APPENDIX

A

Computerized Accounting Systems

The following is a list of some of the features that are available in accounting software programs, which may be used when determining what features your accounting system needs.

General Ledger

- ❑ Allows for the customization of the general ledger accounts
- ❑ Allows for the customization of financial statements
- ❑ Allows the user to save multiple formats for the financial statements with different levels of detail
- ❑ Allows for the tracking of multiple companies
- ❑ Fully integrated with accounts receivable, accounts payable, payroll, job cost, equipment, inventory, and purchase orders
- ❑ Posts to multiple periods
- ❑ Provides standard balancing and monthly/yearly closeout procedures

Accounts Receivable

- ❑ Generates billings using standard AIA forms and the company's own custom invoices
- ❑ Generates time and materials billings
- ❑ Time and materials billings are integrated with job cost and inventory to prevent not billing items or the double billing of items
- ❑ Allows for the billing of labor at fixed labor rates or actual labor cost plus markup when preparing time and materials billings
- ❑ Allows for different cost types to be marked up at different rates when preparing time and materials billings
- ❑ Prepares unit prices bills

- ❑ Calculates finance charges for late bills
- ❑ Reports age of accounts receivable
- ❑ Tracks retention
- ❑ Tracks income by project, phase, and/or cost code
- ❑ Tracks sales and use taxes
- ❑ Posts invoices to multiple periods
- ❑ Posts directly to general ledger, job cost ledger, and equipment ledger

Accounts Payable

- ❑ Allows the user to set up new vendors while entering invoices
- ❑ Warns the user if the invoice exceeds the contract or purchase order amount
- ❑ Allows for holds to be placed on invoices and for invoices to be partially paid
- ❑ Allows user to select invoices to be paid by job, vendor, due date, discount date, suppliers only, subcontractors only, or a combination of these
- ❑ Tracks contract amount, change orders, billings, and payments for subcontracts
- ❑ Tracks license and workers' compensation insurance expiration dates for subcontractors
- ❑ Automatically withholds workers' compensation insurance and retention from subcontractor's invoices
- ❑ Tracks sales and use taxes
- ❑ Posts invoices to multiple periods
- ❑ Posts directly to general ledger, job cost ledger, and equipment ledger
- ❑ Integrated with purchase order and inventory modules
- ❑ Includes procedures for reconciling outstanding checks
- ❑ Produces 1099s

Payroll

- ❑ Allows different pay rates for private work, union work, and prevailing wage (Davis Bacon) work
- ❑ Allows an employee to be paid different rates for performing work in different work classes
- ❑ Allows an employee to work in different states during a pay period and prepares withholding and state unemployment insurance for each state

- ❑ Allows different workers' compensation and liability insurance rates to be paid for an employee during a pay period based on the state and class of work the employee performed
- ❑ Allows for customized deductions to be deducted from the employee's check and custom fringe benefits to be added to the labor burden
- ❑ Prepares certified payroll and union reports
- ❑ Prepares the payroll checks with detailed check stubs, including hours worked at the different pay rates
- ❑ Prepares federal and state unemployment reports
- ❑ Prepares W2s
- ❑ Tracks vacation accrued for each employee
- ❑ Maintains employee information, such as social security number, driver license number, birthday, and other customized fields
- ❑ Automatically posts payroll and burden to the job cost module, equipment module, and the general ledger
- ❑ Allows for the billing of equipment from the payroll module; for example, the superintendent's truck can be billed at the same time as the superintendent is billed

Job Cost

- ❑ Allows for the customization of the job cost codes
- ❑ Allows the user to duplicate job cost coding structure and/or budgets from existing jobs to new jobs, thus decreasing job setup time
- ❑ Tracks original contract amount, change orders to the contract, current contract amount, and income by project, phase, and/or cost code
- ❑ Tracks and reports original budget, change orders to the budget, and current budget by job, phase, cost code, and cost type
- ❑ Reports over- and undervariances by comparing the current job costs to the current budget
- ❑ Tracks unit pricing for individual cost codes
- ❑ Budgets and tracks labor units (e.g., hours) and production rates (e.g., hours per square foot)
- ❑ Reports over- and undervariance for labor units by comparing the current labor units to the current budget for labor units
- ❑ Reports over- and undervariance for production rates by comparing the current production rates to the current budget production rates
- ❑ Reports burden costs separately
- ❑ Reports overtime costs separately
- ❑ Allows for job cost reports to be customized

- ❑ Tracks unbilled committed costs
- ❑ Automatically receives data from accounts receivable, accounts payable, payroll, equipment, inventory, and purchase order modules
- ❑ Provides standard balancing procedures to balance the job cost ledger against the general ledger

Equipment

- ❑ Allows for the customization of the equipment cost codes
- ❑ Allows for different billing rates for different types of jobs
- ❑ Tracks profits and losses for each piece of equipment
- ❑ Tracks ownership and operation costs separately
- ❑ Automatically receives data from accounts payable, payroll, inventory, and purchase order modules
- ❑ Equipment can be billed from the payroll module to the job at the same time the operator is billed to the job
- ❑ Tracks license and insurance information for each piece of equipment
- ❑ Tracks and maintains service schedules for each piece of equipment based on mileage or hours of use
- ❑ Allows for equipment reports to be customized
- ❑ Provides standard balancing procedures to balance the job cost ledger against the general ledger

Inventory

- ❑ Allows materials to be moved from inventory to the job, from one job to another job, or from the job back to inventory (for unused materials)
- ❑ Allows items bought in bulk to be broken up into smaller units for billing purposes
- ❑ Allows for tracking inventory locations
- ❑ Allows for multiple levels of pricing for different customer classes
- ❑ Tracks inventory on an order that has not been received
- ❑ Integrated with time and materials billings
- ❑ Posts to job cost module, equipment module, and the general ledger
- ❑ Reports profit or loss on inventory
- ❑ Allows for the balancing of actual inventory quantities against reported inventory quantities

Purchase Orders

- ❑ Includes quantity, description, and unit/total price for each item on the purchase order
- ❑ Allows for lump sum pricing
- ❑ Includes sales tax, delivery charges, and other costs
- ❑ Allows for a purchase order to be divided between multiple projects
- ❑ Integrated with accounts payable, accounts receivable, job cost, and inventory

APPENDIX

B

Excel Primer

Absolute and Relative References

By default, most cell references used in formulas are relative, which means that the cell references change as the formula is copied to another cell. For example, when a formula containing a relative reference to cell B7 is copied one column to the right, the cell reference moves one column to the right and becomes C7. Similarly, if the formula is copied one row down, the cell reference moves one row down and becomes B8.

The user may prevent the referenced cell from changing its column, row, or both when it is copied by placing a dollar sign ($) in front of the column or row portion of the cell's reference. The dollar sign makes the column or row reference that follows it absolute. For example, if the reference $B7 is used in a formula and the formula is copied one column to the right, the reference remains $B7 because the column portion of the reference is absolute and is not allowed to change. If this formula were copied one row down, the reference would become $B8 because, although the column is absolute, the row is relative. Thus, the row portion is allowed to change. This is known as an absolute column, relative row reference.

Similarly, if the reference B$7 is used in a formula and the formula is copied one column to the right, the reference changes to C$7 because the column reference is relative and is therefore allowed to change. If this formula were copied one row down, the reference would remain B$7 because the row is absolute and is thus not allowed to change. This is known as a relative column, absolute row reference.

For a reference where both the column and row are absolute, the referenced cell does not change regardless of where it is copied. Cell B7 will always be cell B7; this is known as an absolute reference.

AND Function

The AND function allows you to perform multiple tests; if they are all true, it is equal to "True"; if any one of them is false, it is equal to "False." The AND function is useful in writing IF functions. The AND function is written as

=AND(logical1,logical2, . . .)

where logical1, logical2, . . . are the logical tests to be performed. The function

=AND(D1>=12,D1<=24)

is equal to "True" if the contents of D1 is between 12 and 24, inclusive; otherwise it is equal to "False."

Drop-Down Boxes

Drop-down boxes are created by selecting Data from the Menu bar, selecting Validation. . . from the pop-up menu to bring up the Data Validation dialogue box, selecting List from the Allow: drop-down box, entering the list of values separated by a comma or selecting the cells containing the list of values in the Source: box, and pressing the enter key. The Data Validation dialogue box in Figure B-1 would create a drop-down box from which the user could select among the numbers 1, 2, and 3.

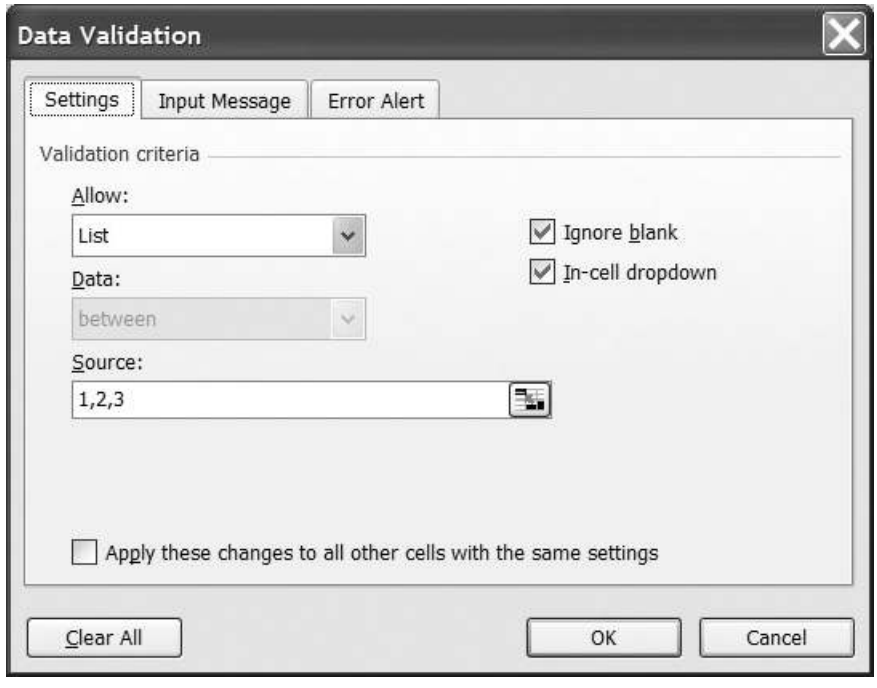

Figure B-1 Data Validation Dialogue Box

IF Function

The IF function allows the computer to select between two responses based on a logical test, selecting one response if the logical test is true and another if the logical test is false. The IF function is written as

=IF(logical_test,value_if_true,value_if_false)

where

logical_test = logical test to be performed
value_if_true = the value or function to be used if the logical test is true
value_if_false = the value or function to be used if the logical test is false

The logical test consists of three parts: (1) the value, cell, or function to be compared, (2) the type of comparison, and (3) the value, cell, or function to which it is to be compared. There are six types of comparisons that may be made. They are:

=	Equals
>	Greater Than
<	Less Than
>=	Greater Than or Equal to
<=	Less Than or Equal to
<>	Not Equal to

For example, the function

=IF(D1>=12,"Greater than or equal to 12","Less than 12")

would display "Greater than or equal to 12" if cell D1 was greater than or equal to 12 and would display "Less than 12" if cell D1 was less than 12. The AND and OR functions can be used in the logical test. For example, the function

=IF(AND(D1>=12,D1<=24),"Between 12 and 24","Out of range")

would display "Between 12 and 24" if cell D1 was greater than or equal to 12 and less than or equal to 24, and would display "Out of range," if cell D1 was greater than 24 or less than 12.

Excel can select among more than two options by using nested IF functions. In a nested IF function, the value_if_true, value_if_false, or both are replaced with IF functions. For example, the following nested IF function:

=IF(D1>=12,IF(D1<=24,"Between 12 and 24","Greater than 24"),"Less than 12")

would check to see if cell D1 was greater than or equal to twelve. If this were true it would execute the second IF function, otherwise, it would display "Less than 12." The second IF function would check to see if cell D1 was less than or equal to 24 and if so, it would display "Between 12 and 24"—otherwise it would display "Greater than 24."

	A	B
1	Cost	100000
2	Profit	=B3*0.1
3	Total Cost	=B1+B2

FIGURE B-2 Worksheet with a Circular Reference

ITERATION

Iteration may be used to handle circular references in Excel. Circular references occur when a formula references a cell that contains a formula that references the original cell. In Figure B-2, cell B3 references cell B2, which references cell B3.

When you set up the formula shown in Figure B-2, you will get an error message unless iteration has been turned on. To turn on iteration, select Tools from the Menu bar, select Options. . . from the pop-up menu to bring up the Options dialogue box, select the Calculation tab, and check the Iteration checkbox. The Calculation tab of the Options dialogue box is shown in Figure B-3.

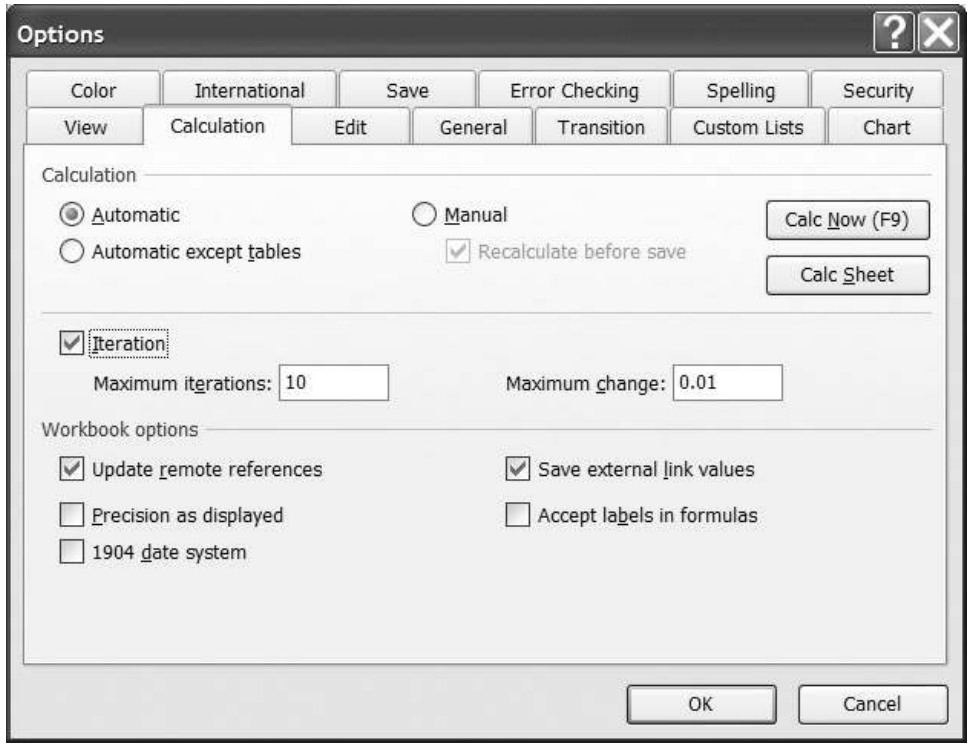

FIGURE B-3 Calculation Tab of the Options Dialogue Box

Using the spreadsheet in Figure B-2 and Options dialogue box in Figure B-3, Excel will continue to perform the calculations, first cell B2, then B3, then B2, and so forth, until it has calculated each cell 10 times or until the change is less than 0.01, whichever comes first. The user may specify the maximum number of iterations or the maximum change that Excel uses to determine when to stop iterating. Care must be used when using iteration because it increases the calculation time.

OR Function

The OR function allows you to perform multiple tests, and if any one of them is true, it is equal to "True" and if all of them are false, it is equal to "False." The OR function is useful in writing IF functions. The OR function is written as

=OR(logical1,logical2, . . .)

where logical1, logical2, . . . are the logical tests to be performed. The function

=OR(D1<12,D1>24)

is equal to "True" if the contents of D1 are less than 12 or greater than 24 and is equal to "False" if the contents of D1 are between 12 and 24.

Round Functions

Excel has five rounding functions. They are ROUND, ROUNDUP, ROUNDDOWN, CEILING, and FLOOR. The ROUND function rounds to the nearest number and is written as

=ROUND(number,num_digits)

where

number = the number, cell, or equation to be rounded

num_digits = the decimal point to be rounded to; a positive number represents digits to the right of the decimal point (for example, 2 represents hundredths) and a negative number represents digits or the left of the decimal point (for example, −1 represents tens)

The function

=ROUND(307.586,2)

rounds 307.586 to 307.59. The ROUNDUP function rounds the number up and is written the same as the ROUND function. The function

=ROUNDUP(307.586,2)

rounds 307.586 up to 307.59. The ROUNDDOWN function rounds the number down and is written the same as the ROUND function. The function

=ROUNDDOWN(307.586,2)

rounds 307.586 to 307.58.

The CEILING function rounds up to the nearest increment specified by the user. The CEILING function is written as

=CEILING(number,significance)

where

number = the number, cell, or equation to be rounded
significance = the multiple to be rounded to; for example, 0.25 would round to quarters

The function

=CEILING(307.586,0.25)

rounds 307.586 up to 307.75. The FLOOR function works like the CEILING function except it rounds down. The function

=FLOOR(307.586,0.25)

rounds 307.586 down to 307.50.

SUM Function

The SUM function allows you to add multiple cells or blocks of cells. The SUM function is written as

=SUM(number1,number2, . . .)

where number1, number2, . . . are the cells or blocks of cells to be summed. The function

=SUM(C8,C12:D14)

sums the contents of cells C8, C12, C13, C14, D12, D13, and D14.

VLOOKUP Function

The VLOOKUP function allows the user to look up values in a table. The VLOOKUP function is written as

=VLOOKUP(lookup_value,table_array,column_index_number)

where

lookup_value = the value to be looked up in the first column of the table

table_array = the cells containing the table (or array), which must be at least two columns wide

column_index_number = the column where the value to be selected is found with the left column equal to 1, the second column equal to 2, and so forth

The values in the left column of the lookup array must be listed in ascending order (−1, 0, 1, . . . , A − Z), because the VLOOKUP function stops when it finds a value in the left column that is equal to or greater than the lookup value. When the VLOOKUP function finds a value in the left column of the array equal to the lookup value, it selects the value from the same row from the column specified by the column index number. For example, using the array in Figure B-4, the function

=VLOOKUP(5,B1:E4,3)

would find 5 in the second row and return the value from the second row and the third column on the table (column D), which is 22. When the VLOOKUP function finds a value in the left column of the array greater than the lookup value, it selects the value from the previous row from the column specified by the column index number. For example, using the array in Figure B-4, the function

=VLOOKUP(6,B1:E4,4)

would find 10, which is greater than 6 in the third row and return the value from the previous (second) row and the fourth column on the table (column E), which is 32. Because the 6 located in the first column is out of numeric order, the VLOOKUP function stops at 10 and never finds the 6.

	A	B	C	D	E
1		3	11	21	31
2		5	12	22	32
3		10	13	23	33
4		6	14	24	34

FIGURE B-4 VLOOKUP Table

APPENDIX

C

Trend Analysis

When faced with projecting future costs based on a number of years of historical data, it can be difficult to see a trend. For example, Table C-1 shows ten years of historical data along with their annual growth rates, with the first year having a base rate of 1.00. These costs are also graphed in Figure C-1.

It is difficult to identify the trend for these data. This is a result of two factors. First, costs grow exponentially rather than linearly due to inflation. The relationship between costs at time zero and a time in the future may be written as follows:

$$\text{Cost}_n = \text{Cost}_0(1 + f)^n \tag{C-1}$$

TABLE C-1 Annual Costs and Growth Rates

YEAR	COSTS	GROWTH RATE (%)
0	1.00	
1	1.13	13.3
2	1.39	22.4
3	1.90	36.8
4	2.25	18.5
5	2.62	16.4
6	2.73	4.3
7	3.08	13.0
8	4.14	34.3
9	5.16	24.6

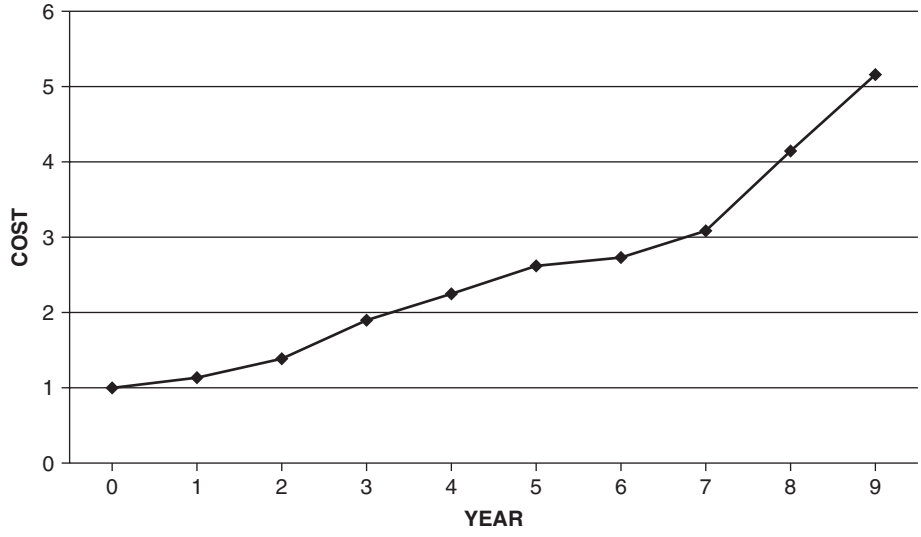

FIGURE C-1 Annual Costs

where

f = Inflation Rate
n = Number of Years

Second, the growth rate is not always constant. To deal with these two issues we may perform an exponential regression, which is a difficult task without computer software. If we take the natural log (ln) of the costs and graph the data, the exponential function forms a straight line. Taking the natural log of the costs in Table C-1 and graphing them as shown in Figure C-2, we see that they more closely follow a straight line.

