35	13	543
40	155,371	142,542	12,829	543	33	13	497
41	162,420	151,794	10,626	497	30	13	454
42	169,733	161,650	8,083	454	27	13	414
43	180,786	172,177	8,609	414	25	13	376
44	192,432	183,269	9,163	376	23	13	340
45	204,694	194,947	9,747	340	20	13	307
46	217,597	207,235	10,362	307	18	13	276
47	231,167	220,159	11,008	276	17	12	247
48	245,429	233,742	11,687	247	15	12	220
49	260,406	248,006	12,400	220	13	12	195
50	276,120	262,972	13,148	195	184	11	-

**Illustration A16 - Illustrative Life Contracts over 50 Years**

A50. Illustration A17 shows the insurer's expectations about cash flows (other than investment return) from the book of contracts.

<u>year</u>	<u>Premiums Received</u>	<u>Commission Paid</u>	<u>Expenses Paid</u>	<u>Benefits Paid Deaths</u>	<u>Withdrawals</u>	<u>Processing Expenses</u>	<u>Net Cash Flow (,000)</u>
1	14,000	(7,000)	(5,277)	(400)	-	(21)	1,302
2	11,194	(560)	(711)	(400)	(716)	(10)	8,797
3	9,845	(492)	(625)	(400)	(1,124)	(6)	7,198
4	9,051	(453)	(574)	(400)	(1,283)	(4)	6,337
5	8,502	(425)	(540)	(400)	(1,741)	(4)	5,392
6	7,987	(399)	(507)	(500)	(2,165)	(4)	4,412
7	7,501	(375)	(476)	(500)	(2,549)	(4)	3,597
8	7,045	(352)	(447)	(500)	(2,906)	(3)	2,837
9	6,615	(331)	(420)	(500)	(3,232)	(3)	2,129
10	6,210	(311)	(394)	(600)	(3,516)	(3)	1,386
11	5,830	(291)	(370)	(600)	(3,736)	(3)	830
12	5,471	(274)	(347)	(600)	(3,924)	(3)	323
13	5,135	(257)	(326)	(600)	(4,111)	(3)	(162)
14	4,819	(241)	(306)	(700)	(4,286)	(3)	(717)
15	4,519	(226)	(287)	(700)	(4,430)	(2)	(1,126)
16	4,238	(212)	(269)	(700)	(4,565)	(2)	(1,510)
17	3,973	(199)	(252)	(700)	(4,668)	(2)	(1,848)
18	3,725	(186)	(236)	(800)	(4,796)	(2)	(2,295)
19	3,490	(175)	(222)	(800)	(4,896)	(2)	(2,605)
20	3,269	(163)	(207)	(800)	(4,963)	(2)	(2,866)
21	3,062	(153)	(194)	(800)	(5,033)	(2)	(3,120)
22	2,867	(143)	(182)	(900)	(5,110)	(2)	(3,470)
23	2,682	(134)	(170)	(900)	(5,157)	(2)	(3,681)
24	2,509	(125)	(159)	(900)	(5,218)	(2)	(3,895)
25	2,345	(117)	(149)	(900)	(5,250)	(2)	(4,073)
26	2,191	(110)	(139)	(1,000)	(5,250)	(2)	(4,310)
27	2,045	(102)	(130)	(1,000)	(5,276)	(2)	(4,465)
28	1,908	(95)	(121)	(1,000)	(5,272)	(1)	(4,581)
29	1,779	(89)	(113)	(1,100)	(5,237)	(1)	(4,761)
30	1,658	(83)	(105)	(1,100)	(5,241)	(1)	(4,872)
31	1,543	(77)	(98)	(1,100)	(5,217)	(1)	(4,950)
32	1,435	(72)	(91)	(1,219)	(5,248)	(1)	(5,196)
33	1,331	(67)	(85)	(1,294)	(5,166)	(1)	(5,282)
34	1,235	(62)	(78)	(1,372)	(5,137)	(1)	(5,415)
35	1,144	(57)	(73)	(1,454)	(5,074)	(1)	(5,515)
36	1,058	(53)	(67)	(1,667)	(4,974)	(1)	(5,704)
37	977	(49)	(62)	(1,762)	(4,951)	(1)	(5,848)
38	900	(45)	(57)	(1,846)	(4,900)	(1)	(5,949)
39	827	(41)	(53)	(1,931)	(4,684)	(1)	(5,883)
40	760	(38)	(48)	(2,020)	(4,704)	(1)	(6,051)
41	696	(35)	(44)	(2,111)	(4,554)	(1)	(6,049)
42	636	(32)	(40)	(2,207)	(4,365)	(1)	(6,009)
43	580	(29)	(37)	(2,350)	(4,304)	(1)	(6,141)
44	526	(26)	(33)	(2,502)	(4,215)	(1)	(6,251)
45	476	(24)	(30)	(2,661)	(3,899)	(1)	(6,139)
46	430	(21)	(27)	(2,829)	(3,730)	(1)	(6,178)
47	386	(19)	(25)	(2,774)	(3,743)	(1)	(6,176)
48	346	(17)	(22)	(2,945)	(3,506)	(1)	(6,145)
49	308	(15)	(20)	(3,125)	(3,224)	(1)	(6,077)
50	273	(14)	(17)	(3,037)	(48,387)	(3)	(51,185)

**Illustration A17 - Cash Flow Detail**

- A51. The two preceding illustrations provide most of the data needed to account for a book of life insurance contracts. At this point, the data has not been adjusted to include a measure of prudence or to adjust for the possibility of adverse deviation. Those and similar adjustments may, or may not, be appropriate and will be discussed later in this Appendix. The data in these two illustrations is a starting point. It is presented without adjustment so that readers can understand both the effect and implications of adjustments presented later. In addition to the information in the illustrations, the insurer expects to:
- (a) earn a long-term return on investments of 7 percent; and
  - (b) credit policyholders with an average rate of 6 percent. The contracts guarantee 3 percent.
- A52. All of the illustrations in this section assume that actual experience emerges as assumed in Illustrations A16 –A17 and paragraph A51.
- A53. Actuaries and accountants have developed two families of accounting models for life insurance. **Policyholder-Benefits (prospective)** models measure the liability for policyholder benefits by focusing on future premium inflows and outflows for policyholder benefits and expenses. Policyholder-benefit models usually report the entire amount of premium as revenue when received and report payments to policyholders as benefit expense. **Policyholder-Deposit (retrospective)** models measure the liability to policyholders based on the accumulation of past transactions between the insurer and policyholders. Policyholder-deposit models usually report premiums as increases in a deposit liability. Payments to policyholders are divided between return of that deposit and net benefits in excess of the deposit.
- A54. The two recognition models are often characterised as prospective (benefit) and retrospective (deposit). However, the terms are used with a meaning somewhat different from that familiar to most actuaries. Early in their training, actuaries learn that by using common assumptions, the results of a prospective computation can also be derived by accumulating past transactions (refer to Illustrations A19-A20 for an example of this principle). One would not expect the policyholder-deposit and policyholder-benefit approaches to produce similar recorded amounts - because they use different information in determining the amount of the benefit liability.

### **A Simple Prospective Computation**

- A55. The simplest form of prospective life insurance model builds on the assumptions just described to compute the present values of individual inflows and outflows, as shown below in Illustration A18.

Projected asset earning rate	<u>7.00%</u>	
Present value of gross premiums	92,882	100.00%
Present value of death & surrender benefits	(55,049)	-59.27%
Present value of costs & expenses	<u>(21,228)</u>	<u>-22.85%</u>
Present value of net income	<u>16,605</u>	<u>17.88%</u>

### Illustration A18—Prospective Computations

A56. The amounts derived in Illustration A18 are then applied to compute a liability for policyholder benefits, as shown below. This buildup approach is familiar to most accountants. Actuaries refer to this computation as a retrospective computation of the liability, as distinguished from the retrospective models discussed later in this section.

		dr. (cr.)	
		Year 1	Year 2
Premiums received		<u>14,000</u>	<u>11,194</u>
Beginning balance		-	(8,458)
Addition to liability	-59.27% of premiums	<u>(8,298)</u>	<u>(6,635)</u>
		(8,298)	(15,093)
Interest at	7.00%	(581)	(1,057)
Benefits paid:			
	Surrenders	-	716
	Deaths	400	400
	Processing	<u>21</u>	<u>10</u>
Ending balance (to balance sheet)		<u>(8,458)</u>	<u>(15,024)</u>

### Illustration A19—Benefit Computation

- A57. Alternatively, the liability can be computed using the approach below. This approach is perhaps more familiar to most actuaries. (In principle, both approaches give the same result, although there is a small rounding difference in this case.)

	dr. (cr.)	
	<u>Year 1</u>	<u>Year 2</u>
Present value of remaining premiums	84,404	78,334
Times percentage needed to fund benefits	<u>59.27%</u>	<u>59.27%</u>
	50,026	46,429
Present value of remaining benefits	<u>(58,482)</u>	<u>(61,449)</u>
Liability balance	<u>(8,456)</u>	<u>(15,020)</u>

### Illustration A20 - Benefit Computation

- A58. If the insurer recognises acquisition costs as an asset, the same techniques can be used to amortise that asset over the life of the book, as shown below:

		dr. (cr.)	
		<u>Year 1</u>	<u>Year 2</u>
Premiums received		<u>14,000</u>	<u>11,194</u>
Beginning balance		-	9,713
Costs incurred	Commissions	7,000	560
	Other 1st year	4,388	-
	Recurring expenses	889	711
Amortization	-22.85% of premiums	<u>(3,199)</u>	<u>(2,558)</u>
		9,078	8,426
Interest at	7.00%	<u>635</u>	<u>590</u>
Ending balance (to balance sheet)		<u>9,713</u>	<u>9,016</u>

