

# INCOME AND CAPITALIZATION APPROACHES 

## UNDERSTANDING AND USING CAPITALIZATION TABLES

The appraisal of the type of properties covered in this book will not require any great use of compound interest tables but the well-informed broker of small properties should understand their use. Capitalization tables may be needed in the appraisal of business properties under lease. For example, you might be requested to appraise a gasoline service station property where the land is under a net lease for a period of years. Such an appraisal could involve two interests-the lessor (property owner) and the lessee (the oil company). Assuming the land lease runs for 30 years at $\$ 300$ per month, the estimated value of the lessor's interest becomes primarily a question of knowing the value of the income stream plus the value of the land (reversion) at the end of the lease. In addition, you need to develop the proper interest rate for investments of this type. Since the lessee is a triple A-rated oil company, let this example assume that a 9 percent rate would be indicated in the market.

## Using Annual Tables

You are now ready to refer to Table I, This is an annual table, so it is necessary to convert the rent to an annual amount as shown: $\$ 300$ x 12 months or $\$ 3600$. Table I shows the Present Worth of One Dollar per Annum at Interest Rates of 3 percent to 15 percent for periods of One to Fifty Years, so you can follow the column under 9 percent down to 30 years where you find the worth of One Dollar per year as being 10.274 dollars. When you want the value of $\$ 3600$, it becomes a matter of computation, thus

$$
\text { \$3,600. x } 10.274 \text { (P/W \$1 year @ 9\% - } 30 \text { years) = \$36, } 986.40
$$

In this example, you have estimated the value of the income stream for the investor allowing the investor a 9 percent net return, disregarding income taxes. If the market indicated the investor would demand a 14 percent return, you would simply follow the $14 \%$ column to the line opposite 30 years and you find the factor 7. 003. This rate would compute:

$$
\$ 3600 \times 7.003 \text { (P/W \$1 per year @ 14\% - } 30 \text { years) = \$25,210.80 }
$$

## Using Monthly Tables

It should be pointed out that the preceding computations are not entirely correct because rent is normally payable monthly in advance, whereas Table I is an annual table assuming payment at the end of the year. The difference that would result from use of the monthly table would not be great, but it can demonstrate the need for a book of monthly tables. Such a book Present Worth Factors for Monthly Payments in Advance and Reversionary Interest has been prepared by Harvey P. Jeffers, and is available from the Society of Real Estate Appraisers Foundation. Because of the required space, no monthly tables will be included here.

## How to Allow For Rent Increases

In the preceding example, let us change the rent and assume that the rental increased each ten years and became:

First ten years @ \$300. mo. or \$3600. yr.
Second ten years @ \$350. mo. or \$4200. yr.
Third ten years @ \$400. mo. or \$4800. yr.
In developing the estimated value of the above income stream, your computations would be:

| $1^{\text {st }} 10 \mathrm{yrs}$. | \$3,600 x 6.418 (P/W \$1 yr. @ 9\%-10 yrs.) = \$23,104.80 |
| :---: | :---: |
| $2^{\text {nd }} 10$ yrs. | 9.128 (P/W \$1 yr. @ 9\%-20 yrs.) |
| Less | 6.418 (P/W \$1 yr. @ 9\%-10 yrs.) |
|  | \$4,200 x $2.710=\$ 11,382.00$ |
| $3^{\text {rd }} 10 \mathrm{yrs}$. | 10.274 (P/W \$1 yr. @ 9\%-30 yrs.) |
| Less | 9.128 (P/W \$1 yr. @ 9\%-20 yrs.) |
|  | \$4,800 x $1.146=\$ 5,500.80$ |
| Total | estimated value of income stream \$39,987.60 |

Note that the rental is computed for the first 10 years by using the 9 percent rate for a 10 -year period. For the second 10 years it was necessary to use the 9 percent-20-year factor (9.128) and subtract the 9 percent10 -year factor (6.418), leaving 2.710 as the factor applicable to the second 10 -year renal of $\$ 4,200$. per year, producing a value of $\$ 11,382.00$ The third 10 -year period followed the same principle, except that the factor for 9 percent-30 years (10.274) was used and the 9 percent-20-year factor (9.128) was subtracted, leaving a factor of 1.146 applicable to the third 10 -years’ rental of $\$ 4,800$ per year, which produces a value of \$5,500.80

Here is a summary of the estimated values for each ten year period:
Where the investor demanded a 14 percent return instead of 9 percent, it reduced the estimated value of the net $\$ 3600$ annual income stream for 30 years from $\$ 36,986.40$ to $\$ 25,210.80$.