To simplify the regression analysis we may convert the exponential growth to a linear growth by taking the natural log (ln) of the costs in Eq. (C-1) as follows:

$$\begin{aligned} \text{Cost}_n &= \text{Cost}_0(1+f)^n \\ \ln(\text{Cost}_n) &= \ln[\text{Cost}_0(1+f)^n] \\ \ln(\text{Cost}_n) &= \ln(\text{Cost}_0) + n\ln(1+f) \end{aligned} \tag{C-2}$$

If we let

$$y = \ln(\text{Cost}_n) \tag{C-3}$$
$$b = \ln(\text{Cost}_0) \tag{C-4}$$
$$m = \ln(1+f) \tag{C-5}$$
$$x = n \tag{C-6}$$

and substitute Equations (C-3) through (C-6) into Eq. (C-2) we get the following:

$$y = b + mx \tag{C-7}$$

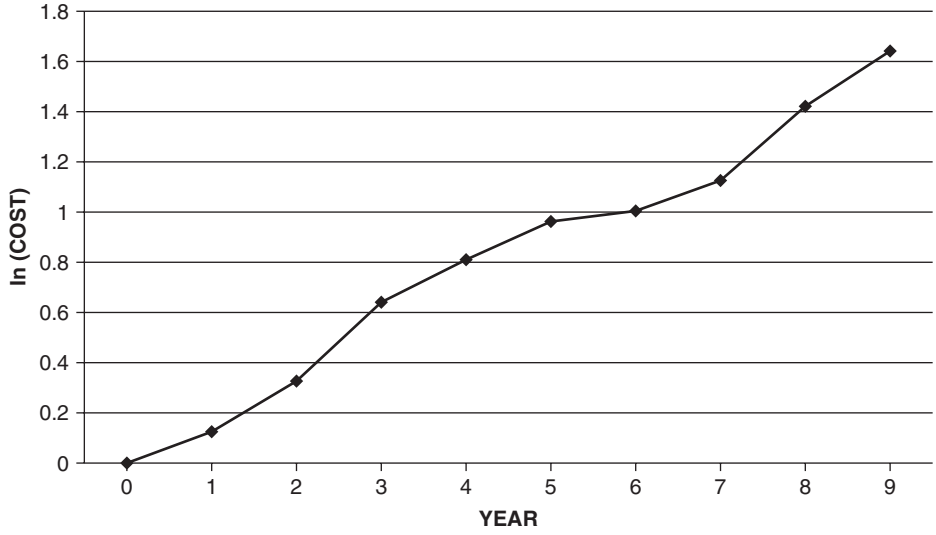

FIGURE C-2 Natural Log of Costs versus Year

This is the standard equation for linear regression, where b and m are constants. The constant m represents the slope of the line and the constant b represents the y intercept. We may then perform linear regression using x and y using the following formulas to find b and m:

$$m = \frac{n\sum xy - \sum x \sum y}{n\sum x^2 - \left(\sum x\right)^2} \tag{C-8}$$[55]

$$b = \frac{\sum y \sum x^2 - \sum x \sum xy}{n\sum x^2 - \left(\sum x\right)^2} \tag{C-9}$$

Solving Eq. (C-4) for the initial estimated cost based on the results of the regression equation we get the following:

$$\text{Cost}_0 = e^b \tag{C-10}$$

Solving Eq. (C-5) for the inflation rate (f) based on the results of the regression we get the following:

$$f = e^m - 1 \tag{C-11}$$

These values may then be used in Eq. (C-1) to project costs for any year n based on the results of the regression equation.

The accuracy of the regression line may be measured by the coefficient of determination (r^2), which measures the relationship between the actual value of y and

[55]The n in Eq. (C-1) represents the number of years where the n in Eq. (C-8) represents the number of data points. These two should not be confused.

the estimated value of y ($\hat{y}$). The coefficient of determination is the square of the correlation coefficient (r). The coefficient of determination is calculated as follows:

$$r^2 = \frac{\left(\sum y\hat{y} - \frac{\sum y \sum \hat{y}}{n}\right)^2}{\left[\sum y^2 - \frac{(\sum y)^2}{n}\right]\left[\sum \hat{y}^2 - \frac{(\sum \hat{y})^2}{n}\right]} \tag{C-12}$$

The correlation coefficient is calculated from the coefficient of determination as follows:

$$r = \sqrt{r^2} \tag{C-13}$$

Both the coefficient of determination and the correlation coefficient result in a number between 0 and 1, with 1 representing a perfect correlation and 0 representing no correlation at all.

Example C-1: Determine the inflation factor and initial estimated cost based on the exponential regression for the data in Table C-1. How good is the correlation between the actual cost and the costs based on the regression line? What is the projected cost for the next year?

Solution: First, we take the natural log of the cost so that we may use linear regression. Next, we let x equal the year and y equal the natural log of the cost. To perform linear regression we also need the sum of x, the sum of y, the sum of x^2, and the sum of xy. The results are shown in Table C-2 with the sums being shown at the bottom of each column.

TABLE C-2 Data for Linear Regression

YEAR (x)	COSTS	IN(COSTS) (y)	x^2	yx
0	1.00	0.000	0	0.000
1	1.13	0.122	1	0.122
2	1.39	0.329	4	0.658
3	1.90	0.642	9	1.926
4	2.25	0.811	16	3.244
5	2.62	0.963	25	4.815
6	2.73	1.004	36	6.024
7	3.08	1.125	49	7.875
8	4.14	1.421	64	11.368
9	5.16	1.641	81	14.769
45		8.058	285	50.801

Using Eq. (C-8) we get the following for m:

$$m = \frac{n\sum xy - \sum x \sum y}{n\sum x^2 - \left(\sum x\right)^2} = \frac{10(50.801) - 45(8.058)}{10(285) - (45)^2} = 0.1762$$

Using Eq. (C-9) we get the following for b:

$$b = \frac{\sum y \sum x^2 - \sum x \sum xy}{n\sum x^2 - \left(\sum x\right)^2} = \frac{8.058(285) - 45(50.801)}{10(285) - (45)^2} = 0.0127$$

Using Eq. (C-10) to find the initial estimated cost based on the results of the regression equation we get the following:

$$\text{Cost}_0 = e^b = e^{0.0127} = 1.013$$

This cost is close to our actual cost of 1.000 for year 0.

Using Eq. (C-11) to find the inflation rate based on the results of the regression we get the following:

$$f = e^m - 1 = e^{0.1762} - 1 = 0.193 \text{ or } 19.3\%$$

To calculate the coefficient of determination (r^2) and the correlation coefficient (r) we need to calculate the estimated value of y ($\hat{y}$), the sum of $\hat{y}$, the sum of y, the sum of y^2, and the sum of $y\,\hat{y}$. These values are found in Table C-3, with the sums shown at the bottom of each column.

The values for $\hat{y}$ were calculated as follows:

$$\hat{y}_0 = b + mx = 0.0127 + 0.1762(0) = 0.0129 \quad \text{say } 0.013$$
$$\hat{y}_1 = b + mx = 0.0127 + 0.1762(1) = 0.1889 \quad \text{say } 0.189$$

TABLE C-3 Data for Correlation

y	y^2	$\hat{y}$	$\hat{y}^2$	$y\hat{y}$
0.000	0.000	0.013	0.000	0.000
0.122	0.015	0.189	0.036	0.023
0.329	0.108	0.365	0.133	0.120
0.642	0.412	0.541	0.293	0.347
0.811	0.658	0.718	0.516	0.582
0.963	0.927	0.894	0.799	0.861
1.004	1.008	1.070	1.145	1.074
1.125	1.266	1.246	1.553	1.402
1.421	2.019	1.422	2.022	2.021
1.641	2.693	1.599	2.557	2.624
8.058	9.106	8.057	9.054	9.054

Using Eq. (C-12) to find the coefficient of determination (r^2) we get the following:

$$r^2 = \frac{\left(\sum y\hat{y} - \frac{\sum y \sum \hat{y}}{n}\right)^2}{\left[\sum y^2 - \frac{(\sum y)^2}{n}\right]\left[\sum \hat{y}^2 - \frac{(\sum \hat{y})^2}{n}\right]}$$

$$r^2 = \frac{\left(9.054 - \frac{8.058(8.057)}{10}\right)^2}{\left[9.106 - \frac{(8.058)^2}{10}\right]\left[9.054 - \frac{(8.057)^2}{10}\right]} = 0.980$$

Using Eq. (C-13) to get the correlation coefficient we get the following:

$$r = \sqrt{r^2} = \sqrt{0.980} = 0.990$$

There is a strong correlation between the regression line and the data in Table C-1.

The relationship between the year and the cost may be described by the following formula:

$$\text{Cost}_n = \text{Cost}_0(1 + f)^n = 1.013(1 + 0.193)^n$$

The cost for the next year (year 10) may be estimated as follows:

$$\text{Cost}_{10} = 1.013(1 + 0.193)^{10} = 5.916$$

Alternately, we could have graphed the data in Microsoft Excel and had Excel graph an exponential trend line as shown in Figure C-3.

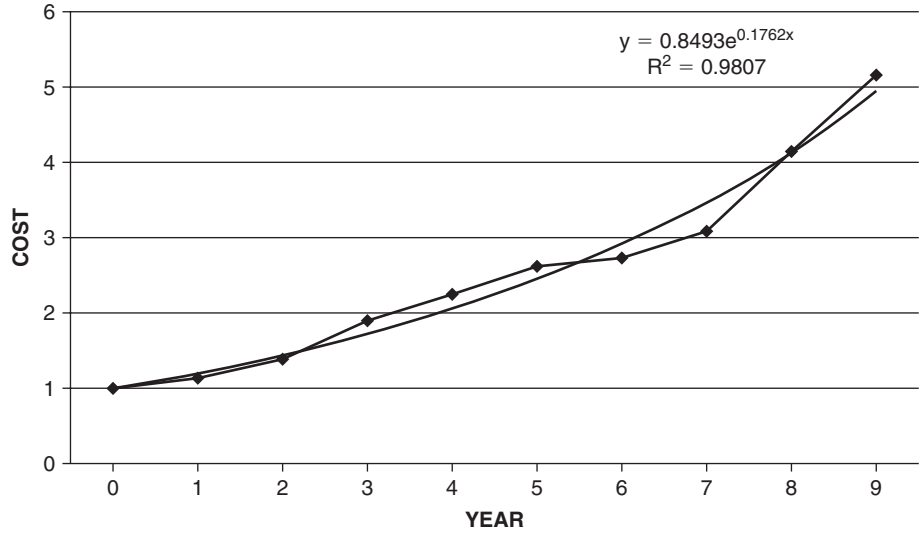

FIGURE C-3 Annual Cost with Regression Line

There are few key differences between the first solution and the solution generated by Excel. First, Excel assumes that the first data point is period 1, the second data point is period 2, and so forth. Excel also assumes that there is a data point for each period. As a result our initial cost for the cost equation generated by Microsoft Excel will occur one year prior to our first set of data (year 0) and in this case x is always one year greater than the actual year. Second, y represents the costs rather than the natural log of the costs. Third, $(1 + f)$ is expressed in the form of e^m; in this case m equals 0.1762 and $(1 + f)$ equals $e^{0.1762}$ or 1.193. By substituting $(1 + f)$ for e^m and $(n + 1)$ for x into the equation generated by Excel we get the following:

$$\text{Cost}_n = \text{Cost}_0(1 + f)^{(n+1)} = 0.849(1.193)^{(n+1)}$$
$$\text{Cost}_n = 0.849(1.193)(1.193)^n$$
$$\text{Cost}_n = 1.013(1.193)^n$$

This is the same equation we found by taking the natural log of the costs and using linear regression.

APPENDIX

D

Derivation of Selected Equations

Equation (15-1)

The future value at the end of the first year equals the principal plus interest on the principal. Writing the equation for the future value at the end of the first year using the generic variables of P, i, and F we get the following:

$$F_1 = P + Pi$$

Combining terms we get the following:

$$F_1 = P(1 + i)$$

Writing the equation for the future value at the end of the second year using the generic variables of P, i, and F we get the following:

$$F_2 = F_1 + F_1(i)$$

where

$$F_1 = P(1 + i)$$

Substituting $P(1 + i)$ for F_1 and combining terms we get the following:

$$F_2 = F_1 + F_1(i) = P(1 + i) + P(1 + i)i = P(1 + i)(1 + i) = P(1 + i)^2$$

Writing the equation for the future value at the end of the third year using the generic variables of P, i, and F we get the following:

$$F_3 = F_2 + F_2(i)$$

where

$$F_2 = P(1 + i)^2$$

Substituting $P(1 + i)^2$ for F_2 and combining terms we get the following:

$$F_3 = F_2 + F_2(i) = P(1 + i)^2 + P(1 + i)^2 i = P(1 + i)^2(1 + i) = P(1 + i)^3$$

Extrapolating this series out to the nth period we get the following formula:

$$F = P(1 + i)^n \qquad (15\text{-}1)$$

EQUATION (15-5)

Summing the future values of a uniform series we get the following:

$$F = F_1 + F_2 + F_3 + \cdots + F_n \tag{D-1}$$

where F and F_n occur at the same point in time. Substituting the present values for F_1 through F_n into Eq. (D-1) we get the following:

$$F = P_1(1 + i)^{n-1} + P_2(1 + i)^{n-2} + P_3(1 + i)^{n-3} + \cdots + P_n(1 + i)^{n-n} \tag{D-2}$$

Because $(1 + i)^{n-n}$ equals 1, Eq. (D-2) may be written as follows:

$$F = P_1(1 + i)^{n-1} + P_2(1 + i)^{n-2} + \cdots + P_n$$

Since $P_1 = P_2 = P_3 = \cdots = P_n$ is a uniform series, we may substitute A for each of these values to get the following:

$$F = A(1 + i)^{n-1} + A(1 + i)^{n-2} + \cdots + A$$

Combining terms we get the following:

$$F = A[(1 + i)^{n-1} + (1 + i)^{n-2} + \cdots + 1] \tag{D-3}$$

Adding $(1 + i)$ to both sides of Eq. (D-3) we get the following:

$$F(1 + i) = A[(1 + i)^n + (1 + i)^{n-1} + \cdots + (1 + i)] \tag{D-4}$$

Subtracting Eq. (D-3) from Eq. (D-4) we get the following:

$$\begin{aligned} F(1 + i) &= A[(1 + i)^n + (1 + i)^{n-1} + \cdots + (1 + i)] \\ F &= A[(1 + i)^{n-1} + (1 + i)^{n-2} + \cdots + 1] \\ \hline Fi &= A[(1 + i)^n - 1] \\ Fi &= A[(1 + i)^n - 1] \end{aligned}$$

And solving for F we get the following:

$$F = A[(1 + i)^n - 1]/i \tag{15-5}$$

EQUATION (16-16)

Equation (16-16) is derived as follows: The cash flow for the equation is as shown in Figure D-1.

The present value at time zero of the monthly payments is written using Eq. (15-9) as follows:

$$P_{\text{Monthly Payments}} = A[(1 + i)^t - 1]/[i(1 + i)^t]$$

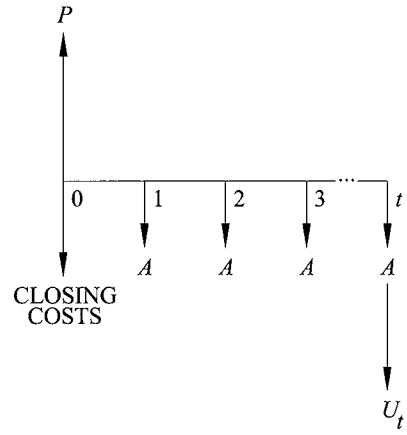

FIGURE D-1 Cash Flow for Eq. (16-16)

The present value at time zero of the loan payoff at the end of month t is written using Eq. (15-3) as follows:

$$P_{\text{Unpaid Balance}} = F/(1 + i)^t = U_t/(1 + i)^t$$

The present value for the loan should be zero at an interest rate of i; therefore, the present value of the cash receipts must equal the present value of the cash disbursements. Setting the present value of the cash receipts equal to the cash disbursements we get the following:

$$P = \text{Closing Costs} + A[(1 + i)^t - 1]/[i(1 + i)^t] + U_t/(1 + i)^t \quad (16\text{-}16)$$

EQUATION (16-17)

Equation (16-17) is derived as follows: The cash flow for the equation is as shown in Figure D-2.

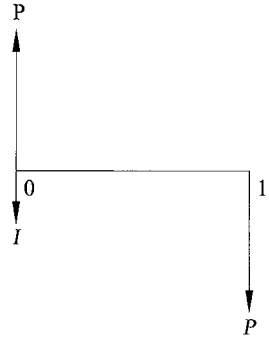

FIGURE D-2 Cash Flow for Eq. (16-17)

The present value at time zero of the principal payment at the end of the period may be written as follows using Eq. (15-3):

$$P_{\text{Principal Payment}} = P/(1 + i)^1 = P/(1 + i)$$

The present value for the loan should be zero at an interest rate of i; therefore, the present value of the cash receipts must equal the present value of the cash disbursements. Setting the present value of the cash receipts equal to the cash disbursements we get the following:

$$P = I + P/(1 + i)$$

Subtracting I from both sides of the equation we get the following:

$$P - I = P/(1 + i)$$

Multiplying both sides of the equation by $(1 + i)$ we get the following:

$$(P - I)(1 + i) = P$$

Dividing both sides of the equation by $(P - I)$ we get the following:

$$1 + i = P/(P - I)$$

Subtracting 1 from both sides of the equation we get the following:

$$i = [P/(P - I)] - 1 \qquad (16\text{-}17)$$

APPENDIX

E

Interest Factors

TABLE E-1 Interest Factors for 0.50%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.0050	0.9950	1.0000	1.0000	0.9950	1.0050
2	1.0100	0.9901	2.0050	0.4988	1.9851	0.5038
3	1.0151	0.9851	3.0150	0.3317	2.9702	0.3367
4	1.0202	0.9802	4.0301	0.2481	3.9505	0.2531
5	1.0253	0.9754	5.0503	0.1980	4.9259	0.2030
6	1.0304	0.9705	6.0755	0.1646	5.8964	0.1696
7	1.0355	0.9657	7.1059	0.1407	6.8621	0.1457
8	1.0407	0.9609	8.1414	0.1228	7.8230	0.1278
9	1.0459	0.9561	9.1821	0.1089	8.7791	0.1139
10	1.0511	0.9513	10.2280	0.0978	9.7304	0.1028
11	1.0564	0.9466	11.2792	0.0887	10.6770	0.0937
12	1.0617	0.9419	12.3356	0.0811	11.6189	0.0861
13	1.0670	0.9372	13.3972	0.0746	12.5562	0.0796
14	1.0723	0.9326	14.4642	0.0691	13.4887	0.0741
15	1.0777	0.9279	15.5365	0.0644	14.4166	0.0694
16	1.0831	0.9233	16.6142	0.0602	15.3399	0.0652
17	1.0885	0.9187	17.6973	0.0565	16.2586	0.0615
18	1.0939	0.9141	18.7858	0.0532	17.1728	0.0582
19	1.0994	0.9096	19.8797	0.0503	18.0824	0.0553
20	1.1049	0.9051	20.9791	0.0477	18.9874	0.0527
21	1.1104	0.9006	22.0840	0.0453	19.8880	0.0503
22	1.1160	0.8961	23.1944	0.0431	20.7841	0.0481
23	1.1216	0.8916	24.3104	0.0411	21.6757	0.0461
24	1.1272	0.8872	25.4320	0.0393	22.5629	0.0443
25	1.1328	0.8828	26.5591	0.0377	23.4456	0.0427
26	1.1385	0.8784	27.6919	0.0361	24.3240	0.0411
27	1.1442	0.8740	28.8304	0.0347	25.1980	0.0397
28	1.1499	0.8697	29.9745	0.0334	26.0677	0.0384
29	1.1556	0.8653	31.1244	0.0321	26.9330	0.0371
30	1.1614	0.8610	32.2800	0.0310	27.7941	0.0360
35	1.1907	0.8398	38.1454	0.0262	32.0354	0.0312
40	1.2208	0.8191	44.1588	0.0226	36.1722	0.0276
45	1.2516	0.7990	50.3242	0.0199	40.2072	0.0249
50	1.2832	0.7793	56.6452	0.0177	44.1428	0.0227
55	1.3156	0.7601	63.1258	0.0158	47.9814	0.0208
60	1.3489	0.7414	69.7700	0.0143	51.7256	0.0193
65	1.3829	0.7231	76.5821	0.0131	55.3775	0.0181
70	1.4178	0.7053	83.5661	0.0120	58.9394	0.0170
75	1.4536	0.6879	90.7265	0.0110	62.4136	0.0160
80	1.4903	0.6710	98.0677	0.0102	65.8023	0.0152
85	1.5280	0.6545	105.5943	0.0095	69.1075	0.0145
90	1.5666	0.6383	113.3109	0.0088	72.3313	0.0138
95	1.6061	0.6226	121.2224	0.0082	75.4757	0.0132
100	1.6467	0.6073	129.3337	0.0077	78.5426	0.0127

