Depreciation Systems

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Contents

Preface

THIS book grew from our recognition of the need for a systematic explanation of depreciation using simple, easy-to-follow illustrations. In particular, we examine the portion of depreciation that relates to accounting, specifically as found in public utilities. However, many of the topics covered relate to other applications of depreciation, including valuation of property and taxation. Several conceptual difficulties surround depreciation. One is the lack of understanding that the determination of depreciation involves an intricate system comprising most aspects of the operation of a company. Another is the tendency to view components of the system as being independent of one another. Finally, the use of complicated arithmetic examples, frequently requiring lengthy, time-consuming calculations when explaining ideas, distracts the reader and obfuscates the idea being illustrated.

Asset management includes four actions: (1) the decision, based on analysis of the associated costs and revenues, to acquire property; (2) its acquisition, installation, and associated accounting; (3) its use and related accounting, including the proration of capital expenses to each accounting period; and (4) its retirement and associated accounting. Each action interacts with the other. As management decisions are often based on information from these accounting records, it is essential to exercise careful control over the annual and cumulative results of the depreciation system. This means that the methods used to make estimates of the variables used in calculating and adjusting depreciation should be scrutinized, because they significantly affect the management of the assets of the company.

Investments in capital assets, such as a turbine used to turn an electri-

14 Salvage Analysis and Forecasting

THIS chapter discusses the analysis of aged salvage data and illustrates the use of a mathematical model to help estimate future salvage. Table 8.1 at the end of Chapter 8 shows the aged retirements for Account 897, Utility Devices. These data will be needed in this chapter. For convenience, Table 8.1 will be called the *retirement matrix*.

Net salvage is composed of gross salvage and cost of retiring.[1] Data reflecting these two categories often are kept separately. Different economic forces act on each, so that the pattern of gross salvage versus age differs from the pattern of cost of retiring versus age. If separate records are kept, each pattern can be analyzed. If the records are combined, the separate patterns may be obscured.

Though the patterns of gross salvage and cost of retiring versus age may be different, the general process for analyzing the patterns is the same. The gross salvage for Utility Devices will be assumed to be zero. This will simplify our illustration, and the cost of retiring will provide an example on which to base a discussion of analyzing and forecasting salvage.

Table 14.1 (see end of chapter) shows the cost of retiring by age for Account 897. Each row represents a vintage (or placement or installation) year, and each column represents an experience (or calendar) year. Each entry in the table is the total cost of retiring units from that vintage during that experience year. Vintage years run from 1962 through 1990 and experience years from 1968 through 1990.

Table 14.2 (see end of chapter) shows the salvage ratios (SR) for Account 897. The SR is the salvage divided by the original cost of the retirements and usually is expressed as a percentage. During 1974, $9.00 from the 1971 vintage was retired (see the retirement matrix). The cost of retiring these dollars, shown in Table 14.1, was $2.03, and the resulting SR is −2.03/9.00 or −22.6%.

SALVAGE ANALYSIS

Salvage analysis starts with an examination of the data reflecting the total annual costs. Often these are the only data available. The final row in Table 14.1 shows the sum of each column and equals the total cost of retiring during the calendar year. The original cost of all retirements during the calendar year is shown in the retirement matrix. Table 14.3 (see end of chapter) combines these annual retirement amounts. Column (a) shows the calendar year, column (b) shows the total dollars retired during the year, and column (c) shows the total cost of retiring during the year. Column (d) is the salvage ratio (SR) for the year (i.e., column (c)/column (b) times 100%). Statistics based on single years are often erratic, making any underlying pattern difficult to detect. The final four columns are used in the calculation of SRs for 3-year "rolling bands" or moving averages. This averaging process smooths the pattern of ratios. Column (e) defines the rolling bands. Each band has 2 years in common with the bands on either side of it. The retirements, column (f), during the 1968–1970 band equal 18.00 + 30.00 + 42.00 or $90.00, and the cost of retiring, column (g), is (−4.28) + (−7.65) + (−10.42) or −22.35. Column (h) is the average SR during the 3-year rolling band.

The average realized salvage is the total cost of retiring divided by the total retirements, or −1452.28/3833.00 or −37.9%. The SRs steadily become more negative, from about −24% during the early years to about −40% during the most recent years. One reason for this trend is that the average age of the annual retirements has increased. The first additions were made in 1962. The average life of the property in Account 897 is known to be about 10 years. During 1969 the account was "young," because a retired unit could not have been older than 7 years (i.e., a retirement from the 1962 vintage), and most retirements were younger than 7 years (i.e., retirements from more recent vintages). The average age of the units retired during 1969 was 4.8 years (the age and number of dollars retired during 1969 can be found in the retirement matrix). As time passed, the average age of the retirements increased. By 1989 the average age of retirements was 10.2 years.

