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Inventory Charge Calculations in the Nuclear Fuel Cycle

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INVENTORY CHARGE CALCULATIONS IN THE NUCLEAR FUEL CYCLE

Royce Salmon

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ABSTRACT

Simplified methods are presented for the calculation of inventory charges or carrying charges on fuel, which represent the indirect component of the fuel cycle cost. These methods permit rapid calculation of the changes in fuel cycle cost caused by changes in the amount or timing of fuel cycle expenditures. The methods are developed by applying the discounted cash flow procedure to a single batch of fuel. In typical cases, this would be a batch representing equilibrium or steady-state reactor operation. The cost equations used are the same as those used in the computer code REFCO, described in ORNL-4695, which was based on the discounted cash flow procedure with continuous discounting.

Equivalent procedures using the fixed charge rate concept also are developed. This is done in such a way that consistency with the discounted cash flow procedure is maintained. The fixed charge rate used here is defined in terms of tax rates and the interest rates on debt and equity capital. An effective inventory time is also defined. This is a function of the lead or lag time, the interest rates on capital, and the exposure time of the batch. Tabulated values of the effective inventory time and other useful functions, such as the ratio of indirect to direct cost, are included. Cost calculations using these tables agree with those produced by REFCO, the accuracy being within 0.001 mill/kWhr in the cases studied.

The calculations described here are brief enough to be performed by use of a desk calculator. Numerical examples are included to illustrate the use of the procedures described.

1. INTRODUCTION

The major objective of this study was to develop simplified methods for the calculation of (1) inventory charges or carrying charges on fuel working capital, and (2) the changes in fuel cycle cost caused by small changes in the timing or costs of fuel cycle services. The methods developed are presented in the form of equations and tables which permit such calculations to be made with a desk calculator, so that quick

estimates can be obtained without the use of a computer. The methods presented here are completely consistent with the discounted cash flow procedure. The theoretical basis for the procedures described is the same as that used in the computer code REFCO, which was based on the discounted cash flow method using continuous discounting.^{1,2}

In the latest version of REFCO, which is listed in Appendix A of this report, the fuel cycle cost is broken down into individual component costs for U_3O_8 purchase, separative duty, fuel fabrication, chemical reprocessing, plutonium credit, etc. For each of these, the code determines the direct and indirect costs (carrying charges) and shows them separately. The cost breakdown is obtained by making a separate cost calculation for each component, inserting into the cost equation each time only those expenditures applicable to the component under consideration. Direct costs are calculated by dividing the direct cash expenditures for fuel purposes (i.e., payments for U_3O_8 , enrichment, etc., exclusive of taxes, insurance, interest, and return on investment) by total electricity produced. Indirect costs or carrying charges are obtained by subtracting the direct cost from the total cost. The indirect costs cover such items as interest on debt, earnings on equity, income taxes, other taxes, and insurance. Recovery of investment is accounted for by the direct cost component.

The simplified methods developed here are based on applying the cost equation used in REFCO to a single batch of fuel. The cash expenditures and credits used in the equation, and the time points at which they occur, are those related to the procurement and recovery of the batch under consideration. When determining costs per unit of electricity, the amount of electricity used in the divisor of the cost expression is that delivered by the batch during its total time in the reactor, which may be several cycles. The steady-state fuel cycle cost is obtained by making this calculation for an equilibrium or steady-state batch. When applied to a single batch of fuel, the cost equation is simple enough so that a solution can be quickly obtained by use of a desk- or pocket-size calculator. This is especially true when only one component cost (such as U_3O_8 cost) is desired.