TABLE E-2 Interest Factors for 0.75%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.0075	0.9926	1.0000	1.0000	0.9926	1.0075
2	1.0151	0.9852	2.0075	0.4981	1.9777	0.5056
3	1.0227	0.9778	3.0226	0.3308	2.9556	0.3383
4	1.0303	0.9706	4.0452	0.2472	3.9261	0.2547
5	1.0381	0.9633	5.0756	0.1970	4.8894	0.2045
6	1.0459	0.9562	6.1136	0.1636	5.8456	0.1711
7	1.0537	0.9490	7.1595	0.1397	6.7946	0.1472
8	1.0616	0.9420	8.2132	0.1218	7.7366	0.1293
9	1.0696	0.9350	9.2748	0.1078	8.6716	0.1153
10	1.0776	0.9280	10.3443	0.0967	9.5996	0.1042
11	1.0857	0.9211	11.4219	0.0876	10.5207	0.0951
12	1.0938	0.9142	12.5076	0.0800	11.4349	0.0875
13	1.1020	0.9074	13.6014	0.0735	12.3423	0.0810
14	1.1103	0.9007	14.7034	0.0680	13.2430	0.0755
15	1.1186	0.8940	15.8137	0.0632	14.1370	0.0707
16	1.1270	0.8873	16.9323	0.0591	15.0243	0.0666
17	1.1354	0.8807	18.0593	0.0554	15.9050	0.0629
18	1.1440	0.8742	19.1947	0.0521	16.7792	0.0596
19	1.1525	0.8676	20.3387	0.0492	17.6468	0.0567
20	1.1612	0.8612	21.4912	0.0465	18.5080	0.0540
21	1.1699	0.8548	22.6524	0.0441	19.3628	0.0516
22	1.1787	0.8484	23.8223	0.0420	20.2112	0.0495
23	1.1875	0.8421	25.0010	0.0400	21.0533	0.0475
24	1.1964	0.8358	26.1885	0.0382	21.8891	0.0457
25	1.2054	0.8296	27.3849	0.0365	22.7188	0.0440
26	1.2144	0.8234	28.5903	0.0350	23.5422	0.0425
27	1.2235	0.8173	29.8047	0.0336	24.3595	0.0411
28	1.2327	0.8112	31.0282	0.0322	25.1707	0.0397
29	1.2420	0.8052	32.2609	0.0310	25.9759	0.0385
30	1.2513	0.7992	33.5029	0.0298	26.7751	0.0373
35	1.2989	0.7699	39.8538	0.0251	30.6827	0.0326
40	1.3483	0.7416	46.4465	0.0215	34.4469	0.0290
45	1.3997	0.7145	53.2901	0.0188	38.0732	0.0263
50	1.4530	0.6883	60.3943	0.0166	41.5664	0.0241
55	1.5083	0.6630	67.7688	0.0148	44.9316	0.0223
60	1.5657	0.6387	75.4241	0.0133	48.1734	0.0208
65	1.6253	0.6153	83.3709	0.0120	51.2963	0.0195
70	1.6872	0.5927	91.6201	0.0109	54.3046	0.0184
75	1.7514	0.5710	100.1833	0.0100	57.2027	0.0175
80	1.8180	0.5500	109.0725	0.0092	59.9944	0.0167
85	1.8873	0.5299	118.3001	0.0085	62.6838	0.0160
90	1.9591	0.5104	127.8790	0.0078	65.2746	0.0153
95	2.0337	0.4917	137.8225	0.0073	67.7704	0.0148
100	2.1111	0.4737	148.1445	0.0068	70.1746	0.0143

TABLE E-3 Interest Factors for 1.00%

	Single Payment		Uniform Series			
	Compound-Amount Factor	Present-Worth Factor	Compound-Amount Factor	Sinking-Fund Factor	Present-Worth Factor	Capital-Recovery Factor
	Convert *P* to *F*	Convert *F* to *P*	Convert *A* to *F*	Convert *F* to *A*	Convert *A* to *P*	Convert *P* to *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.0100	0.9901	1.0000	1.0000	0.9901	1.0100
2	1.0201	0.9803	2.0100	0.4975	1.9704	0.5075
3	1.0303	0.9706	3.0301	0.3300	2.9410	0.3400
4	1.0406	0.9610	4.0604	0.2463	3.9020	0.2563
5	1.0510	0.9515	5.1010	0.1960	4.8534	0.2060
6	1.0615	0.9420	6.1520	0.1625	5.7955	0.1725
7	1.0721	0.9327	7.2135	0.1386	6.7282	0.1486
8	1.0829	0.9235	8.2857	0.1207	7.6517	0.1307
9	1.0937	0.9143	9.3685	0.1067	8.5660	0.1167
10	1.1046	0.9053	10.4622	0.0956	9.4713	0.1056
11	1.1157	0.8963	11.5668	0.0865	10.3676	0.0965
12	1.1268	0.8874	12.6825	0.0788	11.2551	0.0888
13	1.1381	0.8787	13.8093	0.0724	12.1337	0.0824
14	1.1495	0.8700	14.9474	0.0669	13.0037	0.0769
15	1.1610	0.8613	16.0969	0.0621	13.8651	0.0721
16	1.1726	0.8528	17.2579	0.0579	14.7179	0.0679
17	1.1843	0.8444	18.4304	0.0543	15.5623	0.0643
18	1.1961	0.8360	19.6147	0.0510	16.3983	0.0610
19	1.2081	0.8277	20.8109	0.0481	17.2260	0.0581
20	1.2202	0.8195	22.0190	0.0454	18.0456	0.0554
21	1.2324	0.8114	23.2392	0.0430	18.8570	0.0530
22	1.2447	0.8034	24.4716	0.0409	19.6604	0.0509
23	1.2572	0.7954	25.7163	0.0389	20.4558	0.0489
24	1.2697	0.7876	26.9735	0.0371	21.2434	0.0471
25	1.2824	0.7798	28.2432	0.0354	22.0232	0.0454
26	1.2953	0.7720	29.5256	0.0339	22.7952	0.0439
27	1.3082	0.7644	30.8209	0.0324	23.5596	0.0424
28	1.3213	0.7568	32.1291	0.0311	24.3164	0.0411
29	1.3345	0.7493	33.4504	0.0299	25.0658	0.0399
30	1.3478	0.7419	34.7849	0.0287	25.8077	0.0387
35	1.4166	0.7059	41.6603	0.0240	29.4086	0.0340
40	1.4889	0.6717	48.8864	0.0205	32.8347	0.0305
45	1.5648	0.6391	56.4811	0.0177	36.0945	0.0277
50	1.6446	0.6080	64.4632	0.0155	39.1961	0.0255
55	1.7285	0.5785	72.8525	0.0137	42.1472	0.0237
60	1.8167	0.5504	81.6697	0.0122	44.9550	0.0222
65	1.9094	0.5237	90.9366	0.0110	47.6266	0.0210
70	2.0068	0.4983	100.6763	0.0099	50.1685	0.0199
75	2.1091	0.4741	110.9128	0.0090	52.5871	0.0190
80	2.2167	0.4511	121.6715	0.0082	54.8882	0.0182
85	2.3298	0.4292	132.9790	0.0075	57.0777	0.0175
90	2.4486	0.4084	144.8633	0.0069	59.1609	0.0169
95	2.5735	0.3886	157.3538	0.0064	61.1430	0.0164
100	2.7048	0.3697	170.4814	0.0059	63.0289	0.0159

TABLE E-4 Interest Factors for 1.25%

	Single Payment		Uniform Series			
	Compound-Amount Factor	Present-Worth Factor	Compound-Amount Factor	Sinking-Fund Factor	Present-Worth Factor	Capital-Recovery Factor
	Convert *P* to *F*	Convert *F* to *P*	Convert *A* to *F*	Convert *F* to *A*	Convert *A* to *P*	Convert *P* to *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.0125	0.9877	1.0000	1.0000	0.9877	1.0125
2	1.0252	0.9755	2.0125	0.4969	1.9631	0.5094
3	1.0380	0.9634	3.0377	0.3292	2.9265	0.3417
4	1.0509	0.9515	4.0756	0.2454	3.8781	0.2579
5	1.0641	0.9398	5.1266	0.1951	4.8178	0.2076
6	1.0774	0.9282	6.1907	0.1615	5.7460	0.1740
7	1.0909	0.9167	7.2680	0.1376	6.6627	0.1501
8	1.1045	0.9054	8.3589	0.1196	7.5681	0.1321
9	1.1183	0.8942	9.4634	0.1057	8.4623	0.1182
10	1.1323	0.8832	10.5817	0.0945	9.3455	0.1070
11	1.1464	0.8723	11.7139	0.0854	10.2178	0.0979
12	1.1608	0.8615	12.8604	0.0778	11.0793	0.0903
13	1.1753	0.8509	14.0211	0.0713	11.9302	0.0838
14	1.1900	0.8404	15.1964	0.0658	12.7706	0.0783
15	1.2048	0.8300	16.3863	0.0610	13.6005	0.0735
16	1.2199	0.8197	17.5912	0.0568	14.4203	0.0693
17	1.2351	0.8096	18.8111	0.0532	15.2299	0.0657
18	1.2506	0.7996	20.0462	0.0499	16.0295	0.0624
19	1.2662	0.7898	21.2968	0.0470	16.8193	0.0595
20	1.2820	0.7800	22.5630	0.0443	17.5993	0.0568
21	1.2981	0.7704	23.8450	0.0419	18.3697	0.0544
22	1.3143	0.7609	25.1431	0.0398	19.1306	0.0523
23	1.3307	0.7515	26.4574	0.0378	19.8820	0.0503
24	1.3474	0.7422	27.7881	0.0360	20.6242	0.0485
25	1.3642	0.7330	29.1354	0.0343	21.3573	0.0468
26	1.3812	0.7240	30.4996	0.0328	22.0813	0.0453
27	1.3985	0.7150	31.8809	0.0314	22.7963	0.0439
28	1.4160	0.7062	33.2794	0.0300	23.5025	0.0425
29	1.4337	0.6975	34.6954	0.0288	24.2000	0.0413
30	1.4516	0.6889	36.1291	0.0277	24.8889	0.0402
35	1.5446	0.6474	43.5709	0.0230	28.2079	0.0355
40	1.6436	0.6084	51.4896	0.0194	31.3269	0.0319
45	1.7489	0.5718	59.9157	0.0167	34.2582	0.0292
50	1.8610	0.5373	68.8818	0.0145	37.0129	0.0270
55	1.9803	0.5050	78.4225	0.0128	39.6017	0.0253
60	2.1072	0.4746	88.5745	0.0113	42.0346	0.0238
65	2.2422	0.4460	99.3771	0.0101	44.3210	0.0226
70	2.3859	0.4191	110.8720	0.0090	46.4697	0.0215
75	2.5388	0.3939	123.1035	0.0081	48.4890	0.0206
80	2.7015	0.3702	136.1188	0.0073	50.3867	0.0198
85	2.8746	0.3479	149.9682	0.0067	52.1701	0.0192
90	3.0588	0.3269	164.7050	0.0061	53.8461	0.0186
95	3.2548	0.3072	180.3862	0.0055	55.4211	0.0180
100	3.4634	0.2887	197.0723	0.0051	56.9013	0.0176

TABLE E-5 Interest Factors for 1.50%

	Single Payment		Uniform Series			
	Compound-Amount Factor	Present-Worth Factor	Compound-Amount Factor	Sinking-Fund Factor	Present-Worth Factor	Capital-Recovery Factor
	Convert *P* to *F*	Convert *F* to *P*	Convert *A* to *F*	Convert *F* to *A*	Convert *A* to *P*	Convert *P* to *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.0150	0.9852	1.0000	1.0000	0.9852	1.0150
2	1.0302	0.9707	2.0150	0.4963	1.9559	0.5113
3	1.0457	0.9563	3.0452	0.3284	2.9122	0.3434
4	1.0614	0.9422	4.0909	0.2444	3.8544	0.2594
5	1.0773	0.9283	5.1523	0.1941	4.7826	0.2091
6	1.0934	0.9145	6.2296	0.1605	5.6972	0.1755
7	1.1098	0.9010	7.3230	0.1366	6.5982	0.1516
8	1.1265	0.8877	8.4328	0.1186	7.4859	0.1336
9	1.1434	0.8746	9.5593	0.1046	8.3605	0.1196
10	1.1605	0.8617	10.7027	0.0934	9.2222	0.1084
11	1.1779	0.8489	11.8633	0.0843	10.0711	0.0993
12	1.1956	0.8364	13.0412	0.0767	10.9075	0.0917
13	1.2136	0.8240	14.2368	0.0702	11.7315	0.0852
14	1.2318	0.8118	15.4504	0.0647	12.5434	0.0797
15	1.2502	0.7999	16.6821	0.0599	13.3432	0.0749
16	1.2690	0.7880	17.9324	0.0558	14.1313	0.0708
17	1.2880	0.7764	19.2014	0.0521	14.9076	0.0671
18	1.3073	0.7649	20.4894	0.0488	15.6726	0.0638
19	1.3270	0.7536	21.7967	0.0459	16.4262	0.0609
20	1.3469	0.7425	23.1237	0.0432	17.1686	0.0582
21	1.3671	0.7315	24.4705	0.0409	17.9001	0.0559
22	1.3876	0.7207	25.8376	0.0387	18.6208	0.0537
23	1.4084	0.7100	27.2251	0.0367	19.3309	0.0517
24	1.4295	0.6995	28.6335	0.0349	20.0304	0.0499
25	1.4509	0.6892	30.0630	0.0333	20.7196	0.0483
26	1.4727	0.6790	31.5140	0.0317	21.3986	0.0467
27	1.4948	0.6690	32.9867	0.0303	22.0676	0.0453
28	1.5172	0.6591	34.4815	0.0290	22.7267	0.0440
29	1.5400	0.6494	35.9987	0.0278	23.3761	0.0428
30	1.5631	0.6398	37.5387	0.0266	24.0158	0.0416
35	1.6839	0.5939	45.5921	0.0219	27.0756	0.0369
40	1.8140	0.5513	54.2679	0.0184	29.9158	0.0334
45	1.9542	0.5117	63.6142	0.0157	32.5523	0.0307
50	2.1052	0.4750	73.6828	0.0136	34.9997	0.0286
55	2.2679	0.4409	84.5296	0.0118	37.2715	0.0268
60	2.4432	0.4093	96.2147	0.0104	39.3803	0.0254
65	2.6320	0.3799	108.8028	0.0092	41.3378	0.0242
70	2.8355	0.3527	122.3638	0.0082	43.1549	0.0232
75	3.0546	0.3274	136.9728	0.0073	44.8416	0.0223
80	3.2907	0.3039	152.7109	0.0065	46.4073	0.0215
85	3.5450	0.2821	169.6652	0.0059	47.8607	0.0209
90	3.8189	0.2619	187.9299	0.0053	49.2099	0.0203
95	4.1141	0.2431	207.6061	0.0048	50.4622	0.0198
100	4.4320	0.2256	228.8030	0.0044	51.6247	0.0194

TABLE E-6 Interest Factors for 1.75%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.0175	0.9828	1.0000	1.0000	0.9828	1.0175
2	1.0353	0.9659	2.0175	0.4957	1.9487	0.5132
3	1.0534	0.9493	3.0528	0.3276	2.8980	0.3451
4	1.0719	0.9330	4.1062	0.2435	3.8309	0.2610
5	1.0906	0.9169	5.1781	0.1931	4.7479	0.2106
6	1.1097	0.9011	6.2687	0.1595	5.6490	0.1770
7	1.1291	0.8856	7.3784	0.1355	6.5346	0.1530
8	1.1489	0.8704	8.5075	0.1175	7.4051	0.1350
9	1.1690	0.8554	9.6564	0.1036	8.2605	0.1211
10	1.1894	0.8407	10.8254	0.0924	9.1012	0.1099
11	1.2103	0.8263	12.0148	0.0832	9.9275	0.1007
12	1.2314	0.8121	13.2251	0.0756	10.7395	0.0931
13	1.2530	0.7981	14.4565	0.0692	11.5376	0.0867
14	1.2749	0.7844	15.7095	0.0637	12.3220	0.0812
15	1.2972	0.7709	16.9844	0.0589	13.0929	0.0764
16	1.3199	0.7576	18.2817	0.0547	13.8505	0.0722
17	1.3430	0.7446	19.6016	0.0510	14.5951	0.0685
18	1.3665	0.7318	20.9446	0.0477	15.3269	0.0652
19	1.3904	0.7192	22.3112	0.0448	16.0461	0.0623
20	1.4148	0.7068	23.7016	0.0422	16.7529	0.0597
21	1.4395	0.6947	25.1164	0.0398	17.4475	0.0573
22	1.4647	0.6827	26.5559	0.0377	18.1303	0.0552
23	1.4904	0.6710	28.0207	0.0357	18.8012	0.0532
24	1.5164	0.6594	29.5110	0.0339	19.4607	0.0514
25	1.5430	0.6481	31.0275	0.0322	20.1088	0.0497
26	1.5700	0.6369	32.5704	0.0307	20.7457	0.0482
27	1.5975	0.6260	34.1404	0.0293	21.3717	0.0468
28	1.6254	0.6152	35.7379	0.0280	21.9870	0.0455
29	1.6539	0.6046	37.3633	0.0268	22.5916	0.0443
30	1.6828	0.5942	39.0172	0.0256	23.1858	0.0431
35	1.8353	0.5449	47.7308	0.0210	26.0073	0.0385
40	2.0016	0.4996	57.2341	0.0175	28.5942	0.0350
45	2.1830	0.4581	67.5986	0.0148	30.9663	0.0323
50	2.3808	0.4200	78.9022	0.0127	33.1412	0.0302
55	2.5965	0.3851	91.2302	0.0110	35.1354	0.0285
60	2.8318	0.3531	104.6752	0.0096	36.9640	0.0271
65	3.0884	0.3238	119.3386	0.0084	38.6406	0.0259
70	3.3683	0.2969	135.3308	0.0074	40.1779	0.0249
75	3.6735	0.2722	152.7721	0.0065	41.5875	0.0240
80	4.0064	0.2496	171.7938	0.0058	42.8799	0.0233
85	4.3694	0.2289	192.5393	0.0052	44.0650	0.0227
90	4.7654	0.2098	215.1646	0.0046	45.1516	0.0221
95	5.1972	0.1924	239.8402	0.0042	46.1479	0.0217
100	5.6682	0.1764	266.7518	0.0037	47.0615	0.0212

TABLE E-7 Interest Factors for 2.00%

	Single Payment		Uniform Series			
	Compound-Amount Factor	Present-Worth Factor	Compound-Amount Factor	Sinking-Fund Factor	Present-Worth Factor	Capital-Recovery Factor
	Convert *P* to *F*	Convert *F* to *P*	Convert *A* to *F*	Convert *F* to *A*	Convert *A* to *P*	Convert *P* to *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.0200	0.9804	1.0000	1.0000	0.9804	1.0200
2	1.0404	0.9612	2.0200	0.4950	1.9416	0.5150
3	1.0612	0.9423	3.0604	0.3268	2.8839	0.3468
4	1.0824	0.9238	4.1216	0.2426	3.8077	0.2626
5	1.1041	0.9057	5.2040	0.1922	4.7135	0.2122
6	1.1262	0.8880	6.3081	0.1585	5.6014	0.1785
7	1.1487	0.8706	7.4343	0.1345	6.4720	0.1545
8	1.1717	0.8535	8.5830	0.1165	7.3255	0.1365
9	1.1951	0.8368	9.7546	0.1025	8.1622	0.1225
10	1.2190	0.8203	10.9497	0.0913	8.9826	0.1113
11	1.2434	0.8043	12.1687	0.0822	9.7868	0.1022
12	1.2682	0.7885	13.4121	0.0746	10.5753	0.0946
13	1.2936	0.7730	14.6803	0.0681	11.3484	0.0881
14	1.3195	0.7579	15.9739	0.0626	12.1062	0.0826
15	1.3459	0.7430	17.2934	0.0578	12.8493	0.0778
16	1.3728	0.7284	18.6393	0.0537	13.5777	0.0737
17	1.4002	0.7142	20.0121	0.0500	14.2919	0.0700
18	1.4282	0.7002	21.4123	0.0467	14.9920	0.0667
19	1.4568	0.6864	22.8406	0.0438	15.6785	0.0638
20	1.4859	0.6730	24.2974	0.0412	16.3514	0.0612
21	1.5157	0.6598	25.7833	0.0388	17.0112	0.0588
22	1.5460	0.6468	27.2990	0.0366	17.6580	0.0566
23	1.5769	0.6342	28.8450	0.0347	18.2922	0.0547
24	1.6084	0.6217	30.4219	0.0329	18.9139	0.0529
25	1.6406	0.6095	32.0303	0.0312	19.5235	0.0512
26	1.6734	0.5976	33.6709	0.0297	20.1210	0.0497
27	1.7069	0.5859	35.3443	0.0283	20.7069	0.0483
28	1.7410	0.5744	37.0512	0.0270	21.2813	0.0470
29	1.7758	0.5631	38.7922	0.0258	21.8444	0.0458
30	1.8114	0.5521	40.5681	0.0246	22.3965	0.0446
35	1.9999	0.5000	49.9945	0.0200	24.9986	0.0400
40	2.2080	0.4529	60.4020	0.0166	27.3555	0.0366
45	2.4379	0.4102	71.8927	0.0139	29.4902	0.0339
50	2.6916	0.3715	84.5794	0.0118	31.4236	0.0318
55	2.9717	0.3365	98.5865	0.0101	33.1748	0.0301
60	3.2810	0.3048	114.0515	0.0088	34.7609	0.0288
65	3.6225	0.2761	131.1262	0.0076	36.1975	0.0276
70	3.9996	0.2500	149.9779	0.0067	37.4986	0.0267
75	4.4158	0.2265	170.7918	0.0059	38.6771	0.0259
80	4.8754	0.2051	193.7720	0.0052	39.7445	0.0252
85	5.3829	0.1858	219.1439	0.0046	40.7113	0.0246
90	5.9431	0.1683	247.1567	0.0040	41.5869	0.0240
95	6.5617	0.1524	278.0850	0.0036	42.3800	0.0236
100	7.2446	0.1380	312.2323	0.0032	43.0984	0.0232