In a stable account with zero growth (see Chapter 9), the average age of the retirements equal the average life. Though the annual additions to

Account 897 vary from year to year, the net growth in the account is near zero. By 1989 the account is "mature." The oldest vintage was installed more than 25 years ago, so the age of retirements can range from less than a year to the maximum life. Thus, the average age of the retirements during 1989 would be expected to be near the average life, and they are. If no more additions were made to the account, the average age of retirements would increase with time, and, as the plant remaining in service becomes less and less, the average age of the retirements will increase and approach the maximum life. The sum of all future costs of retiring divided by the sum of future retirements (i.e., the current balance) is the future salvage ratio (FSR). The average salvage ratio (ASR) is the sum of the realized cost and the future cost of retiring, divided by the original cost of all additions.

The data in Table 14.3 show that the cost of retiring increases with the age of the retired unit. Though the average cost of retiring all units retired to date is known, the future cost of retiring must be estimated before the ASR can be estimated. Without additional data or adoption of a retirement model, it is difficult to describe how to estimate the future cost of retiring.

Before attempting to forecast the future cost of retiring, the depreciation professional should become familiar with the physical characteristics of the property in the account and with the manner of retiring the property from service. This knowledge will provide the basis for developing a preliminary model describing the relationship between age and salvage. One cost of retiring model is based on the observation that the cost of retiring a unit is often independent of the age of the unit. For example, the process of removing a gas service or a utility pole typically has little to do with the age of the service or pole. This model can be extended by assuming that the process of retiring the unit is labor intensive, and that the hours of labor required to retire a unit have remained constant during the history of the account. This implies the technology used to retire a unit has remained constant.

This model will be adopted and applied to Account 897. Remember that this is one of many possible models, and the depreciation professional cannot adopt a model unless he or she is familiar with the property involved and the company operations that affect the method of retirement. The logic of the mathematical model must reflect the actual world. Whether the model reflects reality is a judgment made by the analyst.

If the model just described reflects the cost of retiring a utility device, then, during periods of inflation, the SRs can be expected to increase as a unit becomes older. Though the hours of labor required to retire the unit remain constant, labor rates can be expected to inflate each year. Thus, the SR for a group of property installed during the same year can be expected to increase (i.e., become more negative) each successive year in direct proportion to the annual rate of inflation. A more comprehensive analysis of

the aged data will reveal the historical relationship between age and salvage ratio and may provide support for the model. Chapter 8 introduced the idea of placement bands and experience bands. A placement band follows the history of a vintage through different experience years, while an experience band follows the history over all vintages during the specified experience years.

These ideas are used to construct a graph of the SR versus age for the placement band consisting of the 1970, 1971, and 1972 vintages. Table 14.4 (see end of chapter) reproduces part of the annual cost of retiring during 1970, 1971, and 1972 from Table 14.1. The cost of retiring is shown in the upper portion of Table 14.4.

Table 14.5 (see end of chapter) shows how the data are used to construct salvage ratios by age. Column (a) of Table 14.5 shows the age interval and column (b) shows the sum of retirements from the 1970, 1971, and 1972 vintages during each age interval. Column (c) shows the corresponding cost of retiring. To obtain the total cost of retiring during the 0.0–0.5 year age interval, refer to the upper portion of Table 14.4. Sum the first entry in each row, $0 + 0 + (-1.02)$ or -1.02. These are the costs of retiring during 1970 from the 1970 vintage, during 1971 from the 1971 vintage, and during 1972 from the 1972 vintage, respectively. Column (d) is the SR, or the cost of retiring divided by the original cost expressed as a percentage. Observe that the SR during the initial age interval is about -20%, and that the SRs steadily become more negative as the property ages. After 20 years, the SR is almost -70%. Because these figures represent costs, the costs increase but the SRs decrease (become more negative).

Because the SR is the quotient of dollars in different price levels (i.e., the retirement year price level is reflected in the numerator and the installation year price level is reflected in the denominator), it may be helpful to calculate the SR using a constant price level. This removes inflation from the ratio so that the salvage schedule adjusted for inflation[2] can be analyzed.

