
Continuing Care Retirement Communities

An Empirical, Financial,
and Legal Analysis

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To our children:
Amanda, Cameron, & Tyler
and
Thandi & Sibongile

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Appendix A _____

CCRC Universe (as of December 31, 1981)

Kirkwood by the River	Birmingham, Ala.
Mount Royal Towers, Inc.	Birmingham, Ala.
*Friendship Village	Tempe, Ariz.
Orangewood Retirement Community	Phoenix, Ariz.
Aldersly, Inc.	San Rafael, Calif.
The Alhambra	Alhambra, Calif.
Brethren Hillcrest Homes, Inc.	La Verne, Calif.
Canterbury Woods	Pacific Grove, Calif.
Carlsbad-by-the-Sea	Carlsbad, Calif.
Carmel Valley Manor, Inc.	Carmel, Calif.
Casa Dorinda	Montecito, Calif.
Channing House	Palo Alto, Calif.
Covenant Village	Turlock, Calif.
Forest Hill Manor	Pacific Grove, Calif.
Grand Lake Gardens	Oakland, Calif.
The Heritage	San Francisco, Calif.
Lake Park Retirement Home	Oakland, Calif.
Los Gatos Meadows	Los Gatos, Calif.
Mount Miguel Covenant Village	Spring Valley, Calif.
Mt. San Antonio Gardens	Pomona, Calif.
Piedmont Gardens	Oakland, Calif.
Pilgrim Haven	Los Altos, Calif.
*Plymouth Village of Redlands	Redlands, Calif.
*Rosewood Retirement Community	Bakersfield, Calif.
Quaker Gardens	Stanton, Calif.
Regents Point	Irvine, Calif.
Royal Oaks Manor	Duarte, Calif.
St. Paul's Towers	Oakland, Calif.
The Samarkand of Santa Barbara, Inc.	Santa Barbara, Calif.
San Joaquin Gardens	Fresno, Calif.
The Scripps Home	Altadena, Calif.
The Sequoias—Portola Valley	Portola Valley, Calif.
The Sequoias—San Francisco	San Francisco, Calif.
*Solheim Lutheran Home	Los Angeles, Calif.
Sunny View Lutheran Home	Cupertino, Calif.
The Tamalpais	Greenbrae, Calif.
The Valle Verde Retirement Center	Santa Barbara, Calif.
*White Sands of La Jolla	La Jolla, Calif.
Windsor Manor	Glendale, Calif.
Frasier Meadows Manor	Boulder, Colo.
*Medalion Retirement Center	Colorado Springs, Colo.
*Medalion West	Colorado Springs, Colo.

* = not included in data base for empirical analysis.

*Sunny Acres Villa	Denver, Colo.
*Villa Pueblo Towers	Pueblo, Colo.
*Covenant Village and Pilgrim Manor	Cromwell, Conn.
Thirty Thirty Park	Bridgeport, Conn.
Whitney Center, Inc.	Hamden, Conn.
Cokesbury Village	Hockessin, Del.
Lisner-Louise Home	Washington, D.C.
*Presbyterian Home of D.C.	Washington, D.C.
*Thomas House	Washington, D.C.
Abbey Delray	Delray Beach, Fla.
Asbury Towers	Brandenton, Fla.
Azalea Trace	Pensacola, Fla.
Bay Village of Sarasota, Inc.	Sarasota, Fla.
Bradenton Manor	Bradenton, Fla.
Calusa Retirement Center	Fort Myers, Fla.
Canterbury Tower, Inc.	Tampa, Fla.
*Congregational House	Clearwater, Fla.
Covenant Palms of Miami	Miami, Fla.
Covenant Village of Florida	Plantation, Fla.
East Ridge Retirement Village, Inc.	Miami, Fla.
Evergreen Woods	Springhill, Fla.
Jacksonville Regency House	Jacksonville, Fla.
*John Knox Village of Central Florida	Orange City, Fla.
John Knox Village of Florida, Inc.	Pompano Beach, Fla.
*John Knox Village of Margate	Margate, Fla.
*John Knox Village of Tampa Bay	Tampa, Fla.
Leisure Manor	St. Petersburg, Fla.
Moorings Park	Naples, Fla.
Oak Bluffs Retirement Center	Clearwater, Fla.
Oak Cove Retirement and Health Center	Clearwater, Fla.
Orlando Lutheran Towers	Orlando, Fla.
Palm Shores Retirement Center	St. Petersburg, Fla.
Plymouth Harbor, Inc.	Sarasota, Fla.
St. Andrews Estates	Boca Raton, Fla.
*St. Mark Village	Palm Harbor, Fla.
Shell Point Village	Fort Myers, Fla.
The Shores	Bradenton, Fla.
*Trinity Lakes	Sun City Center, Fla.
The Waterford	Juno Beach, Fla.
Westminster Oaks	Tallahassee, Fla.
Westminster Towers	Orlando, Fla.
Winter Park Towers and Village	Winter Park, Fla.
*Arcadia Retirement Residence	Honolulu, Hawaii
Apartment Community of Our Lady of the Snows	Belleville, Ill.
Bensenville Home Society	Bensenville, Ill.
*Bethany Home and Hospital	Chicago, Ill.
Covenant Village—Northbrook	Northbrook, Ill.
*Danish Old People's Home	Chicago, Ill.
Evenglow Lodge	Pontiac, Ill.
Friendship Manor	Rock Island, Ill.
*Friendship Village of Schaumburg	Schaumburg, Ill.
The Georgian	Evanston, Ill.
The Holmstad	Batavia, Ill.
Plymouth Place, Inc.	La Grange Park, Ill.
The Presbyterian Home	Evanston, Ill.

*The Scottish Home	North Riverside, Ill.
Wesley Willows	Rockford, Ill.
*Westminster Place	Evanston, Ill.
Westminster Village—Bloomington	Bloomington, Ill.
Altenheim Community	Indianapolis, Ind.
Asbury Towers	Greencastle, Ind.
The Four Seasons Retirement Center	Columbus, Ind.
*Franklin United Methodist Home	Franklin, Ind.
*Friends' Fellowship Community	Richmond, Ind.
Hoosier Village Retirement Center	Indianapolis, Ind.
Topsfield Terrace Retirement Community	South Bend, Ind.
The Towne House	Fort Wayne, Ind.
United Methodist Memorial Home	Warren, Ind.
Calvin Manor	Des Moines, Iowa
*Cedar Falls Lutheran Church	Cedar Falls, Iowa
Friendship Village—Waterloo	Waterloo, Iowa
Heather Manor	Des Moines, Iowa
Heritage House	Atlantic, Iowa
Meth-Wick Manor	Cedar Rapids, Iowa
Northcrest Community	Ames, Iowa
*Oaknoll Retirement Residence	Iowa City, Iowa
Ridgecrest Retirement Village	Davenport, Iowa
United Presbyterian Home	Washington, Iowa
Valley View Village	Des Moines, Iowa
Wesley Acres	Des Moines, Iowa
*Aldersgate Village	Topeka, Kans.
Arkansas City Presbyterian Manor	Arkansas City, Kans.
Brewster Place	Topeka, Kans.
Lakeview Village	Lenexa, Kans.
Lawrence Presbyterian Manor	Lawrence, Kans.
Presbyterian Manor of Kansas City	Kansas City, Kans.
Salina Presbyterian Manor, Inc.	Salina, Kans.
Sterling Presbyterian Manor	Sterling, Kans.
Wesley Towers, Inc.	Hutchinson, Kans.
Wichita Presbyterian Manor	Wichita, Kans.
*St. James Place	Baton Rouge, La.
*Asbury Methodist Home	Gaithersburg, Md.
*Augsburg Lutheran Home	Baltimore, Md.
*Broadmead	Cockeysville, Md.
Fairhaven	Sykesville, Md.
Friendship Village Kalamazoo	Kalamazoo, Mich.
Glacier Hills	Ann Arbor, Mich.
Independence Village	Frankenmuth, Mich.
Inter-City Christian Manor	Allen Park, Mich.
Vista Grande Villa	Jackson, Mich.
Covenant Manor Retirement Community	Minneapolis, Minn.
Friendship Village of Bloomington	Bloomington, Minn.
Madonna Towers	Rochester, Minn.
Thorne-Crest Retirement Center	Albert Lea, Minn.
The Charless Home	St. Louis, Mo.
*Friendship Village of South County	St. Louis, Mo.
Friendship Village of West County	Chesterfield, Mo.
Fulton Presbyterian Manor	Fulton, Mo.
John Knox Village	Lee's Summit, Mo.