TABLE E-8 Interest Factors for 2.50%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.0250	0.9756	1.0000	1.0000	0.9756	1.0250
2	1.0506	0.9518	2.0250	0.4938	1.9274	0.5188
3	1.0769	0.9286	3.0756	0.3251	2.8560	0.3501
4	1.1038	0.9060	4.1525	0.2408	3.7620	0.2658
5	1.1314	0.8839	5.2563	0.1902	4.6458	0.2152
6	1.1597	0.8623	6.3877	0.1565	5.5081	0.1815
7	1.1887	0.8413	7.5474	0.1325	6.3494	0.1575
8	1.2184	0.8207	8.7361	0.1145	7.1701	0.1395
9	1.2489	0.8007	9.9545	0.1005	7.9709	0.1255
10	1.2801	0.7812	11.2034	0.0893	8.7521	0.1143
11	1.3121	0.7621	12.4835	0.0801	9.5142	0.1051
12	1.3449	0.7436	13.7956	0.0725	10.2578	0.0975
13	1.3785	0.7254	15.1404	0.0660	10.9832	0.0910
14	1.4130	0.7077	16.5190	0.0605	11.6909	0.0855
15	1.4483	0.6905	17.9319	0.0558	12.3814	0.0808
16	1.4845	0.6736	19.3802	0.0516	13.0550	0.0766
17	1.5216	0.6572	20.8647	0.0479	13.7122	0.0729
18	1.5597	0.6412	22.3863	0.0447	14.3534	0.0697
19	1.5987	0.6255	23.9460	0.0418	14.9789	0.0668
20	1.6386	0.6103	25.5447	0.0391	15.5892	0.0641
21	1.6796	0.5954	27.1833	0.0368	16.1845	0.0618
22	1.7216	0.5809	28.8629	0.0346	16.7654	0.0596
23	1.7646	0.5667	30.5844	0.0327	17.3321	0.0577
24	1.8087	0.5529	32.3490	0.0309	17.8850	0.0559
25	1.8539	0.5394	34.1578	0.0293	18.4244	0.0543
26	1.9003	0.5262	36.0117	0.0278	18.9506	0.0528
27	1.9478	0.5134	37.9120	0.0264	19.4640	0.0514
28	1.9965	0.5009	39.8598	0.0251	19.9649	0.0501
29	2.0464	0.4887	41.8563	0.0239	20.4535	0.0489
30	2.0976	0.4767	43.9027	0.0228	20.9303	0.0478
35	2.3732	0.4214	54.9282	0.0182	23.1452	0.0432
40	2.6851	0.3724	67.4026	0.0148	25.1028	0.0398
45	3.0379	0.3292	81.5161	0.0123	26.8330	0.0373
50	3.4371	0.2909	97.4843	0.0103	28.3623	0.0353
55	3.8888	0.2572	115.5509	0.0087	29.7140	0.0337
60	4.3998	0.2273	135.9916	0.0074	30.9087	0.0324
65	4.9780	0.2009	159.1183	0.0063	31.9646	0.0313
70	5.6321	0.1776	185.2841	0.0054	32.8979	0.0304
75	6.3722	0.1569	214.8883	0.0047	33.7227	0.0297
80	7.2096	0.1387	248.3827	0.0040	34.4518	0.0290
85	8.1570	0.1226	286.2786	0.0035	35.0962	0.0285
90	9.2289	0.1084	329.1543	0.0030	35.6658	0.0280
95	10.4416	0.0958	377.6642	0.0026	36.1692	0.0276
100	11.8137	0.0846	432.5487	0.0023	36.6141	0.0273

TABLE E-9 Interest Factors for 3.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.0300	0.9709	1.0000	1.0000	0.9709	1.0300
2	1.0609	0.9426	2.0300	0.4926	1.9135	0.5226
3	1.0927	0.9151	3.0909	0.3235	2.8286	0.3535
4	1.1255	0.8885	4.1836	0.2390	3.7171	0.2690
5	1.1593	0.8626	5.3091	0.1884	4.5797	0.2184
6	1.1941	0.8375	6.4684	0.1546	5.4172	0.1846
7	1.2299	0.8131	7.6625	0.1305	6.2303	0.1605
8	1.2668	0.7894	8.8923	0.1125	7.0197	0.1425
9	1.3048	0.7664	10.1591	0.0984	7.7861	0.1284
10	1.3439	0.7441	11.4639	0.0872	8.5302	0.1172
11	1.3842	0.7224	12.8078	0.0781	9.2526	0.1081
12	1.4258	0.7014	14.1920	0.0705	9.9540	0.1005
13	1.4685	0.6810	15.6178	0.0640	10.6350	0.0940
14	1.5126	0.6611	17.0863	0.0585	11.2961	0.0885
15	1.5580	0.6419	18.5989	0.0538	11.9379	0.0838
16	1.6047	0.6232	20.1569	0.0496	12.5611	0.0796
17	1.6528	0.6050	21.7616	0.0460	13.1661	0.0760
18	1.7024	0.5874	23.4144	0.0427	13.7535	0.0727
19	1.7535	0.5703	25.1169	0.0398	14.3238	0.0698
20	1.8061	0.5537	26.8704	0.0372	14.8775	0.0672
21	1.8603	0.5375	28.6765	0.0349	15.4150	0.0649
22	1.9161	0.5219	30.5368	0.0327	15.9369	0.0627
23	1.9736	0.5067	32.4529	0.0308	16.4436	0.0608
24	2.0328	0.4919	34.4265	0.0290	16.9355	0.0590
25	2.0938	0.4776	36.4593	0.0274	17.4131	0.0574
26	2.1566	0.4637	38.5530	0.0259	17.8768	0.0559
27	2.2213	0.4502	40.7096	0.0246	18.3270	0.0546
28	2.2879	0.4371	42.9309	0.0233	18.7641	0.0533
29	2.3566	0.4243	45.2189	0.0221	19.1885	0.0521
30	2.4273	0.4120	47.5754	0.0210	19.6004	0.0510
35	2.8139	0.3554	60.4621	0.0165	21.4872	0.0465
40	3.2620	0.3066	75.4013	0.0133	23.1148	0.0433
45	3.7816	0.2644	92.7199	0.0108	24.5187	0.0408
50	4.3839	0.2281	112.7969	0.0089	25.7298	0.0389
55	5.0821	0.1968	136.0716	0.0073	26.7744	0.0373
60	5.8916	0.1697	163.0534	0.0061	27.6756	0.0361
65	6.8300	0.1464	194.3328	0.0051	28.4529	0.0351
70	7.9178	0.1263	230.5941	0.0043	29.1234	0.0343
75	9.1789	0.1089	272.6309	0.0037	29.7018	0.0337
80	10.6409	0.0940	321.3630	0.0031	30.2008	0.0331
85	12.3357	0.0811	377.8570	0.0026	30.6312	0.0326
90	14.3005	0.0699	443.3489	0.0023	31.0024	0.0323
95	16.5782	0.0603	519.2720	0.0019	31.3227	0.0319
100	19.2186	0.0520	607.2877	0.0016	31.5989	0.0316

TABLE E-10 Interest Factors for 4.00%

	Single Payment		Uniform Series			
	Compound-Amount Factor	Present-Worth Factor	Compound-Amount Factor	Sinking-Fund Factor	Present-Worth Factor	Capital-Recovery Factor
	Convert *P* to *F*	Convert *F* to *P*	Convert *A* to *F*	Convert *F* to *A*	Convert *A* to *P*	Convert *P* to *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.0400	0.9615	1.0000	1.0000	0.9615	1.0400
2	1.0816	0.9246	2.0400	0.4902	1.8861	0.5302
3	1.1249	0.8890	3.1216	0.3203	2.7751	0.3603
4	1.1699	0.8548	4.2465	0.2355	3.6299	0.2755
5	1.2167	0.8219	5.4163	0.1846	4.4518	0.2246
6	1.2653	0.7903	6.6330	0.1508	5.2421	0.1908
7	1.3159	0.7599	7.8983	0.1266	6.0021	0.1666
8	1.3686	0.7307	9.2142	0.1085	6.7327	0.1485
9	1.4233	0.7026	10.5828	0.0945	7.4353	0.1345
10	1.4802	0.6756	12.0061	0.0833	8.1109	0.1233
11	1.5395	0.6496	13.4864	0.0741	8.7605	0.1141
12	1.6010	0.6246	15.0258	0.0666	9.3851	0.1066
13	1.6651	0.6006	16.6268	0.0601	9.9856	0.1001
14	1.7317	0.5775	18.2919	0.0547	10.5631	0.0947
15	1.8009	0.5553	20.0236	0.0499	11.1184	0.0899
16	1.8730	0.5339	21.8245	0.0458	11.6523	0.0858
17	1.9479	0.5134	23.6975	0.0422	12.1657	0.0822
18	2.0258	0.4936	25.6454	0.0390	12.6593	0.0790
19	2.1068	0.4746	27.6712	0.0361	13.1339	0.0761
20	2.1911	0.4564	29.7781	0.0336	13.5903	0.0736
21	2.2788	0.4388	31.9692	0.0313	14.0292	0.0713
22	2.3699	0.4220	34.2480	0.0292	14.4511	0.0692
23	2.4647	0.4057	36.6179	0.0273	14.8568	0.0673
24	2.5633	0.3901	39.0826	0.0256	15.2470	0.0656
25	2.6658	0.3751	41.6459	0.0240	15.6221	0.0640
26	2.7725	0.3607	44.3117	0.0226	15.9828	0.0626
27	2.8834	0.3468	47.0842	0.0212	16.3296	0.0612
28	2.9987	0.3335	49.9676	0.0200	16.6631	0.0600
29	3.1187	0.3207	52.9663	0.0189	16.9837	0.0589
30	3.2434	0.3083	56.0849	0.0178	17.2920	0.0578
35	3.9461	0.2534	73.6522	0.0136	18.6646	0.0536
40	4.8010	0.2083	95.0255	0.0105	19.7928	0.0505
45	5.8412	0.1712	121.0294	0.0083	20.7200	0.0483
50	7.1067	0.1407	152.6671	0.0066	21.4822	0.0466
55	8.6464	0.1157	191.1592	0.0052	22.1086	0.0452
60	10.5196	0.0951	237.9907	0.0042	22.6235	0.0442
65	12.7987	0.0781	294.9684	0.0034	23.0467	0.0434
70	15.5716	0.0642	364.2905	0.0027	23.3945	0.0427
75	18.9453	0.0528	448.6314	0.0022	23.6804	0.0422
80	23.0498	0.0434	551.2450	0.0018	23.9154	0.0418
85	28.0436	0.0357	676.0901	0.0015	24.1085	0.0415
90	34.1193	0.0293	827.9833	0.0012	24.2673	0.0412

TABLE E-11 Interest Factors for 5.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.0500	0.9524	1.0000	1.0000	0.9524	1.0500
2	1.1025	0.9070	2.0500	0.4878	1.8594	0.5378
3	1.1576	0.8638	3.1525	0.3172	2.7232	0.3672
4	1.2155	0.8227	4.3101	0.2320	3.5460	0.2820
5	1.2763	0.7835	5.5256	0.1810	4.3295	0.2310
6	1.3401	0.7462	6.8019	0.1470	5.0757	0.1970
7	1.4071	0.7107	8.1420	0.1228	5.7864	0.1728
8	1.4775	0.6768	9.5491	0.1047	6.4632	0.1547
9	1.5513	0.6446	11.0266	0.0907	7.1078	0.1407
10	1.6289	0.6139	12.5779	0.0795	7.7217	0.1295
11	1.7103	0.5847	14.2068	0.0704	8.3064	0.1204
12	1.7959	0.5568	15.9171	0.0628	8.8633	0.1128
13	1.8856	0.5303	17.7130	0.0565	9.3936	0.1065
14	1.9799	0.5051	19.5986	0.0510	9.8986	0.1010
15	2.0789	0.4810	21.5786	0.0463	10.3797	0.0963
16	2.1829	0.4581	23.6575	0.0423	10.8378	0.0923
17	2.2920	0.4363	25.8404	0.0387	11.2741	0.0887
18	2.4066	0.4155	28.1324	0.0355	11.6896	0.0855
19	2.5270	0.3957	30.5390	0.0327	12.0853	0.0827
20	2.6533	0.3769	33.0660	0.0302	12.4622	0.0802
21	2.7860	0.3589	35.7193	0.0280	12.8212	0.0780
22	2.9253	0.3418	38.5052	0.0260	13.1630	0.0760
23	3.0715	0.3256	41.4305	0.0241	13.4886	0.0741
24	3.2251	0.3101	44.5020	0.0225	13.7986	0.0725
25	3.3864	0.2953	47.7271	0.0210	14.0939	0.0710
26	3.5557	0.2812	51.1135	0.0196	14.3752	0.0696
27	3.7335	0.2678	54.6691	0.0183	14.6430	0.0683
28	3.9201	0.2551	58.4026	0.0171	14.8981	0.0671
29	4.1161	0.2429	62.3227	0.0160	15.1411	0.0660
30	4.3219	0.2314	66.4388	0.0151	15.3725	0.0651
35	5.5160	0.1813	90.3203	0.0111	16.3742	0.0611
40	7.0400	0.1420	120.7998	0.0083	17.1591	0.0583
45	8.9850	0.1113	159.7002	0.0063	17.7741	0.0563
50	11.4674	0.0872	209.3480	0.0048	18.2559	0.0548
55	14.6356	0.0683	272.7126	0.0037	18.6335	0.0537
60	18.6792	0.0535	353.5837	0.0028	18.9293	0.0528
65	23.8399	0.0419	456.7980	0.0022	19.1611	0.0522
70	30.4264	0.0329	588.5285	0.0017	19.3427	0.0517
75	38.8327	0.0258	756.6537	0.0013	19.4850	0.0513
80	49.5614	0.0202	971.2288	0.0010	19.5965	0.0510

TABLE E-12 Interest Factors for 6.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.0600	0.9434	1.0000	1.0000	0.9434	1.0600
2	1.1236	0.8900	2.0600	0.4854	1.8334	0.5454
3	1.1910	0.8396	3.1836	0.3141	2.6730	0.3741
4	1.2625	0.7921	4.3746	0.2286	3.4651	0.2886
5	1.3382	0.7473	5.6371	0.1774	4.2124	0.2374
6	1.4185	0.7050	6.9753	0.1434	4.9173	0.2034
7	1.5036	0.6651	8.3938	0.1191	5.5824	0.1791
8	1.5938	0.6274	9.8975	0.1010	6.2098	0.1610
9	1.6895	0.5919	11.4913	0.0870	6.8017	0.1470
10	1.7908	0.5584	13.1808	0.0759	7.3601	0.1359
11	1.8983	0.5268	14.9716	0.0668	7.8869	0.1268
12	2.0122	0.4970	16.8699	0.0593	8.3838	0.1193
13	2.1329	0.4688	18.8821	0.0530	8.8527	0.1130
14	2.2609	0.4423	21.0151	0.0476	9.2950	0.1076
15	2.3966	0.4173	23.2760	0.0430	9.7122	0.1030
16	2.5404	0.3936	25.6725	0.0390	10.1059	0.0990
17	2.6928	0.3714	28.2129	0.0354	10.4773	0.0954
18	2.8543	0.3503	30.9057	0.0324	10.8276	0.0924
19	3.0256	0.3305	33.7600	0.0296	11.1581	0.0896
20	3.2071	0.3118	36.7856	0.0272	11.4699	0.0872
21	3.3996	0.2942	39.9927	0.0250	11.7641	0.0850
22	3.6035	0.2775	43.3923	0.0230	12.0416	0.0830
23	3.8197	0.2618	46.9958	0.0213	12.3034	0.0813
24	4.0489	0.2470	50.8156	0.0197	12.5504	0.0797
25	4.2919	0.2330	54.8645	0.0182	12.7834	0.0782
26	4.5494	0.2198	59.1564	0.0169	13.0032	0.0769
27	4.8223	0.2074	63.7058	0.0157	13.2105	0.0757
28	5.1117	0.1956	68.5281	0.0146	13.4062	0.0746
29	5.4184	0.1846	73.6398	0.0136	13.5907	0.0736
30	5.7435	0.1741	79.0582	0.0126	13.7648	0.0726
35	7.6861	0.1301	111.4348	0.0090	14.4982	0.0690
40	10.2857	0.0972	154.7620	0.0065	15.0463	0.0665
45	13.7646	0.0727	212.7435	0.0047	15.4558	0.0647
50	18.4202	0.0543	290.3359	0.0034	15.7619	0.0634
55	24.6503	0.0406	394.1720	0.0025	15.9905	0.0625
`60	32.9877	0.0303	533.1282	0.0019	16.1614	0.0619
65	44.1450	0.0227	719.0829	0.0014	16.2891	0.0614
70	59.0759	0.0169	967.9322	0.0010	16.3845	0.0610

TABLE E-13 Interest Factors for 7.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.0700	0.9346	1.0000	1.0000	0.9346	1.0700
2	1.1449	0.8734	2.0700	0.4831	1.8080	0.5531
3	1.2250	0.8163	3.2149	0.3111	2.6243	0.3811
4	1.3108	0.7629	4.4399	0.2252	3.3872	0.2952
5	1.4026	0.7130	5.7507	0.1739	4.1002	0.2439
6	1.5007	0.6663	7.1533	0.1398	4.7665	0.2098
7	1.6058	0.6227	8.6540	0.1156	5.3893	0.1856
8	1.7182	0.5820	10.2598	0.0975	5.9713	0.1675
9	1.8385	0.5439	11.9780	0.0835	6.5152	0.1535
10	1.9672	0.5083	13.8164	0.0724	7.0236	0.1424
11	2.1049	0.4751	15.7836	0.0634	7.4987	0.1334
12	2.2522	0.4440	17.8885	0.0559	7.9427	0.1259
13	2.4098	0.4150	20.1406	0.0497	8.3577	0.1197
14	2.5785	0.3878	22.5505	0.0443	8.7455	0.1143
15	2.7590	0.3624	25.1290	0.0398	9.1079	0.1098
16	2.9522	0.3387	27.8881	0.0359	9.4466	0.1059
17	3.1588	0.3166	30.8402	0.0324	9.7632	0.1024
18	3.3799	0.2959	33.9990	0.0294	10.0591	0.0994
19	3.6165	0.2765	37.3790	0.0268	10.3356	0.0968
20	3.8697	0.2584	40.9955	0.0244	10.5940	0.0944
21	4.1406	0.2415	44.8652	0.0223	10.8355	0.0923
22	4.4304	0.2257	49.0057	0.0204	11.0612	0.0904
23	4.7405	0.2109	53.4361	0.0187	11.2722	0.0887
24	5.0724	0.1971	58.1767	0.0172	11.4693	0.0872
25	5.4274	0.1842	63.2490	0.0158	11.6536	0.0858
26	5.8074	0.1722	68.6765	0.0146	11.8258	0.0846
27	6.2139	0.1609	74.4838	0.0134	11.9867	0.0834
28	6.6488	0.1504	80.6977	0.0124	12.1371	0.0824
29	7.1143	0.1406	87.3465	0.0114	12.2777	0.0814
30	7.6123	0.1314	94.4608	0.0106	12.4090	0.0806
35	10.6766	0.0937	138.2369	0.0072	12.9477	0.0772
40	14.9745	0.0668	199.6351	0.0050	13.3317	0.0750
45	21.0025	0.0476	285.7493	0.0035	13.6055	0.0735
50	29.4570	0.0339	406.5289	0.0025	13.8007	0.0725
55	41.3150	0.0242	575.9286	0.0017	13.9399	0.0717
60	57.9464	0.0173	813.5204	0.0012	14.0392	0.0712

TABLE E-14 Interest Factors for 8.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.0800	0.9259	1.0000	1.0000	0.9259	1.0800
2	1.1664	0.8573	2.0800	0.4808	1.7833	0.5608
3	1.2597	0.7938	3.2464	0.3080	2.5771	0.3880
4	1.3605	0.7350	4.5061	0.2219	3.3121	0.3019
5	1.4693	0.6806	5.8666	0.1705	3.9927	0.2505
6	1.5869	0.6302	7.3359	0.1363	4.6229	0.2163
7	1.7138	0.5835	8.9228	0.1121	5.2064	0.1921
8	1.8509	0.5403	10.6366	0.0940	5.7466	0.1740
9	1.9990	0.5002	12.4876	0.0801	6.2469	0.1601
10	2.1589	0.4632	14.4866	0.0690	6.7101	0.1490
11	2.3316	0.4289	16.6455	0.0601	7.1390	0.1401
12	2.5182	0.3971	18.9771	0.0527	7.5361	0.1327
13	2.7196	0.3677	21.4953	0.0465	7.9038	0.1265
14	2.9372	0.3405	24.2149	0.0413	8.2442	0.1213
15	3.1722	0.3152	27.1521	0.0368	8.5595	0.1168
16	3.4259	0.2919	30.3243	0.0330	8.8514	0.1130
17	3.7000	0.2703	33.7502	0.0296	9.1216	0.1096
18	3.9960	0.2502	37.4502	0.0267	9.3719	0.1067
19	4.3157	0.2317	41.4463	0.0241	9.6036	0.1041
20	4.6610	0.2145	45.7620	0.0219	9.8181	0.1019
21	5.0338	0.1987	50.4229	0.0198	10.0168	0.0998
22	5.4365	0.1839	55.4568	0.0180	10.2007	0.0980
23	5.8715	0.1703	60.8933	0.0164	10.3711	0.0964
24	6.3412	0.1577	66.7648	0.0150	10.5288	0.0950
25	6.8485	0.1460	73.1059	0.0137	10.6748	0.0937
26	7.3964	0.1352	79.9544	0.0125	10.8100	0.0925
27	7.9881	0.1252	87.3508	0.0114	10.9352	0.0914
28	8.6271	0.1159	95.3388	0.0105	11.0511	0.0905
29	9.3173	0.1073	103.9659	0.0096	11.1584	0.0896
30	10.0627	0.0994	113.2832	0.0088	11.2578	0.0888
35	14.7853	0.0676	172.3168	0.0058	11.6546	0.0858
40	21.7245	0.0460	259.0565	0.0039	11.9246	0.0839
45	31.9204	0.0313	386.5056	0.0026	12.1084	0.0826
50	46.9016	0.0213	573.7702	0.0017	12.2335	0.0817
55	68.9139	0.0145	848.9232	0.0012	12.3186	0.0812