To calculate the adjusted SR shown in column (f) of Table 14.5, return to Table 14.4 and note the row labeled CPI-U. These data are the July consumer price indexes for all urban consumers (CPI-U) from the U.S. Bureau of Labor Statistics for the years 1970 through 1977. The July figures were chosen because both additions and retirements are assumed to take place at midyear. During 1975, the cost of retiring units placed in service during 1971 totaled $-\$1.49$. To adjust 1975 dollars to 1971 dollars, multiply the 1975 dollars by the ratio of the 1971 index/1975 index. This is $-1.49 \times (40.70/54.20)$ or $-\$1.12$ measured in July 1971 dollars. The lower portion of the table shows the salvage from the upper portion of the table after being adjusted to dollars during the placement year. The adjusted cost of retiring can now be used to calculate the adjusted cost of

retiring shown in column (e) of Table 14.5. The original cost of the retirements shown in column (b) and the salvage shown in column (e) are measured in dollars of the same price level. Column (f) shows the adjusted SR, i.e., column (e)/column (b) × 100%.

Figure 14.1 is a graph of columns (d) and (f). Observe the graph of the SRs with inflation. If the SRs are increasing in proportion to inflation, they will form a pattern that is curved upward, reflecting the exponential growth of the price levels. However, it is difficult to tell the underlying shape of this curve. Observe the graph of the SRs when inflation is removed. The pattern of constant SRs, with a value of about −20%, is clear. Though a formal statistical test of the relationship can be made, such a test is not necessary because the graph is strong evidence that when inflation is removed, the cost of retiring is independent of age. Thus, the data supports, or verifies, the model that the time required to retire a unit is constant and that the increased cost of retiring is proportional to the rate of inflation.

Can this model be used to forecast future cost of retiring? *If* the depreciation professional believes that the same procedure for retiring that has been used in the past will continue to be used in the future, *then* the model can be used to forecast future cost of retiring. Under this model, future SRs

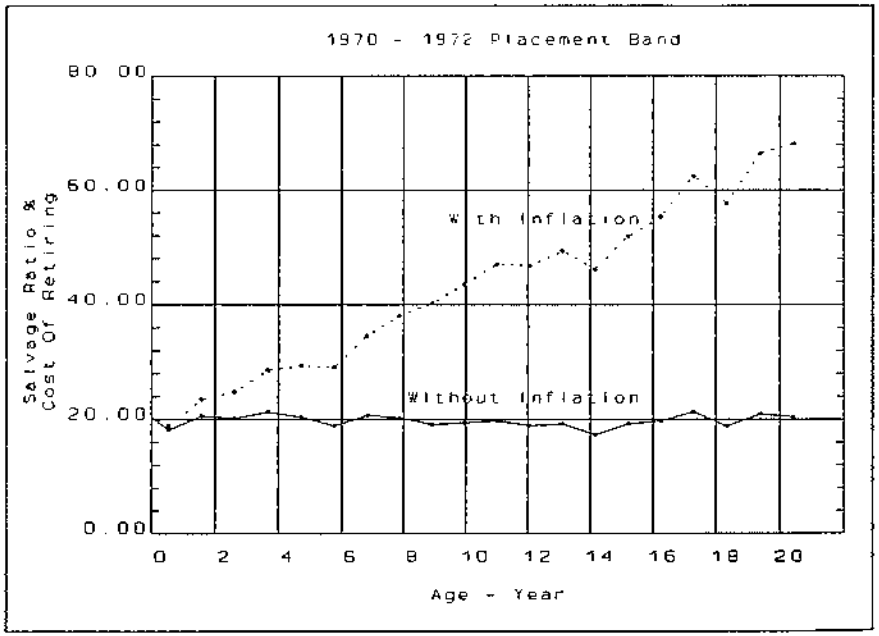

Figure 14.1. Salvage ratios versus age both with and without inflation. Data are from Table 14.3.

can be derived if three parameters are estimated. They are (a) the SR during the 0.0–0.5 year age interval, (b) the annual rate of inflation, and (c) the life characteristics of the property.

Table 14.6 (see end of chapter) shows the construction of the salvage schedule for the 1981 vintage. Construction of the survivor curve for this vintage is shown in Table 6.12 of Chapter 6, and the survivor curve from that table is shown in column (b) of Table 14.6. The values from age 0.0–8.5 years are based on the observed exposures and retirements. The values from age 8.5–21.5 years are based on the estimate that the future life characteristics will be described by an Iowa S0–12 survivor curve. The SRs, column (d), from age 0.0–8.5 years are the observed values shown in Table 14.2. The forecast for all age intervals beyond 8.5 years is the SR from the previous age interval inflated by *5%* (i.e., the SR during age interval 9.5–10.5 is 29.72 × 1.05 or 31.20%). The 5% rate is the estimate of the future inflation rate. Column (e) is the SR weighted by the fraction retired, i.e., column (c) × column (d)/100%, and the sum of column (e) is the ASR, −34.81%. The realized salvage ratio is shown in column (f) and the future salvage ratio (FSR) is shown in column (g). Because the observed SRs were used during the early age intervals, it was not necessary to estimate the initial SR.