*John Knox Village East	Higginsville, Mo.
*John Knox Village of the Ozarks	Waynesville, Mo.
*Presbyterian Manor at Farmington	Farmington, Mo.
Rolla Presbyterian Manor	Rolla, Mo.
St. Louis Altenheim	St. Louis, Mo.
Vista del Rio	Kansas City, Mo.
*Eastmont Towers	Lincoln, Neb.
Gateway Manor, Inc.	Lincoln, Neb.
Northfield Villa, Inc.	Gering, Neb.
*Skyline Manor	Omaha, Neb.
Home for Aged Women	Portsmouth, N.H.
Cadbury	Cherry Hill, N.J.
Meadow Lakes	Princeton, N.J.
Medford Leas	Medford, N.J.
Navesink House	Red Bank, N.J.
Workmen's Circle Home for the Aged	Elizabeth, N.J.
*El Castillo Retirement Residence	Santa Fe, N.Mex.
Landsun Homes, Inc.	Carlsbad, N.Mex.
J. W. Abernethy Center	Newtown, N.C.
Carol Woods Retirement Community	Chapel Hill, N.C.
*Carolina Village	Hendersonville, N.C.
*Episcopal Home for the Aging	Southern Pines, N.C.
The Methodist Home	Charlotte, N.C.
*Moravian Home, Inc.	Winston-Salem, N.C.
The Presbyterian Home, Inc.	High Point, N.C.
*The Presbyterian Home at Charlotte	Charlotte, N.C.
Bethesda Scarlet Oaks Retirement Community	Cincinnati, Ohio
Breckenridge Village	Willoughby, Ohio
Copeland Oaks	Sebring, Ohio
Dorothy Love Retirement Community	Sidney, Ohio
*First Community Village	Columbus, Ohio
*Friends Care Center of Yellow Springs	Yellow Springs, Ohio
Friendship Village of Columbus	Columbus, Ohio
*Friendship Village of Dayton	Dayton, Ohio
Friendship Village of Dublin	Dublin, Ohio
*Hill View Retirement Center	Portsmouth, Ohio
Judson Park	Cleveland Heights, Ohio
Maple Knoll Village	Springdale, Ohio
The Marjorie P. Lee Home	Cincinnati, Ohio
Methodist Home on College Hill	Cincinnati, Ohio
Otterbein Home	Lebanon, Ohio
Mt. Pleasant Retirement Village	Monroe, Ohio
Park Vista Presbyterian Home	Youngstown, Ohio
Portage Valley Retirement Village	Pemberville, Ohio
Rockynol	Akron, Ohio
*Trinity Home	Dayton, Ohio
Wesley Glen, Inc.	Columbus, Ohio
Westminster Thurber Community	Columbus, Ohio
Oklahoma Christian Home/Apartments	Edmond, Okla.
Cascade Manor	Eugene, Ore.
Friendsview Manor	Newberg, Ore.
Holladay Park Plaza	Portland, Ore.
Rogue Valley Manor, Inc.	Medford, Ore.
*Rose Villa, Inc.	Portland, Ore.
*Willamette View Manor	Portland, Ore.

Calvary Fellowship Homes, Inc.	Lancaster, Pa.
Cathedral Village	Philadelphia, Pa.
Cross Keys Village	New Oxford, Pa.
Crosslands	Kennett Square, Pa.
Dunwoody Village	Newtown Square, Pa.
*Gloria Dei Village	Holland, Pa.
Fiddler's Woods	Philadelphia, Pa.
Fort Washington Estates	Fort Washington, Pa.
Foulkeways at Gwynedd	Gwynedd, Pa.
Friendship Village of South Hill	Upper St. Clair, Pa.
Green Ridge Village	Dillsburg, Pa.
Gwynedd Estates	Springhouse, Pa.
*Heritage Towers	Doylestown, Pa.
Kendal at Longwood	Kennett Square, Pa.
Lima Estates	Lima, Pa.
*Martin's Run	Marple Township, Pa.
Messiah Village	Mechanicsburg, Pa.
Paul's Run	Philadelphia, Pa.
Pennswood Village, Inc.	Newtown, Pa.
Philadelphia Protestant Home	Philadelphia, Pa.
Pine Run	Doylestown, Pa.
Rosemont Presbyterian Village	Rosemont, Pa.
Rydal Park	Rydal, Pa.
Sarah A. Reed Home—Retirement Center	Erie, Pa.
*Sherwood Oaks	Wexford, Pa.
*Simpson House	Philadelphia, Pa.
Southampton Estates	Southampton, Pa.
Spring House Estates	Springhouse, Pa.
*Springfield Retirement Residence	Wyndmoor, Pa.
The Village at St. Barnabas	Gibsonia, Pa.
*Wood River Village	Bensalem, Pa.
McKendree Manor, Inc.	Hermitage, Tenn.
*Shannondale	Knoxville, Tenn.
The Trezevant Episcopal Home	Memphis, Tenn.
*Bayou Manor	Houston, Tex.
*The Hallmark	Houston, Tex.
*John Knox Village of Metroplex	Denton, Tex.
John Knox Village of the Rio Grand Valley	Weslaco, Tex.
John Knox Village of West Texas	Lubbock, Tex.
Presbyterian Village North, Inc.	Dallas, Tex.
*Westminster Manor	Austin, Tex.
Goodwin House	Alexandria, Va.
Hermitage Home of Richmond	Richmond, Va.
*Hermitage in Northern Virginia	Alexandria, Va.
*Hermitage on the Eastern Shore	Onancock, Va.
Lakewood Manor	Richmond, Va.
*Masonic Home of Virginia	Richmond, Va.
United Methodist Home in Roanoke	Roanoke, Va.
Virginia Baptist Homes—Culpeper	Culpeper, Va.
Westminster Canterbury Corporation	Richmond, Va.
Westminster-Canterbury in Virginia Beach	Virginia Beach, Va.
Westminster-Canterbury of Lynchburg, Inc.	Lynchburg, Va.
Bayview Manor	Seattle, Wash.
Covenant Shores, Inc.	Mercer Island, Wash.
The Frank Tobey Jones Home	Tacoma, Wash.
The Hearthstone	Seattle, Wash.
Horizon House, Inc.	Seattle, Wash.

*Judson Park Retirement Residence	Seattle, Wash.
Riverview Terrace	Spokane, Wash.
Alexian Village of Milwaukee	Milwaukee, Wis.
Evergreen Manor, Inc.	Oshkosh, Wis.
Fairhaven Corporation	Whitewater, Wis.
*Friendship Village of Milwaukee	Milwaukee, Wis.
Methodist Manor, Inc.	West Allis, Wis.
Milwaukee Catholic Home, Inc.	Milwaukee, Wis.
Milwaukee Protestant Home for the Aged	Milwaukee, Wis.
St. John's Home of Milwaukee	Milwaukee, Wis.
Tudor Oaks Retirement Community	Hales Corners, Wis.