### Illustration A21 - Amortisation of Acquisition Costs

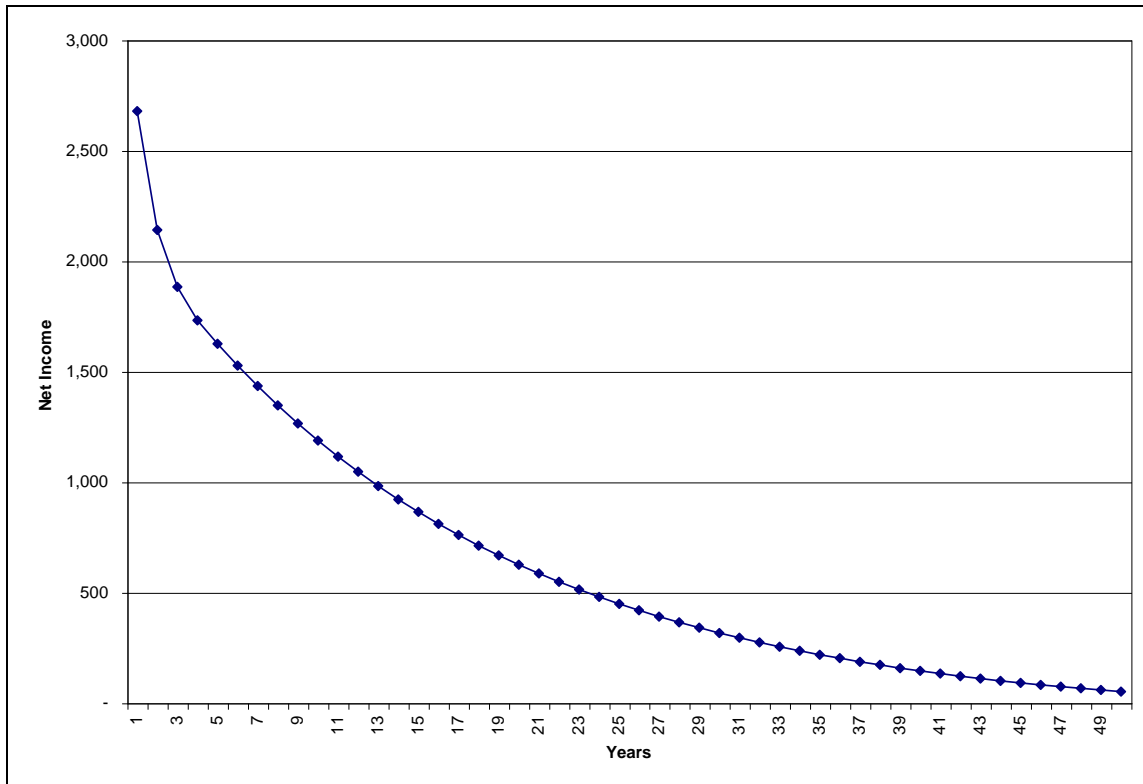
- A59. Illustration A22 shows financial statements for the first five years of the book's life, using the simple prospective method developed in the preceding paragraphs. This approach is also referred to as a **premium method** or as **premium-driven**. If the insurer's expectations emerge as originally projected, net income will equal a constant percentage of premium revenues. Accountants who are more familiar with commercial accounting than insurance accounting may see a similarity between this method and the installment sale method sometimes applied in non-insurance situations in some countries.

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<b>Cash and investments</b>					
Beginning balance	-	(1,255)	6,009	12,356	18,388
Premiums received	14,000	11,194	9,845	9,051	8,502
Policy expenses	(12,277)	(1,270)	(1,117)	(1,027)	(965)
Benefits and related expenses	(421)	(1,126)	(1,530)	(1,687)	(2,145)
Investment earnings	121	607	1,032	1,426	1,815
Contribution (Distribution)	<u>(2,678)</u>	<u>(2,141)</u>	<u>(1,883)</u>	<u>(1,731)</u>	<u>(1,626)</u>
Ending balance	<u>(1,255)</u>	<u>6,009</u>	<u>12,356</u>	<u>18,388</u>	<u>23,969</u>
<b>Balance sheets</b>					
Cash and investments	(1,255)	6,009	12,356	18,388	23,969
Deferred acquisition costs	9,712	9,014	8,433	7,909	7,416
Benefit liability	<u>(8,457)</u>	<u>(15,022)</u>	<u>(20,787)</u>	<u>(26,295)</u>	<u>(31,382)</u>
(Equity)/Deficit	<u>-</u>	<u>1</u>	<u>2</u>	<u>2</u>	<u>3</u>
<b>Income statements</b>					
Premium revenue	(14,000)	(11,194)	(9,845)	(9,051)	(8,502)
Investment income	(121)	(607)	(1,032)	(1,426)	(1,815)
Policy expenses	12,277	1,270	1,117	1,027	965
Change in deferred acquisition costs	(9,712)	698	581	524	493
Benefits and related expenses	421	1,126	1,530	1,687	2,145
Change in benefit liability	<u>8,457</u>	<u>6,565</u>	<u>5,765</u>	<u>5,508</u>	<u>5,087</u>
Net (income)/loss	<u>(2,678)</u>	<u>(2,142)</u>	<u>(1,884)</u>	<u>(1,731)</u>	<u>(1,627)</u>
Net income as a percentage of premium revenue	<u>19.13%</u>	<u>19.14%</u>	<u>19.14%</u>	<u>19.12%</u>	<u>19.14%</u>

**Illustration A22 - Simple Prospective Model<sup>1</sup>**

- A60. The financial statements shown above include a line labelled **distribution**. This convention removes the assets and liabilities not required by the ongoing book of business, in this case, the amounts reported as net income. Actuaries use a different convention in their illustrations to achieve the same purpose, but most accountants find the fictional "dividend" easier to understand.
- A61. If actual events occur as expected, an insurer that uses the prospective or premium model described above will report net income in a declining pattern, reflecting the declining number of policyholders that remain in the book and pay premiums.

<sup>1</sup> Readers will note small differences between some balances reported in the financial statements and the associated schedules. The differences are due to rounding in computations.



**Figure A5 - Pattern of Reported Income, Simple Prospective Model**

### **Methods Required by Insurance Regulators**

A62. Paragraph A51 described the assumptions used in the preceding illustrations as unadjusted for prudence or other factors. Insurance regulators often require insurers to use a combination of prescribed assumptions and accounting conventions in reporting to the regulator. The illustrations that follow portray a hypothetical regulatory accounting regime in which the regulator imposes the following requirements:

- (a) the insurer must use assumptions about policyholder mortality dictated by the regulator. The assumptions are based on a standardised mortality table that projects considerably higher mortality rates than the insurer's estimates;
- (b) the insurer must not make assumptions about contract terminations. Instead, all policyholders are assumed to maintain their contracts in force until death or the end of the 50-year term used in the illustration;
- (c) the insurer must base estimated benefit payments on contract guarantees. The contracts guarantee accumulation of cash values at 3 percent, while the insurer expects to credit policyholders at 6 percent;
- (d) the insurer must use a discount rate of 5 percent. The previous illustrations used a 7 percent rate; and

- (e) the insurer must maintain a balance of cash and investments equal to 110 percent of the benefit liability, computed on the basis described above.

A63. Illustration A23 shows how the assumptions alter the computations that will be used in reporting to the regulatory authority.

Discount rate	<u>5.00%</u>	
Present value of gross premiums	234,306	100.00%
Present value of death & surrender benefits	(197,092)	-84.12%
Present value of costs & expenses	<u>(37,275)</u>	<u>-15.91%</u>
Present value of net income	<u>(61)</u>	<u>-0.03%</u>

**Illustration A23 - Hypothetical Regulatory Assumptions**

A64. The regulator and the insurer understand that actual results are not likely to follow the regulator's assumptions. As a result, a convention is needed to adjust the insurer's liability as actual experience emerges. Actuaries and accountants have developed a number of such conventions. Illustration 24 shows one convention, known as a **factor method**. The insurer computes the liability that would have been recorded if actual experience was the same as the assumptions. It then selects a contract feature and computes a ratio between an assumed amount and the actual amount at year end. In this case, the insurer uses the amount accumulated in policyholder accounts as the base for applying the factor method.

		dr. (cr.)	
		<u>Year 1</u>	<u>Year 2</u>
Assumed premium revenue (regulatory basis)		<u>14,000</u>	<u>13,965</u>
Beginning balance		-	(9,864)
Addition to liability		<u>(11,777)</u>	<u>(11,747)</u>
		(11,777)	(21,611)
Interest at		(589)	(1,081)
Assumed benefit payments (regulatory basis)	Surrenders	-	-
	Deaths	2,500	2,600
	Processing	<u>2</u>	<u>2</u>
Ending balance (regulatory basis)		<u>(9,864)</u>	<u>(20,090)</u>
Surviving policyholders using regulatory assumptions		9,975	9,949
Contract accumulation using regulatory assumptions		<u>1,019.70</u>	<u>2,054.39</u>
In-force accumulation using regulatory assumptions (,000 omitted)		<u>10,172</u>	<u>20,439</u>
Actual surviving policyholders		7,996	7,032
Actual contract accumulation		<u>1,049.40</u>	<u>2,145.77</u>
In-force accumulation (,000 omitted)		<u>8,391</u>	<u>15,089</u>
Ratio of actual in-force to regulatory assumptions		82.49%	73.82%
Balance to regulatory-basis balance sheet		<u>(8,137)</u>	<u>(14,830)</u>