THE BROAD AND VINTAGE GROUP MODELS

Depreciation calculations require an estimate of the average salvage ratio (ASR) and the future salvage ratio (FSR) for each vintage. The method of determining these ratios depends on whether the broad group or vintage group model is used.

If the broad group model is used, the same salvage schedule is applied to each vintage. Chapter 6 contains an illustration of the application of a single salvage schedule to each vintage. Table 6.11 of that chapter is a salvage schedule used in the calculation of the annual accrual using both the AL and ELG procedures. The salvage ratio during the 0.0–0.5 year age interval is −15%, and it increases (becomes more negative) at an annual rate of 5%. These ratios are used with the ELG procedure. The Iowa S0–12 curve describes the life characteristics of each vintage. The resulting ASR, −28%, is used with the AL procedure. The FSR at the start of each age interval is matched to the appropriate vintage. Depending on the depreciation system, the CAD of the future accrual is then calculated using the proper FSR. Thus, a single salvage schedule provides the information to calculate the annual accrual for each vintage.

If the vintage group model is applied to salvage, a different salvage schedule is applied to each vintage. The calculation of the schedule for the 1981 vintage is shown in Table 14.6. It results in the ASR and the FSR for

the 1981 vintage, and similar calculations must be made for all other vintages. The vintage group model, which uses observed life and observed salvage data to construct the realized portion of the schedule, is a refinement of the broad group model. It has the advantage of more accurately reflecting the actual world transactions then does the broad group model.

THE SIMULATION OF SALVAGE BY AGE

It is not uncommon to record only the total salvage during the year. The data shown in Table 14.3 are of this type. Estimates of the ASR and an average FSR must be based on the unaged salvage data. When retirements are recorded by age, an alternate method of using this data is available. The alternative requires the depreciation professional to adopt a salvage model and use it to allocate the total annual salvage to each vintage. The result is salvage by age, as shown in Table 14.1, except the data are simulated rather than observed. The simulated data can be used in the manner described earlier in this chapter. However, the simulated data cannot be used to verify the model because to do so would be circular logic.

Table 14.7 (see end of chapter) shows how the $10.42 cost of retiring during 1970 can be allocated to the 1962 through 1970 vintages *if* the cost of retiring model discussed earlier in this chapter is adopted. The depreciation professional must be familiar with the account Utility Devices so that he or she can judge whether the model will result in a reasonable representation of the cost of retiring. Column (a) shows the vintage year and column (b) shows the original cost of the retirements during the 1970 calendar year. Column (c) shows the consumer price index (CPI-U) for July of the vintage year. Column (d) shows the ratio of the CPI-U for the vintage year to the CPI-U for the 1970 calendar year. For 1963, the ratio 61.0/39.0 or 1.56 suggests that a dollar spent in 1963 would purchase 1.56 times as much as a dollar spent in 1970. Column (e) is the product of column (b) times column (d), and represents a restatement of the vintage dollars to 1970 price level dollars. The $14.00 retired in 1963 are restated as $21.90 in the 1970 price level.

Thus, entries in column (e) are proportional to the *units* retired during 1970 *if* the model is applicable *and* the CPI-U is an appropriate index. The entries in column (e) are used as weights to allocate the $10.42 cost of retiring. Column (f) is the entry from column (e) divided by the sum of column (e). The fraction of the $10.42 allocated to the 1963 vintage is 21.90/61.84 or 0.3541. The allocation to the 1962 vintage is 0.3541 × 10.42 or $3.69, as shown in column (g). If this process is repeated for each calendar year, the result is the simulated cost of retiring by age. The simulated data can be used to construct salvage schedules similar to the schedule shown in Table 14.5.

SUMMARY

It is desirable to analyze gross salvage and cost of retiring separately. The two salvage schedules can be combined to find the average net salvage ratio and the future net salvage ratios by age. Data that reflect salvage by age, rather than only the total annual salvage, provide valuable information.

In practice, the procedure for estimating salvage varies widely. The depreciation professional's judgment of whether a procedure is reasonable is based on several variables. These include the magnitude of the salvage ratio, the available data, and the importance of the depreciable group. It is not unusual for a mass property account of a utility to exhibit large negative salvage. In such cases, the depreciation accrual rate may be more sensitive to the salvage estimate than to the life estimate.

If both the realized gross salvage and realized cost of retiring are near zero, extensive analyses may not be productive because the depreciation calculations are not sensitive to salvage ratios near zero. In such cases, the key to forecasting is predicting whether there will be a significant change in future operations that will change the levels of gross salvage or cost of retiring.