A second objective of this study was to develop a fixed charge rate procedure that could be used for the rapid estimation of inventory charges on fuel, and would give costs consistent with those determined by the discounted cash flow procedure. To accomplish this, the cost equations based on the discounted cash flow procedure were converted into equivalent equations in terms of a fixed charge rate. The fixed charge rate used here is explicitly defined in terms of basic economic parameters such as debt-equity ratio, interest rate on debt, after-tax return on equity, and tax rates. The equations developed permit calculation of inventory charges based on the fixed charge rate, the expenditures for fuel, and the effective inventory time. The effective inventory time is defined as a function of the lead or lag time, the exposure time, and the tax-adjusted average interest rate (average cost of money). Values of the effective inventory time are tabulated for various values of these variables. Discount factors for fuel expenditures and electricity production are also tabulated. Carrying charges can be quickly determined by means of these tables. The tables can also be used to determine the changes in inventory charges resulting from changes in either the unit costs (\$/kg U for U_3O_8 , fabrication, etc.) or in the timing of fuel cycle events, or both. For example, it is possible to calculate the change in inventory charges caused by reducing the lag time for reprocessing and plutonium sale by 10 days, 30 days, etc. This is useful in trade-off studies involving changes in inventory time and costs.

Numerical examples are given to illustrate the use of the tables and procedures described here. The results are compared with those obtained by the use of REFCO. The agreement is generally within 0.001 mill/kWhr. The accuracy of the results is verified by means of payout calculations using the POW76 computer code.¹ Payout tables are produced showing that the investments and other expenses are indeed paid out in the desired time, together with the required interest and taxes. Examples are included showing that the POW76 results, using monthly time periods, agree with those of REFCO within 0.001 mill/kWhr.

A table of notation appears at the back of the report. The notation used is consistent with that used in refs. 1 and 2.

2. DEVELOPMENT OF BASIC CALCULATIONAL TOOLS

The expression for fuel cycle cost used in REFCO is given by Eq. (27) of ORNL-4695:¹

$$U_F = \frac{(1 - k_m) \sum \phi_i A_i + \sum P_r J'_r - k_e \sum \phi_i F_i}{10^{-9} (1 - k_e) \sum \phi_i Z_i}, \quad (1)$$

in which costs are collected over any desired number of cycles i . Payments (J'_r , F_i , A_i) are expressed in millions of dollars, electricity production (Z_i) in kWhr, and fuel cycle cost in mills/kWhr. The expenditures J'_r represent those sums paid for procurement of U_3O_8 , conversion, enrichment, fabrication, shipping, chemical reprocessing, etc. Each J'_r refers to an individual cash payment at time t_r . If J'_r is an expenditure, it is positive; if a credit, it is negative. F_i is the portion of the total fuel expense allocated for tax purposes to cycle i . P_r is the discount factor for a single payment ($P_r = e^{-gt_r}$), and ϕ_i is the uniform continuous discount factor for time period (cycle) i , which starts at time t_1 and ends at time t_2 :

$$\phi_i = \left[\frac{e^{-gt_1} - e^{-gt_2}}{gt_2 - gt_1} \right]_i. \quad (2)$$

The continuous discount rate g is defined by the equation

$$g = \ln (1 + i_{vs}),$$

in which i_{vs} , the tax-adjusted weighted average cost of money, is defined by the equation

$$i_{vs} = b(1 - k_m)i_b + (1 - b)i_e, \quad (3)$$

and the economic parameters used here are defined as follows:

- b = debt fraction
- i_b = annual interest rate on debt
- $1 - b$ = equity fraction
- i_e = annual after-tax rate of return on equity

$$\begin{aligned}
 k_e &= 1 - (1 - k_t)(1 - k_s) \\
 k_e &= 1 - 1 - k_t(1 - k_s)(1 - k_r) \\
 k_t &= \text{federal income tax rate} \\
 k_s &= \text{state income tax rate} \\
 k_r &= \text{state gross revenues tax rate.}
 \end{aligned}$$

If there is no gross revenues tax, k_e is equal to k_m .

It might also be mentioned at this point that continuous discount factors of the form $(1 - i_{vs})^{-t}$ are mathematically identical to those of the form e^{-it} .

Cash expenditures for property taxes and property insurance are represented by the A_i terms. The basis used for calculating these costs may vary rather widely from one locality to another. For reasons described later, it was found desirable to make the temporary simplification of omitting the A_i terms. After completing the discussion of the simplified case, the procedure for including the property taxes and insurance will be described.