Appendix B ---

Actuarial Assumptions

TABLE B-1A
Mortality Rates for Illustrative Financial Analysis
(rates per 100 residents)

Age	Mortality rates for apartment residents		Mortality rates for health care residents	
	Female	Male	Female	Male
65	0.5 deaths	0.9 deaths	1.9 deaths	5.2 deaths
66	0.5	1.0	2.0	5.6
67	0.5	1.1	2.1	6.1
68	0.6	1.1	2.3	6.6
69	0.6	1.2	2.5	7.2
70	0.7	1.3	2.8	7.8
71	0.8	1.4	3.1	8.5
72	0.9	1.5	3.5	9.3
73	1.0	1.7	3.9	10.1
74	1.1	1.8	4.5	11.1
75	1.3	2.0	5.0	12.1
76	1.4	2.2	5.7	13.3
77	1.6	2.4	6.4	14.6
78	1.8	2.7	7.2	16.1
79	2.0	2.9	8.2	17.6
80	2.3	3.2	9.3	19.4
81	2.6	3.5	10.5	21.3
82	3.0	3.9	11.9	23.3
83	3.4	4.2	13.4	25.5
84	3.8	4.6	15.2	27.9
85	4.3	5.1	17.2	30.5
86	4.8	5.6	19.4	33.5
87	5.5	6.2	21.9	36.9
88	6.1	6.8	24.6	40.8
89	6.9	7.5	27.5	45.3

TABLE B-1B
Mortality Rates for Illustrative Financial Analyses
(rates per 100 residents)

Age	Mortality rates for apartment residents		Mortality rates for health care residents	
	Female	Male	Female	Male
90	7.6 deaths	8.4 deaths	30.5 deaths	50.4 deaths
91	8.4	9.4	33.5	56.1
92	9.1	10.4	36.4	62.5
93	9.8	11.6	39.1	69.6
94	10.4	12.9	41.6	77.1
95	11.0	14.2	44.0	85.2
96	11.6	15.6	46.2	93.5
97	12.1	17.0	48.4	100.0
98	12.7	18.5	50.8	—
99	13.3	20.1	53.3	—
100	14.0	21.6	56.1	—
101	14.8	23.2	59.3	—
102	15.7	24.8	62.9	—
103	16.8	26.4	67.0	—
104	17.9	28.1	71.7	—
105	19.3	29.7	77.0	—
106	20.8	31.4	83.0	—
107	22.5	33.0	89.9	—
108	24.4	34.7	97.5	—
109	26.3	36.3	100.0	—
110	100.0	100.0	—	—

TABLE B-1C
Morbidity Rates for Illustrative Financial Analyses
(rates per 100 residents)

Age	Permanent transfer morbidity rates		Temporary transfer morbidity rates	
	Female	Male	Female	Male
65	0.9 transfers	1.2 transfers	400 days	0 days
66	1.0	1.3	500	0
67	1.1	1.4	600	0
68	1.2	1.6	700	0
69	1.3	1.7	800	100
70	1.4	1.8	900	200
71	1.6	2.0	1,000	300
72	1.8	2.2	1,100	400
73	2.0	2.4	1,200	500
74	2.2	2.6	1,300	600
75	2.5	2.8	1,400	700
76	2.8	3.1	1,500	800
77	3.2	3.4	1,600	900
78	3.6	3.7	1,700	1,000
79	4.1	4.1	1,800	1,100
80	4.6	4.5	1,900	1,200
81	5.3	5.0	2,000	1,300
82	5.9	5.4	2,100	1,400
83	6.7	5.9	2,200	1,500
84	7.6	6.5	2,300	1,600
85	8.6	7.1	2,400	1,700
86	9.7	7.8	2,500	1,800
87	10.9	8.6	2,600	1,900
88	12.3	9.5	2,700	2,000
89	13.8	10.6	2,800	2,100

TABLE B-1D
Morbidity Rates for Illustrative Financial Analyses
(rates per 100 residents)

Age	Permanent transfer morbidity rates		Temporary transfer morbidity rates	
	Female	Male	Female	Male
90	15.2 transfers	11.8 transfers	2,900 days	2,200 days
91	16.7	13.1	3,000	2,300
92	18.2	14.6	3,100	2,400
93	19.6	16.2	3,200	2,500
94	20.8	18.0	3,300	2,600
95	22.0	19.9	3,400	2,700
96	23.1	21.9	3,500	2,800
97	24.2	23.8	3,600	2,900
98	25.4	25.9	3,700	3,000
99	26.6	28.9	3,800	3,100
100	28.1	30.2	3,900	3,200
101	29.6	32.4	4,000	3,300
102	31.5	34.7	4,100	3,400
103	33.5	37.0	4,200	3,500
104	35.9	39.3	4,300	3,600
105	38.5	41.6	4,400	3,700
106	41.5	44.0	4,500	3,800
107	44.9	46.5	4,600	3,900
108	48.8	48.5	4,700	4,000
109	53.1	50.8	4,800	4,100
110	0.0	0.0	4,900	4,200

TABLE B-2
New Entrant Assumptions for Illustrative Financial Analyses*

Assumption	Female	Male
Entry age distribution:		
64 and younger	0%	0%
65-74	30	30
75-84	60	60
85 and older	10	10
Average	77 years	77 years
Gender distribution:		
Single entrants	90%	10%
Paired entrants (percent same sex)		10%
Double-occupancy percentage:		
Studio		0%
One bedroom		50
Two bedrooms		100

* These assumptions are applied to all entrants after the initial move-in of first generation.

TABLE B-3 _____
**Economic Assumptions for Illustrative
Financial Analyses***

Time period	Inflation rates	Interest rates
Short-term rates:		
1983	10%	12%
1984	10	12
1985	10	12
1986	10	12
1987	10	12
Long-term rates:		
1988 and thereafter	10%	12%

* Format of this table is used to illustrate that short-term assumptions could differ from long-term assumptions.

Appendix C ---

Expense and Valuation Assumptions

EXPENSE ASSUMPTIONS

The four steps required to develop expense assumptions are: (1) defining expense items and their aggregate values for the initial year; (2) projecting aggregate expenses for at least as many years as the difference between the age of the youngest resident and the assumed end of the human life span; (3) defining expense allocation factors that specify the portion of each aggregate expense allocated to the apartment center versus the health care center, the portion of each cost center expense allocated on a per capita (per person) basis versus a per unit (square footage) basis, and the number of residents over whom each expense is to be shared; and (4) specifying annual expenses by living status for an individual resident.

Table C-1 contains the base year assumptions for eight operating expense categories and six capital expense categories. These values were derived from projected expenses for three similar communities whose first full year of operation begins in 1983. This facility is assumed to contain 295 apartment units and 60 health care beds. The notes to Table C-1 describe the assumptions used to calculate actuarial expenses for fixed assets. These assumptions result in total actuarial expenses for the base year of approximately \$5 million.

Tables C-2 and C-3 contain the expense allocation assumptions used to determine the proportion of each expense category allocated to individual residents. Table C-3 presents the allocation assumptions that define the amount of each expense category allocated between the apartment center and the health care center. For example, 85 percent of the \$451,000 administrative expenses in the base year, or \$383,350, is allocated to the apartment center, and 15 percent, or \$67,650, is allocated to the health care center. Table C-3 presents the allocation assumptions that specify the portion of each expense estimated to vary as the number of residents changes (per capita allocation) and the

portion that does not vary as the number of residents changes (per unit allocation).¹ Apartment center expenses that are allocated on a per unit basis are assumed to be shared among 280 units (95 percent occupancy) consisting of three types: studio, one-bedroom, and two-bedroom. The relative sizes of the units follow a ratio of 1 to 1.5 to 2, and the percentage mix of unit types is 20 percent studio, 60 percent one-bedroom, and 20 percent two-bedroom. By way of example, the per unit allocations imply that residents of studio apartments will be allocated 13 percent of the apartment per unit expenses, residents of one-bedroom apartments will be allocated 60 percent, and residents of two-bedroom apartments will be allocated 27 percent.

¹ The apartment center per capita expenses are assumed to be shared among 350 residents (1.25 residents per occupied apartment). The health care center expenses are also allocated on a per capita basis over 57 residents (95 percent occupancy). Any portion of the health care center expenses that would be allocated on a per unit basis would be the same as per capita because all health care beds are assumed to occupy the same square footage.