Often the only available data are the total annual gross salvage and cost of retiring. An example of this type of data is shown in Table 14.3. When analyzing unaged salvage, remember that realized salvage depends on the age of the retirements. Realized salvage starts at zero and does not reach the average until the final unit in the group is retired. Thus, the average age of the annual retirements and the average life of the group are important variables. Continuous property groups showing growth typically have large differences between the average age of the retirements and the average life of the group.

Salvage ratios are a function of inflation. For long-lived property, the salvage associated with the longest-lived property is affected most. However, this effect may not be reflected in the data for some time. A mathematical model that includes the effect of salvage can be a valuable forecasting tool. Salvage data by age contains information helpful for constructing and verifying a mathematical model.

NOTES

1. Cost of retiring is also called cost of removal.
2. See Chapter 4 for a discussion of inflation and salvage ratios.

Table 14.1 The cost of retiring by age for Account 897.

Account 897 - Utility Devices

Cost of Retiring

Calendar Year	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	
Year installed																							
1962	1.92	1.87	3.21	.72	2.42	2.77	5.04	.87	.00	.00	.00	2.51	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
1963	.00	.89	3.17	1.84	2.75	2.51	5.34	4.37	5.06	9.89	2.29	4.13	3.96	4.00	3.16	3.07	4.09	.00	.00	.00	.00	.00	.00
1964	.66	.50	1.00	1.94	1.06	2.35	2.99	6.77	18.36	15.50	11.02	1.33	4.63	3.93	.00	.00	.00	.00	.00	.00	.00	.00	.00
1965	.00	1.54	.00	2.93	2.21	2.66	2.74	1.76	1.40	.00	2.40	3.15	2.12	13.34	5.10	3.61	.00	.00	.00	.00	.00	.00	.00
1966	1.71	1.96	1.75	2.88	4.88	3.20	4.68	11.57	5.82	.77	14.60	2.59	3.08	26.85	2.27	1.23	1.70	12.56	3.94	9.68	.00	.00	12.45
1967	.00	.44	.89	3.26	3.70	8.84	4.14	6.40	6.67	2.99	2.64	10.61	2.50	12.68	4.68	8.78	6.71	5.44	.00	.00	.00	.00	.00
1968	.00	.44	.40	.50	.00	.89	.95	1.58	1.76	2.33	2.24	2.50	2.46	4.79	19.23	6.67	6.79	8.46	4.55	.00	10.78	.00	2.
1969		.00	.00	2.25	.00	.00	.00	.00	.56	.00	10.12	.00	7.55	.00	.00	.00	7.25	.00	.00	.00	.00	.00	8.
1970			.00	.20	.19	1.58	.80	.81	.88	2.48	1.73	2.35	3.64	3.15	1.93	2.81	2.30	1.70	3.83	2.39	.00	2.66	
1971				.00	.71	.63	2.03	1.49	1.57	2.79	3.19	4.26	2.95	5.85	.87	4.47	4.92	.00	8.62	13.47	9.09	11.60	.00
1972					1.02	.41	1.30	2.83	3.13	7.03	7.97	6.78	7.29	9.98	4.44	20.88	4.34	6.09	.00	4.20	5.40	5.38	6.
1973						1.72	.00	.00	.00	2.11	11.54	7.09	5.56	3.41	15.67	10.23	9.82	24.77	10.68	16.94	.00	.00	6.
1974							.00	.22	.73	1.86	.56	2.48	2.01	2.86	4.97	4.59	3.20	2.80	1.37	3.44	4.86	5.19	2.
1975								.00	.00	.00	.00	.00	1.54	2.00	9.31	8.46	5.52	3.94	2.52	1.78	3.73	3.61	.0
1976									.00	3.29	1.65	10.88	8.86	20.24	7.16	27.59	9.78	7.55	23.88	10.28	8.16	5.71	5.
1977										1.46	.00	.00	1.10	.85	2.13	4.15	3.82	6.49	20.16	24.95	23.93	7.00	
1978											.00	.99	.00	2.02	.00	5.39	.00	26.01	7.82	9.10	8.52	7.06	.00
1979												.00	.00	.00	.00	1.91	5.92	8.76	5.36	11.44	9.95	8.95	4.38
1980													.64	.00	.00	.95	.00	22.51	4.96	11.11	9.96	9.82	1.89
1981														1.22	.00	.45	.90	.66	1.39	2.57	2.39	3.11	.00
1982															1.05	1.14	.00	.00	1.48	.44	.51	2.67	2.40
1983																.00	.00	.46	.92	1.24	1.64	2.30	.27
1984																	.00	.00	.00	.00	.00	8.11	.00
1985																		2.18	.93	1.48	2.28	3.66	.00
1986																			.75	.00	.00	.00	.00
1987																				.00	.00	1.69	.45
1988																					1.43	1.15	.00
1989																						.00	.00
1990																							.00
Total	4.28	7.65	10.42	16.51	18.93	27.57	30.02	38.67	45.94	52.48	71.96	61.65	59.89	117.16	81.97	116.39	77.04	140.41	103.17	124.50	102.63	89.68	53.38

Table 14.2. The salvage ratios (SR) by age for Account 897.