TABLE E-15 Interest Factors for 9.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.0900	0.9174	1.0000	1.0000	0.9174	1.0900
2	1.1881	0.8417	2.0900	0.4785	1.7591	0.5685
3	1.2950	0.7722	3.2781	0.3051	2.5313	0.3951
4	1.4116	0.7084	4.5731	0.2187	3.2397	0.3087
5	1.5386	0.6499	5.9847	0.1671	3.8897	0.2571
6	1.6771	0.5963	7.5233	0.1329	4.4859	0.2229
7	1.8280	0.5470	9.2004	0.1087	5.0330	0.1987
8	1.9926	0.5019	11.0285	0.0907	5.5348	0.1807
9	2.1719	0.4604	13.0210	0.0768	5.9952	0.1668
10	2.3674	0.4224	15.1929	0.0658	6.4177	0.1558
11	2.5804	0.3875	17.5603	0.0569	6.8052	0.1469
12	2.8127	0.3555	20.1407	0.0497	7.1607	0.1397
13	3.0658	0.3262	22.9534	0.0436	7.4869	0.1336
14	3.3417	0.2992	26.0192	0.0384	7.7862	0.1284
15	3.6425	0.2745	29.3609	0.0341	8.0607	0.1241
16	3.9703	0.2519	33.0034	0.0303	8.3126	0.1203
17	4.3276	0.2311	36.9737	0.0270	8.5436	0.1170
18	4.7171	0.2120	41.3013	0.0242	8.7556	0.1142
19	5.1417	0.1945	46.0185	0.0217	8.9501	0.1117
20	5.6044	0.1784	51.1601	0.0195	9.1285	0.1095
21	6.1088	0.1637	56.7645	0.0176	9.2922	0.1076
22	6.6586	0.1502	62.8733	0.0159	9.4424	0.1059
23	7.2579	0.1378	69.5319	0.0144	9.5802	0.1044
24	7.9111	0.1264	76.7898	0.0130	9.7066	0.1030
25	8.6231	0.1160	84.7009	0.0118	9.8226	0.1018
26	9.3992	0.1064	93.3240	0.0107	9.9290	0.1007
27	10.2451	0.0976	102.7231	0.0097	10.0266	0.0997
28	11.1671	0.0895	112.9682	0.0089	10.1161	0.0989
29	12.1722	0.0822	124.1354	0.0081	10.1983	0.0981
30	13.2677	0.0754	136.3075	0.0073	10.2737	0.0973
35	20.4140	0.0490	215.7108	0.0046	10.5668	0.0946
40	31.4094	0.0318	337.8824	0.0030	10.7574	0.0930
45	48.3273	0.0207	525.8587	0.0019	10.8812	0.0919
50	74.3575	0.0134	815.0836	0.0012	10.9617	0.0912

TABLE E-16 Interest Factors for 10.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.1000	0.9091	1.0000	1.0000	0.9091	1.1000
2	1.2100	0.8264	2.1000	0.4762	1.7355	0.5762
3	1.3310	0.7513	3.3100	0.3021	2.4869	0.4021
4	1.4641	0.6830	4.6410	0.2155	3.1699	0.3155
5	1.6105	0.6209	6.1051	0.1638	3.7908	0.2638
6	1.7716	0.5645	7.7156	0.1296	4.3553	0.2296
7	1.9487	0.5132	9.4872	0.1054	4.8684	0.2054
8	2.1436	0.4665	11.4359	0.0874	5.3349	0.1874
9	2.3579	0.4241	13.5795	0.0736	5.7590	0.1736
10	2.5937	0.3855	15.9374	0.0627	6.1446	0.1627
11	2.8531	0.3505	18.5312	0.0540	6.4951	0.1540
12	3.1384	0.3186	21.3843	0.0468	6.8137	0.1468
13	3.4523	0.2897	24.5227	0.0408	7.1034	0.1408
14	3.7975	0.2633	27.9750	0.0357	7.3667	0.1357
15	4.1772	0.2394	31.7725	0.0315	7.6061	0.1315
16	4.5950	0.2176	35.9497	0.0278	7.8237	0.1278
17	5.0545	0.1978	40.5447	0.0247	8.0216	0.1247
18	5.5599	0.1799	45.5992	0.0219	8.2014	0.1219
19	6.1159	0.1635	51.1591	0.0195	8.3649	0.1195
20	6.7275	0.1486	57.2750	0.0175	8.5136	0.1175
21	7.4002	0.1351	64.0025	0.0156	8.6487	0.1156
22	8.1403	0.1228	71.4027	0.0140	8.7715	0.1140
23	8.9543	0.1117	79.5430	0.0126	8.8832	0.1126
24	9.8497	0.1015	88.4973	0.0113	8.9847	0.1113
25	10.8347	0.0923	98.3471	0.0102	9.0770	0.1102
26	11.9182	0.0839	109.1818	0.0092	9.1609	0.1092
27	13.1100	0.0763	121.0999	0.0083	9.2372	0.1083
28	14.4210	0.0693	134.2099	0.0075	9.3066	0.1075
29	15.8631	0.0630	148.6309	0.0067	9.3696	0.1067
30	17.4494	0.0573	164.4940	0.0061	9.4269	0.1061
35	28.1024	0.0356	271.0244	0.0037	9.6442	0.1037
40	45.2593	0.0221	442.5926	0.0023	9.7791	0.1023
45	72.8905	0.0137	718.9048	0.0014	9.8628	0.1014

TABLE E-17 Interest Factors for 11.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.1100	0.9009	1.0000	1.0000	0.9009	1.1100
2	1.2321	0.8116	2.1100	0.4739	1.7125	0.5839
3	1.3676	0.7312	3.3421	0.2992	2.4437	0.4092
4	1.5181	0.6587	4.7097	0.2123	3.1024	0.3223
5	1.6851	0.5935	6.2278	0.1606	3.6959	0.2706
6	1.8704	0.5346	7.9129	0.1264	4.2305	0.2364
7	2.0762	0.4817	9.7833	0.1022	4.7122	0.2122
8	2.3045	0.4339	11.8594	0.0843	5.1461	0.1943
9	2.5580	0.3909	14.1640	0.0706	5.5370	0.1806
10	2.8394	0.3522	16.7220	0.0598	5.8892	0.1698
11	3.1518	0.3173	19.5614	0.0511	6.2065	0.1611
12	3.4985	0.2858	22.7132	0.0440	6.4924	0.1540
13	3.8833	0.2575	26.2116	0.0382	6.7499	0.1482
14	4.3104	0.2320	30.0949	0.0332	6.9819	0.1432
15	4.7846	0.2090	34.4054	0.0291	7.1909	0.1391
16	5.3109	0.1883	39.1899	0.0255	7.3792	0.1355
17	5.8951	0.1696	44.5008	0.0225	7.5488	0.1325
18	6.5436	0.1528	50.3959	0.0198	7.7016	0.1298
19	7.2633	0.1377	56.9395	0.0176	7.8393	0.1276
20	8.0623	0.1240	64.2028	0.0156	7.9633	0.1256
21	8.9492	0.1117	72.2651	0.0138	8.0751	0.1238
22	9.9336	0.1007	81.2143	0.0123	8.1757	0.1223
23	11.0263	0.0907	91.1479	0.0110	8.2664	0.1210
24	12.2392	0.0817	102.1742	0.0098	8.3481	0.1198
25	13.5855	0.0736	114.4133	0.0087	8.4217	0.1187
26	15.0799	0.0663	127.9988	0.0078	8.4881	0.1178
27	16.7386	0.0597	143.0786	0.0070	8.5478	0.1170
28	18.5799	0.0538	159.8173	0.0063	8.6016	0.1163
29	20.6237	0.0485	178.3972	0.0056	8.6501	0.1156
30	22.8923	0.0437	199.0209	0.0050	8.6938	0.1150
35	38.5749	0.0259	341.5896	0.0029	8.8552	0.1129
40	65.0009	0.0154	581.8261	0.0017	8.9511	0.1117
45	109.5302	0.0091	986.6386	0.0010	9.0079	0.1110

TABLE E-18 Interest Factors for 12.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.1200	0.8929	1.0000	1.0000	0.8929	1.1200
2	1.2544	0.7972	2.1200	0.4717	1.6901	0.5917
3	1.4049	0.7118	3.3744	0.2963	2.4018	0.4163
4	1.5735	0.6355	4.7793	0.2092	3.0373	0.3292
5	1.7623	0.5674	6.3528	0.1574	3.6048	0.2774
6	1.9738	0.5066	8.1152	0.1232	4.1114	0.2432
7	2.2107	0.4523	10.0890	0.0991	4.5638	0.2191
8	2.4760	0.4039	12.2997	0.0813	4.9676	0.2013
9	2.7731	0.3606	14.7757	0.0677	5.3282	0.1877
10	3.1058	0.3220	17.5487	0.0570	5.6502	0.1770
11	3.4785	0.2875	20.6546	0.0484	5.9377	0.1684
12	3.8960	0.2567	24.1331	0.0414	6.1944	0.1614
13	4.3635	0.2292	28.0291	0.0357	6.4235	0.1557
14	4.8871	0.2046	32.3926	0.0309	6.6282	0.1509
15	5.4736	0.1827	37.2797	0.0268	6.8109	0.1468
16	6.1304	0.1631	42.7533	0.0234	6.9740	0.1434
17	6.8660	0.1456	48.8837	0.0205	7.1196	0.1405
18	7.6900	0.1300	55.7497	0.0179	7.2497	0.1379
19	8.6128	0.1161	63.4397	0.0158	7.3658	0.1358
20	9.6463	0.1037	72.0524	0.0139	7.4694	0.1339
21	10.8038	0.0926	81.6987	0.0122	7.5620	0.1322
22	12.1003	0.0826	92.5026	0.0108	7.6446	0.1308
23	13.5523	0.0738	104.6029	0.0096	7.7184	0.1296
24	15.1786	0.0659	118.1552	0.0085	7.7843	0.1285
25	17.0001	0.0588	133.3339	0.0075	7.8431	0.1275
26	19.0401	0.0525	150.3339	0.0067	7.8957	0.1267
27	21.3249	0.0469	169.3740	0.0059	7.9426	0.1259
28	23.8839	0.0419	190.6989	0.0052	7.9844	0.1252
29	26.7499	0.0374	214.5828	0.0047	8.0218	0.1247
30	29.9599	0.0334	241.3327	0.0041	8.0552	0.1241
35	52.7996	0.0189	431.6635	0.0023	8.1755	0.1223
40	93.0510	0.0107	767.0914	0.0013	8.2438	0.1213

TABLE E-19 Interest Factors for 13.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.1300	0.8850	1.0000	1.0000	0.8850	1.1300
2	1.2769	0.7831	2.1300	0.4695	1.6681	0.5995
3	1.4429	0.6931	3.4069	0.2935	2.3612	0.4235
4	1.6305	0.6133	4.8498	0.2062	2.9745	0.3362
5	1.8424	0.5428	6.4803	0.1543	3.5172	0.2843
6	2.0820	0.4803	8.3227	0.1202	3.9975	0.2502
7	2.3526	0.4251	10.4047	0.0961	4.4226	0.2261
8	2.6584	0.3762	12.7573	0.0784	4.7988	0.2084
9	3.0040	0.3329	15.4157	0.0649	5.1317	0.1949
10	3.3946	0.2946	18.4197	0.0543	5.4262	0.1843
11	3.8359	0.2607	21.8143	0.0458	5.6869	0.1758
12	4.3345	0.2307	25.6502	0.0390	5.9176	0.1690
13	4.8980	0.2042	29.9847	0.0334	6.1218	0.1634
14	5.5348	0.1807	34.8827	0.0287	6.3025	0.1587
15	6.2543	0.1599	40.4175	0.0247	6.4624	0.1547
16	7.0673	0.1415	46.6717	0.0214	6.6039	0.1514
17	7.9861	0.1252	53.7391	0.0186	6.7291	0.1486
18	9.0243	0.1108	61.7251	0.0162	6.8399	0.1462
19	10.1974	0.0981	70.7494	0.0141	6.9380	0.1441
20	11.5231	0.0868	80.9468	0.0124	7.0248	0.1424
21	13.0211	0.0768	92.4699	0.0108	7.1016	0.1408
22	14.7138	0.0680	105.4910	0.0095	7.1695	0.1395
23	16.6266	0.0601	120.2048	0.0083	7.2297	0.1383
24	18.7881	0.0532	136.8315	0.0073	7.2829	0.1373
25	21.2305	0.0471	155.6196	0.0064	7.3300	0.1364
26	23.9905	0.0417	176.8501	0.0057	7.3717	0.1357
27	27.1093	0.0369	200.8406	0.0050	7.4086	0.1350
28	30.6335	0.0326	227.9499	0.0044	7.4412	0.1344
29	34.6158	0.0289	258.5834	0.0039	7.4701	0.1339
30	39.1159	0.0256	293.1992	0.0034	7.4957	0.1334
35	72.0685	0.0139	546.6808	0.0018	7.5856	0.1318

TABLE E-20 Interest Factors for 14.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.1400	0.8772	1.0000	1.0000	0.8772	1.1400
2	1.2996	0.7695	2.1400	0.4673	1.6467	0.6073
3	1.4815	0.6750	3.4396	0.2907	2.3216	0.4307
4	1.6890	0.5921	4.9211	0.2032	2.9137	0.3432
5	1.9254	0.5194	6.6101	0.1513	3.4331	0.2913
6	2.1950	0.4556	8.5355	0.1172	3.8887	0.2572
7	2.5023	0.3996	10.7305	0.0932	4.2883	0.2332
8	2.8526	0.3506	13.2328	0.0756	4.6389	0.2156
9	3.2519	0.3075	16.0853	0.0622	4.9464	0.2022
10	3.7072	0.2697	19.3373	0.0517	5.2161	0.1917
11	4.2262	0.2366	23.0445	0.0434	5.4527	0.1834
12	4.8179	0.2076	27.2707	0.0367	5.6603	0.1767
13	5.4924	0.1821	32.0887	0.0312	5.8424	0.1712
14	6.2613	0.1597	37.5811	0.0266	6.0021	0.1666
15	7.1379	0.1401	43.8424	0.0228	6.1422	0.1628
16	8.1372	0.1229	50.9804	0.0196	6.2651	0.1596
17	9.2765	0.1078	59.1176	0.0169	6.3729	0.1569
18	10.5752	0.0946	68.3941	0.0146	6.4674	0.1546
19	12.0557	0.0829	78.9692	0.0127	6.5504	0.1527
20	13.7435	0.0728	91.0249	0.0110	6.6231	0.1510
21	15.6676	0.0638	104.7684	0.0095	6.6870	0.1495
22	17.8610	0.0560	120.4360	0.0083	6.7429	0.1483
23	20.3616	0.0491	138.2970	0.0072	6.7921	0.1472
24	23.2122	0.0431	158.6586	0.0063	6.8351	0.1463
25	26.4619	0.0378	181.8708	0.0055	6.8729	0.1455
26	30.1666	0.0331	208.3327	0.0048	6.9061	0.1448
27	34.3899	0.0291	238.4993	0.0042	6.9352	0.1442
28	39.2045	0.0255	272.8892	0.0037	6.9607	0.1437
29	44.6931	0.0224	312.0937	0.0032	6.9830	0.1432
30	50.9502	0.0196	356.7868	0.0028	7.0027	0.1428
35	98.1002	0.0102	693.5727	0.0014	7.0700	0.1414

TABLE E-21 Interest Factors for 15.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.1500	0.8696	1.0000	1.0000	0.8696	1.1500
2	1.3225	0.7561	2.1500	0.4651	1.6257	0.6151
3	1.5209	0.6575	3.4725	0.2880	2.2832	0.4380
4	1.7490	0.5718	4.9934	0.2003	2.8550	0.3503
5	2.0114	0.4972	6.7424	0.1483	3.3522	0.2983
6	2.3131	0.4323	8.7537	0.1142	3.7845	0.2642
7	2.6600	0.3759	11.0668	0.0904	4.1604	0.2404
8	3.0590	0.3269	13.7268	0.0729	4.4873	0.2229
9	3.5179	0.2843	16.7858	0.0596	4.7716	0.2096
10	4.0456	0.2472	20.3037	0.0493	5.0188	0.1993
11	4.6524	0.2149	24.3493	0.0411	5.2337	0.1911
12	5.3503	0.1869	29.0017	0.0345	5.4206	0.1845
13	6.1528	0.1625	34.3519	0.0291	5.5831	0.1791
14	7.0757	0.1413	40.5047	0.0247	5.7245	0.1747
15	8.1371	0.1229	47.5804	0.0210	5.8474	0.1710
16	9.3576	0.1069	55.7175	0.0179	5.9542	0.1679
17	10.7613	0.0929	65.0751	0.0154	6.0472	0.1654
18	12.3755	0.0808	75.8364	0.0132	6.1280	0.1632
19	14.2318	0.0703	88.2118	0.0113	6.1982	0.1613
20	16.3665	0.0611	102.4436	0.0098	6.2593	0.1598
21	18.8215	0.0531	118.8101	0.0084	6.3125	0.1584
22	21.6447	0.0462	137.6316	0.0073	6.3587	0.1573
23	24.8915	0.0402	159.2764	0.0063	6.3988	0.1563
24	28.6252	0.0349	184.1678	0.0054	6.4338	0.1554
25	32.9190	0.0304	212.7930	0.0047	6.4641	0.1547
26	37.8568	0.0264	245.7120	0.0041	6.4906	0.1541
27	43.5353	0.0230	283.5688	0.0035	6.5135	0.1535
28	50.0656	0.0200	327.1041	0.0031	6.5335	0.1531
29	57.5755	0.0174	377.1697	0.0027	6.5509	0.1527
30	66.2118	0.0151	434.7451	0.0023	6.5660	0.1523
35	133.1755	0.0075	881.1702	0.0011	6.6166	0.1511

TABLE E-22 Interest Factors for 16.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.1600	0.8621	1.0000	1.0000	0.8621	1.1600
2	1.3456	0.7432	2.1600	0.4630	1.6052	0.6230
3	1.5609	0.6407	3.5056	0.2853	2.2459	0.4453
4	1.8106	0.5523	5.0665	0.1974	2.7982	0.3574
5	2.1003	0.4761	6.8771	0.1454	3.2743	0.3054
6	2.4364	0.4104	8.9775	0.1114	3.6847	0.2714
7	2.8262	0.3538	11.4139	0.0876	4.0386	0.2476
8	3.2784	0.3050	14.2401	0.0702	4.3436	0.2302
9	3.8030	0.2630	17.5185	0.0571	4.6065	0.2171
10	4.4114	0.2267	21.3215	0.0469	4.8332	0.2069
11	5.1173	0.1954	25.7329	0.0389	5.0286	0.1989
12	5.9360	0.1685	30.8502	0.0324	5.1971	0.1924
13	6.8858	0.1452	36.7862	0.0272	5.3423	0.1872
14	7.9875	0.1252	43.6720	0.0229	5.4675	0.1829
15	9.2655	0.1079	51.6595	0.0194	5.5755	0.1794
16	10.7480	0.0930	60.9250	0.0164	5.6685	0.1764
17	12.4677	0.0802	71.6730	0.0140	5.7487	0.1740
18	14.4625	0.0691	84.1407	0.0119	5.8178	0.1719
19	16.7765	0.0596	98.6032	0.0101	5.8775	0.1701
20	19.4608	0.0514	115.3797	0.0087	5.9288	0.1687
21	22.5745	0.0443	134.8405	0.0074	5.9731	0.1674
22	26.1864	0.0382	157.4150	0.0064	6.0113	0.1664
23	30.3762	0.0329	183.6014	0.0054	6.0442	0.1654
24	35.2364	0.0284	213.9776	0.0047	6.0726	0.1647
25	40.8742	0.0245	249.2140	0.0040	6.0971	0.1640
26	47.4141	0.0211	290.0883	0.0034	6.1182	0.1634
27	55.0004	0.0182	337.5024	0.0030	6.1364	0.1630
28	63.8004	0.0157	392.5028	0.0025	6.1520	0.1625
29	74.0085	0.0135	456.3032	0.0022	6.1656	0.1622
30	85.8499	0.0116	530.3117	0.0019	6.1772	0.1619

TABLE E-23 Interest Factors for 17.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.1700	0.8547	1.0000	1.0000	0.8547	1.1700
2	1.3689	0.7305	2.1700	0.4608	1.5852	0.6308
3	1.6016	0.6244	3.5389	0.2826	2.2096	0.4526
4	1.8739	0.5337	5.1405	0.1945	2.7432	0.3645
5	2.1924	0.4561	7.0144	0.1426	3.1993	0.3126
6	2.5652	0.3898	9.2068	0.1086	3.5892	0.2786
7	3.0012	0.3332	11.7720	0.0849	3.9224	0.2549
8	3.5115	0.2848	14.7733	0.0677	4.2072	0.2377
9	4.1084	0.2434	18.2847	0.0547	4.4506	0.2247
10	4.8068	0.2080	22.3931	0.0447	4.6586	0.2147
11	5.6240	0.1778	27.1999	0.0368	4.8364	0.2068
12	6.5801	0.1520	32.8239	0.0305	4.9884	0.2005
13	7.6987	0.1299	39.4040	0.0254	5.1183	0.1954
14	9.0075	0.1110	47.1027	0.0212	5.2293	0.1912
15	10.5387	0.0949	56.1101	0.0178	5.3242	0.1878
16	12.3303	0.0811	66.6488	0.0150	5.4053	0.1850
17	14.4265	0.0693	78.9792	0.0127	5.4746	0.1827
18	16.8790	0.0592	93.4056	0.0107	5.5339	0.1807
19	19.7484	0.0506	110.2846	0.0091	5.5845	0.1791
20	23.1056	0.0433	130.0329	0.0077	5.6278	0.1777
21	27.0336	0.0370	153.1385	0.0065	5.6648	0.1765
22	31.6293	0.0316	180.1721	0.0056	5.6964	0.1756
23	37.0062	0.0270	211.8013	0.0047	5.7234	0.1747
24	43.2973	0.0231	248.8076	0.0040	5.7465	0.1740
25	50.6578	0.0197	292.1049	0.0034	5.7662	0.1734
26	59.2697	0.0169	342.7627	0.0029	5.7831	0.1729
27	69.3455	0.0144	402.0323	0.0025	5.7975	0.1725
28	81.1342	0.0123	471.3778	0.0021	5.8099	0.1721
29	94.9271	0.0105	552.5121	0.0018	5.8204	0.1718
30	111.0647	0.0090	647.4391	0.0015	5.8294	0.1715