TABLE C-1
Base Year Expense Assumptions for Actuarial Liability Calculation

Operating expenses:	
Administrative	\$ 451,000
Food service	568,000
Housekeeping	196,000
Maintenance	249,000
Utilities	374,000
Nursing care	584,950
Resident services	125,000
Taxes and insurance	80,000
Total operating expenses	<u>2,627,950</u>
Capital expenses:	
Building	1,624,602
Land	60,000
Original equipment and furnishings	189,626
Equipment and furnishings replacement	18,963
Refurbishments	17,930
Original start-up costs	406,151
Total capital expenses	<u>2,317,272</u>
Total expenses	<u><u>\$4,945,222</u></u>

Notes:

1. Interest rate used to expense all fixed assets is 12 percent.
2. Building cost is assumed to be \$15 million: with an assumed useful lifetime equal to 40 years.
3. Cost of land was \$500,000; actuarial methodology treats land expense as a perpetuity. (Since land is assumed to have an infinite useful lifetime, the actuarial expensing methodology implies that the proper expense for land should last forever.)
4. Cost of fully equipping and furnishing the facility is \$1,200,000; these short-term assets are assumed to have an average useful lifetime equal to 10 years.
5. Equipment and furnishings replacement expenditures are assumed to be \$120,000 ($\$1,200,000 \div 10$) initially and are increased by 10 percent annually. These expenditures are expensed over 10 years, and future expenses will be added to the initial value, generating a 10-year layer of expense for each calendar year.
6. The initial refurbishment expenditure is equal to 1 percent of the building cost, \$150,000, and is assumed to increase 10 percent annually. The annual expenditures are expensed over 20 years, and future expenses will be added to the preceding year's expense, generating a 20-year layer of expense for each calendar year.
7. Original start-up costs include architects' fees, legal fees, marketing costs, development fees, sewer construction, and financing costs, which are assumed to be 25 percent of the construction cost, or \$3,750,000; these costs are expensed over the assumed useful lifetime of the facility (40 years).

TABLE C-2
Expense Allocation Factors for Apartment and Health Care Cost Centers

	Allocation percentage		Expense amount allocated to	
	Apartment center	Health care center	Apartment center	Health care center
Operating expenses:				
Administrative	85%	15%	\$ 383,350	\$ 67,650
Food service.....	85	15	482,800	85,200
Housekeeping.....	80	20	156,800	39,200
Maintenance.....	85	15	211,650	37,350
Utilities	85	15	317,900	56,100
Nursing care.....	0	100	0	584,950
Resident services.....	80	20	100,000	25,000
Taxes and insurance.....	85	15	68,000	12,000
Total operating expenses.....			1,720,500	907,450
Capital expenses:				
Building.....	85	15	1,380,912	243,690
Land.....	85	15	51,000	9,000
Original equipment and furnishings.....	65	35	123,257	66,369
Equipment and furnishings replacement	65	35	12,326	6,637
Refurbishments	65	35	11,654	6,276
Original start-up costs	85	15	345,228	60,923
Total capital expenses			1,924,377	392,895
Total expenses.....			<u>\$3,644,877</u>	<u>\$1,300,345</u>

TABLE C-3
Expense Allocation Factors for Per Capita and Per Unit Allocations to Apartment and Health Care Center Residents

	Apartment center per capita percentage	Apartment center per unit percentage	Apartment center expense amount		Health care expense amount allocated on a per capita basis
			Allocated on a per capita basis	Allocated on a per unit basis	
Operating expenses:					
Administrative	60%	40%	\$ 230,010	\$ 153,340	\$ 67,650
Food service	100	0	482,800	0	85,200
Housekeeping	40	60	62,720	94,080	39,200
Maintenance	20	80	42,330	169,320	37,350
Utilities	20	80	63,580	254,320	56,100
Nursing care	100	0	0	0	584,950
Resident services	100	0	100,000	0	25,000
Taxes and insurance	20	80	13,600	54,400	12,000
Total operating expenses			995,040	725,460	907,450
Capital expenses:					
Building	20	80	276,183	1,104,729	243,690
Land	20	80	10,200	40,800	9,000
Original equipment and furnishings	20	80	24,651	98,606	66,369
Equipment and furnishings replacement	20	80	2,465	9,861	6,637
Refurbishments	20	80	2,331	9,323	6,276
Original start-up costs	20	80	69,046	276,182	60,923
Total capital expenses			384,876	1,539,501	392,895
Total expenses			<u>\$1,379,916</u>	<u>\$2,264,961</u>	<u>\$1,300,345</u>

TABLE C-4
Valuation Assumptions

Occupancy distribution

	Occupied units	Residents
Studio	56	56
One bedroom	168	210
Two bedrooms	<u>56</u>	<u>84</u>
Total	280	350

Fees as of January 1, 1983

	Entry fees		Monthly fees	
	One person	Two persons	One person	Two persons
Studio	\$40,781	—	\$659	—
One bedroom	52,129	\$72,512	720	\$1,157
Two bedrooms	63,475	85,901	781	1,222
Average age of residents	77.0 years			
Percentage female	75.7%			
Revenue and expense inflation rate	10%			
Interest discount rate	12%			
Mortgage interest rate	12%			

TABLE C-5
Statement of Estimated Uses and Sources of Funds

Uses of funds:	
Construction	\$15,000,000
Land	500,000
Equipment	1,200,000
Contingency	500,000
Working capital	700,000
Start-up:	
Architect	\$ 750,000
Sewer	350,000
Development	300,000
Marketing	1,000,000
Legal	375,000
Financing	975,000
Debt service reserve	1,800,000
Funded interest	3,150,000
Total uses of funds	<u>\$26,600,000</u>
Sources of funds	
Debt	\$15,000,000
Entry fees*	<u>11,600,000</u>
Total sources of funds	<u>\$26,600,000</u>

* Total entry fees received are \$16,079,917.

Appendix D _____

Technical Description of Actuarial Pricing Methodology

METHODOLOGY FOR DETERMINING ACTUARIAL LIABILITIES AND FEES

The purpose of this appendix is to present the technical details of the methodology used to determine actuarial liabilities and corresponding fees for funding those liabilities. This methodology was used to generate the numerical values presented in Chapters 7 and 8. The discussion begins with the basic pricing equation that equates monthly fee revenues and entry fee earnings with expenses. This equation is modified to incorporate the time value of money (present values), probability of survival, and health care cost differentials. The final result is a generalized pricing equation that can be used to develop actuarial liabilities for a specific set of demographic (age, sex, health status), contractual (limited or extensive health care guarantee and alternative refund provisions), accounting policy (per capita and per unit allocations and timing of capital expenses), and economic (inflation and interest) assumptions, as well as to determine various fee setting methods under alternative pricing philosophies that may or may not vary fees on some or all of the characteristics affecting costs.

Basic Pricing Equation

The fundamental pricing equation for any continuing care contract is that the revenues expected to be collected from a group of residents must equal their expected expenses. Not only must total revenues equal total expenses for the group, but annual revenues must also “match” annual expenses (in order to prevent intergroup subsidies). Algebraically, this equivalency can be represented by the following equation:

$$R_0 + R_1 + R_2 + \cdots = E_0 + E_1 + E_2 + \cdots$$

where

R_t = Expected revenues in year t
 E_t = Expected expenses in year t

This formula, which will be referred to as the actuarial pricing equation, is the basis for developing a theoretically equitable and adequate pricing structure.