With the A_i terms eliminated, Eq. (1) reduces to

$$U_F = \frac{\sum_{i=1}^N \frac{J'_i}{r} - k_m \sum_{i=1}^N \phi_i F_i}{10^{-9} (1 - k_e) \sum_{i=1}^N \phi_i Z_i} \quad (4)$$

As indicated earlier, the fuel cycle cost U_F is the sum of the direct cost U_D and the indirect cost (carrying charges) U_C , defining these costs as follows:

$$U_D = \frac{\sum_{i=1}^N \frac{J'_i}{r}}{10^{-9} \sum_{i=1}^N Z_i} \quad (5)$$

$$U_C = U_F - U_D \quad (6)$$

U_F is used in this report to denote either the total fuel cycle cost or a single component of that cost, such as U_3O_8 procurement, fabrication, etc. Similarly, the indirect and direct costs U_C and U_D may refer to either total or single component costs. This was done to avoid a multiplicity of equations and subscripts. Total costs are obtained by taking summations of component costs.

Referring to the calculation of direct cost in Eq. (5), the electricity production in the divisor is given here as the undiscounted electricity $\sum Z_i$, rather than as the discounted electricity $\sum \phi_i Z_i$. The reason for this is that direct costs are defined here to mean costs exclusive of interest and taxes. The use of discount factors would imply the inclusion of interest charges. If the interest rate is zero, $\sum \phi_i Z_i$ reduces to $\sum Z_i$.

Combining Eqs. (4), (5), and (6), the indirect fuel cost U_C can be expressed in mills/kWhr as follows:

$$U_C = \frac{\sum P_r J'_r - k_m \sum \phi_i F_i}{10^{-9} (1 - k_e) \sum \phi_i Z_i} - \frac{\sum J'_r}{10^{-9} \sum Z_i} \quad (7)$$

For a single fuel cycle event (i.e., a single payment of cash J'_r for some purpose such as U_3O_8 procurement) this reduces to

$$U_C = \frac{P_r J'_r - k_m \sum \phi_i F_i}{10^{-9} (1 - k_e) \sum \phi_i Z_i} - \frac{J'_r}{10^{-9} \sum Z_i} \quad (8)$$

Considering a single batch of fuel, which remains in the reactor for N cycles, the simplifying assumption will be made that this batch delivers the same amount of energy in each cycle. For this case,

$$\sum \phi_i Z_i = \left(\sum Z_i \right) \left(\frac{\sum \phi_i}{N} \right), \quad (9)$$

$$\sum \phi_i F_i = \left(\sum F_i \right) \left(\frac{\sum \phi_i}{N} \right). \quad (10)$$

The quantity $\frac{c_i}{N}$ represents the average continuous discount factor for uniform electricity production over the N cycles during which the batch is in the reactor. For convenience, this average discount factor will be denoted by a_i ; that is,

$$a_i = \frac{c_i}{N}. \quad (11)$$

The quantity F_i , as described in ref. 1, is a bookkeeping quantity representing the allocated cash fuel expense for the cycle i . The total allocated expense must be equal to the total actual cash expenditure; that is,

$$\sum F_i = \sum J'_R / i. \quad (12)$$

For the case of a single batch and a single J'_R , this becomes

$$\sum F_i = J'_R. \quad (13)$$

For further simplification, it will be assumed that there is no gross revenues tax, so that k_g becomes equal to k_m .

Making the indicated substitutions in Eq. 7, the expression for the inventory charges in mills/kWhr reduces to:

$$U_D = \frac{J'_R (P_R - k_m a_i)}{10^{-9} (1 - k_m) a_i \sum Z_i}, \quad (14)$$

and the total cost and direct cost components are given by the following expressions:

$$U_F = \frac{J'_R (P_R - k_m a_i)}{10^{-9} (1 - k_m) a_i \sum Z_i}, \quad (15)$$

$$U_D = \frac{J'_R}{10^{-9} \sum Z_i}. \quad (16)$$

It should be remembered that Eqs. (14), (15), and (16) refer to a single batch of fuel and a single cash expenditure (or credit) J'_R . The time t_R indicates the time point at which the expenditure is paid or the credit is received. When considering several batches, the reference point used in REWCO is the time at which exposure of the first batch starts. At this point, time is equal to zero. For a single batch, t_R is negative for events prior to exposure and positive for events after start of exposure. For example, if J'_R refers to procurement of U_3O_8 , and if this occurs 1 year prior to the time at which fuel exposure starts for this batch, then $t_R = -1.00$ year. Similarly, if J'_R refers to chemical reprocessing of spent fuel, and if the batch is withdrawn from the reactor 3.0 years after insertion and is reprocessed 0.5 years after withdrawal, then $t_R = +3.50$ years.