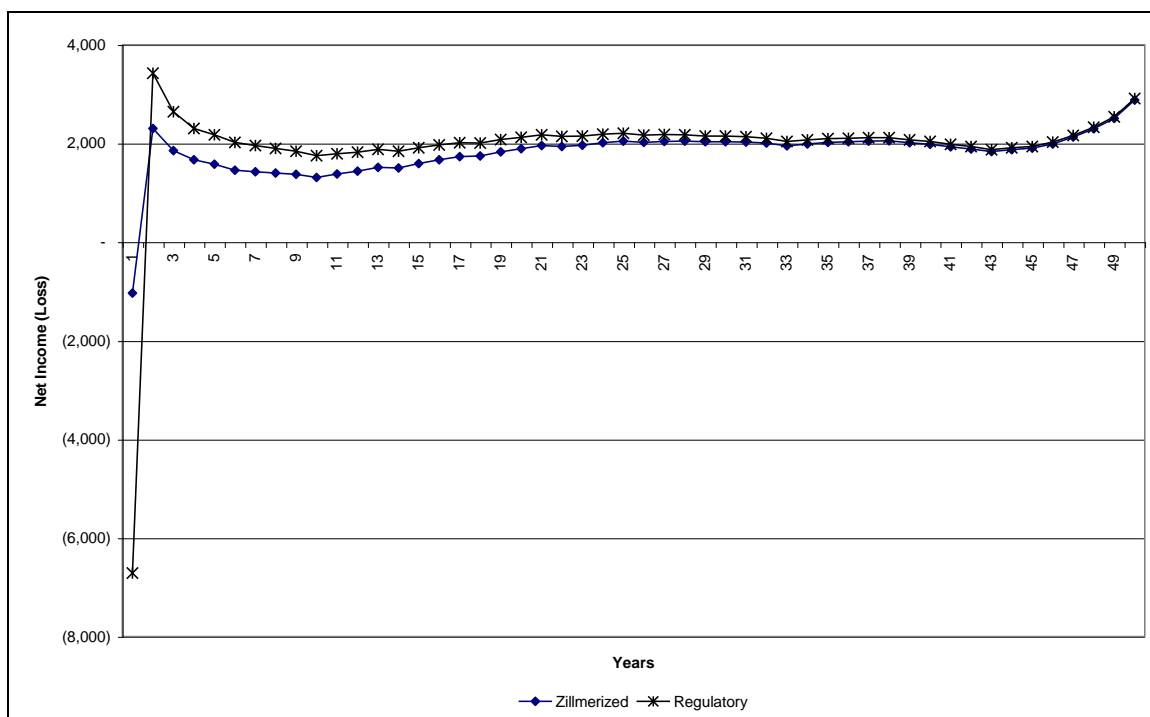
#### **Illustration 24 - Liability Computation Using a Factor Method**

A65. Illustration A25 shows five years of financial statements prepared under the hypothetical regulatory regime using the factor method described above.

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<b>Cash and investments</b>					
Beginning balance	-	8,951	16,314	23,254	30,100
Premiums received	14,000	11,194	9,845	9,051	8,502
Policy expenses	(12,298)	(1,280)	(1,123)	(1,031)	(969)
Benefits and related expenses	(400)	(1,116)	(1,524)	(1,683)	(2,141)
Investment earnings	121	1,321	1,753	2,189	2,635
Contribution (Distribution)	<u>7,528</u>	<u>(2,756)</u>	<u>(2,011)</u>	<u>(1,680)</u>	<u>(1,588)</u>
Ending balance	<u>8,951</u>	<u>16,314</u>	<u>23,254</u>	<u>30,100</u>	<u>36,539</u>
<b>Balance sheets</b>					
Cash and investments	8,951	16,314	23,254	30,100	36,539
Deferred acquisition costs	-	-	-	-	-
Benefit liability	<u>(8,137)</u>	<u>(14,831)</u>	<u>(21,140)</u>	<u>(27,363)</u>	<u>(33,217)</u>
(Equity)/Deficit	<u>814</u>	<u>1,483</u>	<u>2,114</u>	<u>2,737</u>	<u>3,322</u>
<b>Income statements</b>					
Premium revenue	(14,000)	(11,194)	(9,845)	(9,051)	(8,502)
Investment income	(121)	(1,321)	(1,753)	(2,189)	(2,635)
Policy expenses	12,298	1,280	1,123	1,031	969
Change in deferred acquisition costs	-	-	-	-	-
Benefits and related expenses	400	1,116	1,524	1,683	2,141
Change in benefit liability	<u>8,137</u>	<u>6,694</u>	<u>6,309</u>	<u>6,223</u>	<u>5,854</u>
Net (income)/loss	<u>6,714</u>	<u>(3,425)</u>	<u>(2,642)</u>	<u>(2,303)</u>	<u>(2,173)</u>

### Illustration A25 - Hypothetical Regulatory Model

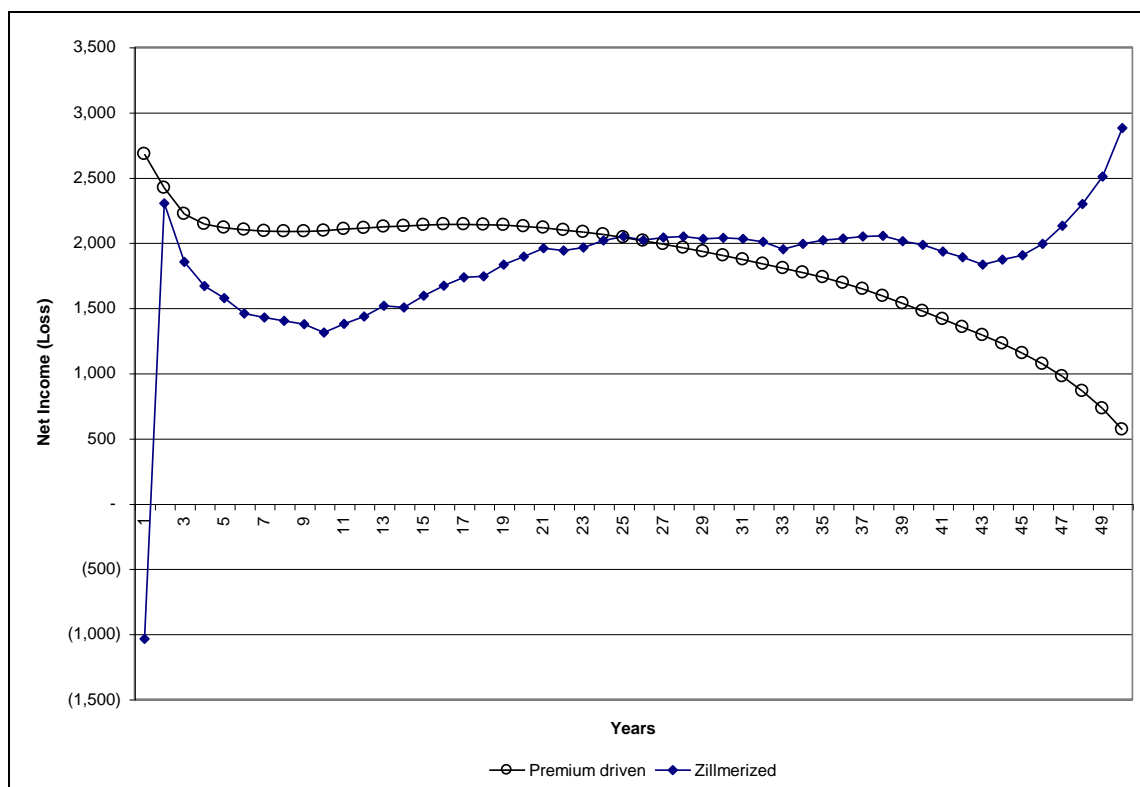
- A66. Regulatory authorities sometimes allow an adjustment mechanism, referred to as a **Zillmer adjustment** to compensate for the uneven incidence of expenses in a net premium. A Zillmer adjustment has the effect of reducing the benefit liability and thus reduces new business strain - the accounting loss (or reduction in solvency margin) that the insurer would otherwise suffer when it sells new contracts. Figure A6 compares the patterns of reported income under the hypothetical regulatory regime as described above and the same regime with a Zillmer adjustment applied over the 50-year life of the illustration.



**Figure A6 - Income Patterns Compared, Hypothetical Regulatory Model**

- A67. Illustrations from this point forward assume that the regulator allows a Zillmer adjustment over the 50-year life of the illustrations.
- A68. The regulatory model alters the pattern of reported earnings, but readers should remember that a regulatory regime cannot, by itself, alter the ultimate economic result. The insurer's actual cash inflows and outflows are determined by policyholder behaviour, investment results, and contract terms. However, regulatory authorities can and do control when amounts are available to the insurer for other purposes - the **distribution** included in the illustrated financial statements. An insurer may use different assumptions in general purpose financial statements, but its ability to use assets for purposes other than in support of existing contracts is controlled to a large extent by the regulator. Figure A7 compares reported income under the regulatory regime with amounts reported using the premium-driven approach portrayed in Illustration A22. The amounts from that illustration have been adjusted to reflect distributions consistent with the regulatory control.<sup>2</sup> All of the illustrations from here forward include a similar adjustment.

<sup>2</sup> The total amount of reported income is the same for both methods - about 91,000.



**Figure A7 - Income Patterns Compared, Premium-Drive Approach and Zillmerized Regulatory Model**

### Prospective Methods and Source of Earnings

A69. The regulator chooses assumptions that alter the pattern of reported earnings as part of its mandate to protect policyholders. Actuaries and accountants sometimes use similar techniques to produce a pattern of reported earnings that is consistent with what they consider to be contract's **source of earnings**. The simple prospective approach shown in Illustration A22 portrays a view that premium receipt is the source of earnings. A different set of assumptions would produce a pattern of reported earnings consistent with a view that investment return is the source of earnings, as illustrated below. Illustration A26 uses the insurer's unadjusted estimates for all contract cash flows and adjusts the discount rate to the internal rate of return in those cash flows.

Discount rate	<u>4.85%</u>	
Present value of gross premiums	107,602	100.00%
Present value of death & surrender benefits	(84,704)	-78.72%
Present value of costs & expenses	<u>(22,898)</u>	<u>-21.28%</u>
Present value of net income	<u>-</u>	<u>0.00%</u>

**Illustration A26 - Computations, Investment Return as the Source of Earnings**

- A70. Illustration A27 shows the computation of the benefit liability using the adjusted assumptions. Because actual policyholder deaths, terminations, and other activity do not vary from the original assumptions, no factor adjustment is necessary.