In order to introduce the “inflation-constrained increase in monthly fees” objective, the revenue (left-hand) side of the equation must be separated into two components. One is monthly fee revenues, and the other is the amortization of entry fees (or entry fee earnings).

$$(MF_0 + EFE_0) + (MF_1 + EFE_1) + (MF_2 + EFE_2) + \dots = E_0 + E_1 + E_2 + \dots$$

where

MF_t = Monthly fees during year t
 EFE_t = Entry fee earnings during year t

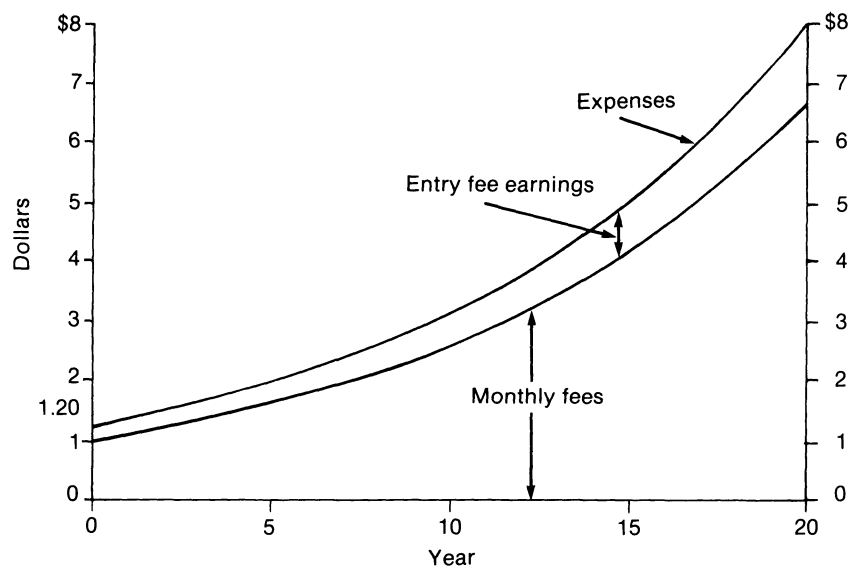
Entry fee earnings represent the portion of the original entry fee plus interest on the unearned balance recognized as revenue each year. The inflation-constrained monthly fees increase objective implies that the maximum change in monthly fees in any one year is limited; hence, entry fee earnings must equal the difference between total expenses and monthly fee revenues for the cohort group of residents. This condition has an important impact both on the method by which entry fees are determined and on how they are earned on an income statement.

Figure D-1 presents the ideal relationship between expenses, monthly fees, and entry fee earnings. Expenses and monthly fees are assumed to increase by 10 percent annually for inflation, and all residents are assumed to live for 20 years.¹ For purposes of this illustration, all values are given in terms of monthly fees that total to \$1 annually, that is, monthly fees of \$0.08 ($\$1 \div 12$). In the first year, annual monthly fees are assumed to be \$1 and expenses are assumed to be \$1.20. By the end of 20 years, monthly fees (on an annual basis) are projected to increase to \$6.73 and expenses to \$8.07, reflecting 20 years of 10 percent inflation.

The amortization of entry fees, which are defined to be the difference between expenses and monthly fees, are also given in this graph. Initially, entry fee earnings are \$0.20 ($\$1.20 - \1.00). By the end of 20 years, entry fee earnings are \$1.34 ($\$8.07 - \6.73). In this example, these earnings increase at the same rate as expenses and monthly fees;

¹ This unrealistic assumption is used at this point for pedagogic purposes. The assumption will be relaxed in further developments of the pricing structure.

FIGURE D-1
Inflation-Adjusted Expense, Monthly Fee, and Entry Fee Earnings



however, as shown later in this appendix, they will increase faster than inflation.²

Time Value of Money

Revenues and expenses for a group of continuing care contractholders are spread over a period of years. In order to equate the value of these future dollars, it is necessary to determine their value today. This requires that the "time value" of money be incorporated into the actuarial pricing equation. The time value of money reflects the fact that \$1 today is worth more than \$1 payable in the future since interest can be earned by investing today's dollar.

The actuarial pricing equation modified to reflect the time value of money is given below:

$$(MF_0v_0 + EFE_1v_1) + (MF_1v_1 + EFE_1v_1) + \dots \\ = E_0v_0 + E_1v_1 + E_2v_2 + \dots$$

where

v_t = Present value of \$1 promised in t years

² The correct method for earning entry fees is a major point of controversy for the financial statements used by CCRCs. The manner in which entry fees should be earned bears a direct relationship to the philosophy used to establish fees. Since there is no universally accepted philosophy for determining fees, there is no one entry fee earnings schedule that is correct for all communities.

By way of example, assume that money invested today earns 12 percent interest compounded annually. Column 2 of Table D-1 contains the present value of \$1 payable in future years. The present value of \$1 today is \$1. The present value of \$1 promised at year 1 is \$0.89. In other words, if one invested \$0.89 in a fund that yields 12 percent per year, the original investment would accumulate to \$1 at the end of one year. Similarly, \$1 promised at year 4 has a present value of \$0.64; the present value of \$1 at year 19 is \$0.12; and so forth.

Table D-1 applies these present values to discount the projected annual expenses and revenues, both of which are assumed to increase by 10 percent inflation, as shown previously in Figure D-1. Column 3 shows the projected annual expense, and column 4 gives the present value of those expenses (i.e., column 2 times column 3). The present value of future expense is \$1.12 at year 4, while at year 9 the present value is \$1.02. The sum of the present value of future expenses over the 20 years is \$20.33. The present value of future monthly fees and entry fee earnings is given in columns 6 and 8, respectively.

Entry fee earnings, equal to the difference between projected expenses and projected monthly fees, sum to \$11.47. The present value of entry fee earnings is derived by subtracting the present value of monthly fees, \$16.94, from the present value of future expenses, \$20.33, and is equal to \$3.39, one third of the sum of entry fee earnings.³

Probability of Survival

The preceding example was based on the assumption that all residents survived for 20 years. A more realistic scenario is that only a portion of the cohort will survive to each future year. In order to properly match expenses and revenues, these dollar payment streams must additionally be discounted for death. The survivors from a closed group of residents can be estimated by using an actuarial model, known as a life table, which specifies the probability of survival (or death) in each year.

In actuarial terminology, the probability of surviving to future years is specified by a 1_x column, in which the "1" refers to the number of lives and the "x" refers to a specific age. By way of example, consider 100 females at age 75. Table D-2 shows the expected number of survivors from this group over the next 20 years.⁴ Column 2 shows that

³ This implies that an actuarially correct method of earning entry fees would have total earnings that would exceed the initial entry fee due to interest earnings on the unearned balance.

⁴ These probabilities were developed from the mortality assumptions presented in Appendix B.

TABLE D-1
Calculation of Interest-Discounted Expenses and Revenues

Year t	Present value of \$1 promised in year t	Projected expenses	Interest-discounted expenses	Projected monthly fees	Interest-discounted monthly fees	Projected entry fee earnings	Interest-discounted entry fee earnings
0	1.00000	\$ 1.20	\$ 1.20	\$ 1.00	\$ 1.00	\$ 0.20	\$0.20
1	0.89286	1.32	1.18	1.10	0.98	0.22	0.20
2	0.79719	1.45	1.16	1.21	0.96	0.24	0.19
3	0.71178	1.60	1.14	1.33	0.95	0.27	0.19
4	0.63552	1.76	1.12	1.46	0.93	0.30	0.19
5	0.56743	1.93	1.10	1.61	0.91	0.32	0.18
6	0.50663	2.13	1.08	1.77	0.90	0.36	0.18
7	0.45235	2.34	1.06	1.95	0.88	0.39	0.18
8	0.40388	2.57	1.04	2.14	0.87	0.43	0.17
9	0.36061	2.83	1.02	2.36	0.85	0.47	0.17
10	0.32197	3.11	1.00	2.59	0.84	0.52	0.17
11	0.28748	3.42	0.98	2.85	0.82	0.57	0.16
12	0.25668	3.77	0.97	3.14	0.81	0.63	0.16
13	0.22917	4.14	0.95	3.45	0.79	0.69	0.16
14	0.20462	4.56	0.93	3.80	0.78	0.76	0.16
15	0.18270	5.01	0.92	4.18	0.76	0.84	0.15
16	0.16312	5.51	0.90	4.59	0.75	0.92	0.15
17	0.14564	6.07	0.88	5.05	0.74	1.01	0.15
18	0.13004	6.67	0.87	5.56	0.72	1.11	0.14
19	0.11611	7.34	0.85	6.12	0.71	1.22	0.14
Sum*	8.36578	\$68.73	\$20.33	\$57.26	\$16.94	\$11.47	\$3.39

* Some columns may not sum exactly due to rounding errors.