TABLE E-24 Interest Factors for 18.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.1800	0.8475	1.0000	1.0000	0.8475	1.1800
2	1.3924	0.7182	2.1800	0.4587	1.5656	0.6387
3	1.6430	0.6086	3.5724	0.2799	2.1743	0.4599
4	1.9388	0.5158	5.2154	0.1917	2.6901	0.3717
5	2.2878	0.4371	7.1542	0.1398	3.1272	0.3198
6	2.6996	0.3704	9.4420	0.1059	3.4976	0.2859
7	3.1855	0.3139	12.1415	0.0824	3.8115	0.2624
8	3.7589	0.2660	15.3270	0.0652	4.0776	0.2452
9	4.4355	0.2255	19.0859	0.0524	4.3030	0.2324
10	5.2338	0.1911	23.5213	0.0425	4.4941	0.2225
11	6.1759	0.1619	28.7551	0.0348	4.6560	0.2148
12	7.2876	0.1372	34.9311	0.0286	4.7932	0.2086
13	8.5994	0.1163	42.2187	0.0237	4.9095	0.2037
14	10.1472	0.0985	50.8180	0.0197	5.0081	0.1997
15	11.9737	0.0835	60.9653	0.0164	5.0916	0.1964
16	14.1290	0.0708	72.9390	0.0137	5.1624	0.1937
17	16.6722	0.0600	87.0680	0.0115	5.2223	0.1915
18	19.6733	0.0508	103.7403	0.0096	5.2732	0.1896
19	23.2144	0.0431	123.4135	0.0081	5.3162	0.1881
20	27.3930	0.0365	146.6280	0.0068	5.3527	0.1868
21	32.3238	0.0309	174.0210	0.0057	5.3837	0.1857
`22	38.1421	0.0262	206.3448	0.0048	5.4099	0.1848
23	45.0076	0.0222	244.4868	0.0041	5.4321	0.1841
24	53.1090	0.0188	289.4945	0.0035	5.4509	0.1835
25	62.6686	0.0160	342.6035	0.0029	5.4669	0.1829
26	73.9490	0.0135	405.2721	0.0025	5.4804	0.1825
27	87.2598	0.0115	479.2211	0.0021	5.4919	0.1821
28	102.9666	0.0097	566.4809	0.0018	5.5016	0.1818
29	121.5005	0.0082	669.4475	0.0015	5.5098	0.1815
30	143.3706	0.0070	790.9480	0.0013	5.5168	0.1813

TABLE E-25 Interest Factors for 19.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.1900	0.8403	1.0000	1.0000	0.8403	1.1900
2	1.4161	0.7062	2.1900	0.4566	1.5465	0.6466
3	1.6852	0.5934	3.6061	0.2773	2.1399	0.4673
4	2.0053	0.4987	5.2913	0.1890	2.6386	0.3790
5	2.3864	0.4190	7.2966	0.1371	3.0576	0.3271
6	2.8398	0.3521	9.6830	0.1033	3.4098	0.2933
7	3.3793	0.2959	12.5227	0.0799	3.7057	0.2699
8	4.0214	0.2487	15.9020	0.0629	3.9544	0.2529
9	4.7854	0.2090	19.9234	0.0502	4.1633	0.2402
10	5.6947	0.1756	24.7089	0.0405	4.3389	0.2305
11	6.7767	0.1476	30.4035	0.0329	4.4865	0.2229
12	8.0642	0.1240	37.1802	0.0269	4.6105	0.2169
13	9.5964	0.1042	45.2445	0.0221	4.7147	0.2121
14	11.4198	0.0876	54.8409	0.0182	4.8023	0.2082
15	13.5895	0.0736	66.2607	0.0151	4.8759	0.2051
16	16.1715	0.0618	79.8502	0.0125	4.9377	0.2025
17	19.2441	0.0520	96.0218	0.0104	4.9897	0.2004
18	22.9005	0.0437	115.2659	0.0087	5.0333	0.1987
19	27.2516	0.0367	138.1664	0.0072	5.0700	0.1972
20	32.4294	0.0308	165.4180	0.0060	5.1009	0.1960
21	38.5910	0.0259	197.8474	0.0051	5.1268	0.1951
22	45.9233	0.0218	236.4385	0.0042	5.1486	0.1942
23	54.6487	0.0183	282.3618	0.0035	5.1668	0.1935
24	65.0320	0.0154	337.0105	0.0030	5.1822	0.1930
25	77.3881	0.0129	402.0425	0.0025	5.1951	0.1925
26	92.0918	0.0109	479.4306	0.0021	5.2060	0.1921
27	109.5893	0.0091	571.5224	0.0017	5.2151	0.1917
28	130.4112	0.0077	681.1116	0.0015	5.2228	0.1915
29	155.1893	0.0064	811.5228	0.0012	5.2292	0.1912
30	184.6753	0.0054	966.7122	0.0010	5.2347	0.1910

TABLE E-26 Interest Factors for 20.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.2000	0.8333	1.0000	1.0000	0.8333	1.2000
2	1.4400	0.6944	2.2000	0.4545	1.5278	0.6545
3	1.7280	0.5787	3.6400	0.2747	2.1065	0.4747
4	2.0736	0.4823	5.3680	0.1863	2.5887	0.3863
5	2.4883	0.4019	7.4416	0.1344	2.9906	0.3344
6	2.9860	0.3349	9.9299	0.1007	3.3255	0.3007
7	3.5832	0.2791	12.9159	0.0774	3.6046	0.2774
8	4.2998	0.2326	16.4991	0.0606	3.8372	0.2606
9	5.1598	0.1938	20.7989	0.0481	4.0310	0.2481
10	6.1917	0.1615	25.9587	0.0385	4.1925	0.2385
11	7.4301	0.1346	32.1504	0.0311	4.3271	0.2311
12	8.9161	0.1122	39.5805	0.0253	4.4392	0.2253
13	10.6993	0.0935	48.4966	0.0206	4.5327	0.2206
14	12.8392	0.0779	59.1959	0.0169	4.6106	0.2169
15	15.4070	0.0649	72.0351	0.0139	4.6755	0.2139
16	18.4884	0.0541	87.4421	0.0114	4.7296	0.2114
17	22.1861	0.0451	105.9306	0.0094	4.7746	0.2094
18	26.6233	0.0376	128.1167	0.0078	4.8122	0.2078
19	31.9480	0.0313	154.7400	0.0065	4.8435	0.2065
20	38.3376	0.0261	186.6880	0.0054	4.8696	0.2054
21	46.0051	0.0217	225.0256	0.0044	4.8913	0.2044
22	55.2061	0.0181	271.0307	0.0037	4.9094	0.2037
23	66.2474	0.0151	326.2369	0.0031	4.9245	0.2031
24	79.4968	0.0126	392.4842	0.0025	4.9371	0.2025
25	95.3962	0.0105	471.9811	0.0021	4.9476	0.2021
26	114.4755	0.0087	567.3773	0.0018	4.9563	0.2018
27	137.3706	0.0073	681.8528	0.0015	4.9636	0.2015
28	164.8447	0.0061	819.2233	0.0012	4.9697	0.2012
29	197.8136	0.0051	984.0680	0.0010	4.9747	0.2010
30	237.3763	0.0042	1,181.8816	0.0008	4.9789	0.2008

TABLE E-27 Interest Factors for 25.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.2500	0.8000	1.0000	1.0000	0.8000	1.2500
2	1.5625	0.6400	2.2500	0.4444	1.4400	0.6944
3	1.9531	0.5120	3.8125	0.2623	1.9520	0.5123
4	2.4414	0.4096	5.7656	0.1734	2.3616	0.4234
5	3.0518	0.3277	8.2070	0.1218	2.6893	0.3718
6	3.8147	0.2621	11.2588	0.0888	2.9514	0.3388
7	4.7684	0.2097	15.0735	0.0663	3.1611	0.3163
8	5.9605	0.1678	19.8419	0.0504	3.3289	0.3004
9	7.4506	0.1342	25.8023	0.0388	3.4631	0.2888
10	9.3132	0.1074	33.2529	0.0301	3.5705	0.2801
11	11.6415	0.0859	42.5661	0.0235	3.6564	0.2735
12	14.5519	0.0687	54.2077	0.0184	3.7251	0.2684
13	18.1899	0.0550	68.7596	0.0145	3.7801	0.2645
14	22.7374	0.0440	86.9495	0.0115	3.8241	0.2615
15	28.4217	0.0352	109.6868	0.0091	3.8593	0.2591
16	35.5271	0.0281	138.1085	0.0072	3.8874	0.2572
17	44.4089	0.0225	173.6357	0.0058	3.9099	0.2558
18	55.5112	0.0180	218.0446	0.0046	3.9279	0.2546
19	69.3889	0.0144	273.5558	0.0037	3.9424	0.2537
20	86.7362	0.0115	342.9447	0.0029	3.9539	0.2529
21	108.4202	0.0092	429.6809	0.0023	3.9631	0.2523
22	135.5253	0.0074	538.1011	0.0019	3.9705	0.2519
23	169.4066	0.0059	673.6264	0.0015	3.9764	0.2515
24	211.7582	0.0047	843.0329	0.0012	3.9811	0.2512
25	264.6978	0.0038	1,054.7912	0.0009	3.9849	0.2509

TABLE E-28 Interest Factors for 30.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.3000	0.7692	1.0000	1.0000	0.7692	1.3000
2	1.6900	0.5917	2.3000	0.4348	1.3609	0.7348
3	2.1970	0.4552	3.9900	0.2506	1.8161	0.5506
4	2.8561	0.3501	6.1870	0.1616	2.1662	0.4616
5	3.7129	0.2693	9.0431	0.1106	2.4356	0.4106
6	4.8268	0.2072	12.7560	0.0784	2.6427	0.3784
7	6.2749	0.1594	17.5828	0.0569	2.8021	0.3569
8	8.1573	0.1226	23.8577	0.0419	2.9247	0.3419
9	10.6045	0.0943	32.0150	0.0312	3.0190	0.3312
10	13.7858	0.0725	42.6195	0.0235	3.0915	0.3235
11	17.9216	0.0558	56.4053	0.0177	3.1473	0.3177
12	23.2981	0.0429	74.3270	0.0135	3.1903	0.3135
13	30.2875	0.0330	97.6250	0.0102	3.2233	0.3102
14	39.3738	0.0254	127.9125	0.0078	3.2487	0.3078
15	51.1859	0.0195	167.2863	0.0060	3.2682	0.3060
16	66.5417	0.0150	218.4722	0.0046	3.2832	0.3046
17	86.5042	0.0116	285.0139	0.0035	3.2948	0.3035
18	112.4554	0.0089	371.5180	0.0027	3.3037	0.3027
19	146.1920	0.0068	483.9734	0.0021	3.3105	0.3021
20	190.0496	0.0053	630.1655	0.0016	3.3158	0.3016

TABLE E-29 Interest Factors for 35.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.3500	0.7407	1.0000	1.0000	0.7407	1.3500
2	1.8225	0.5487	2.3500	0.4255	1.2894	0.7755
3	2.4604	0.4064	4.1725	0.2397	1.6959	0.5897
4	3.3215	0.3011	6.6329	0.1508	1.9969	0.5008
5	4.4840	0.2230	9.9544	0.1005	2.2200	0.4505
6	6.0534	0.1652	14.4384	0.0693	2.3852	0.4193
7	8.1722	0.1224	20.4919	0.0488	2.5075	0.3988
8	11.0324	0.0906	28.6640	0.0349	2.5982	0.3849
9	14.8937	0.0671	39.6964	0.0252	2.6653	0.3752
10	20.1066	0.0497	54.5902	0.0183	2.7150	0.3683
11	27.1439	0.0368	74.6967	0.0134	2.7519	0.3634
12	36.6442	0.0273	101.8406	0.0098	2.7792	0.3598
13	49.4697	0.0202	138.4848	0.0072	2.7994	0.3572
14	66.7841	0.0150	187.9544	0.0053	2.8144	0.3553
15	90.1585	0.0111	254.7385	0.0039	2.8255	0.3539
16	121.7139	0.0082	344.8970	0.0029	2.8337	0.3529
17	164.3138	0.0061	466.6109	0.0021	2.8398	0.3521
18	221.8236	0.0045	630.9247	0.0016	2.8443	0.3516
19	299.4619	0.0033	852.7483	0.0012	2.8476	0.3512
20	404.2736	0.0025	1,152.2103	0.0009	2.8501	0.3509

TABLE E-30 Interest Factors for 40.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.4000	0.7143	1.0000	1.0000	0.7143	1.4000
2	1.9600	0.5102	2.4000	0.4167	1.2245	0.8167
3	2.7440	0.3644	4.3600	0.2294	1.5889	0.6294
4	3.8416	0.2603	7.1040	0.1408	1.8492	0.5408
5	5.3782	0.1859	10.9456	0.0914	2.0352	0.4914
6	7.5295	0.1328	16.3238	0.0613	2.1680	0.4613
7	10.5414	0.0949	23.8534	0.0419	2.2628	0.4419
8	14.7579	0.0678	34.3947	0.0291	2.3306	0.4291
9	20.6610	0.0484	49.1526	0.0203	2.3790	0.4203
10	28.9255	0.0346	69.8137	0.0143	2.4136	0.4143
11	40.4957	0.0247	98.7391	0.0101	2.4383	0.4101
12	56.6939	0.0176	139.2348	0.0072	2.4559	0.4072
13	79.3715	0.0126	195.9287	0.0051	2.4685	0.4051
14	111.1201	0.0090	275.3002	0.0036	2.4775	0.4036
15	155.5681	0.0064	386.4202	0.0026	2.4839	0.4026

TABLE E-31 Interest Factors for 45.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F*/*P*,*I*,*N*)	(*P*/*F*,*I*,*N*)	(*F*/*A*,*I*,*N*)	(*A*/*F*,*I*,*N*)	(*P*/*A*,*I*,*N*)	(*A*/*P*,*I*,*N*)
1	1.4500	0.6897	1.0000	1.0000	0.6897	1.4500
2	2.1025	0.4756	2.4500	0.4082	1.1653	0.8582
3	3.0486	0.3280	4.5525	0.2197	1.4933	0.6697
4	4.4205	0.2262	7.6011	0.1316	1.7195	0.5816
5	6.4097	0.1560	12.0216	0.0832	1.8755	0.5332
6	9.2941	0.1076	18.4314	0.0543	1.9831	0.5043
7	13.4765	0.0742	27.7255	0.0361	2.0573	0.4861
8	19.5409	0.0512	41.2019	0.0243	2.1085	0.4743
9	28.3343	0.0353	60.7428	0.0165	2.1438	0.4665
10	41.0847	0.0243	89.0771	0.0112	2.1681	0.4612
11	59.5728	0.0168	130.1618	0.0077	2.1849	0.4577
12	86.3806	0.0116	189.7346	0.0053	2.1965	0.4553
13	125.2518	0.0080	276.1151	0.0036	2.2045	0.4536
14	181.6151	0.0055	401.3670	0.0025	2.2100	0.4525
15	263.3419	0.0038	582.9821	0.0017	2.2138	0.4517

TABLE E-32 Interest Factors for 50.00%

	SINGLE PAYMENT		UNIFORM SERIES			
	COMPOUND-AMOUNT FACTOR	PRESENT-WORTH FACTOR	COMPOUND-AMOUNT FACTOR	SINKING-FUND FACTOR	PRESENT-WORTH FACTOR	CAPITAL-RECOVERY FACTOR
	CONVERT *P* TO *F*	CONVERT *F* TO *P*	CONVERT *A* TO *F*	CONVERT *F* TO *A*	CONVERT *A* TO *P*	CONVERT *P* TO *A*
N	(*F/P,I,N*)	(*P/F,I,N*)	(*F/A,I,N*)	(*A/F,I,N*)	(*P/A,I,N*)	(*A/P,I,N*)
1	1.5000	0.6667	1.0000	1.0000	0.6667	1.5000
2	2.2500	0.4444	2.5000	0.4000	1.1111	0.9000
3	3.3750	0.2963	4.7500	0.2105	1.4074	0.7105
4	5.0625	0.1975	8.1250	0.1231	1.6049	0.6231
5	7.5938	0.1317	13.1875	0.0758	1.7366	0.5758
6	11.3906	0.0878	20.7813	0.0481	1.8244	0.5481
7	17.0859	0.0585	32.1719	0.0311	1.8829	0.5311
8	25.6289	0.0390	49.2578	0.0203	1.9220	0.5203
9	38.4434	0.0260	74.8867	0.0134	1.9480	0.5134
10	57.6650	0.0173	113.3301	0.0088	1.9653	0.5088
11	86.4976	0.0116	170.9951	0.0058	1.9769	0.5058
12	129.7463	0.0077	257.4927	0.0039	1.9846	0.5039
13	194.6195	0.0051	387.2390	0.0026	1.9897	0.5026
14	291.9293	0.0034	581.8585	0.0017	1.9931	0.5017
15	437.8939	0.0023	873.7878	0.0011	1.9954	0.5011

APPENDIX

F

Amortization Schedule

APR: 9.00%
Term: 360 Months
Monthly Payment: $1,206.93

Month	Beginning Principal	Monthly Payment	Monthly Interest	Principal Reduction	Ending Principal
0					150,000.00
1	150,000.00	1,206.93	1,125.00	81.93	149,918.07
2	149,918.07	1,206.93	1,124.39	82.54	149,835.53
3	149,835.53	1,206.93	1,123.77	83.16	149,752.37
4	149,752.37	1,206.93	1,123.14	83.79	149,668.58
5	149,668.58	1,206.93	1,122.51	84.42	149,584.16
6	149,584.16	1,206.93	1,121.88	85.05	149,499.11
7	149,499.11	1,206.93	1,121.24	85.69	149,413.42
8	149,413.42	1,206.93	1,120.60	86.33	149,327.09
9	149,327.09	1,206.93	1,119.95	86.98	149,240.11
10	149,240.11	1,206.93	1,119.30	87.63	149,152.48
11	149,152.48	1,206.93	1,118.64	88.29	149,064.19
12	149,064.19	1,206.93	1,117.98	88.95	148,975.24
13	148,975.24	1,206.93	1,117.31	89.62	148,885.62
14	148,885.62	1,206.93	1,116.64	90.29	148,795.33
15	148,795.33	1,206.93	1,115.96	90.97	148,704.36
16	148,704.36	1,206.93	1,115.28	91.65	148,612.71
17	148,612.71	1,206.93	1,114.60	92.33	148,520.38
18	148,520.38	1,206.93	1,113.90	93.03	148,427.35
19	148,427.35	1,206.93	1,113.21	93.72	148,333.63
20	148,333.63	1,206.93	1,112.50	94.43	148,239.20
21	148,239.20	1,206.93	1,111.79	95.14	148,144.06
22	148,144.06	1,206.93	1,111.08	95.85	148,048.21
23	148,048.21	1,206.93	1,110.36	96.57	147,951.64

Month	Beginning Principal	Monthly Payment	Monthly Interest	Principal Reduction	Ending Principal
24	147,951.64	1,206.93	1,109.64	97.29	147,854.35
25	147,854.35	1,206.93	1,108.91	98.02	147,756.33
26	147,756.33	1,206.93	1,108.17	98.76	147,657.57
27	147,657.57	1,206.93	1,107.43	99.50	147,558.07
28	147,558.07	1,206.93	1,106.69	100.24	147,457.83
29	147,457.83	1,206.93	1,105.93	101.00	147,356.83
30	147,356.83	1,206.93	1,105.18	101.75	147,255.08
31	147,255.08	1,206.93	1,104.41	102.52	147,152.56
32	147,152.56	1,206.93	1,103.64	103.29	147,049.27
33	147,049.27	1,206.93	1,102.87	104.06	146,945.21
34	146,945.21	1,206.93	1,102.09	104.84	146,840.37
35	146,840.37	1,206.93	1,101.30	105.63	146,734.74
36	146,734.74	1,206.93	1,100.51	106.42	146,628.32
37	146,628.32	1,206.93	1,099.71	107.22	146,521.10
38	146,521.10	1,206.93	1,098.91	108.02	146,413.08
39	146,413.08	1,206.93	1,098.10	108.83	146,304.25
40	146,304.25	1,206.93	1,097.28	109.65	146,194.60
41	146,194.60	1,206.93	1,096.46	110.47	146,084.13
42	146,084.13	1,206.93	1,095.63	111.30	145,972.83
43	145,972.83	1,206.93	1,094.80	112.13	145,860.70
44	145,860.70	1,206.93	1,093.96	112.97	145,747.73
45	145,747.73	1,206.93	1,093.11	113.82	145,633.91
46	145,633.91	1,206.93	1,092.25	114.68	145,519.23
47	145,519.23	1,206.93	1,091.39	115.54	145,403.69
48	145,403.69	1,206.93	1,090.53	116.40	145,287.29
49	145,287.29	1,206.93	1,089.65	117.28	145,170.01
50	145,170.01	1,206.93	1,088.78	118.15	145,051.86
51	145,051.86	1,206.93	1,087.89	119.04	144,932.82
52	144,932.82	1,206.93	1,087.00	119.93	144,812.89
53	144,812.89	1,206.93	1,086.10	120.83	144,692.06
54	144,692.06	1,206.93	1,085.19	121.74	144,570.32
55	144,570.32	1,206.93	1,084.28	122.65	144,447.67
56	144,477.67	1,206.93	1,083.36	123.57	144,324.10
57	144,324.10	1,206.93	1,082.43	124.50	144,199.60
58	144,199.60	1,206.93	1,081.50	125.43	144,074.17
59	144,074.17	1,206.93	1,080.56	126.37	143,947.80
60	143,947.80	1,206.93	1,079.61	127.32	143,820.48
61	143,820.48	1,206.93	1,078.65	128.28	143,692.20
62	143,692.20	1,206.93	1,077.69	129.24	143,562.96