Account 897 - Utility Devices

Salvage Ratios ** All Ratios Are Negative

Calendar Year	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Year installed																							
1962	23.9	31.2	29.2	35.8	34.5	30.8	38.8	43.3	.0	.0	.0	50.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
1963	.0	22.2	22.6	30.6	22.9	31.4	31.4	36.4	31.6	44.9	45.7	45.9	56.6	66.7	63.2	61.4	68.2	.0	.0	.0	.0	.0	.0
1964	22.0	25.1	25.0	27.7	26.6	29.4	33.2	29.4	36.0	35.2	36.7	44.4	57.9	49.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
1965	.0	25.6	.0	22.6	27.6	26.6	30.5	35.2	35.0	.0	48.0	45.0	52.9	55.6	63.8	72.2	.0	.0	.0	.0	.0	.0	.0
1966	24.4	24.5	25.0	26.2	22.2	26.7	29.2	36.2	32.3	38.4	38.4	43.2	51.3	62.4	56.7	61.4	56.7	66.1	65.6	74.5	.0	.0	83.0
1967	.0	22.2	22.3	21.7	28.4	23.9	31.9	37.6	35.1	33.2	37.7	44.2	50.1	52.8	58.4	58.5	67.1	60.4	.0	.0	.0	.0	.0
1968	.0	22.0	20.2	24.8	.0	22.2	31.8	31.6	35.3	38.8	32.1	41.7	49.2	53.2	60.1	60.7	61.7	60.5	56.9	.0	77.0	.0	.0
1969		.0	.0	20.5	.0	.0	.0	.0	28.1	.0	34.9	.0	44.4	.0	.0	.0	55.7	.0	.0	.0	.0	.0	70.9
1970			.0	20.2	19.1	22.6	26.7	27.1	29.2	31.0	34.6	39.2	45.5	45.0	48.2	46.8	46.1	56.8	63.8	59.8	60.6	66.5	68.2
1971				.0	17.8	21.0	22.6	29.8	26.1	31.0	31.9	38.8	42.1	41.8	43.5	44.7	49.2	.0	50.7	53.9	54.0	58.0	.0
1972					20.3	20.5	25.9	28.3	28.5	30.6	28.4	37.7	38.4	39.9	44.4	47.5	48.2	50.8	.0	52.5	53.9	67.2	57.3
1973						21.5	.0	.0	.0	26.4	31.2	37.3	39.7	37.8	36.4	46.5	49.1	48.6	50.9	54.7	.0	.0	61.2
1974							.0	22.1	24.4	23.3	27.8	31.0	33.4	40.8	45.2	41.7	45.7	46.7	45.8	49.1	53.9	51.9	45.8
1975								.0	.0	.0	.0	.0	30.8	33.3	35.8	35.2	34.5	39.4	42.1	44.5	46.7	45.1	44.5
1976									.0	21.9	23.6	29.4	26.8	33.2	34.1	32.1	37.6	37.8	44.2	41.1	40.8	44.0	.0
1977										18.2	.0	.0	27.4	28.5	30.5	34.6	34.7	32.4	38.0	39.6	43.5	35.0	44.5
1978											.0	24.7	.0	25.2	.0	33.7	.0	32.5	34.0	35.0	34.1	35.3	.0
1979												.0	.0	.0	.0	27.3	29.6	27.4	28.2	29.3	33.2	35.8	33.7
1980													21.5	.0	.0	23.8	.0	26.5	26.1	29.2	29.3	33.9	31.4
1981														20.4	.0	22.7	22.4	22.0	23.2	25.7	26.6	28.3	.0
1982															20.9	22.8	.0	.0	24.6	21.9	25.4	26.7	24.0
1983																.0	.0	23.1	23.1	24.9	23.5	28.8	26.8
1984																	.0	.0	.0	.0	.0	23.2	.0
1985																		21.8	23.3	18.5	22.8	24.4	.0
1986																			18.8	.0	.0	.0	.0
1987																				.0	.0	21.1	22.5
1988																					17.9	19.2	.0
1989																						.0	.0
1990																							.0

Table 14.3. Salvage ratios by calendar year for Account 897, Utility Devices. Column (d) is the SR for a single year and column (h) is the average SR for 3-year rolling bands.