Tabulated values of P_R and ϕ_R are given in Tables A-1 and A-2 of Appendix A. P_R is given as a function of i_{VS} and t_R ($P_R = e^{-gt_R}$), and ϕ_R is given as a function of i_{VS} and the exposure time (in-reactor time), t_{exp} . The values of ϕ_R are based on the assumption of uniform electricity production throughout the exposure time. Intermediate shutdowns, during which the batch remains in the reactor, are included in t_{exp} . The resulting error in ϕ_R is negligible unless the shutdown is very prolonged, in which case Eq. (1) should be used.

3.1 Change in Amount or Timing of Cash Expenditure

Equation (14) will now be examined with regard to the change in indirect cost caused by changing the amount of the cash expenditure, J'_R , or its timing, t_R . It will be assumed that there is no change in the amount or timing of the electricity production. Denoting initial and final conditions by subscripts 1 and 2, the change in U_C is as follows:

$$U_{C2} - U_{C1} = \frac{J'_{R2} (P_{R2} - \phi_R)}{10^{-9} (1 - k_m) \phi_N \Delta Z_i} - \frac{J'_{R1} (P_{R1} - \phi_R)}{10^{-9} (1 - k_m) \phi_N \Delta Z_i},$$

or

$$\Delta U_C = \frac{J'_{r2} P_{r2} - J'_{r1} P_{r1} - \phi_N (J'_{r2} - J'_{r1})}{10^{-9} (1 - k_m) \phi_N \sum Z_i} \quad (17)$$

If there is a change in J'_r but not in t_r , then

$$\Delta U_C = \frac{(P_r - \phi_N) \Delta J'_r}{10^{-9} (1 - k_m) \phi_N \sum Z_i} \quad (18)$$

If there is a change in t_r but not in J'_r , then

$$\Delta U_C = \frac{J'_r (P_{r2} - P_{r1})}{10^{-9} (1 - k_m) \phi_N \sum Z_i} \quad (19)$$

An approximate form of Eq. (19), which may be used if the change in t_r is small, is

$$\Delta U_C = - \frac{g P_r J'_r \Delta t_r}{10^{-9} (1 - k_m) \phi_N \sum Z_i} \quad (20)$$

When using Eq. (20), P_r should be evaluated at the midpoint between t_{r1} and t_{r2} .

2.2 Change in Amount and Timing of Payment, Holding Fuel Cycle Cost Constant

In economic studies it is frequently useful to know the relationship between a change in the amount J'_r and a change in the timing t_r of a fuel cycle payment (or credit) when the fuel cycle cost is held constant. The required relationship is obtained by differentiating Eq. (15) and equating the derivative of the fuel cycle cost to zero. Since all the terms in the denominator of Eq. (15) are constant,

$$d [J'_r (P_r - k_m \phi_N)] = 0.$$

Replacing P_r by e^{-gt_r} and performing the differentiation gives the differential equation:

$$\frac{dJ'_r}{J'_r} = \frac{g e^{-gt_r} dt_r}{e^{-gt_r} - k_m \phi_N},$$

which, upon integration, yields the desired expression:

$$\frac{J'_{r2}}{J'_{r1}} = \frac{P_{r1} - k_m \phi_N}{P_{r2} - k_m \phi_N}. \quad (21)$$

If the changes in J'_r and t_r are small, the following approximate equation may be used:

$$\frac{\Delta J'_r}{J'_r} = \Delta t_r \left[\frac{g P_r}{P_r - k_m \phi_N} \right]. \quad (22)$$

When using this equation, J'_r is taken as the average of J'_{r1} and J'_{r2} , and P_r is evaluated at the midpoint between t_{r1} and t_{r2} .