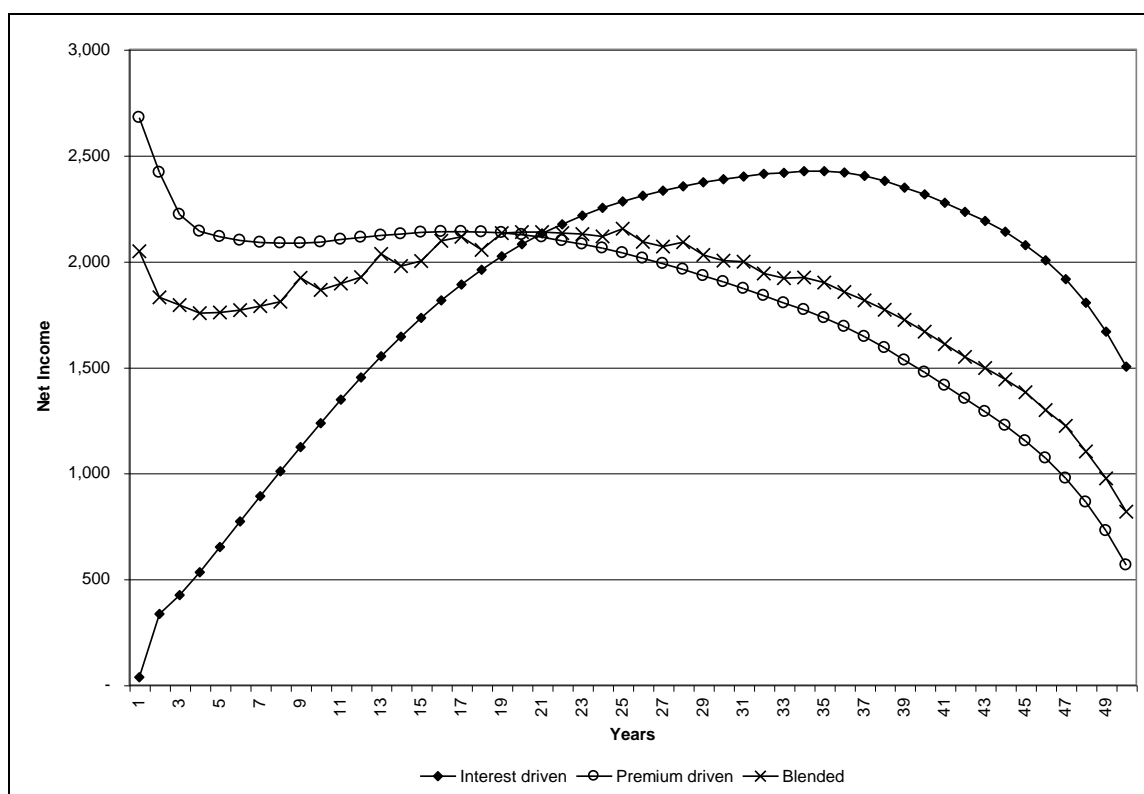
		dr. (cr.)	
		<u>Year 1</u>	<u>Year 2</u>
Assumed premium revenue		<u>14,000</u>	<u>11,194</u>
Beginning balance		-	(11,135)
Addition to liability	-78.72% of premiums	<u>(11,021)</u>	<u>(8,812)</u>
		(11,021)	(19,947)
Interest at	4.85%	(535)	(968)
Assumed benefit payments	Surrenders	-	716
	Deaths	400	400
	Processing	<u>21</u>	<u>10</u>
Ending balance		<u>(11,135)</u>	<u>(19,789)</u>

**Illustration A27 - Benefit Liability, Interest as the Source of Earnings**

- A71. Illustration A28 shows five years of financial statements prepared with a view that investment returns are the principal source of earnings.
- A72. Figure A8 compares the patterns of reported earnings from a premium-driven, an interest-driven, and a third, blended, approach to the source of earnings.
- A73. In the blended approach, the insurer attributes income to a combination of premiums, policyholder mortality, and investment returns.

	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Cash and investments</b>					
Beginning balance	-	2,707	10,826	18,213	25,370
Premiums received	14,000	11,194	9,845	9,051	8,502
Policy expenses	(12,298)	(1,280)	(1,123)	(1,031)	(969)
Benefits and related expenses	(400)	(1,116)	(1,524)	(1,683)	(2,141)
Investment earnings	121	884	1,369	1,837	2,303
Distribution	1,284	(1,563)	(1,180)	(1,017)	(963)
Ending balance	2,707	10,826	18,213	25,370	32,102
<b>Balance sheets</b>					
Cash and investments	2,707	10,826	18,213	25,370	32,102
Deferred acquisition costs	9,748	9,055	8,469	7,938	7,437
Benefit liability	(11,134)	(19,788)	(27,344)	(34,453)	(40,997)
(Equity)/Deficit	(1,321)	(93)	662	1,145	1,458
<b>Income statements</b>					
Premium revenue	(14,000)	(11,194)	(9,845)	(9,051)	(8,502)
Investment income	(121)	(884)	(1,369)	(1,837)	(2,303)
Policy expenses	12,298	1,280	1,123	1,031	969
Change in deferred acquisition costs	(9,748)	693	586	531	501
Benefits and related expenses	400	1,116	1,524	1,683	2,141
Change in benefit liability	11,134	8,654	7,556	7,109	6,544
Net (income)/loss	(37)	(335)	(425)	(534)	(650)

**Illustration A28 - Investment Return as Source of Earnings**



**Figure A8 - Income Patterns Compared, Interest-driven, Premium-driven and Blended**

## Embedded-Value Methods

- A74. In some jurisdictions, insurers have developed a family of prospective methods that combine liability measurements required by regulatory authorities with a view that the sale of an insurance contract produces an asset for the insurer. The insurer's asset is equal to the present value of future profits that the regulator will allow the insurer to release from the book of business and use for other purposes. In this illustration, the embedded-value asset is determined based on distributions of regulatory-basis profits and does not include additional assets that the insurer must hold in support of the book (refer to paragraphs A62 and A68). The present value is typically computed at a risk-adjusted discount rate that is higher than the expected earning rate on invested assets.
- A75. Illustration A29 shows the computation of the embedded-value asset. In this case, the insurer uses a risk-adjusted discount rate of 10 percent. Changes in estimates of future distributable amounts would increase or decrease the asset, as would experience in the current period that differs from previous estimates. The illustrations in this section assume that actual experience will follow the original assumptions, so no adjustment is necessary.

	dr. (cr.)	
	<u>Year 1</u>	<u>Year 2</u>
Embedded value, beginning balance	-	16,804
Addition to embedded value, present value of projected distributions allowed by regulatory authority	14,333	-
Changes due to revised estimates and current experience variances	<u>-</u>	<u>-</u>
	14,333	16,804
Interest at 10.00%	1,433	1,680
Contributions required by regulatory authority	1,284	-
Distributions allowed by regulatory authority	-	(1,563)
Additional supporting assets in excess of distributable profits	<u>(246)</u>	<u>(738)</u>
Net contribution (distribution)	<u>1,038</u>	<u>(2,301)</u>
Ending balance	<u>16,804</u>	<u>16,183</u>

**Illustration A29 - Embedded Value Computations**

- A76. Illustration A30 shows five years of financial statements prepared using an embedded-value approach. The embedded-value asset replaces deferred acquisition costs, and the benefit liability is the amount required by the regulator (including the Zillmer adjustment). Net income is equal to additions in the embedded-value asset, changes in assumptions and experience, and interest accrued to the balance.

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<b>Cash and investments</b>					
Beginning balance	-	2,707	10,826	18,213	25,370
Premiums received	14,000	11,194	9,845	9,051	8,502
Policy expenses	(12,298)	(1,280)	(1,123)	(1,031)	(969)
Benefits and related expenses	(400)	(1,116)	(1,524)	(1,683)	(2,141)
Investment earnings	121	884	1,369	1,837	2,303
Contribution (Distribution)	<u>1,284</u>	<u>(1,563)</u>	<u>(1,180)</u>	<u>(1,017)</u>	<u>(963)</u>
Ending balance	<u><u>2,707</u></u>	<u><u>10,826</u></u>	<u><u>18,213</u></u>	<u><u>25,370</u></u>	<u><u>32,102</u></u>
<b>Balance sheets</b>					
Cash and investments	2,707	10,826	18,213	25,370	32,102
Embedded value asset	16,805	16,183	15,950	15,878	15,891
Benefit liability	<u>(2,461)</u>	<u>(9,842)</u>	<u>(16,557)</u>	<u>(23,063)</u>	<u>(29,183)</u>
(Equity)/Deficit	<u><u>17,051</u></u>	<u><u>17,167</u></u>	<u><u>17,606</u></u>	<u><u>18,185</u></u>	<u><u>18,810</u></u>
<b>Income statements</b>					
Premium revenue	(14,000)	(11,194)	(9,845)	(9,051)	(8,502)
Investment income	(121)	(884)	(1,369)	(1,837)	(2,303)
Policy expenses	12,298	1,280	1,123	1,031	969
Change in embedded value	(16,805)	622	233	72	(13)
Benefits and related expenses	400	1,116	1,524	1,683	2,141
Change in benefit liability	<u>2,461</u>	<u>7,381</u>	<u>6,715</u>	<u>6,506</u>	<u>6,120</u>
Net (income)/loss	<u><u>(15,767)</u></u>	<u><u>(1,679)</u></u>	<u><u>(1,619)</u></u>	<u><u>(1,596)</u></u>	<u><u>(1,588)</u></u>
<b>Income statements, alternative presentation</b>					
Addition to embedded value asset	(14,333)	-	-	-	-
Interest at 10%	(1,433)	(1,681)	(1,618)	(1,595)	(1,588)
Changes due to experience and revised estimates	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Net (income)/loss	<u><u>(15,766)</u></u>	<u><u>(1,681)</u></u>	<u><u>(1,618)</u></u>	<u><u>(1,595)</u></u>	<u><u>(1,588)</u></u>

### Illustration A30 - Embedded-Value Approach

#### Policyholder-Deposit Approach

- A77. Policyholder-deposit approaches are retrospective. That is, the carrying amount of the insurer's liability reflects the accumulation of past transactions between the insurer and policyholder rather than estimates of future activity. Those transactions are reflected in the balance of a policyholder's account in much the same manner as transactions in any other deposit account. When the contract does not provide for an explicit policyholder account, the insurer must sometimes use prospective techniques to estimate the aggregate balance that accrues to policyholders. However, the estimate is a surrogate for the amount that would have resulted from accumulating past transactions.
- A78. The pattern of reported income produced by a policyholder-deposit approach is often characterised as **margin-driven**. Revenue includes amounts charged to policyholders for mortality and administration, penalties assessed for early surrender, and amounts

earned from investment of assets. Expenses include death benefits in excess of policyholder balances, administration costs, interest credited to policyholder balances, and amortisation of acquisition costs. The pattern of reported income reflects the terms of the contract and the actual experience of mortality, lapse, expenses, and investment results. A different contract design, for example, a contract that charged a larger amount for mortality protection and a smaller penalty for policyholder surrender, would produce a different pattern of reported income.