Year (a)	Dollars retired (b)	Cost of retiring (c)	SR % (d)	Years (e)	Dollars retired (f)	Cost of retiring (g)	SR % (h)
1968	18.00	-4.28	-23.8				
1969	30.00	-7.65	-25.5	1968-70	90.00	-22.35	-24.8
1970	42.00	-10.42	-24.8	1969-71	140.00	-34.57	-24.7
1971	68.00	-16.51	-24.3	1970-72	186.00	-45.86	-24.7
1972	76.00	-18.93	-24.9	1971-73	252.00	-63.01	-25.0
1973	108.00	-27.57	-25.5	1972-74	281.00	-76.51	-27.2
1974	97.00	-30.02	-30.9	1973-75	320.00	-96.25	-30.1
1975	115.00	-38.67	-33.6	1974-76	350.00	-114.62	-32.7
1976	138.00	-45.94	-33.3	1975-77	415.00	-137.09	-33.0
1977	162.00	-52.48	-32.4	1976-78	510.00	-170.38	-33.4
1978	210.00	-71.96	-34.3	1977-79	535.00	-186.08	-34.8
1979	163.00	-61.65	-37.8	1978-80	524.00	-193.49	-36.9
1980	151.00	-59.89	-39.7	1979-81	574.00	-238.69	-41.6
1981	260.00	-117.16	-45.1	1980-82	597.00	-259.01	-43.4
1982	186.00	-81.97	-44.1	1981-83	733.00	-315.51	-43.0
1983	287.00	-116.39	-40.6	1982-84	644.00	-275.40	-42.8
1984	171.00	-77.04	-45.1	1983-85	834.00	-333.84	-40.0
1985	376.00	-140.41	-37.3	1984-86	806.00	-320.62	-39.8
1986	259.00	-103.17	-39.8	1985-87	943.00	-368.09	-39.0
1987	308.00	-124.50	-40.4	1986-88	823.00	-330.31	-40.1
1988	256.00	-102.63	-40.1	1987-89	814.00	-316.81	-38.9
1989	250.00	-89.68	-35.9	1988-90	606.00	-245.69	-40.4
1990	102.00	-53.38	-52.3				
Total	3833.00	-1452.28	-37.9				

Table 14.4. Aged cost of retiring for the 1970 through 1972 vintage, as extracted from Table 14.1. The lower portion of the table adjusts the annual cost of retiring to the price level during the year the property was installed using the consumer price index for all urban consumers (CPI-U) from the U.S. Bureau of Labor Statistics, 1982-1984 = 100.

	70	71	72	73	74	75	76	77	78
1970	.00	-.20	-.19	-.58	-.80	-.81	-.88	-2.48	-1.73
1971		.00	-.71	-2.03	-2.03	-1.49	-1.57	-2.79	-3.19
1972			-1.02	-3.41	-1.30	-2.83	-3.13	-7.03	-7.97
CPI-U	39.00	40.70	41.90	42.30	49.40	54.20	57.10	61.00	65.70
1970	.00	-.19	-.18	-1.09	-.63	-.59	-.60	-1.58	-1.03
1971		.00	-.69	-2.58	-1.67	-1.12	-1.12	-1.86	-1.98
1972			-1.02	-3.39	-1.10	-2.19	-2.30	-4.83	-5.08

Table 14.5. The salvage ratio schedule for the 1970-1992 placement band. The nonadjusted retirement cost is measured in dollars during the year of retirement. The adjusted retirement cost is measured in dollars during the year of installation.