TABLE D-2
Discounting Expenses and Revenues for the Probability of Survival

Year t	Age x	Number of survivors to age x	Probability of survival to age x	Survival-discounted expenses	Survival-discounted monthly fees	Survival-discounted entry fees
0	75	100.000	1.00000	\$ 1.20	\$ 1.00	\$0.20
1	76	98.697	.98697	1.30	1.09	0.22
2	77	97.147	.97147	1.41	1.18	0.24
3	78	95.307	.95307	1.52	1.27	0.25
4	79	93.130	.93130	1.64	1.36	0.27
5	80	90.563	.90563	1.75	1.46	0.29
6	81	87.551	.87551	1.86	1.55	0.31
7	82	84.053	.84053	1.97	1.64	0.33
8	83	80.028	.80028	2.06	1.72	0.34
9	84	75.453	.75453	2.13	1.78	0.36
10	85	70.318	.70318	2.19	1.82	0.36
11	86	64.638	.64638	2.21	1.84	0.37
12	87	58.463	.58463	2.20	1.83	0.37
13	88	51.886	.51886	2.15	1.79	0.36
14	89	45.058	.45058	2.05	1.71	0.34
15	90	38.188	.38188	1.91	1.60	0.32
16	91	31.526	.31526	1.74	1.45	0.29
17	92	25.321	.25321	1.54	1.28	0.26
18	93	19.782	.19782	1.32	1.10	0.22
19	94	15.041	.15041	1.10	0.92	0.18
Sum*		1,357.948	13.57948	\$38.82	\$32.35	\$6.47

* The sums are based on projections to age 110.

98.697⁵ of the original 100 females are expected to survive to age 76. This indicates that the probability of survival for one year is 98.7 percent for a female age 75. The probability of surviving two years is 97.1 percent. Other probabilities are determined by dividing the number of survivors at a given time by the initial number of residents.⁶

Taking the probability of survival into consideration, the basic pricing formula now becomes:

$$(MF_0v_0p_0 + EFE_0v_0p_0) + (MF_1v_1p_1 + EFE_1v_1p_1) + \dots = E_0v_0p_0 + E_1p_1p_1 + E_2v_2p_2$$

⁵ Fractional deaths are used to make precise actuarial calculations, even though in real-life situations only whole numbers of persons survive.

⁶ The projected number of survivors extends past the 20 years presented in this table. In deriving fees, actuarial projections of survivors are extended to the assumed end of the human life span (in our example, this is age 110). The total number of years lived by the original group of residents is derived by summing the number of survivors over all future years and deducting one-half year per resident for the assumption that deaths occur midway through the year. This sum is 1,308 [1,358 (-1/2 x 100)]. The life expectancy is equal to the sum of years lived divided by the number of original residents, 13.1 (1,308 ÷ 100) years. Due to the characteristics of the mortality curve, the life expectancy, or mean of the death distribution, will approximately equal the median of that distribution. Hence, the life expectancy can be thought of as the maximum number of years that the survivors for a closed group will equal 50 percent of the original number.

where

p_t = Probability of surviving t years

Columns 5 through 7 of Table D-2 contain the survival-discounted value of expenses, monthly fees, and entry fees over the next 20 years, respectively. The sum of survival-discounted expenses to the end of the human life span (assumed to be 100) is \$38.82. This amount represents, in today's dollars, the expenses for services provided to survivors from the current group of residents. The sum of the expected monthly fees and entry fees is \$32.35 and \$6.47, respectively. This table shows that even though the number of surviving residents decreases annually, their expenses increase for 11 years before declining.

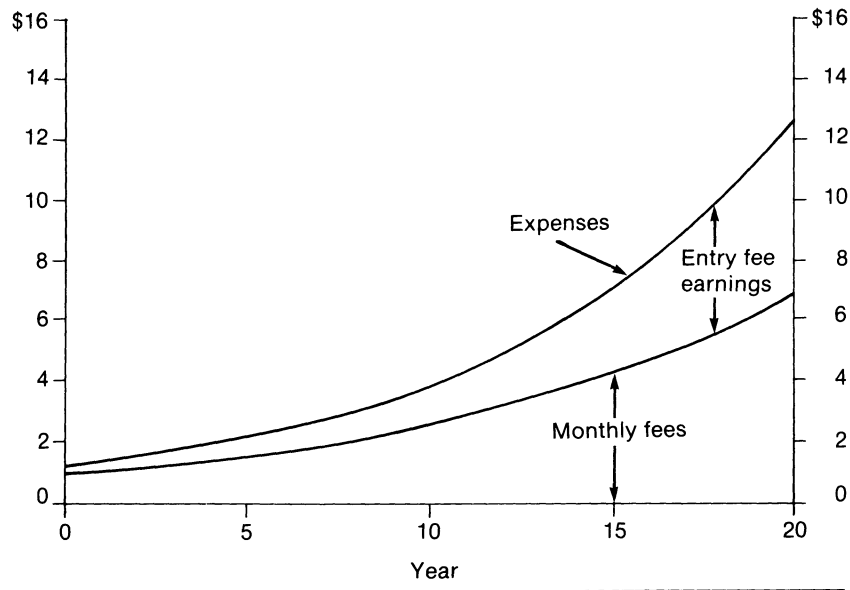
Health Care Cost Differential

The preceding examples do not reflect the consequences of changes in the residents' living status during their stay in the community. Such changes have a significant impact on projecting future *expenses*. Typically, nursing care costs are 2 to 3 times greater than apartment costs. Therefore, in order to reflect properly the future costs of offering a continuing care contract, it is necessary to define the probability of survival by living status, and to adjust projected expenses to reflect changes in living status.

This projection can be made by using a multiple decrement model to estimate the future living status of survivors. This also means that the mortality assumptions used for pricing decisions must be differentiated by living status (i.e., apartment versus health care). In addition, morbidity (health care utilization) assumptions are required to estimate the probability of permanent transfer from the apartment center to the health care center and of temporary utilization of the health care center.

Figure D-2 shows the impact of higher health care costs. Health care center expenses are initially assumed to be twice apartment center expenses, and are assumed to increase 10 percent annually for inflation. The expected expense curve is weighted according to costs of living in the apartment center versus the health care center according to the relative probability of survival in each living status. For this example, however, neither the expense curve nor the revenue curve is discounted for survivorship. The monthly fee curve is the same as in Figure D-1 since monthly fees are not assumed to change with living status. However, both the expense curve and the entry fee earnings curve change substantially. The expense curve is found to increase faster than the underlying inflation assumption because of increasing expected health care utilization with its proportionately higher costs. The expense curve increases to \$12.51 from \$1.20 in 20 years—an

FIGURE D-2
Living Status Weighted Expense, Monthly Fee, and Entry Fee Earnings



average annual rate of 12 percent, or two percentage points more than the underlying inflation rate. (The example in Figure D-1 shows that total expenses increase to \$8.07 in 20 years.)

Entry fee earnings also increase faster than inflation since they must equal the difference between expenses and monthly fees. Entry fee earnings start at \$0.20 and increase to \$5.78 in 20 years (compared to \$1.35 in the Figure D-1 example), an average annual rate of 18 percent.