2.3 Property Taxes and Insurance

The fuel cost due to property taxes and property insurance on fuel, in mills/kWhr, will be denoted by U_A . The basis used for calculating these costs may vary from one firm to another. The basis described here is currently used in REFCO and illustrates one possible method of calculation. The equations used are as follows:

$$U_A = \frac{\sum A_i}{10^{-9} \sum Z_i} \quad (23)$$

$$\sum A_i = k_a t \exp \sum J'_r, \quad (24)$$

in which $\sum J'_r$ represents the pre-exposure property value.

In Eq. (24), $\sum A_i$ represents the total amount paid for property taxes and insurance, and k_a is a combined constant representing the sum of the property tax and insurance rates expressed as fractions of property value per year. It is assumed that the property value is the sum of the pre-exposure expenditures for fuel, that is, the sum of expenditures for U_3O_8 procurement, conversion, enrichment, and fabrication. These are the expenditures represented by $\sum J'_r$. It is assumed that payment of property taxes and insurance starts at the beginning of exposure and continues throughout the exposure period. It is also assumed that the value of the fuel, for the calculation of property tax and insurance payments, remains constant during exposure. The result is that these payments are on the same uniform schedule as the schedule of electricity production, and there is no discounting required in Eq. (23). It is not necessary to include the divisor $1 - k_m$ in Eq. (23), since the A_i expenditures are deductible for income tax purposes.

The ratio of U_A to the direct cost U_D is obtained by dividing Eq. (23) by Eq. (16). This yields:

$$\frac{U_A}{U_D} = \frac{\sum A_i}{\sum J'_r}.$$

When the value of $\sum A_i$ from Eq. (24) is substituted, the result is:

$$\frac{U_A}{U_D} = k_a t_{\text{exp}}. \quad (25)$$

This equation provides a convenient method for calculating U_A , once the direct cost U_D has been determined.

To recapitulate, the total fuel cycle cost U_F is the sum of U_D , U_C , and U_A , where property taxes and insurance are not included in U_D or U_C but are shown as a separate cost U_A .

3. FIXED CHARGE RATE PROCEDURE

The objective of this section is to interpret the equations developed in the preceding section in terms of a fixed charge rate on fuel.

It is assumed for purposes of this discussion that the accounting and income tax practices of the hypothetical firm under discussion are such that expenditures for fuel purposes are treated as working capital, which is nondepreciable, rather than as depreciable capital. The cost of the fuel is recovered by writing it off against electricity production at a constant rate per kilowatt-hour. This represents the direct component of the fuel cycle cost. The discussion in this section is concerned primarily with the indirect cost.

Referring to Eq. (14), the indirect cost is given by

$$U_C = \frac{J'_R (P_R - \phi_N)}{10^{-9} (1 - k_m) \phi_N \sum Z_i}.$$

An effective inventory time t_m is now defined as follows:

$$t_m = \frac{P_R - \phi_N}{g}. \quad (26)$$

Thus, t_m is a function of the continuous interest factor g , the exposure time, and the time at which the expenditure is made. It will later be seen that t_m is roughly (within $\pm 20\%$) equal to the time interval from the expenditure time t_R to the mid-exposure point. The sign of t_m is opposite to that of t_R ; t_m is positive for events prior to exposure and negative for events after exposure.

Combining Eqs. (14) and (26),

$$U_C = \frac{1}{10^{-9}} \cdot \frac{g}{1 - k_m} \cdot \frac{J'_R t_m}{\phi_N \sum Z_i}. \quad (27)$$

The quantity $g/(1 - k_m)$ can be interpreted as a fixed charge rate on fuel working capital. The basis for this statement will be given later, but for the present, it may be considered as a definition. Thus, denoting the fixed charge rate on fuel by L_F ,

$$L_F = \frac{g}{1 - k_m} \quad (28)$$

When discounting by discrete time periods is being used, the analogous fixed charge rate would be $i_{vs}/(1 - k_m)$, since the annual interest rate i_{vs} used in discrete discounting is equivalent to the annual rate g used in continuous discounting.