Month	Beginning Principal	Monthly Payment	Monthly Interest	Principal Reduction	Ending Principal
63	143,562.96	1,206.93	1,076.72	130.21	143,432.75
64	143,432.75	1,206.93	1,075.75	131.18	143,301.57
65	143,301.57	1,206.93	1,074.76	132.17	143,169.40
66	143,169.40	1,206.93	1,073.77	133.16	143,036.24
67	143,036.24	1,206.93	1,072.77	134.16	142,902.08
68	142,902.08	1,206.93	1,071.77	135.16	142,766.92
69	142,766.92	1,206.93	1,070.75	136.18	142,630.74
70	142,630.74	1,206.93	1,069.73	137.20	142,493.54
71	142,493.54	1,206.93	1,068.70	138.23	142,355.31
72	142,355.31	1,206.93	1,067.66	139.27	142,216.04
73	142,216.04	1,206.93	1,066.62	140.31	142,075.73
74	142,075.73	1,206.93	1,065.57	141.36	141,934.73
75	141,934.37	1,206.93	1,064.51	142.42	141,791.95
76	141,791.95	1,206.93	1,063.44	143.49	141,648.46
77	141,648.46	1,206.93	1,062.36	144.57	141,503.89
78	141,503.89	1,206.93	1,061.28	145.65	141,358.24
79	141,358.24	1,206.93	1,060.19	146.74	141,211.50
80	141,211.50	1,206.93	1,059.09	147.84	141,063.66
81	141,063.66	1,206.93	1,057.98	148.95	140,914.71
82	140,914.71	1,206.93	1,056.86	150.07	140,764.64
83	140,764.64	1,206.93	1,055.73	151.20	140,613.44
84	140,613.44	1,206.93	1,054.60	152.33	140,461.11
85	140,461.11	1,206.93	1,053.46	153.47	140,307.64
86	140,307.64	1,206.93	1,052.31	154.62	140,153.02
87	140,153.02	1,206.93	1,051.15	155.78	139,997.24
88	139,997.24	1,206.93	1,049.98	156.95	139,840.29
89	139,840.29	1,206.93	1,048.80	158.13	139,682.16
90	139,682.16	1,206.93	1,047.62	159.31	139,522.85
91	139,522.85	1,206.93	1,046.42	160.51	139,362.34
92	139,362.34	1,206.93	1,045.22	161.71	139,200.63
93	139,200.63	1,206.93	1,044.00	162.93	139,037.70
94	139,037.70	1,206.93	1,042.78	164.15	138,873.55
95	138,873.55	1,206.93	1,041.55	165.38	138,708.17
96	138,708.17	1,206.93	1,040.31	166.62	138,541.55
97	138,541.55	1,206.93	1,039.06	167.87	138,373.68
98	138,373.68	1,206.93	1,037.80	169.13	138,204.55
99	138,204.55	1,206.93	1,036.53	170.40	138,034.15
100	138,034.15	1,206.93	1,035.26	171.67	137,862.48
101	137,862.48	1,206.93	1,033.97	172.96	137,689.52

Month	Beginning Principal	Monthly Payment	Monthly Interest	Principal Reduction	Ending Principal
102	137,689.52	1,206.93	1,032.67	174.26	137,515.26
103	137,515.26	1,206.93	1,031.36	175.57	137,339.69
104	137,339.69	1,206.93	1,030.05	176.88	137,162.81
105	137,162.81	1,206.93	1,028.72	178.21	136,984.60
106	136,984.60	1,206.93	1,027.38	179.55	136,805.05
107	136,805.05	1,206.93	1,026.04	180.89	136,624.16
108	136,624.16	1,206.93	1,024.68	182.25	136,441.91
109	136,441.91	1,206.93	1,023.31	183.62	136,258.29
110	136,258.29	1,206.93	1,021.94	184.99	136,073.30
111	136,073.30	1,206.93	1,020.55	186.38	135,886.92
112	135,886.92	1,206.93	1,019.15	187.78	135,699.14
113	135,699.14	1,206.93	1,017.74	189.19	135,509.95
114	135,509.95	1,206.93	1,016.32	190.61	135,319.34
115	135,319.34	1,206.93	1,014.90	192.03	135,127.31
116	135,127.31	1,206.93	1,013.45	193.48	134,933.83
117	134,933.83	1,206.93	1,012.00	194.93	134,738.90
118	134,738.90	1,206.93	1,010.54	196.39	134,542.51
119	134,542.51	1,206.93	1,009.07	197.86	134,344.65
120	134,344.65	1,206.93	1,007.58	199.35	134,145.30
121	134,145.30	1,206.93	1,006.09	200.84	133,944.46
122	133,944.46	1,206.93	1,004.58	202.35	133,742.11
123	133,742.11	1,206.93	1,003.07	203.86	133,538.25
124	133,538.25	1,206.93	1,001.54	205.39	133,332.86
125	133,332.86	1,206.93	1,000.00	206.93	133,125.93
126	133,125.93	1,206.93	998.44	208.49	132,917.44
127	132,917.44	1,206.93	996.88	210.05	132,707.39
128	132,707.39	1,206.93	995.31	211.62	132,495.77
129	132,495.77	1,206.93	993.72	213.21	132,282.56
130	132,282.56	1,206.93	992.12	214.81	132,067.75
131	132,067.75	1,206.93	990.51	216.42	131,851.33
132	131,851.33	1,206.93	988.88	218.05	131,633.28
133	131,633.28	1,206.93	987.25	219.68	131,413.60
134	131,413.60	1,206.93	985.60	221.33	131,192.27
135	131,192.27	1,206.93	983.94	222.99	130,969.28
136	130,969.28	1,206.93	982.27	224.66	130,744.62
137	130,744.62	1,206.93	980.58	226.35	130,518.27
138	130,518.27	1,206.93	978.89	228.04	130,290.23
139	130,290.23	1,206.93	977.18	229.75	130,060.48
140	130,060.48	1,206.93	975.45	231.48	129,829.00

Month	Beginning Principal	Monthly Payment	Monthly Interest	Principal Reduction	Ending Principal
141	129,829.00	1,206.93	973.72	233.21	129,595.79
142	129,595.79	1,206.93	971.97	234.96	129,360.83
143	129,360.83	1,206.93	970.21	236.72	129,124.11
144	129,124.11	1,206.93	968.43	238.50	128,885.61
145	128,885.61	1,206.93	966.64	240.29	128,645.32
146	128,645.32	1,206.93	964.84	242.09	128,403.23
147	128,403.23	1,206.93	963.02	243.91	128,159.32
148	128,159.32	1,206.93	961.19	245.74	127,913.58
149	127,913.58	1,206.93	959.35	247.58	127,666.00
150	127,666.00	1,206.93	957.50	249.43	127,416.57
151	127,416.57	1,206.93	955.62	251.31	127,165.26
152	127,165.26	1,206.93	953.74	253.19	126,912.07
153	126,912.07	1,206.93	951.84	255.09	126,656.98
154	126,656.98	1,206.93	949.93	257.00	126,399.98
155	126,399.98	1,206.93	948.00	258.93	126,141.05
156	126,141.05	1,206.93	946.06	260.87	125,880.18
157	125,880.18	1,206.93	944.10	262.83	125,617.35
158	125,617.35	1,206.93	942.13	264.80	125,352.55
159	125,352.55	1,206.93	940.14	266.79	125,085.76
160	125,085.76	1,206.93	938.14	268.79	124,816.97
161	124,816.97	1,206.93	936.13	270.80	124,546.17
162	124,546.17	1,206.93	934.10	272.83	124,273.34
163	124,273.34	1,206.93	932.05	274.88	123,998.46
164	123,998.46	1,206.93	929.99	276.94	123,721.52
165	123,721.52	1,206.93	927.91	279.02	123,442.50
166	123,442.50	1,206.93	925.82	281.11	123,161.39
167	123,161.39	1,206.93	923.71	283.22	122,878.17
168	122,878.17	1,206.93	921.59	285.34	122,592.83
169	122,592.83	1,206.93	919.45	287.48	122,305.35
170	122,305.35	1,206.93	917.29	289.64	122,015.71
171	122,015.71	1,206.93	915.12	291.81	121,723.90
172	121,723.90	1,206.93	912.93	294.00	121,429.90
173	121,429.90	1,206.93	910.72	296.21	121,133.69
174	121,133.69	1,206.93	908.50	298.43	120,835.26
175	120,835.26	1,206.93	906.26	300.67	120,534.59
176	120,534.59	1,206.93	904.01	302.92	120,231.67
177	120,231.67	1,206.93	901.74	305.19	119,926.48
178	119,926.48	1,206.93	899.45	307.48	119,619.00
179	119,619.00	1,206.93	897.14	309.79	119,309.21

Month	Beginning Principal	Monthly Payment	Monthly Interest	Principal Reduction	Ending Principal
180	119,309.21	1,206.93	894.82	312.11	118,997.10
181	118,997.10	1,206.93	892.48	314.45	118,682.65
182	118,682.65	1,206.93	890.12	316.81	118,365.84
183	118,365.84	1,206.93	887.74	319.19	118,046.65
184	118,046.65	1,206.93	885.35	321.58	117,725.07
185	117,725.07	1,206.93	882.94	323.99	117,401.08
186	117,401.08	1,206.93	880.51	326.42	117,074.66
187	117,074.66	1,206.93	878.06	328.87	116,745.79
188	116,745.79	1,206.93	875.59	331.34	116,414.45
189	116,414.45	1,206.93	873.11	333.82	116,080.63
190	116,080.63	1,206.93	870.60	336.33	115,744.30
191	115,744.30	1,206.93	868.08	338.85	115,405.45
192	115,405.45	1,206.93	865.54	341.39	115,064.06
193	115,064.06	1,206.93	862.98	343.95	114,720.11
194	114,720.11	1,206.93	860.40	346.53	114,373.58
195	114,373.58	1,206.93	857.80	349.13	114,024.45
196	114,024.45	1,206.93	855.18	351.75	113,672.70
197	113,672.70	1,206.93	852.55	354.38	113,318.32
198	113,318.32	1,206.93	849.89	357.04	112,961.28
199	112,961.28	1,206.93	847.21	359.72	112,601.56
200	112,601.56	1,206.93	844.51	362.42	112,239.14
201	112,239.14	1,206.93	841.79	365.14	111,874.00
202	111,874.00	1,206.93	839.06	367.87	111,506.13
203	111,506.13	1,206.93	836.30	370.63	111,135.50
204	111,135.50	1,206.93	833.52	373.41	110,762.09
205	110,762.09	1,206.93	830.72	376.21	110,385.88
206	110,385.88	1,206.93	827.89	379.04	110,006.84
207	110,006.84	1,206.93	825.05	381.88	109,624.96
208	109,624.96	1,206.93	822.19	384.74	109,240.22
209	109,240.22	1,206.93	819.30	387.63	108,852.59
210	108,852.59	1,206.93	816.39	390.54	108,462.05
211	108,462.05	1,206.93	813.47	393.46	108,068.59
212	108,068.59	1,206.93	810.51	396.42	107,672.17
213	107,672.17	1,206.93	807.54	399.39	107,272.78
214	107,272.78	1,206.93	804.55	402.38	106,870.40
215	106,870.40	1,206.93	801.53	405.40	106,465.00
216	106,465.00	1,206.93	798.49	408.44	106,056.56
217	106,056.56	1,206.93	795.42	411.51	105,645.05
218	105,645.05	1,206.93	792.34	414.59	105,230.46

Month	Beginning Principal	Monthly Payment	Monthly Interest	Principal Reduction	Ending Principal
219	105,230.46	1,206.93	789.23	417.70	104,812.76
220	104,812.76	1,206.93	786.10	420.83	104,391.93
221	104,391.93	1,206.93	782.94	423.99	103,967.94
222	103,967.94	1,206.93	779.76	427.17	103,540.77
223	103,540.77	1,206.93	776.56	430.37	103,110.40
224	103,110.40	1,206.93	773.33	433.60	102,676.80
225	102,676.80	1,206.93	770.08	436.85	102,239.95
226	102,239.95	1,206.93	766.80	440.13	101,799.82
227	101,799.82	1,206.93	763.50	443.43	101,356.39
228	101,356.39	1,206.93	760.17	446.76	100,909.63
229	100,909.63	1,206.93	756.82	450.11	100,459.52
230	100,459.52	1,206.93	753.45	453.48	100,006.04
231	100,006.04	1,206.93	750.05	456.88	99,549.16
232	99,549.16	1,206.93	746.62	460.31	99,088.85
233	99,088.85	1,206.93	743.17	463.76	98,625.09
234	98,625.09	1,206.93	739.69	467.24	98,157.85
235	98,157.85	1,206.93	736.18	470.75	97,687.10
236	97,687.10	1,206.93	732.65	474.28	97,212.82
237	97,212.82	1,206.93	729.10	477.83	96,734.99
238	96,734.99	1,206.93	725.51	481.42	96,253.57
239	96,253.57	1,206.93	721.90	485.03	95,768.54
240	95,768.54	1,206.93	718.26	488.67	95,279.87
241	95,279.87	1,206.93	714.60	492.33	94,787.54
242	94,787.54	1,206.93	710.91	496.02	94,291.52
243	94,291.52	1,206.93	707.19	499.74	93,791.78
244	93,791.78	1,206.93	703.44	503.49	93,288.29
245	93,288.29	1,206.93	699.66	507.27	92,781.02
246	92,781.02	1,206.93	695.86	511.07	92,269.95
247	92,269.95	1,206.93	692.02	514.91	91,755.04
248	91,755.04	1,206.93	688.16	518.77	91,236.27
249	91,236.27	1,206.93	684.27	522.66	90,713.61
250	90,713.61	1,206.93	680.35	526.58	90,187.03
251	90,187.03	1,206.93	676.40	530.53	89,656.50
252	89,656.50	1,206.93	672.42	534.51	89,121.99
253	89,121.99	1,206.93	668.41	538.52	88,583.47
254	88,853.47	1,206.93	664.38	542.55	88,040.92
255	88,040.92	1,206.93	660.31	546.62	87,494.30
256	87,494.30	1,206.93	656.21	550.72	86,943.58
257	86,943.58	1,206.93	652.08	554.85	86,388.73

Month	Beginning Principal	Monthly Payment	Monthly Interest	Principal Reduction	Ending Principal
258	86,388.73	1,206.93	647.92	559.01	85,829.72
259	85,829.72	1,206.93	643.72	563.21	85,266.51
260	85,266.51	1,206.93	639.50	567.43	84,699.08
261	84,699.08	1,206.93	635.24	571.69	84,127.39
262	84,127.39	1,206.93	630.96	575.97	83,551.42
263	83,551.42	1,206.93	626.64	580.29	82,971.13
264	82,971.13	1,206.93	622.28	584.65	82,386.48
265	82,386.48	1,206.93	617.90	589.03	81,797.45
266	81,797.45	1,206.93	613.48	593.45	81,204.00
267	81,204.00	1,206.93	609.03	597.90	80,606.10
268	80,606.10	1,206.93	604.55	602.38	80,003.72
269	80,003.72	1,206.93	600.03	606.90	79,396.82
270	79,396.82	1,206.93	596.48	611.45	78,785.37
271	78,785.37	1,206.93	590.89	616.04	78,169.33
272	78,169.33	1,206.93	586.27	620.66	77,548.67
273	77,548.67	1,206.93	581.62	625.31	76,923.36
274	76,923.36	1,206.93	576.93	630.00	76,293.36
275	76,293.36	1,206.93	572.20	634.73	75,658.63
276	75,658.63	1,206.93	567.44	639.49	75,019.14
277	75,019.14	1,206.93	562.64	644.29	74,374.85
278	74,374.85	1,206.93	557.81	649.12	73,725.73
279	73,725.73	1,206.93	552.94	653.99	73,071.74
280	73,071.74	1,206.93	548.04	658.89	72,412.85
281	72,412.85	1,206.93	543.10	663.83	71,749.02
282	71,749.02	1,206.93	538.12	668.81	71,080.21
283	71,080.21	1,206.93	533.10	673.83	70,406.38
284	70,406.38	1,206.93	528.05	678.88	69,727.50
285	69,727.50	1,206.93	522.96	683.97	69,043.53
286	69,043.53	1,206.93	517.83	689.10	68,354.43
287	68,354.43	1,206.93	512.66	694.27	67,660.16
288	67,660.16	1,206.93	507.45	699.48	66,960.68
289	66,960.68	1,206.93	502.21	704.72	66,255.96
290	66,255.96	1,206.93	496.92	710.01	65,545.95
291	65,545.95	1,206.93	491.59	715.34	64,830.61
292	64,830.61	1,206.93	486.23	720.70	64,109.91
293	64,109.91	1,206.93	480.82	726.11	63,383.80
294	63,383.80	1,206.93	475.38	731.55	62,652.25
295	62,652.25	1,206.93	469.89	737.04	61,915.21
296	61,915.21	1,206.93	464.36	742.57	61,172.64

Month	Beginning Principal	Monthly Payment	Monthly Interest	Principal Reduction	Ending Principal
297	61,172.64	1,206.93	458.79	748.14	60,424.50
298	60,424.50	1,206.93	453.18	753.75	59,670.75
299	59,670.75	1,206.93	447.53	759.40	58,911.35
300	58,911.35	1,206.93	441.84	765.09	58,146.26
301	58,146.26	1,206.93	436.10	770.83	57,375.43
302	57,375.43	1,206.93	430.32	776.61	56,598.82
303	56,598.82	1,206.93	424.49	782.44	55,816.38
304	55,816.38	1,206.93	418.62	788.31	55,028.07
305	55,028.07	1,206.93	412.71	794.22	54,233.67
306	54,233.85	1,206.93	406.75	800.18	53,433.67
307	53,433.67	1,206.93	400.75	806.18	52,627.49
308	52,627.49	1,206.93	394.71	812.22	51,815.27
309	51,815.27	1,206.93	388.61	818.32	50,996.95
310	50,996.95	1,206.93	382.48	824.45	50,172.50
311	50,172.50	1,206.93	376.29	830.64	49,341.86
312	49,341.86	1,206.93	370.06	836.87	48,504.99
313	48,504.99	1,206.93	363.79	843.14	47,661.85
314	47,661.85	1,206.93	357.46	849.47	46,812.38
315	46,812.38	1,206.93	351.09	855.84	45,956.54
316	45,956.54	1,206.93	344.67	862.26	45,094.28
317	45,094.28	1,206.93	338.21	868.72	44,225.56
318	44,225.56	1,206.93	331.69	875.24	43,350.32
319	43,350.32	1,206.93	325.13	881.80	42,468.52
320	42,468.52	1,206.93	318.51	888.42	41,580.10
321	41,580.10	1,206.93	311.85	895.08	40,685.02
322	40,685.02	1,206.93	305.14	901.79	39,783.23
323	39,783.23	1,206.93	298.37	908.56	38,874.67
324	38,874.67	1,206.93	291.56	915.37	37,959.30
325	37,959.30	1,206.93	284.69	922.24	37,037.06
326	37,037.06	1,206.93	277.78	929.15	36,107.91
327	36,107.91	1,206.93	270.81	936.12	35,171.79
328	35,171.79	1,206.93	263.79	943.14	34,228.65
329	34,228.65	1,206.93	256.71	950.22	33,278.43
330	33,278.43	1,206.93	249.59	957.34	32,321.09
331	32,321.09	1,206.93	242.41	964.52	31,356.57
332	31,356.57	1,206.93	235.17	971.76	30,384.81
333	30,384.81	1,206.93	227.89	979.04	29,405.77
334	29,405.77	1,206.93	220.54	986.39	28,419.38
335	28,419.38	1,206.93	213.15	993.78	27,425.60

Month	Beginning Principal	Monthly Payment	Monthly Interest	Principal Reduction	Ending Principal
336	27,425.60	1,206.93	205.69	1,001.24	26,424.36
337	26,424.36	1,206.93	198.18	1,008.75	25,415.61
338	25,415.61	1,206.93	190.62	1,016.31	24,399.30
339	24,399.30	1,206.93	182.99	1,023.94	23,375.36
340	23,375.36	1,206.93	175.32	1,031.61	22,343.75
341	22,343.75	1,206.93	167.58	1,039.35	21,304.40
342	21,304.40	1,206.93	159.78	1,047.15	20,257.25
343	20,257.25	1,206.93	151.93	1,055.00	19,202.25
344	19,202.25	1,206.93	144.02	1,062.91	18,139.34
345	18,139.34	1,206.93	136.05	1,070.88	17,068.46
346	17,068.46	1,206.93	128.01	1,078.92	15,989.54
347	15,989.54	1,206.93	119.92	1,087.01	14,902.53
348	14,902.53	1,206.93	111.77	1,095.16	13,807.37
349	13,807.37	1,206.93	103.56	1,103.37	12,704.00
350	12,704.00	1,206.93	95.28	1,111.65	11,592.35
351	11,592.35	1,206.93	86.94	1,119.99	10,472.36
352	10,472.36	1,206.93	78.54	1,128.39	9,343.97
353	9,343.97	1,206.93	70.08	1,136.85	8,207.12
354	8,207.12	1,206.93	61.55	1,145.38	7,061.74
355	7,061.74	1,206.93	52.96	1,153.97	5,907.77
356	5,907.77	1,206.93	44.31	1,162.62	4,745.15
357	4,745.15	1,206.93	35.59	1,171.34	3,573.81
358	3,573.81	1,206.93	26.80	1,180.13	2,393.68
359	2,393.68	1,206.93	17.95	1,188.98	1,204.70
360	1,204.70	1,213.74	9.04	1,204.70	0.00
Total		434,501.61	284,501.61	150,000.00	

APPENDIX

G

Glossary

A

Accounts Payable Debts the company owes and expects to pay within one year that are not evidenced by a written promise to pay.