Table D-3 shows the results of a multiple decrement projection incorporating survival probabilities with living status cost differentials. Column 3 contains the number of surviving apartment residents; initially, this number is assumed to be 100. During the first year, 2,496 are expected to transfer permanently to the health care center (column 4), leaving 96,264 survivors in their apartments at the end of the year. The number of deaths in apartments, 1,240 residents, is equal to the original number of apartment residents minus the number of survivors at the end of the year plus the permanent transfers (this value is not given in the table). Of the 2,496 transfers to the health care center, 2,434 (column 5) are expected to live to the end of the year. In the first year, 1,337 residents are expected to die while residing in their apartments and 2,712 residents are expected to transfer permanently to the health care center. Hence, there are 92,215 apartment survivors at year 2 and 4,932 in the health care center. This sequence is continued for each successive year. At year 10 there are 70,318 surviving residents, 29.7

TABLE D-3
Probability of Survival by Living Status and Survival Discounted Revenues and Expenses by Living Status

Year	Age	Number of apartment residents	Number of permanent transfers	Number of health care residents	Survival-discounted apartment expenses	Survival-discounted health care expenses	Total survival-discounted expenses
0	75	100.000	2.496	0.000	\$ 1.20	\$ 0.00	\$ 1.20
1	76	96.264	2.712	2.434	1.27	0.06	1.33
2	77	92.215	2.932	4.932	1.34	0.14	1.48
3	78	87.848	3.154	7.459	1.40	0.24	1.64
4	79	83.160	3.373	9.970	1.46	0.35	1.81
5	80	78.154	3.584	12.409	1.51	0.48	1.99
6	81	72.843	3.776	14.708	1.55	0.63	2.17
7	82	67.259	3.938	16.793	1.57	0.79	2.36
8	83	61.449	4.060	18.579	1.58	0.96	2.54
9	84	55.473	4.134	19.980	1.57	1.13	2.70
10	85	49.403	4.151	20.915	1.54	1.30	2.84
11	86	43.323	4.102	21.315	1.48	1.46	2.94
12	87	37.332	3.977	21.131	1.41	1.59	3.00
13	88	31.538	3.767	20.348	1.31	1.69	2.99
14	89	26.066	3.469	18.991	1.19	1.73	2.92
15	90	21.041	3.095	17.147	1.05	1.72	2.77
16	91	16.572	2.667	14.954	0.91	1.65	2.56
17	92	12.732	2.218	12.589	0.77	1.53	2.30
18	93	9.548	2.782	10.234	0.64	1.37	2.00
19	94	6.997	1.387	8.044	0.51	1.18	1.69
Sum*		1,064.675		293.274	\$26.79	\$24.05	\$50.84

* The sums are based on projections to age 110.

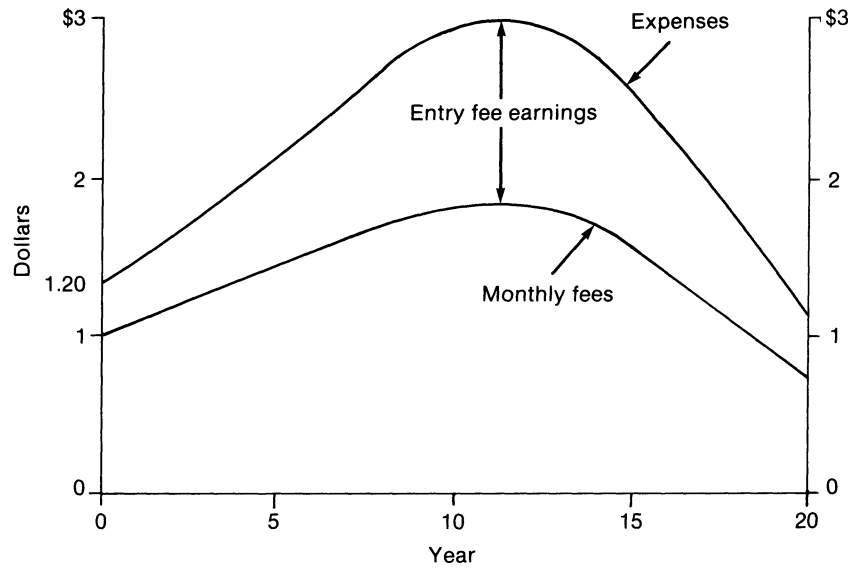
percent of whom reside in the health care center. 50 percent of the survivors are in the health care center by the end of year 18.⁷

Table D-3 also shows the development of survival-discounted expenses based on different apartment and health care center expenses. Column 6 contains the survival-discounted apartment expenses (these are initially assumed to be \$1.20, increased by 10 percent per year). Column 7 contains survival-discounted health care expenses (health care expenses are twice projected apartment expenses). The total survival-discounted expenses, given in column 8, are the sum of columns 6 and 7.

Figure D-3 shows the relationship between survival-discounted expenses and revenues. It can be observed from this graph that expected expenses are at their highest value after 12 years, while monthly fee

⁷ It should be noted that apartment center mortality rates are significantly less than those for health care center residents. This may not be apparent from Table D-3 since the total number of health care residents increases for a period while apartment residents decrease. This is due to the fact that the number of permanent transfers to the health care center exceeds the number of deaths during the first 13 years.

FIGURE D-3
Living Status Weighted Expenses, Monthly Fees, and Entry Fee Earnings
Discounted for Probability of Survival



revenues and entry fee earnings reach their highest levels in 11 and 14 years, respectively.⁸

Table D-4 shows the expected expenses and revenues discounted for both interest and the probability of survival, with expenses weighted according to the differential costs of apartment center versus health care center. This table shows that the present value of future expenses, based on expense projections and survival to the assumed end of the life span, is equal to \$16.86, which is 33 percent ($\$16.86 \div \50.84) of projected expenses not discounted for interest. The present value of future monthly fees is \$11.76, and the entry fee (the present value of entry fee earnings) must now be \$5.11 to make up the difference. Hence, by incorporating interest discounts, probability of survival, and cost differentials, the true actuarial liability of a continuing care contract can be estimated. In other words, today's value of expected expenses is \$16.86, while the cash flow associated with those expenses will be 3 times more than the present value.

⁸ This graph also illustrates several key considerations in developing a theoretically sound methodology for earning entry fees. Under the proposed pricing philosophy, initially very small portions of the entry fees should be earned in order to match revenues with expenses correctly. Maximum entry fee earnings should occur some 10 to 12 years after entry into the community. Also, the earnings schedule should not be limited to a fixed time period, such as life expectancy, which is 13 years in this case, since expenses exceed monthly fees after that point.

TABLE D-4
Present Value of Future Expenses and Revenues Discounted for Interest and Survival

Year t	Age x	Present value of expenses discounted for interest and survival	Present value of monthly fees discounted for interest and survival	Present value of entry fee earnings discounted for interest and survival
0	75	\$ 1.20	\$ 1.00	\$0.20
1	76	1.19	0.97	0.22
2	77	1.18	0.94	0.24
3	78	1.17	0.90	0.27
4	79	1.15	0.87	0.28
5	80	1.13	0.83	0.28
6	81	1.10	0.79	0.32
7	82	1.07	0.74	0.33
8	83	1.02	0.69	0.33
9	84	0.97	0.64	0.33
10	85	0.91	0.59	0.33
11	86	0.85	0.53	0.32
12	87	0.77	0.47	0.30
13	88	0.69	0.41	0.28
14	89	0.60	0.35	0.25
15	90	0.51	0.29	0.22
16	91	0.42	0.24	0.18
17	92	0.33	0.19	0.15
18	93	0.26	0.14	0.12
19	94	0.20	0.11	0.09
Sum*		\$16.86	\$11.76	\$5.11

* These sums are based on projections to age 110.