Age interval (a)	Dollars retired (b)	Non-adj cost of retiring (c)	Non-adj SR (d)	Adjusted cost of retiring (e)	Adjusted SR (f)
0- 0.5	5.00	-1.02	-20.3	-1.02	-20.3
.5- 1.5	7.00	-1.32	-18.9	-1.27	-18.2
1.5- 2.5	9.00	-2.12	-23.5	-1.86	-20.6
2.5- 3.5	26.00	-6.44	-24.8	-5.25	-20.2
3.5- 4.5	19.00	-5.43	-28.6	-4.05	-21.3
4.5- 5.5	32.00	-9.41	-29.4	-6.53	-20.4
5.5- 6.5	40.00	-11.63	-29.1	-7.54	-18.9
6.5- 7.5	36.00	-12.45	-34.6	-7.45	-20.7
7.5- 8.5	35.00	-13.29	-38.0	-7.10	-20.3
8.5- 9.5	38.00	-15.28	-40.2	-7.27	-19.1
9.5-10.5	32.00	-13.93	-43.5	-6.22	-19.4
10.5-11.5	53.00	-24.90	-47.0	-10.46	-19.7
11.5-12.5	23.00	-10.74	-46.7	-4.34	-18.9
12.5-13.5	28.00	-13.81	-49.3	-5.39	-19.2
13.5-14.5	5.00	-2.30	-46.1	-.86	-17.3
14.5-15.5	28.00	-14.52	-51.9	-5.37	-19.2
15.5-16.5	41.00	-22.69	-55.3	-8.09	-19.7
16.5-17.5	27.00	-16.86	-62.5	-5.75	-21.3
17.5-18.5	32.00	-18.47	-57.7	-6.00	-18.8
18.5-19.5	4.00	-2.66	-66.5	-.83	-20.9
19.5-20.5	12.00	-8.18	-68.2	-2.45	-20.4

Table 14.6. The salvage schedule for the 1981 vintage. Observed values are used through age 8.5 years. The future survivor curve is an Iowa S0-12 curve. Future salvage ratios are found by inflating the SR from the previous year by 5%.

Age interval (a)	Percent surviving (b)	Percent retired (c)	SR % (d)	Wtd SR (e)	Realized SR% (f)	Future SR% (g)
0.0- 0.5	100.00	3.17	-20.40	-.65	.00	-34.81
0.5- 1.5	96.83	.00	.00	.00	-20.40	-35.29
1.5- 2.5	96.83	1.06	-22.40	-.24	-20.40	-35.29
2.5- 3.5	95.77	2.12	-22.00	-.47	-20.90	-35.43
3.5- 4.5	93.65	1.59	-23.20	-.37	-21.27	-35.73
4.5- 5.5	92.06	3.17	-25.70	-.82	-21.65	-35.95
5.5- 6.5	88.89	5.29	-26.60	-1.41	-22.81	-36.32
6.5- 7.5	83.60	4.76	-28.30	-1.35	-24.03	-36.93
7.5- 8.5	78.84	5.82	.00	.00	-24.99	-37.45
8.5- 9.5	73.02	5.77	-29.72	-1.71	-19.60	-40.44
9.5-10.5	67.25	5.92	-31.20	-1.85	-21.38	-41.36
10.5-11.5	61.33	6.02	-32.76	-1.97	-22.89	-42.34
11.5-12.5	55.31	6.06	-34.40	-2.09	-24.22	-43.38
12.5-13.5	49.24	6.02	-36.12	-2.18	-25.43	-44.48
13.5-14.5	43.22	5.92	-37.92	-2.24	-26.57	-45.65
14.5-15.5	37.30	5.78	-39.82	-2.30	-27.64	-46.88
15.5-16.5	31.52	5.53	-41.81	-2.31	-28.67	-48.17
16.5-17.5	25.99	5.25	-43.90	-2.30	-29.65	-49.52
17.5-18.5	20.74	4.88	-46.10	-2.25	-30.59	-50.94
18.5-19.5	15.86	4.43	-48.40	-2.15	-31.49	-52.44
19.5-20.5	11.43	3.90	-50.82	-1.98	-32.34	-54.00
20.5-21.5	7.53	3.26	-53.36	-1.74	-33.12	-55.65
21.5-22.5	4.27	2.48	-56.03	-1.39	-33.81	-57.39
22.5-23.5	1.79	1.52	-58.83	-.89	-34.37	-59.28
23.5-24.5	.27	.27	-61.78	-.17	-34.74	-61.78
24.5-25.5	.00	.00	-64.86	.00	-34.81	
				-34.81		

Table 14.7. Allocation of the total cost of retiring during 1970, $10.42, to each vintage.

Year (a)	Retired (b)	CPI-U (c)	Ratio of CPI-U to 39.00 (d)	Adjusted retired (e)	Factor (f)	Allocated cost of retiring (g)
1962	11.00	65.7	1.68	18.53	.2996	3.12
1963	14.00	61.0	1.56	21.90	.3541	3.69
1964	4.00	57.1	1.46	5.86	.0947	.99
1965	0.00	54.2	1.39	.00	.0000	.00
1966	7.00	49.4	1.27	8.87	.1434	1.49
1967	4.00	44.3	1.14	4.54	.0735	.77
1968	2.00	41.9	1.07	2.15	.0347	.36
1969	0.00	40.7	1.04	.00	.0000	.00
1970	0.00	39.0	1.00	.00	.0000	.00
	42.00			61.84		10.42