Here is a summary of the estimated values for each ten year period:

$$
\begin{array}{lr}
\text { First ten years @ \$300 mo. or \$3600 yr. } & \$ 23,104.80 \\
\text { Second ten years @ \$350 mo. or \$4200 yr. } & 11,382.00 \\
\text { Third ten years @ \$400 mo. or \$4800 yr. } & \underline{5,500.80} \\
& \$ 39,987.60
\end{array}
$$

## How to Compute Lessor's Interest

Thus far, we have discussed the value of the Income Stream. To compute an estimate of the lessor's (owner's) interest, it is necessary to estimate the value of the land reversion (land at end of lease period) and add it to the value of the Income Stream. Factors for the Present Worth of One Dollar, showing factors for three percent to fifteen percent over periods of one year to fifty years, are listed in Table II.

In computing the estimated value of the Reversion, the example will continue to use the 9 percent interest rate and the 30 -year lease period. However, before making any computation, it is necessary to know the estimated market value of the subject land free and clear of any lease. Developing the present value of the land free and clear can best be done by market data. In other words, what was the sale price for similar vacant land which was free and clear? In this example, let us assume that the subject land, if free and clear, would bring $\$ 40,000$. We will not attempt to use any crystal ball, but will assume that the subject land, at the end of 30 years, will still have a market value of $\$ 40,000$.

Our problem now becomes a question of computing the amount an investor would pay for the $\$ 40,000$ vacant parcel, based upon a 9 percent net return with possession of the Land deferred for 30 years. In Table II, the factor under nine percent opposite 30 years is .0754 . This is the value of $\$ 1$ discounted at nine percent for 30 years, and it is used to discount the $\$ 40,000$ parcel as follows:

$$
\text { \$40, } 000 \text { x . } 0754 \text { (P/W \$1 @1 9\%-30 yrs.) = \$3,016 }
$$

On the basis of yielding a net 9 percent return with possession at end of 30 years, the investor would pay \$3,016 for the vacant land.

It should be noted that estimates of the present free and clear market value could vary materially with only a small effect on the discounted value. For example, let us assume a current free and clear market value of the subject parcel as vacant land of $\$ 50,000$ instead of $\$ 40,000$. The discounted value would be:

$$
\text { \$50, } 000 \times .0754 \text { (P/W \$1 @ 9\% - } 30 \text { yrs. ) = \$3,770 }
$$

The difference of $\$ 750$ becomes less significant when we complete the estimate of the lessor's interest as follows:

Estimated Value of Income Stream \$3600 yr. @ 9\% - 30 yrs.
\$36, 986. 40
Estimated Value of Reversion @ 9\%-30 yrs. 3, 016. 00
3,016.00
TOTAL ESTIMATED VALUE-Lessor's Interest
\$40,002.40
Rounded to
\$40,000.00
In the preceding example, the land, free and clear, as vacant ground was estimated to have a market value of $\$ 40,000$. The lessor's interest also was estimated at $\$ 40,000$. When the estimate based upon market data-for the subject as vacant land free of lease-is equal to the estimate based upon income stream plus reversion, then the lease has added no value to the land. From this we know that the lease rental is at the market.

## How to Compute Leasehold Interest

Suppose, however, that a vacant corner lot with the same area and frontage, located directly across the street from the subject sold recently for $\$ 100,000$. Further assume that each lot has equal zoning, traffic conditions and other qualities making the subject just as desirable as the lot which sold for $\$ 100,000$. Under these conditions, it is reasonable to believe that the subject lot, if free and clear of the 30year lease would have a market value of about $\$ 100,000$. Thus the lessee has a leasehold interest in the land, as shown in the following computation:
Estimated Value of the Whole (Land free and clear) \$100,000.00 Lessor's Interest-Income Stream
\$39,986.40
Lessor's Interest-Land Reversion \$100,000 x . $0754=$ 7,540.00 47,526.40 \$52,473.60
Rounded to $\quad \$ 52,500.00$