Generalized Actuarial Pricing Equation

The generalized actuarial pricing equation, incorporating interest discount, probability of surviving by living status, and living status cost differentials, is as follows:

$$(MF_0v_0p_0 + EFE_0v_0p_0) + (MF_1v_1p_1 + EFE_1v_1p_1) + \dots \\ = (E_0^a v_0 p_0^a + E_0^h v_0 p_0^h) + (E_1^a v_1 p_1^a + E_1^h v_1 p_1^h) + \dots$$

where

- p_t = Probability of being alive in year t
- p_t^a = Probability of residing in the apartment center in year t
- p_t^h = Probability of residing in the health care center in year t
- E_t^a = Apartment center expenses in year t
- E_t^h = Health care center expenses in year t

By regrouping values on the left-hand side of the generalized actuarial pricing equation, we get

$$\begin{aligned} & (EFE_0v_0p_0 + EFE_{p_1v_1p_1}) + (MF_0v_0p_0 + MF_1v_1p_1) + \dots \\ & = (E_0^av_0p_0^a + E_0^hv_0p_0^h) + (E_1^av_1p_1^a + E_1^hv_1p_1^h) + \dots \end{aligned}$$

The above equation is summarized as:

$$PVEF + PVMF = PVFE$$

or

$$PVFR = PVFE$$

where

- PVEF = Present value of entry fee earnings
- PVMF = Present value of monthly fees
- PVFE = Present value of future expenses
- PVFR = Present value of future revenues

Even though this formula appears to be somewhat complex, it is a straightforward extension of the initial actuarial pricing equation developed at the beginning of this appendix. With appropriate assumptions for determining expenses and revenues, this equation can be used to develop pricing structures that meet the pricing objectives set forth in Chapter 7. Other refinements to this general pricing equation include the development of probabilities for the temporary utilization of the health care center and the expenses associated with such utilization and the development of survival probabilities that vary by age, sex, number of occupants in a particular unit, and mortality improvements.

Appendix E _____

Illustrative CCRC Financial Statements

Statements of Changes in Financial Position
of Unrestricted Funds
For the Years Ended March 31, 1981 and 1980

	1981	1980
Sources of working capital:		
Resident entry fees received	\$1,202,400	\$1,432,150
Increase (decrease) in advance deposits	(1,000)	22,000
Equipment donated	20,241	13,746
Transfer from restricted funds	6,296	—
Working capital provided	<u>1,227,937</u>	<u>1,467,896</u>
Uses of working capital:		
Excess of (revenues) expenses	7,006	(417,752)
Items not providing (requiring) working capital:		
Depreciation and amortization	(1,040,837)	(1,033,122)
Resident entry fee amortization	<u>1,538,458</u>	<u>2,141,182</u>
Working capital used in operations	504,627	690,308
Additions to land, buildings and equipment	141,683	42,132
Repayments and current maturities of long-term debt:		
Scheduled	271,205	290,310
Advanced payment	—	600,000
Transfer of loan	150,000	—
Entry fee refunds	<u>64,620</u>	<u>52,228</u>
Working capital used	<u>1,132,135</u>	<u>1,674,978</u>
Increase (decrease) in working capital	<u>\$ 95,802</u>	<u>\$ (207,082)</u>
Working capital changes—increase (decrease):		
Cash, certificates of deposit, and short-term investments	\$ 303,056	\$ (383,462)
Accounts receivable	(94,451)	165,906
Accrued interest receivable	(59,012)	68,151
Inventory and prepaid expenses	13,783	16,900
Current portion of long-term debt	20,008	8,106
Accounts payable and accrued expenses	(26,518)	5,225
Advance billings for residents' care	<u>(61,064)</u>	<u>(87,908)</u>
Increase (decrease) in working capital	<u>\$ 95,802</u>	<u>\$ (207,082)</u>

Statements of Changes in Fund Balances
For the Years Ended March 31, 1981 and 1980

Restricted

	Unrestricted operating	Plant replacement and expansion fund and other restricted funds		Reserve fund I	Reserve fund II	Financial assistance fund I	Financial assistance fund II	Funds I and II	Life income fund I	Life income fund II	Addition fund	Independent housing project fund
		Plant	Other									
Balances, March 31, 1979.....	\$ 664,505	\$ 9,560	\$ 400	\$112,069	\$36,827	\$24,003	\$11,000	—				
Excess of revenues over expenses.....	417,752											
Restricted contributions			7,985	35,718	9,581	1,000		\$10,000	\$281,516			
Donated equipment	11,142											
Investment income.....		1,090	47	13,794	5,121	1,309	563	1,026				
Unrealized depreciation of investments in common stocks									(18,672)			
Noncapital expenditures of restricted funds			(569)									
Transfers of restricted funds for capital additions	2,604	(1,004)	(1,600)									
Loss on sale of investment.....									(13,611)			
Balances, March 31, 1980.....	1,096,003	9,646	6,263	161,581	51,529	26,312	11,563	11,026	249,233			
Excess of expenses over revenues.....	(7,006)											
Restricted contributions			21,199	30,258	18,579				30,375	\$25,000	\$230,832	
Income:												
Investment income.....		1,194	56	19,821	6,626	1,230	202	1,298	22,415	655	37,435	\$25,339
Other.....												1,450
Change in unrealized depreciation of investments in common stocks.....									15,637			
Noncapital transfer of restricted funds	6,296		(6,296)									
Transfers of restricted funds for capital additions	20,241		(20,241)									
Loss on sale of investments									(1,340)			
Distributions to beneficiaries									(23,609)			
Interest expense.....											(10,239)	(6,539)
Balances, March 31, 1981.....	<u>\$1,115,534</u>	<u>\$10,840</u>	<u>\$ 981</u>	<u>\$211,660</u>	<u>\$76,734</u>	<u>\$27,542</u>	<u>\$11,765</u>	<u>\$12,324</u>	<u>\$292,711</u>	<u>\$25,655</u>	<u>\$258,028</u>	<u>\$20,250</u>

Statements of Revenues and Expenses
of Unrestricted Funds
For the Years Ended March 31, 1981 and 1980

	1981	1980*
Revenues:		
Resident care fees	\$5,210,137	\$4,517,295
Amortization of entry fees	1,538,458	2,141,182
Medical center fees:		
Resident	1,025,357	844,836
Medicare and other insurance reimbursement	453,261	343,927
Nonresident	146,826	226,439
Registration fees	13,000	19,700
Interest income	253,955	233,549
Other	27,244	20,266
Total revenues	<u>\$8,668,238</u>	<u>\$8,347,194</u>
Expenses:		
General and administrative	\$1,044,267	\$ 861,213
Housekeeping	528,213	468,020
Maintenance	697,687	633,384
Food service	1,731,152	1,598,093
Medical center	1,750,849	1,487,369
Utilities	784,527	668,584
Real estate taxes	360,599	318,674
Depreciation	972,219	964,482
Amortization of preopening expenses	68,618	68,641
Interest expense	732,199	843,932
Other	4,914	17,050
Total expenses	<u>8,675,244</u>	<u>7,929,442</u>
Excess of revenues (expenses)	<u>\$ (7,006)</u>	<u>\$ 417,752</u>

* Reclassified to conform to 1981 presentation.

Appendix F _____

Sources of Additional Information Regarding State Statutes

Arizona	Department of Insurance 1601 West Jefferson Phoenix, Arizona 85007
California	Department of Social Services 744 P Street Sacramento, California 95814
Colorado	Department of Insurance 201 East Colfax Avenue Denver, Colorado 80203
Florida	Department of Insurance Office of the Treasurer State of Florida Tallahassee, Florida 32304
Indiana	Department of Securities Room 102, Statehouse Indianapolis, Indiana 46204
Maryland	Office on Aging 301 West Preston Street Room 1004 Baltimore, Maryland 21201
Michigan	Corporation Securities Bureau Department of Commerce PO Box 30220 Lansing, Michigan 48909
Minnesota	none
Missouri	Division of Insurance Department of Consumer Affairs 515 East High Street Jefferson City, Missouri 65101

AAHA	American Association of Homes for the Aging Suite 770 1050 17th Street NW Washington, D.C. 20036
LCSC	Life Care Services Corporation 800 Second Avenue Des Moines, Iowa 50309

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