- A79. Policyholder-deposit approaches rely on the presence of a policyholder account, identified charges against that balance, and an identified accrual of interest to the balance. For that reason, they are easy to apply to contracts that explicitly communicate such information to policyholders. Data from the policyholder accounting system is entered directly into the financial accounting system. If a contract does not include those features, then surrogates must be developed to approximate the amount of the policyholder account and charges and credits.
- A80. Illustration A31 shows the computation of the benefit liability using a policyholder-deposit method.

	dr. (cr.)	
	<u>Year 1</u>	<u>Year 2</u>
Beginning balance	-	(8,391)
Premiums received	(14,000)	(11,194)
Amounts assessed against policyholders		
Mortality charges	1,730	1,504
Contract maintenance	<u>2,370</u>	<u>1,895</u>
	(9,900)	(16,186)
Interest at the credit rate of 6.00%	<u>(594)</u>	<u>(971)</u>
	(10,494)	(17,157)
Contract balances of policyholders deceased during the period	4	9
Contract balances of policies surrendered during the period	<u>2,099</u>	<u>2,060</u>
Ending balance	<u>(8,391)</u>	<u>(15,088)</u>

### **Illustration A31 - Policyholder Deposit Computations**

- A81. A policyholder-deposit approach requires a different approach to amortising deferred acquisition costs. Because the approach looks to contract margins as the source of earnings, deferred acquisition costs are amortised based on the present value of estimated margins, as shown in Illustrations A32-A33.

Present value (at credited rate of 6%) of:	
Charges for early surrender	(4,862)
Mortality assessments	(16,548)
Mortality benefits paid in excess of contract balances	6,605
Contract maintenance assessments	(15,831)
Recurring contract expenses	10,679
Investment income related to policy balances	(59,556)
Interest credited to policyholders	<u>51,048</u>
Present value of gross profits	<u>(28,465)</u>
Present value of capitalized acquisition costs	<u>10,688</u>
Amortization rate	<u>-37.548%</u>

**Illustration A32 - Policyholder-deposit Approach,  
Computation of Amortisation Factor**

		dr. (cr.)	
		<u>Year 1</u>	<u>Year 2</u>
Beginning balance		-	9,717
Nonrecurring costs incurred		<u>10,688</u>	<u>-</u>
		10,688	9,717
Interest at 6.00%		<u>641</u>	<u>583</u>
	(a)	<u>11,329</u>	<u>10,300</u>
Gross profits		4,292	3,233
times amortization factor		<u>-37.55%</u>	<u>-37.55%</u>
	(b)	<u>(1,612)</u>	<u>(1,214)</u>
Ending balance, (a) + (b)		<u>9,717</u>	<u>9,086</u>

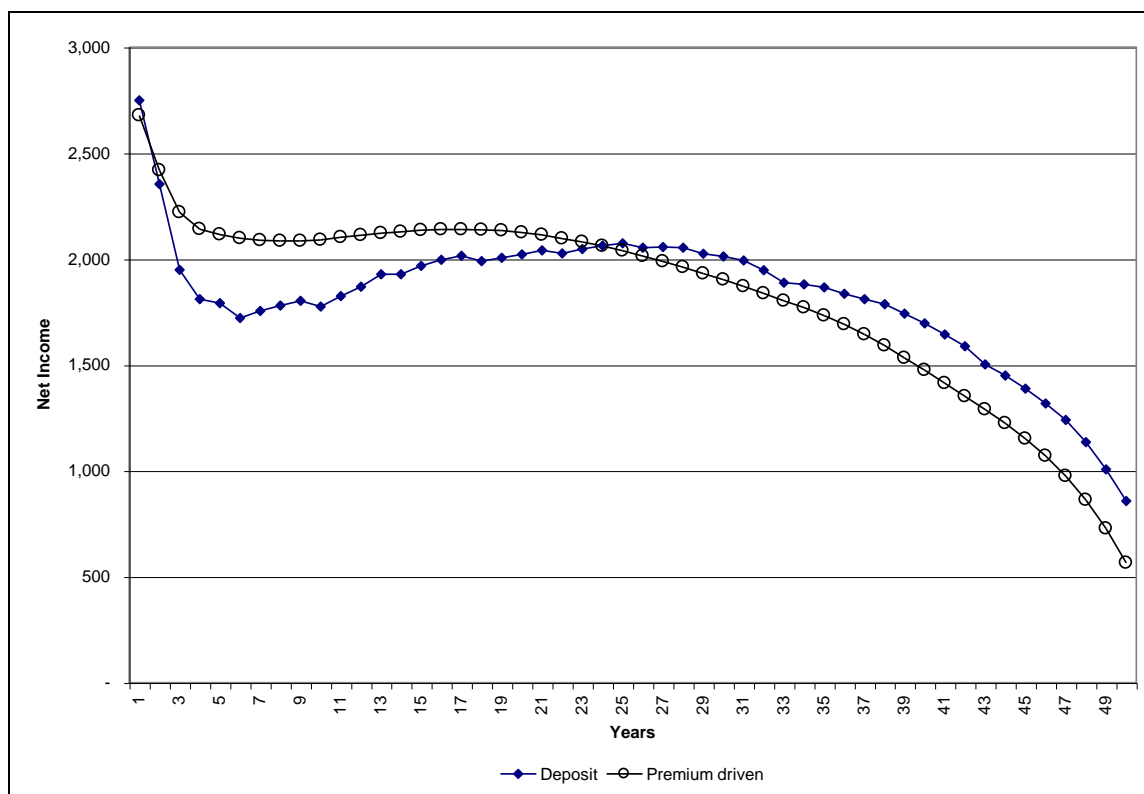
**Illustration A33 - Policyholder-deposit Approach,  
Amortisation of Deferred Acquisition Costs**

A82. Illustration A34 shows five years of financial statements prepared using a policyholder-deposit approach. As mentioned earlier, charges against policyholders are reported as revenue, while premium receipts are reported as additions to the policyholder deposit.

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<b>Cash and investments</b>					
Beginning balance	-	2,707	10,826	18,213	25,370
Premiums received	14,000	11,194	9,845	9,051	8,502
Policy expenses	(12,298)	(1,280)	(1,123)	(1,031)	(969)
Benefits and related expenses	(400)	(1,116)	(1,524)	(1,683)	(2,141)
Investment earnings	121	884	1,369	1,837	2,303
Contribution (Distribution)	<u>1,284</u>	<u>(1,563)</u>	<u>(1,180)</u>	<u>(1,017)</u>	<u>(963)</u>
Ending balance	<u>2,707</u>	<u>10,826</u>	<u>18,213</u>	<u>25,370</u>	<u>32,102</u>
<b>Balance sheets</b>					
Cash and investments	2,707	10,826	18,213	25,370	32,102
Deferred acquisition costs	9,718	9,087	8,691	8,385	8,104
Benefit liability	<u>(8,391)</u>	<u>(15,089)</u>	<u>(21,311)</u>	<u>(27,369)</u>	<u>(32,993)</u>
(Equity)/Deficit	<u>(4,034)</u>	<u>(4,824)</u>	<u>(5,593)</u>	<u>(6,386)</u>	<u>(7,213)</u>
<b>Income statements</b>					
Mortality, surrender, and expense charges	(6,199)	(4,743)	(3,798)	(3,342)	(3,102)
Investment income	(121)	(884)	(1,369)	(1,837)	(2,303)
Recurring policy expenses	1,589	1,270	1,117	1,027	965
Death benefits in excess of account balance	417	402	393	386	381
Amortization of deferred acquisition costs	970	631	396	306	281
Interest credited to policyholder balances	<u>594</u>	<u>971</u>	<u>1,312</u>	<u>1,649</u>	<u>1,988</u>
Net (income)/loss	<u>(2,750)</u>	<u>(2,353)</u>	<u>(1,949)</u>	<u>(1,811)</u>	<u>(1,790)</u>

### Illustration A34 - Policyholder-Deposit Approach

A83. Figure A9 compares the pattern of reported earnings from a policyholder-deposit approach with the premium-driven prospective approach discussed earlier.



**Figure A9 - Income Patterns Compared, Policyholder-Deposit Approach and Premium-Driven Prospective Approach**

### Implementing the Steering Committee View, Financial Statements not at Fair Value

A84. In Sub-issue 8D, the Steering Committee came to the tentative view that an insurer should adopt a prospective (policyholder-benefit) approach to life insurance contracts, but that the amount recorded as a liability should not be less than the amount that would result from applying a retrospective (policyholder-deposit) approach. In implementing this approach:

- (a) the policyholder-deposit amount (the minimum liability) is equal to the account balance that accrues to the benefit of policyholders, net of any surrender charges that would apply if the contracts were terminated prior to the death of the insured. If the contract has no account balance but has a cash surrender value, the cash surrender value is used. If the contract has no account balance or cash surrender value (as is the case with the term-life contract discussed earlier in this appendix), the policyholder deposit amount is the amount, if any, that must be refunded if a policyholder terminates the contract prior to the death of the insured. Unless the insurer has the ability to recover additional amounts from policyholders who terminate contracts before the death of the insured, the minimum amount computed under the policyholder deposit approach is zero;
- (b) the policyholder-benefit amount represents the present value of expected premium receipts, less the present value of expected payments to policyholders, payments for contract administration, and payments for claim processing. Consistent with the tentative Steering Committee view expressed

in Sub-issue 6F, assumptions used in developing those estimates should be adjusted for the amount that marketplace participants would demand for bearing the uncertainty inherent in the estimates. Because adjustments for risk have been incorporated in cash flows, present value should be computed using a risk-free rate of interest; and

- (c) consistent with the Steering Committee view expressed in Sub-issue 6G, changes in estimates, changes in market conditions, and current period experience different from assumed amounts should be reflected through a fresh-start measurement of the liability and the effect of those changes should be reported in income.