| Years | 3\% | 4\% | $41 / 2 \%$ | 5\% | $51 / 2 \%$ | 6\% | $61 / 2 \%$ | 7\% | $71 / 2 \%$ | 8\% | 9\% | 10\% | 11\% | 12\% | 13\% | 14\% | 15\% |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 0.971 | 0.961 | 0.957 | 0.952 | 0.948 | 0.943 | 0.939 | 0.935 | 0.930 | 0.926 | 0.917 | 0.909 | 0.901 | 0.893 | 0.885 | 0.877 | 0.870 |
| 2 | 1.913 | 1.886 | 1.873 | 1.859 | 1.846 | 1.833 | 1.821 | 1.803 | 1.796 | 1.783 | 1.759 | 1.736 | 1.713 | 1.690 | 1.668 | 1.647 | 1.626 |
| 3 | 2.829 | 2.775 | 2.749 | 2.723 | 2.698 | 2.673 | 2.648 | 2.624 | 2.600 | 2.577 | 2.531 | 2.487 | 2.444 | 2.402 | 2.361 | 2.322 | 2.283 |
| 4 | 3.717 | 3.630 | 3.587 | 3.546 | 3.505 | 3.465 | 3.426 | 3.387 | 3.349 | 3.312 | 3.240 | 3.170 | 3.102 | 3.037 | 2.974 | 2.914 | 2.855 |
| 5 | 4.580 | 4.452 | 4.390 | 4.329 | 4.270 | 4.212 | 4.156 | 4.100 | 4.046 | 3.993 | 3.890 | 3.791 | 3.696 | 3.605 | 3.517 | 3.433 | 3.352 |
| 6 | 5.417 | 5.242 | 5.158 | 5.076 | 4.996 | 4.917 | 4.841 | 4.766 | 4.694 | 4.623 | 4.486 | 4.355 | 4.231 | 4.111 | 3.998 | 3.889 | 3.785 |
| 7 | 6.230 | 6.002 | 5.893 | 5.786 | 5.683 | 5.582 | 5.485 | 5.389 | 5.297 | 5.206 | 5.033 | 4.868 | 4.712 | 4.564 | 4.423 | 4.288 | 4.160 |
| 8 | 7.020 | 6.733 | 6.596 | 53463 | 6.334 | 6.210 | 6.089 | 5.971 | 5.857 | 5.747 | 5.535 | 5.335 | 5.146 | 4.968 | 4.799 | 4.639 | 4.487 |
| 9 | 7.786 | 7.435 | 7.269 | 7.108 | 6.952 | 6.802 | 6.656 | 6.515 | 6.379 | 6.247 | 5.995 | 5.759 | 5.537 | 5.328 | 5.132 | 4.946 | 4.772 |
| 10 | 8.530 | 8.111 | 7.913 | 7.722 | 7.538 | 7.360 | 7.189 | 7.024 | 6.864 | 6.710 | 6.418 | 6.145 | 5.889 | 5.650 | 5.426 | 5.216 | 5.019 |
| 11 | 9.253 | 8.760 | 8.529 | 8.306 | 8.093 | 7.887 | 7.689 | 7.499 | 7.315 | 7.139 | 6.805 | 6.495 | 6.206 | 5.938 | 5.687 | 5.453 | 5.234 |
| 12 | 9.954 | 9.385 | 9.118 | 8.863 | 8.618 | 8.384 | 8.159 | 7.943 | 7.735 | 7.536 | 7.161 | 6.814 | 6.492 | 6.194 | 5.918 | 5.660 | 5.421 |
| 13 | 10.635 | 9.986 | 9.683 | 9.394 | 9.117 | 8.853 | 8.600 | 8.358 | 8.126 | 7.904 | 7.487 | 7.103 | 6.750 | 6.424 | 6.122 | 5.842 | 5.583 |
| 14 | 11.296 | 10.563 | 10.233 | 9.899 | 9.590 | 9.295 | 9.014 | 8.745 | 8.489 | 8.244 | 7.786 | 7.367 | 6.982 | 6.628 | 6.302 | 6.002 | 5.724 |
| 15 | 11.938 | 11.118 | 10.739 | 10.380 | 10.038 | 9.712 | 9.403 | 9.108 | 8.827 | 8.559 | 8.061 | 7.606 | 7.191 | 6.811 | 6.462 | 6.142 | 5.847 |
| 16 | 12.561 | 11.652 | 11.234 | 10.838 | 10.462 | 10.106 | 9.768 | 9.447 | 9.142 | 8.851 | 8.313 | 7.824 | 7.379 | 6.974 | 6.604 | 6.265 | 5.954 |
| 17 | 13.166 | 12.166 | 11.707 | 11.274 | 10.865 | 10.477 | 10.110 | 9.763 | 9.434 | 9.122 | 8.544 | 8.022 | 7.549 | 7.120 | 6.729 | 6.373 | 6.047 |