Accounts Payable to Revenue Ratio Accounts payable divided by revenue. Often expressed as a percentage.

Accounts Payable to Sales Ratio See **Accounts Payable to Revenue Ratio**.

Accounts Receivable Invoices owed to the company that will likely be paid within one year and have not been formalized by a written promise to pay. Most commonly these are bills to the project owners.

Accrual Method of Accounting An accounting method where revenue is recognized when the company has the right to receive the revenues and expenses are recognized when the company is obligated to pay the expenses.

Accrued Payables Monies owed for supplies and services that have not been billed, including accrued taxes, rents, wages, and vacation time.

Acid Test Ratio See **Quick Ratio**.

Alternate Minimum Tax An alternate method of calculating income tax liability used to ensure those with large amounts of deductions pay a minimum amount of income tax.

Amortization Schedule The table showing how a loan is paid off, which shows the monthly payment, interest, and outstanding principal balance for each month of a loan's existence.

Annual Equivalent An analytical method where investment alternatives are compared based on their equivalent annual receipts less their equivalent annual disbursements over the study period of the alternatives.

Annual Percentage Rate The nominal or stated interest rate on a financial instrument. The annual percentage rate ignores the effects of compound interest.

Annual Percentage Yield The annually compounded interest rate that produces the same amount of interest as the interest rate that is compounded on a more frequent basis.

Annual Value The value of a single cash flow in a uniform series of cash flows that occurs at the end of each period and continues for a number of periods. These cash flows must be uniform or equal in amount (not equivalent), the cash flows must occur at the end of the each period in the series, and the length of the periods must be the same as the length of the periods for the periodic interest rate.

APR See **Annual Percentage Rate**.

APY See **Annual Percentage Yield**.

Assets Resources held by a company or person that will probably lead to some future cash inflows.

Assets to Revenues Ratio Total assets divided by revenues. Often expressed as a percentage.

Assets to Sales Ratio See **Assets to Revenues Ratio**.

Average Age of Accounts Payable A ratio calculated by multiplying accounts payable by 365 days and dividing the resultant by the total of invoices processed through the accounts payable.

Average Age of Accounts Receivable See **Collection Period**.

Average Daily Balance The average of the daily balances in an account. The average daily balance is determined by summing the daily balances in an account and dividing the result by the number of days in the period.

B

Book Value The value of equipment on the accounting books, which equals the purchase price less depreciation.

Burden See **Labor Burden**.

Buyout The process of hiring subcontractors and procuring materials for a construction project.

C

Capital Gain Gain on the sale or disposition of a capital asset, depreciable property, and real property (real estate).

Capital Lease Leases that are noncancelable and meet at least one of the following conditions: (1) The lease extends for 75% or more of the equipment or property's useful life, (2) ownership transfers at the end of the lease, (3) ownership is likely to transfer at the end of the lease through a purchase option with a heavily discounted price, or (4) the present value of the lease payments at market interest rates exceeds 90% of the fair market value of the equipment or property.

Capital Loss Loss on the sale or disposition of a capital asset, depreciable property, and real property (real estate).

Capital Recovery with Return An analytical method where investment alternatives are compared based on the annual return necessary to cover the annual equivalent of the initial investment less the annual equivalent of the salvage value.

Capital Stock Initial investment in a corporation by the shareholders.

Cash Demand deposits, time deposits with a maturity of one year or less, and petty cash.

Cash Disbursement Cash flow from a company; for example, the payment of a bill.

Cash Equivalents The payment of cash to an employee in lieu of providing certain benefits.

Cash Flow Diagram A diagram showing receipts and disbursements of cash. In a cash flow diagram, the periods are represented along the horizontal axis and the cash flows are drawn as vertical arrows next to the period in which they occur. Arrows drawn in the

up direction represent cash receipts and arrows drawn in the down direction represent cash disbursements.

Cash Method of Accounting An accounting method where revenue is recognized when the payments are received and expenses are recognized when bills are paid.

Cash Receipt Cash flow into a company.

Collection Period A ratio calculated by multiplying accounts receivable by 365 days and dividing the resultant by revenues.

Completed Contract Method of Accounting An accounting method where revenues, expenses, and profits are recognized at the completion of the project.

Compound Interest Interest that is paid on interest from the previous periods.

Construction Loan A short-term loan used to cover the costs of construction and must be paid off at or shortly after the completion of construction.

Contingent Alternatives Alternatives that may be selected only after another alternative has been selected.

Contra Account An account that is subtracted from another account.

Contribution Margin The amount of money that a project or projects contributes to the company to be used to pay for the fixed overhead and provide a profit for the stakeholders.

Contribution Margin Ratio The contribution margin expressed as a percentage of the company's revenues from construction operations.

Corporate Income Tax Federal income tax levied to corporations, specifically traditional C corporations and some partnerships.

Cost Performance Index A measure of the success of a project's management team to complete a project under budget, which is based on the ratio of budgeted cost of the work performed to the actual cost of the work performed.

Current Assets Assets that are expected to be converted to cash, exchanged, or consumed within one year.

Current Assets to Total Assets Ratio Current assets divided by total assets.

Current Liabilities Liabilities that are expected to be paid within the next year.

Current Liabilities to Net Worth Ratio Current liabilities divided by net worth. Often expressed as a percentage.

Current Period Net Income Profits or losses incurred during the current accounting period.

Current Ratio A measure of a company's ability to use current assets to pay for current liabilities.

D

Debt to Equity Ratio Total liabilities divided by equity (net worth).

Debt to Worth Ratio See **Debt to Equity Ratio**.

Degree of Fixed Asset Newness A ratio calculated by dividing net fixed assets by total fixed assets.

Depreciation The loss in value of an asset, such as equipment and buildings, due to wear and tear, the age of the asset, and obsolescence.

Depreciation Rate The percentage of an asset's depreciation taken in a specified year.

Depreciation Schedule A table showing each year's book value and depreciation for an asset.

Direct Costs Cost of materials, labor, and equipment that are incorporated into the construction of a project.

Direct Overhead Costs See **Indirect Costs**.

"Do Nothing" Alternative The alternative where all other alternatives have been rejected.

E

Effective Tax Rate The average tax rate paid on the taxable income.

Equal Cash flows that are the same amount. The time value of money is ignored with equal cash flows.

Equity See **Owner's Equity**.

Equivalence Cash flows that produce the same results. Equivalence is a function of the size of the cash flows, the timing of the cash flows, and the interest rate.

Equivalent See **Equivalence**.

External Constraints Constraints outside a pool of alternatives that may limit the number or restrict the alternatives than may be selected from the pool of alternatives, such as a limited supply of money or contractual obligations.

F

FICA Federal Insurance Contribution Act. FICA requires employers and employees to pay social security and Medicare taxes.

FIFO See **First-In/First-Out**.

Financial Management The use of a company's financial resources, encompassing all decisions that affect a company's financial health.

First-In/First-Out A method of pricing inventory where it is assumed that the materials purchased first are the materials that are used first.

Fiscal Year A consecutive twelve-month period used by businesses as their financial year, which may be different from the calendar year.

Fixed Assets Building, land, construction equipment, trucks, autos, and office equipment.

Fixed Asset to Net Worth Ratio Fixed asset divided by net worth (equity). Often expressed as a percentage.

Fixed Overhead Overhead costs that do not change with a change in volume of work over a specified range of volume of work.

FUTA Federal Unemployment Tax Act. FUTA requires employers to pay federal unemployment tax.

Future Value The value of a cash flow(s) at some specific point in the future. The future value occurs at the end of the year. The future value may be at any point in time after a cash flow. The future value may also occur concurrently with the last payment in a uniform series of cash flows.

Future Worth An analytical method where investment alternatives are compared based on their worth at some time in the future.

G

General and Administrative Cost Ratio See **General Overhead Ratio**.

General and Administrative Expense See **General Overhead**.

General Overhead Costs that cannot be charged to a specific construction project or be included in the equipment costs section of the income statement.

General Overhead Ratio General overhead divided by revenues. Usually expressed as a percentage.

Good Faith Estimate An estimate of the closing costs for a loan prepared by the lending institution in good faith.

Grace Period The time between a credit card purchase and the date interest is charged on that purchase. The grace period usually only applies to those cardholders who pay their bill in full each month.

Gross Profit Margin Gross profit divided by revenues. Usually expressed as a percentage.

Gross Profit Ratio See **Gross Profit Margin**.

I

Incremental Net Present Value An analytical method where investment alternatives are compared based on the present worth of the difference in the cash flows of the alternatives at the time of the initial investment.

Incremental Rate of Return An analytical method where investment alternatives are compared based on the rate of return of the difference in the cash flows of the alternatives.

Incremental Tax Rate See **Marginal Tax Rate**.

Independent Alternatives Alternatives where the acceptance of one alternative does not, in and of itself, preclude the selection of the other alternatives.

Indirect Costs Costs that can be specifically identified to the completion of a specific construction project, but cannot be identified with the completion of a specific construction component on that project. Indirect costs may also be referred to as indirect project costs, project overhead, or direct overhead costs.

Indirect Project Costs See **Indirect Costs**.

Indirect Overhead See **General Overhead**.

Interest Money paid by banks or borrowers for the use of money. Interest is generally expressed as an annual percentage rate and annual percentage yield.

Inventory Materials available for sale or are available and expected to be incorporated into a construction project within the next year.

L

Labor Burden Cost to the employer to pay for employee taxes, insurances, and other benefits.

Labor Burden Markup Labor burden expressed as a percentage of the employee's wages excluding wages paid for vacation and sick leave.

Last-In/First-Out A method of pricing inventory where it is assumed that the materials purchased last are the materials that are used first.

Liabilities An obligation to transfer assets or render services at some time in the future for which the commitment has already been made.

LIFO See **Last-In/First-Out**.

Loan Provisions Conditions attached to a loan that require the borrower to perform specific actions, such as maintain a compensating balance.

Long-Term Assets Assets with an expected useful life of more than one year at the time of their purchase.

Long-Term Capital Gain or Loss Gains and losses on capital assets held for more than one year.

Long-Term Contract Any construction contract that is likely to span more than one tax year.

Long-Term Liabilities Debts that are not expected to be paid within one year.

M

Marginal Tax Rate The income tax rate paid on the last dollar of taxable income.

MARR See **Minimum Attractive Rate of Return**.

Maturity Matching Matching the term of the financing to the length of the financial need.

Minimum Attractive Rate of Return The lowest rate of return that is acceptable for an investment alternative or the rate of return at which an investments become attractive.

Mixed Overhead Overhead that has both a variable and fixed component.

Mutually Exclusive Alternatives Alternatives where the acceptance of one of the alternatives precludes investment in the other alternatives.

N

Net Income A positive taxable income.

Net Loss A negative taxable income.

Net Present Value An analytical method where investment alternatives are compared based on their present worth at the time of the initial investment.

Net Worth See **Owner's Equity**

Net Worth Ratio See **Debt to Equity Ratio**.

Nominal Interest Rate See **Annual Percentage Rate**.

Notes Payable Debts that will likely be paid within one year and have been formalized by a written promise to pay.

Notes Receivable Invoices, short-term loans, or employee advances owed to the company that will likely be paid within one year and have been formalized by a written promise to pay.

NPV See **Net Present Value**.

O

Off-Balance-Sheet Financing Financing which does not appear on the balance sheet. An operating lease is one form of off-balance-sheet financing.

Operation Cost The costs associated with operating an asset. For a piece of construction equipment this includes tires and other wear items, fuel, lubricants and filters, and repairs.

Operational Lease Any lease that is not a capital lease.

Opportunity Cost The cost of having to pass on one alternative to select another alternative.

Ordinary Income Income that is not considered capital gains for income tax purposes.

Other Assets Assets not elsewhere classified. This includes inventory that will not be sold within a year, investment in other companies, and the cash value of life insurance policies.

Overhead See **General Overhead**.

Owner's Equity The claim of the company's owner or shareholders on the assets that remain after the liabilities are paid.

Ownership Costs The cost of owing an asset that includes purchase price, salvage value, interest, property taxes, and insurance.

P

Paid When Paid Clause A clause that ties the payment of supplier and subcontractor bills to a specified number of days after the contractor has received payment for the bills in the form of unrestricted funds from the owner. It is used to arrange with suppliers and subcontractors to provide the capital needed to construct a construction project.

Passive Activity Generally passive activities include all business activities in which the taxpayer did not materially participate in during the tax year and most rental activities. Passive activities must meet very specific requirements that are defined by the Internal Revenue Code.

Payable Turns A ratio calculated by dividing 365 by the average age of accounts payable.

Payback Period with Interest The time required to recoup the initial investment plus interest on the investment at the MARR.

Payback Period without Interest The time required to recoup the initial investment while ignoring interest on the investment.

Percentage-of-Completion Method of Accounting An accounting method where revenues, expenses, and estimated profits are recognized as the project is completed, based on the percentage of the project that is completed.

Periodic Interest Rate The interest rate for one period. The period may be any specified amount of time with years, quarters, and months being the most common. The period must be the same as the compounding period for the interest rate.

Prepaid Expenses Payments that have been made for future supplies and services, including prepaid taxes, insurance premiums, rent, and deposits.

Personal Endorsement The owners of a company pledge their personal assets to ensure payment of a debt incurred by the company.

Personal Income Tax Federal income tax levied at the personal level. Limited liability companies (LLCs), S corporations, most partnerships, and sole proprietorships pass their tax on to their shareholders to be paid at the personal level.

Present Value The value of a cash flow at the present time. When used in the equivalence formulas, the present value occurs at the beginning of the year. The present value may be used to refer to any point in time prior to a cash flow.

Present Worth See **Net Present Value**.

Principal The original amount of money deposited in a saving instrument, such as a certificate of deposit, or borrowed from a debt instrument, such as a loan.

Profit and Overhead Markup A markup added to construction costs to cover general overhead and provide for a profit, which is expressed as a percentage of construction costs.

Profit Margin A ratio that is calculated by dividing profit by revenues and may be measured before income taxes or after income taxes. Usually expressed as a percentage of revenues.

Project Balance A graphical method used to analyze investment alternatives, which include the future worth of the investment at the end of the study period and the payback period with interest.

Project Overhead See **Indirect Costs**.

Q

Quick Ratio Sum of cash and accounts receivable divided by the current liabilities. Retention and allowances for bad debts are excluded from the accounts receivable.

R

Rate of Return (1) An analytical method where investment alternatives are compared based on their rates of returns. (2) The interest rate that produces a net present value of zero for an investment alternative.

Ratios The resulting number obtained by dividing one category or a group of categories on the company's financial statement into another category or group of categories on the company's financial statement. Ratios provide insights into a company's ability to pay bills, how efficiently it uses its financial resources, its profitability, and the capital structure of the company.

Real Property Land and the buildings permanently affixed to the land.

Receivable Turns A ratio calculated by dividing 365 by the collection period.

Recovery Period The number of years over which an asset is to be depreciated. For tax purposes the Internal Revenue Code identifies the recovery period for different classes of assets. For other purposes the recovery period is often equal to the useful life of the asset.

Retained Earnings Prior accounting period's profits or earnings retained by the corporation to invest in a company's operations rather than be distributed to the shareholders.

Retention Funds withheld from a payment to ensure that a contractor completes a construction project.

Return on Assets A ratio calculated by dividing net profit after taxes by total assets. Often expressed as a percentage.

Return on Equity A ratio calculated by dividing net profit after taxes by equity and may be measured before or after income tax. Often expressed as a percentage.

Return on Investment See **Return on Equity**.

Return on Revenues See **Profit Margin**.

Return on Sales See **Profit Margin**.

Revenue Income from the completion of part or all of a construction project.

Revenues to Net Working Capital Ratio See **Working Capital Turns**.

S

Sales to Net Working Capital Ratio See **Working Capital Turns**.

Salvage Value The estimated resale value of an asset when the asset is sold at some future time.

Schedule Performance Index A measure of the success of a project's management team to complete a project on time, which is based on the ratio of budgeted cost of the work performed to the budgeted cost of the work scheduled.

Secured Debt A debt where the borrower has pledged specific assets as security for the debt.

Short-Term Capital Gain or Loss Gains and losses on capital assets held for one year or less.

Single-Payment Compound-Amount Factor A function or factor used to convert a present value to a future value at a specified rate of interest.

Single-Payment Present-Worth Factor A function or factor used to convert a future value to a present value at a specified rate of interest.

Study Period The period of time over which investment alternatives are studied.

Subordinate Debt A debt that may be paid off only after another debt—the debt it is subordinate to—has been paid off.

Sunk Costs Cost that have been spent or irrevocably committed.

SUTA State Unemployment Tax Act. SUTA requires employers to pay state unemployment tax.

T

Tax Credits Credits that directly reduce income tax liability.

Taxable Income The amount of income that is subject to income tax and equals the company's income minus tax deductions.

Third-Party Guarantee Where a company or person other than the borrower becomes a party to a loan and guarantees payment of the loan.

Trade Financing Financing provided by suppliers and subcontractors by providing materials, labor, and equipment to a construction project before receiving payment for the materials, labor, or equipment.

U

Unallowed Losses Unused losses from passive income.

Uniform See **Equal**.

Uniform Series A series of cash flows that are uniform or equal in amount and occur at the end of each period in the series, where the periods are the same length as each other and are the same length as the compounding period for the period interest rate.

Uniform-Series Capital-Recovery Factor A function or factor used to convert a present value into a series of uniform cash flows.

Uniform-Series Compounding-Amount Factor A function or factor used to convert a series of uniform cash flows into a future value.

Uniform-Series Present-Worth Factor A function or factor used to convert a series of uniform cash flows into a present value.

Uniform-Series Sinking-Fund Factor A function or factor used to convert a future value into a series of uniform cash flows.

Unsecured Debt A debt where the borrower has not pledged specific assets as security for the debt.

Useful Life The number of years for which an asset is useful. The useful life is most often based on economics rather than the number of years an asset can be used.

V

Variable Overhead Overhead costs that change or vary with a change in volume of work.

W

Warranty Reserves Funds set aside to cover the foreseeable cost of warranty work.

Working Capital Turns A ratio calculated by dividing revenues by net working capital. The revenues are reduced by the subcontractor costs when a company passes payments from the owners to subcontractors.

Y

Yield See **Annual Percentage Yield**.

APPENDIX

H

List of Variables

A	Annual Value in a Uniform Series (Time Value of Money)
A	Monthly Payment (Financial Instruments)
AAI	Average Annual Investment
$(A/F,i,n)$	Uniform-Series Sinking-Fund Factor
$(A/P,i,n)$	Uniform-Series Capital-Recovery Factor
ACWP	Actual Cost of Work Performed
ADB_t	Average Daily Balance for Period t
AE	Annual Equivalent
b	Intercept Point of a Linear Line Along the y Axis
BCWP	Budgeted Cost of Work Performed
BCWS	Budgeted Cost of Work Scheduled
B_t	Reduction in Unpaid Principal for Payment t
BV_m	Book Value at the End of Year m
c	Compounding Periods in a Year
CPI	Cost Performance Index
CR	Capital Recovery with Return
D	Number of Days
D_m	Depreciation for Year m
f	Inflation Rate
F	Future Value of a Cash Flow (Time Value of Money)
F	Salvage Value (Depreciation)
$(F/A,i,n)$	Uniform-Series Compound-Amount Factor
$(F/P,i,n)$	Single-Payment Compound-Amount Factor
F'	Constant Dollar Future Value
FW	Future Worth
I	Interest
I_t	Interest for Period t
i	Periodic Interest Rate
i'	Constant Dollar Periodic Interest Rate

i_a	Yield, Annual Percentage Yield, or APY (Financial Instruments)
i_a	Effective Annual Interest Rate (Financial Instruments)
m	Slope of a Linear Line (Linear Regression)
m	Year (Depreciation)
MARR	Minimum Attractive Rate of Return
N	Recovery Period (Depreciation)
N	Number of Payments (Financial Instruments)
n	Number of Interest Compounding Periods of Time
n'	Payback Period
NPV	Net Present Value
P	Present Value (Time Value of Money)
P	Purchase Price (Depreciation)
P	Principal (Financial Instruments)
$(P/A,i,n)$	Uniform-Series Present-Worth Factor
$(P/F,i,n)$	Single-Payment Present-Worth Factor
P'	Constant Dollar Present Value
R_m	Depreciation Rate or Percentage of Depreciation Taken in Year m
r	Nominal Interest Rate, Annual Percentage Rate, or APR (Financial Instruments)
r	Correlation Coefficient (Statistics)
r^2	Coefficient of Determination
SPI	Schedule Performance Index
SOY	Sum of the Years
t	Number of Monthly Payments That Have Been Made
U_t	Unpaid Principal at End of Period t
$\hat{y}$	Estimated Value of y