A85. The illustration below shows the computation of the policyholder-benefit amount, using the hypothetical book of contracts developed in this appendix.

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<b>Present value of future:</b>					
Premiums	84,076	79,211	74,454	69,803	65,424
Commissions and expenses	(9,540)	(8,988)	(8,448)	(7,921)	(7,424)
Death and surrender benefits	<u>(74,226)</u>	<u>(79,397)</u>	<u>(83,295)</u>	<u>(86,685)</u>	<u>(89,744)</u>
Liability balance	<u>309</u>	<u>(9,174)</u>	<u>(17,289)</u>	<u>(24,803)</u>	<u>(31,744)</u>

#### **Illustration A35 - Liability Computation, Policy-Benefit Approach**

A86. Illustration A36 shows financial statements for the first five years of the book. Note that the liability in Year 1 is computed using the policyholder-deposit computation because that generates a higher liability (in this case, nil) than the policyholder-benefit approach, which generates an asset balance of 309.

#### **Implementing the Steering Committee View, Financial Statements at Fair Value**

A87. In the Steering Committee's tentative view, the fair value of a life insurance liability should be computed using a policyholder-benefit approach, without the policyholder-deposit limitation described and illustrated above.

A88. The Steering Committee did not reach a conclusion about the discount rate to be used or the role of the insurer's credit standing in the estimate of fair value. If the estimate uses the risk-free rate, then the amounts shown in the illustrations above would also be estimates of fair value. The liability balance in Year 1 would be a debit of 309 and net income would be 1,734. Illustration A37 shows the computations of liability balance using an asset-based discount rate of 7 percent, adjusted for risk to 6 percent.

A89. Illustration A38 shows the resulting financial statements for Years 1-5.

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<b>Cash and investments</b>					
Beginning balance	-	8,951	16,314	23,254	30,100
Premiums received	14,000	11,194	9,845	9,051	8,502
Policy expenses	(12,298)	(1,280)	(1,123)	(1,031)	(969)
Benefits and related expenses	(400)	(1,116)	(1,524)	(1,683)	(2,141)
Investment earnings	121	1,321	1,753	2,189	2,635
Contribution (Distribution)	<u>7,528</u>	<u>(2,756)</u>	<u>(2,011)</u>	<u>(1,680)</u>	<u>(1,588)</u>
Ending balance	<u>8,951</u>	<u>16,314</u>	<u>23,254</u>	<u>30,100</u>	<u>36,539</u>
<b>Balance sheets</b>					
Cash and investments	8,951	16,314	23,254	30,100	36,539
Deferred acquisition costs	-	-	-	-	-
Benefit liability	<u>-</u>	<u>(9,174)</u>	<u>(17,289)</u>	<u>(24,803)</u>	<u>(31,744)</u>
(Equity)/Deficit	<u>(8,951)</u>	<u>(7,140)</u>	<u>(5,965)</u>	<u>(5,297)</u>	<u>(4,795)</u>
<b>Income statements</b>					
Premium revenue	(14,000)	(11,194)	(9,845)	(9,051)	(8,502)
Investment income	(121)	(1,321)	(1,753)	(2,189)	(2,635)
Policy expenses	12,298	1,280	1,123	1,031	969
Change in deferred acquisition costs	-	-	-	-	-
Benefits and related expenses	400	1,116	1,524	1,683	2,141
Change in benefit liability	<u>-</u>	<u>9,174</u>	<u>8,115</u>	<u>7,514</u>	<u>6,941</u>
Net (income)/loss	<u>(1,423)</u>	<u>(945)</u>	<u>(836)</u>	<u>(1,012)</u>	<u>(1,086)</u>
<b>Benefit liability</b>					
Benefit method	<u>309</u>	<u>(9,174)</u>	<u>(17,289)</u>	<u>(24,803)</u>	<u>(31,744)</u>
Deposit method	<u>-</u>	<u>(5,244)</u>	<u>(12,907)</u>	<u>(20,081)</u>	<u>(27,288)</u>

### Illustration A36 - Steering Committee View

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<b>Present value of future:</b>					
Premiums	78,899	74,287	69,826	65,482	61,392
Commissions and expenses	(8,953)	(8,429)	(7,923)	(7,430)	(6,966)
Death and surrender benefits	<u>(62,634)</u>	<u>(67,450)</u>	<u>(71,153)</u>	<u>(74,455)</u>	<u>(77,456)</u>
Liability balance	<u>7,312</u>	<u>(1,592)</u>	<u>(9,250)</u>	<u>(16,403)</u>	<u>(23,030)</u>

### Illustration A37 - Liability Computation, Asset-Based Discount Rate

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<b>Cash and investments</b>					
Beginning balance	-	8,951	16,314	23,254	30,100
Premiums received	14,000	11,194	9,845	9,051	8,502
Policy expenses	(12,298)	(1,280)	(1,123)	(1,031)	(969)
Benefits and related expenses	(400)	(1,116)	(1,524)	(1,683)	(2,141)
Investment earnings	121	1,321	1,753	2,189	2,635
Contribution (Distribution)	<u>7,528</u>	<u>(2,756)</u>	<u>(2,011)</u>	<u>(1,680)</u>	<u>(1,588)</u>
Ending balance	<u>8,951</u>	<u>16,314</u>	<u>23,254</u>	<u>30,100</u>	<u>36,539</u>
<b>Balance sheets</b>					
Cash and investments	8,951	16,314	23,254	30,100	36,539
Deferred acquisition costs	-	-	-	-	-
Benefit liability	<u>7,312</u>	<u>(1,592)</u>	<u>(9,250)</u>	<u>(16,403)</u>	<u>(23,030)</u>
(Equity)/Deficit	<u>(16,263)</u>	<u>(14,722)</u>	<u>(14,004)</u>	<u>(13,697)</u>	<u>(13,509)</u>
<b>Income statements</b>					
Premium revenue	(14,000)	(11,194)	(9,845)	(9,051)	(8,502)
Investment income	(121)	(1,321)	(1,753)	(2,189)	(2,635)
Policy expenses	12,298	1,280	1,123	1,031	969
Change in deferred acquisition costs	-	-	-	-	-
Benefits and related expenses	400	1,116	1,524	1,683	2,141
Change in benefit liability	<u>(7,312)</u>	<u>8,904</u>	<u>7,658</u>	<u>7,153</u>	<u>6,627</u>
Net (income)/loss	<u>(8,735)</u>	<u>(1,215)</u>	<u>(1,293)</u>	<u>(1,373)</u>	<u>(1,400)</u>

**Illustration A38 - Asset-Based Discount Rate**

## Participating (with Profits) Contracts

- A90. Insurers in many jurisdictions market contracts that allow policyholders to participate in favourable experience of the insurer. If investment returns, expenses, and benefits are better than anticipated in the contract guarantees, the policyholder receives a **dividend** or **bonus**. The policyholder may take the dividend in cash, apply it to the purchase of additional insurance coverage, or leave the amount on deposit with the insurer.
- A91. To illustrate accounting approaches to participating contracts, the assumptions used in previous illustrations have been altered as follows:
- (a) the insurer does not credit policyholders with investment returns in excess of the guaranteed 3 percent. As a result, death and surrender benefits are based on contract guarantees;
  - (b) beginning in year 2, the insurer distributes a contract dividend based on a five-year moving average of profits, as determined under the regulatory assumptions. The insurer intends by this device to distribute approximately 93 percent of profits to the policyholders over the 50-year life of the illustration; and
  - (c) contract dividends are determined and distributed on the last day of each year. All policyholders take their dividends as cash payments.
- A92. Illustration A39 shows five years of financial statements for participating contracts, prepared using the hypothetical regulatory basis described in paragraph A62.
- A93. Basic Issue 9 describes a number of approaches to accounting for participating contracts, two of which are illustrated in this section.

## Modified Regulatory Basis

- A94. In some jurisdictions, insurers modify the regulatory basis of accounting by recording a **provision for future dividends** or **fund for future distributions**.
- A95. This approach records as a liability amounts that would have been reported as income under the regulatory basis of accounting. Amounts are removed from the liability as they are declared by management to be distributable to policyholders and shareholders.
- A96. Illustration A40 shows the computation of a provision for future dividends, based on the projected percentage of regulatory-basis income that will ultimately be distributed to policyholders.
- A97. Illustration A41 shows five years of financial statements prepared on a modified regulatory basis.