| 18 | 13.753 | 12.659 | 12.160 | 11.690 | 11.246 | 10.828 | 10.432 | 10.359 | 9.706 | 9.372 | 8.756 | 8.201 | 7.702 | 7.250 | 6.840 | 6.467 | 6.128 |
| 19 | 14.324 | 13.134 | 12.593 | 12.085 | 11.608 | 11.158 | 10.735 | 10.336 | 9.959 | 9.604 | 8.950 | 8.365 | 7.839 | 7.366 | 6.938 | 6.550 | 6.198 |
| 20 | 14.877 | 13.590 | 13.008 | 12.462 | 11.950 | 11.470 | 11.019 | 10.594 | 10.194 | 9.818 | 9.128 | 8.514 | 7.963 | 7.469 | 7.025 | 6.623 | 6.259 |
| 21 | 15.415 | 14.029 | 13.405 | 12.821 | 12.275 | 11.764 | 11.285 | 10.835 | 10.413 | 10.017 | 9.292 | 8.649 | 8.075 | 7.562 | 7.102 | 6.687 | 6.312 |
| 22 | 15.937 | 14.451 | 13.784 | 13.163 | 12.583 | 12.042 | 11.535 | 11.061 | 10.617 | 10.201 | 9.442 | 8.772 | 8.176 | 7.645 | 7.170 | 6.743 | 6.359 |
| 23 | 16.444 | 14.857 | 14.148 | 13.489 | 12.875 | 12.303 | 11.770 | 11.272 | 10.807 | 10.371 | 9.580 | 8.883 | 8.266 | 7.718 | 7.230 | 6.792 | 6.399 |
| 24 | 16.935 | 15.247 | 14.495 | 13.799 | 13.152 | 12.550 | 11.991 | 11.469 | 10.983 | 10.529 | 9.707 | 8.985 | 8.348 | 7.784 | 7.283 | 6.835 | 6.434 |
| 25 | 17.413 | 15.622 | 14.828 | 14.094 | 13.414 | 12.783 | 12.198 | 11.654 | 11.147 | 10.675 | 9.823 | 9.077 | 8.422 | 7.843 | 7.330 | 6.873 | 6.464 |
| 26 | 17.877 | 15.983 | 15.147 | 14.375 | 13.662 | 13.003 | 12.392 | 11.826 | 11.299 | 10.810 | 9.929 | 9.161 | 8.488 | 7.896 | 7.372 | 6.906 | 6.491 |
| 27 | 18.327 | 16.330 | 15.451 | 14.643 | 13.898 | 13.210 | 12.575 | 11.987 | 11.441 | 10.925 | 10.026 | 9.237 | 8.548 | 7.943 | 7.409 | 6.935 | 6.513 |
| 28 | 18.764 | 16.663 | 15.743 | 14.898 | 14.121 | 13.406 | 12.746 | 12.137 | 11.573 | 11.051 | 10.116 | 9.307 | 8.602 | 7.984 | 7.441 | 6.961 | 6.534 |
| 29 | 19.188 | 16.984 | 16.022 | 15.141 | 14.333 | 13.591 | 12.907 | 12.278 | 11.696 | 11.158 | 10.198 | 9.370 | 8.650 | 8.022 | 7.470 | 6.983 | 6.551 |
| 30 | 19.600 | 17.292 | 16.289 | 15.372 | 14.534 | 13.765 | 13.059 | 12.409 | 11.810 | 11.258 | 10.274 | 9.427 | 8.694 | 8.055 | 7.496 | 7.003 | 6.566 |
| 31 | 20.000 | 17.588 | 16.544 | 15.593 | 14.724 | 13.929 | 13.201 | 12.532 | 11.917 | 11.350 | 10.343 | 9.479 | 8.733 | 8.085 | 7.518 | 7.020 | 6.579 |
| 32 | 20.389 | 17.874 | 16.789 | 15.803 | 14.904 | 14.084 | 13.334 | 12.647 | 12.015 | 11.435 | 10.406 | 9.526 | 8.769 | 8.112 | 7.538 | 7.035 | 6.590 |
| 33 | 20.766 | 18.148 | 17.023 | 16.002 | 15.075 | 14.230 | 13.459 | 12.754 | 12.107 | 11.514 | 10.464 | 9.569 | 8.801 | 8.135 | 7.556 | 7.048 | 6.600 |
| 34 | 21.132 | 18.411 | 17.247 | 16.193 | 15.237 | 14.368 | 13.577 | 12.854 | 12.193 | 11.587 | 10.518 | 9.609 | 8.829 | 8.157 | 7.572 | 7.060 | 6.609 |
| 35 | 21.487 | 18.665 | 17.461 | 16.374 | 15.390 | 14.498 | 13.687 | 12.948 | 12.272 | 11.655 | 10.567 | 9.644 | 8.855 | 8.176 | 7.586 | 7.070 | 6.617 |
| 36 | 21.832 | 18.908 | 17.666 | 16.547 | 15.536 | 14.621 | 13.791 | 13.035 | 12.347 | 11.717 | 10.612 | 9.676 | 8.879 | 8.193 | 7.598 | 7.079 | 6.623 |
| 37 | 22.167 | 19.143 | 17.862 | 16.711 | 15.674 | 14.737 | 13.888 | 13.117 | 12.415 | 11.775 | 10.653 | 9.706 | 8.900 | 8.207 | 7.609 | 7.087 | 6.629 |
| 38 | 22.492 | 19.368 | 18.050 | 16.868 | 15.805 | 14.846 | 13.979 | 13.193 | 12.479 | 11.829 | 10.691 | 9.733 | 8.919 | 8.221 | 7.618 | 7.094 | 6.634 |
| 39 | 22.808 | 19.584 | 18.230 | 17.017 | 15.929 | 14.949 | 14.065 | 13.265 | 12.539 | 11.879 | 10.726 | 9.757 | 8.936 | 8.233 | 7.627 | 7.100 | 6.638 |
| 40 | 23.115 | 19.793 | 18.401 | 17.159 | 16.046 | 15.046 | 14.145 | 13.332 | 12.594 | 11.925 | 10.757 | 9.779 | 8.951 | 8.244 | 7.634 | 7.105 | 6.642 |
| 41 | 23.412 | 19.993 | 18.566 | 17.294 | 16.157 | 15.138 | 14.221 | 13.394 | 12.646 | 11.967 | 10.786 | 9.799 | 8.965 | 8.253 | 7.641 | 7.110 | 6.645 |
| 42 | 23.701 | 20.186 | 18.724 | 17.423 | 16.263 | 15.224 | 14.292 | 13.452 | 12.694 | 12.007 | 10.813 | 9.817 | 8.977 | 8.262 | 7.647 | 7.114 | 6.648 |
| 43 | 23.982 | 20.371 | 18.874 | 17.546 | 16.363 | 15.306 | 14.359 | 13.507 | 12.738 | 12.043 | 10.838 | 9.834 | 8.989 | 8.270 | 7.652 | 7.117 | 6.650 |
| 44 | 24.254 | 20.549 | 19.018 | 17.663 | 16.458 | 15.383 | 14.421 | 13.558 | 12.780 | 12.077 | 10.861 | 9.849 | 8.999 | 8.276 | 7.657 | 7.120 | 6.652 |
| 45 | 24.519 | 20.720 | 19.156 | 17.774 | 16.548 | 15.456 | 14.480 | 13.605 | 12.819 | 12.108 | 10.881 | 9.863 | 9.008 | 8.283 | 7.661 | 7.123 | 6.654 |
| 46 | 24.775 | 20.885 | 19.288 | 17.880 | 16.633 | 15.524 | 14.535 | 13.650 | 12.855 | 12.137 | 10.900 | 9.875 | 9.016 | 8.288 | 7.664 | 7.126 | 6.656 |
| 47 | 25.025 | 21.043 | 19.415 | 17.981 | 16.714 | 15.589 | 14.587 | 13.692 | 12.888 | 12.164 | 10.918 | 9.887 | 9.024 | 8.293 | 7.668 | 7.128 | 6.657 |
| 48 | 25.267 | 21.195 | 19.536 | 18.077 | 16.790 | 15.650 | 14.636 | 13.730 | 12.919 | 12.189 | 10.933 | 9.897 | 9.030 | 8.297 | 7.670 | 7.130 | 6.659 |
| 49 | 25.502 | 21.341 | 19.651 | 18.169 | 16.863 | 15.708 | 14.682 | 13.767 | 12.948 | 12.212 | 10.948 | 9.906 | 9.036 | 8.301 | 7.673 | 7.131 | 6.660 |
| 50 | 25.730 | 21.482 | 19.762 | 18.256 | 16.931 | 15.762 | 14.724 | 13.801 | 12.975 | 12.233 | 10.962 | 9.915 | 9.042 | 8.305 | 7.675 | 7.133 | 6.661 |