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<b>Cash and investments</b>					
Beginning balance	-	2,630	10,365	17,177	23,562
Premiums received	14,000	11,194	9,845	9,051	8,502
Policy expenses	(12,277)	(1,270)	(1,117)	(1,027)	(965)
Benefits and related expenses	(421)	(1,038)	(1,424)	(1,563)	(1,965)
Policyholder dividends paid	-	(335)	(800)	(1,260)	(1,732)
Investment earnings	121	879	1,336	1,764	2,177
Contribution (Distribution)	<u>1,207</u>	<u>(1,695)</u>	<u>(1,028)</u>	<u>(580)</u>	<u>(226)</u>
Ending balance	<u>2,630</u>	<u>10,365</u>	<u>17,177</u>	<u>23,562</u>	<u>29,353</u>
<b>Balance sheets</b>					
Cash and investments	2,630	10,365	17,177	23,562	29,353
Deferred acquisition costs	-	-	-	-	-
Benefit liability	<u>(2,391)</u>	<u>(9,423)</u>	<u>(15,614)</u>	<u>(21,419)</u>	<u>(26,684)</u>
(Equity)/Deficit	<u>(239)</u>	<u>(942)</u>	<u>(1,563)</u>	<u>(2,143)</u>	<u>(2,669)</u>
<b>Income statements</b>					
Premium revenue	(14,000)	(11,194)	(9,845)	(9,051)	(8,502)
Investment income	(121)	(879)	(1,336)	(1,764)	(2,177)
Policy expenses	12,277	1,270	1,117	1,027	965
Change in deferred acquisition costs	-	-	-	-	-
Benefits and related expenses	421	1,038	1,424	1,563	1,965
Policyholder dividends	-	335	800	1,260	1,732
Change in benefit liability	<u>2,391</u>	<u>7,032</u>	<u>6,191</u>	<u>5,805</u>	<u>5,265</u>
Net (income)/loss	<u>968</u>	<u>(2,398)</u>	<u>(1,649)</u>	<u>(1,160)</u>	<u>(752)</u>
	<u>(239)</u>	<u>(942)</u>	<u>(1,563)</u>	<u>(2,143)</u>	<u>(2,669)</u>

### Illustration A39 - Participating Contracts, Hypothetical Regulatory Basis

	dr. (cr)	
	<u>Year 1</u>	<u>Year 2</u>
Net loss (income), regulatory basis	968	(2,733)
Projected dividend rate	<u>93.24%</u>	<u>93.24%</u>
Addition to provision	903	(2,548)
Beginning balance	-	903
Dividends paid	<u>-</u>	<u>335</u>
Ending balance	<u>903</u>	<u>(1,310)</u>

### Illustration A40 - Provision for Future Dividends

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<b>Cash and investments</b>					
Beginning balance	-	2,630	10,365	17,177	23,562
Premiums received	14,000	11,194	9,845	9,051	8,502
Policy expenses	(12,277)	(1,270)	(1,117)	(1,027)	(965)
Benefits and related expenses	(421)	(1,038)	(1,424)	(1,563)	(1,965)
Investment earnings	121	879	1,336	1,764	2,177
Policyholder dividends	-	(335)	(800)	(1,260)	(1,732)
Contribution (Distribution)	<u>1,207</u>	<u>(1,695)</u>	<u>(1,028)</u>	<u>(580)</u>	<u>(226)</u>
Ending balance	<u>2,630</u>	<u>10,365</u>	<u>17,177</u>	<u>23,562</u>	<u>29,353</u>
<b>Balance sheets</b>					
Cash and investments	2,630	10,365	17,177	23,562	29,353
Deferred acquisition costs	-	-	-	-	-
Provision for future dividends	903	(1,310)	(2,792)	(3,789)	(4,373)
Benefit liability	<u>(2,391)</u>	<u>(9,423)</u>	<u>(15,614)</u>	<u>(21,419)</u>	<u>(26,684)</u>
(Equity)/Deficit	<u>(1,142)</u>	<u>368</u>	<u>1,229</u>	<u>1,646</u>	<u>1,704</u>
<b>Income statements</b>					
Premium revenue	(14,000)	(11,194)	(9,845)	(9,051)	(8,502)
Investment income	(121)	(879)	(1,336)	(1,764)	(2,177)
Policy expenses	12,277	1,270	1,117	1,027	965
Change in deferred acquisition costs	-	-	-	-	-
Benefits and related expenses	421	1,038	1,424	1,563	1,965
Policyholder dividends	-	335	800	1,260	1,732
Change in provision for future dividends	(903)	2,213	1,482	997	584
Change in benefit liability	<u>2,391</u>	<u>7,032</u>	<u>6,191</u>	<u>5,805</u>	<u>5,265</u>
Net (income)/loss	<u>65</u>	<u>(185)</u>	<u>(167)</u>	<u>(163)</u>	<u>(168)</u>

### Illustration A41 - Modified Regulatory Basis

#### Dividends as a Benefit Stream

A98. In some jurisdictions, contract dividends are treated as a stream of benefit payments, in the same manner as death and surrender benefits. The insurer incorporates those benefits in applying a prospective method, as portrayed in Illustration A42-A43.

Projected asset earning rate	<u>7.00%</u>	
Present value of gross premiums	92,882	100.00%
Present value of death & surrender benefits	(40,266)	-43.35%
Present value of contract dividends	(28,997)	-31.22%
Present value of costs & expenses	<u>(21,228)</u>	<u>-22.85%</u>
Present value of net income	<u>2,391</u>	<u>2.58%</u>

### Illustration A42 - Prospective Computations, Dividends as Benefits

		dr. (cr.)	
		<u>Year 1</u>	<u>Year 2</u>
Premiums received		<u>14,000</u>	<u>11,194</u>
Beginning balance		-	(10,750)
Addition to liability	-74.57% of premiums	<u>(10,440)</u>	<u>(8,347)</u>
		(10,440)	(19,097)
Interest at	7.00%	(731)	(1,337)
Benefits paid:			
Contract dividends		-	335
Surrenders		-	628
Deaths		400	400
Processing		<u>21</u>	<u>10</u>
Ending balance (to balance sheet)		<u>(10,750)</u>	<u>(19,061)</u>

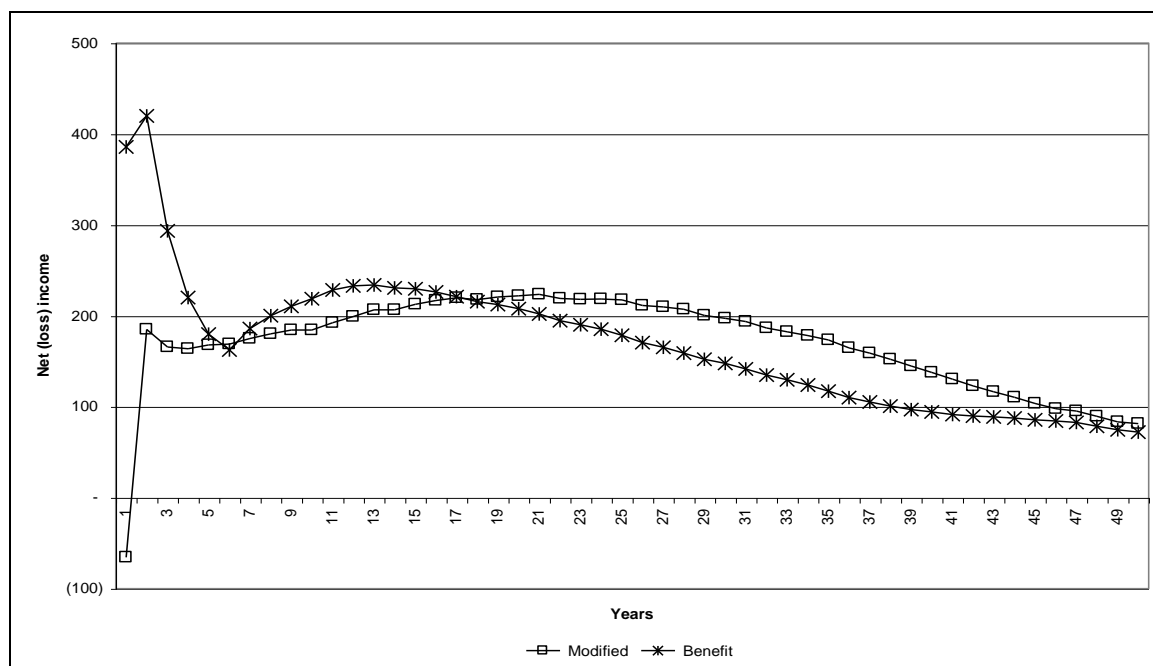
### Illustration A43 - Benefit Computation, Dividends as Benefits

A99. Illustration A44 shows five years of financial statements prepared using an approach in which contract dividends are treated as a benefit stream.

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<b>Cash and investments</b>					
Beginning balance	-	2,630	10,365	17,177	23,562
Premiums received	14,000	11,194	9,845	9,051	8,502
Policy expenses	(12,277)	(1,270)	(1,117)	(1,027)	(965)
Benefits and related expenses	(421)	(1,038)	(1,424)	(1,563)	(1,965)
Policyholder dividends paid	-	(335)	(800)	(1,260)	(1,732)
Investment earnings	121	879	1,336	1,764	2,177
Contribution (Distribution)	<u>1,207</u>	<u>(1,695)</u>	<u>(1,028)</u>	<u>(580)</u>	<u>(226)</u>
Ending balance	<u>2,630</u>	<u>10,365</u>	<u>17,177</u>	<u>23,562</u>	<u>29,353</u>
<b>Balance sheets</b>					
Cash and investments	2,630	10,365	17,177	23,562	29,353
Deferred acquisition costs	9,712	9,014	8,433	7,909	7,416
Benefit liability	<u>(10,750)</u>	<u>(19,060)</u>	<u>(26,025)</u>	<u>(32,246)</u>	<u>(37,589)</u>
(Equity)/Deficit	<u>(1,592)</u>	<u>(319)</u>	<u>415</u>	<u>775</u>	<u>820</u>
<b>Income statements</b>					
Premium revenue	(14,000)	(11,194)	(9,845)	(9,051)	(8,502)
Investment income	(121)	(879)	(1,336)	(1,764)	(2,177)
Policy expenses	12,277	1,270	1,117	1,027	965
Change in deferred acquisition costs	(9,712)	698	581	524	493
Benefits and related expenses	421	1,038	1,424	1,563	1,965
Policyholder dividends	-	335	800	1,260	1,732
Change in benefit liability	<u>10,750</u>	<u>8,310</u>	<u>6,965</u>	<u>6,221</u>	<u>5,343</u>
Net (income)/loss	<u>(385)</u>	<u>(422)</u>	<u>(294)</u>	<u>(220)</u>	<u>(181)</u>

### Illustration A44 - Contract Dividends as Benefits

A100. Figure A10 compares the patterns of reported income using the modified regulatory basis and a basis that treats policyholder dividends as a benefit stream.



**Figure A10 - Income Patterns Compared,  
Modified Regulatory Method and Dividends as Benefits**

## Accounting for Changes in Estimate

A101. Sub-issue 6G explores the various approaches to accounting for changes in estimate in general terms. The illustrations that follow explore different approaches to changes in estimate in the context of a prospective (policyholder-benefits) life insurance accounting model. The illustrations examine the effect of a change in estimated policyholder terminations on the premium-driven model first shown in Illustration A22. The illustrations that follow assume a sudden increase in policyholder terminations during year 7. Management estimates that termination rates gradually return to original estimated rates over the next 5 years. Illustration A45 shows the effect of this change over the first 20 years of the illustrations.

Revised Estimates--Behavior of the Book of Policies					
<u>Year</u>	<u>Beginning Policyholders</u>	<u>Surrenders</u>	<u>Deaths</u>	<u>Ending Policyholders</u>	<u>Original Estimates</u>
1	10,000	2,000	4	7,996	7,996
2	7,996	960	4	7,032	7,032
3	7,032	563	4	6,465	6,465
4	6,465	388	4	6,073	6,073
5	6,073	364	4	5,705	5,705
6	5,705	342	5	5,358	5,358
7	5,358	643	5	4,710	5,032
8	4,710	518	5	4,187	4,725
9	4,187	419	5	3,763	4,436
10	3,763	339	5	3,419	4,164
11	3,419	274	5	3,140	3,908
12	3,140	220	5	2,915	3,668
13	2,915	175	5	2,735	3,442
14	2,735	164	5	2,566	3,228
15	2,566	154	5	2,407	3,027
16	2,407	144	6	2,257	2,838
17	2,257	135	6	2,116	2,661
18	2,116	127	6	1,983	2,493
19	1,983	119	6	1,858	2,335
20	1,858	111	6	1,741	2,187

**Illustration A45 - Change in Termination Rates**

A102. To a degree, all of the illustrations in this Appendix are imitations of the real world. The illustrations are designed to show how accounting models work, and the simplifications are a necessary element in reaching that goal. However, the illustrations that follow require an additional caveat. The illustrations assume that policyholder terminations change, but that all of the other assumptions remain the same. Mortality rates, investment returns, and expense rates do not change. In a more realistic scenario, one might expect a change in policyholder terminations to accompany:

- (a) a change in market rates of return;
- (b) a change in the value of invested assets;
- (c) a change in the rate credited to policyholders;
- (d) a change in mortality rates as the remaining policyholders tend to be those who could not obtain new contracts, a phenomenon known as **anti-selection**; and
- (e) a change in amounts distributable from the book, depending on how the regulator views unrealised changes in the value of invested assets.

A103. An illustration that included all of those changes would be too complex for the purposes of this Appendix.

## Lock-In Approach

A104. Some jurisdictions have adopted a lock-in approach to changes in estimate. Under this approach, the insurer uses a factor method (refer to Illustration A24) to adjust for differences in the current period. The insurer gives no recognition to changes in estimate, unless a premium deficiency exists. Illustration A46 shows the elements that change Year 7 income if the insurer uses a lock-in approach.

Net income before changes	(2,089)
Additional surrender benefits paid	2,557
Additional processing expenses	3
Adjustment to benefit liability to reflect fewer contracts	(2,572)
Adjustment to deferred costs to reflect fewer contracts	417
Net income, lock-in approach	(1,684)

**Illustration A46 - Year 7, Lock-In Approach**

## Prospective Approach

A105. A prospective approach is designed to spread the effects of changes in estimate over the remaining term of the contracts. To accomplish this, the insurer repeats the computations from Illustration A18 with the new information and existing amounts in the liability and deferred costs, as summarised below.

	<u>Revised</u>	<u>Original</u>
Projected asset earning rate	<u>7.00%</u>	<u>7.00%</u>
Present value of gross premiums		<u>92,882</u>
Years 7 to 50	<u>51,444</u>	
Present value of death and surrender benefits		<u>55,049</u>
Years 7 to 50	66,835	
Liability balance, end of year 6	<u>(35,975)</u>	
	<u>30,860</u>	
Annual addition to liability, percentage of premium	<u>59.99%</u>	<u>59.27%</u>
Present value of costs and expenses		<u>21,228</u>
Years 7 to 50	5,837	
Deferred cost balance, end of year 6	<u>6,951</u>	
	<u>12,789</u>	
Annual amortization, percentage of premium	<u>24.86%</u>	<u>22.85%</u>

**Illustration A47 - Adjustments to Report Changes Prospectively**

A106. Illustration A48 shows the elements that change Year 7 income if the insurer uses a prospective approach.

Net income before changes	(2,089)
Prospective adjustment to benefit liability	58
Prospective adjustment to deferred costs	<u>161</u>
Net income, prospective approach	<u><u>(1,870)</u></u>

#### **Illustration A48 - Year 7, Prospective Approach**

### **Fresh-Start, Retrospective, and Catch-up Approach**

A107. The fresh-start, retrospective, and catch-up approaches are described in greater detail in Sub-Issue 6G. Each is designed to address a change in estimate in a present value framework, as is the case in life insurance accounting. The approaches differ in the way they combine changes in cash flows and rates:

- (a) the fresh-start method uses new assumptions about cash flows and a new interest rate;
- (b) the retrospective method uses new assumptions about cash flows and an interest rate derived from the combination of actual past cash flows and assumed future cash flows; and
- (c) the catch-up approach uses new assumptions about cash flows and the interest rate used in original measurements.

A108. The assumptions used in this series of illustrations present a change in cash flows with no change in the rate of return on assets, which is the discount rate used in a premium-driven computation. As a result, the three approaches to a change in estimate are the same for this series of illustrations. The insurer recomputes the balance of the benefit liability and deferred costs as if the new information had been available on inception. The balances are then adjusted accordingly, as illustrated below.

	<u><b>Revised</b></u>		<u><b>Original</b></u>	
Projected asset earning rate	<u>7.00%</u>		<u>7.00%</u>	
Present value of gross premiums	86,910	100.00%	92,882	100.00%
Present value of death & surrender benefits	(51,756)	-59.55%	(55,049)	-59.27%
Present value of costs & expenses	<u>(20,550)</u>	<u>-23.65%</u>	<u>(21,228)</u>	<u>-22.85%</u>
Present value of net income	<u><u>14,604</u></u>	<u><u>16.80%</u></u>	<u><u>16,605</u></u>	<u><u>17.88%</u></u>

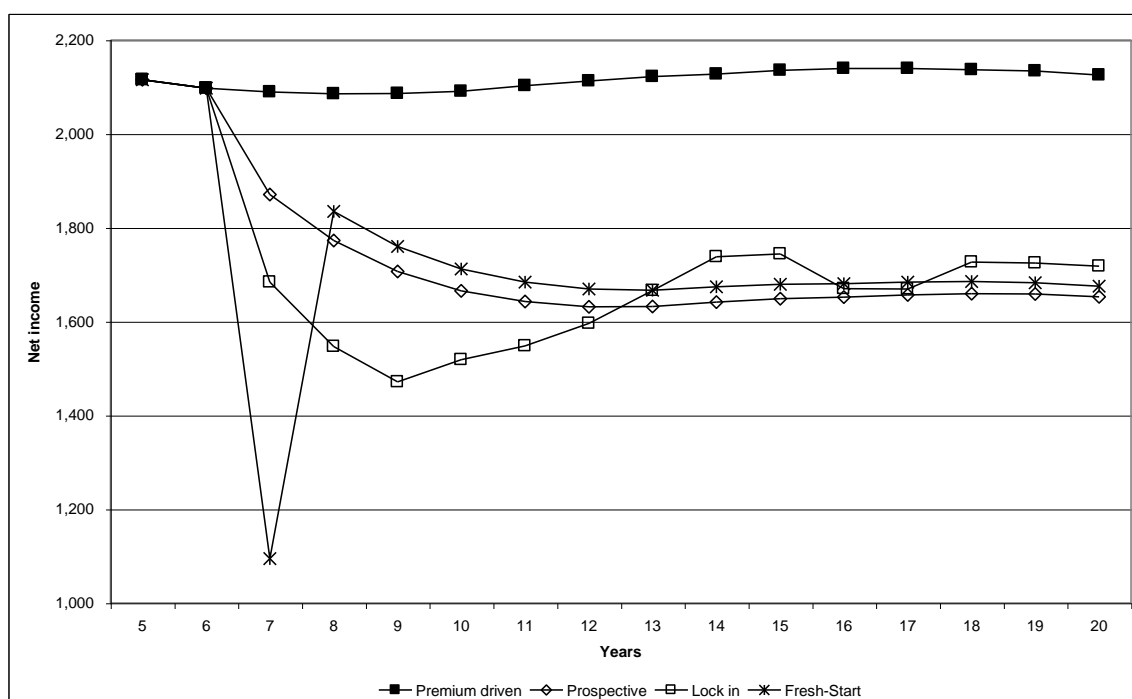
#### **Illustration A49 - Fresh-Start Computations**

A109. Illustration A50 shows the elements that change Year 7 income if the insurer uses a fresh-start approach.

Net income before changes	(2,089)
Fresh-start adjustment to benefit obligation, opening balance	240
Adjustment to current-year addition to obligation	22
Fresh-start adjustment to deferred costs, opening balance	668
Adjustment to current-year amortization	63
Net income, fresh-start approach	<u>(1,095)</u>

### Illustration A50 - Year 7, Fresh-Start Approach

A110. Figure A11 compares the patterns of reported income from each approach to change in estimate with the pattern that would have emerged, had the change not occurred. The graph begins in Year 5 (2 years before the change) and extends to year 20.



**Figure A11 - Income Patterns Compared, Changes in Cash Flows**