Combining Eqs. (27) and (28),

$$U_C = \frac{L_F J'_r t_m}{10^{-9} \phi_N \sum Z_i} \quad (29)$$

When the fixed charge rate L_F is multiplied by the expenditure J'_r and by the effective inventory time t_m , the result can be thought of as the carrying charge, in 10^6 dollars, committed at the time the expenditure J'_r is made. This is discounted, through the definition of t_m , to the start of electricity production. The denominator, $\phi_N \sum Z_i$, represents the total kilowatt-hours delivered, also discounted to the start of electricity production. The quotient is discounted carrying charges divided by discounted electricity, and represents the carrying charge component of the fuel cycle cost in mills per kilowatt-hour.

Referring to the sign of t_m mentioned earlier, it is seen from Eq. (29) that for an expenditure made prior to exposure, both J'_r and t_m are positive, so U_C is positive. For an expenditure after exposure, J'_r is positive and t_m is negative, so U_C is negative. For a credit received after exposure, both J'_r and t_m are negative, and thus U_C is positive.

In converting Eq. (14) to Eq. (29), the only change made was to define two new terms, t_m and L_F . Thus, there is no substantive difference between these equations, and they must give the same result for U_C .

To make use of Eq. (29), a method is needed for quickly estimating the effective inventory time t_m , which was defined by Eq. (26). By use of this equation, values of t_m were calculated for various values of exposure time, interest rate, and lead or lag time. These values are tabulated in Table A-3 of Appendix A.

3.1 Use of Fixed Charge Rate to Calculate Changes in Fuel Cycle Cost

Making use of the definitions of L_F and t_m , the change in U_C can be expressed in terms of the fixed charge rate L_F and the effective inventory time t_m as follows:

$$\Delta U_C = \frac{L_F (t_m \Delta J'_R - J'_R P_R \Delta t_R)}{10^{-9} \phi_N \sum Z_i} \quad (30)$$

This equation can be used to calculate the change in carrying charges caused by changing the amount of the payment by $\Delta J'_R$ and the timing of the payment by Δt_R . In using this equation, P_R and t_m should be evaluated at the mean of the two time points, and J'_R should be the mean of the two payments. It is assumed that the exposure time and the amount of electricity delivered do not change, that a single batch of fuel is involved, and that the changes $\Delta J'_R$ and Δt_R are small. The units of J'_R are millions of dollars, Z_i is in kWhr, and ΔU_C is in mills/kWhr.

3.2 Interpretation of Effective Inventory Time t_m

The average time point for discounted electricity production will be denoted by t_ϕ and will be defined as follows:

$$t_\phi = - \frac{\ln \phi_N}{g} \quad (31)$$

so that the average discount factor for electricity production is given by

$$e^{-gt_\phi} = \phi_N \quad (32)$$

For example, using the data of Problems 237 and 244 in Sect. 5, with a fuel exposure time of 2.85 years,

$$t_{\phi} = - \frac{\ln 0.8974}{0.07739} = 1.40 \text{ years} .$$

Thus, t_{ϕ} occurs slightly before the midexposure point, which in this case would be $2.85/2$ or 1.425 years.

The quantity $t_{\phi} - t_r$ represents the time interval from a payment of cash J_r' to the average time point for electricity production, noting that for lead times, t_r is a negative quantity. These time relationships are indicated below:

For payments prior to exposure, calculations show that the effective inventory time is approximately equal to the time from the cash payment to the average electricity production point. For payments after exposure, this approximation is less accurate.

The diagram representing postexposure payments is as follows:

Thus, for postexposure transactions, the quantity $t_\phi - t_r$ is negative, and t_m is also negative. When used in Eq. (27), this has the effect of making the inventory charges negative, as they should be.

For a cash credit (such as sale of plutonium) received after exposure, inventory charges are positive, since credits are negative payments. Increasing t_r (i.e., postponing the credit) will therefore increase inventory costs.

3.3 Interpretation of $g/(1 - k_m)$ as a Fixed Charge Rate

It is being assumed in this report that money spent for fuel is nondepreciable for book and tax purposes, and that the fixed charge rate on fuel is, therefore, not intended to include capital recovery. Thus, the only items included in the fixed charge rate are interest on capital and federal and state income taxes; property taxes and insurance are omitted for reasons discussed later. The fixed charge rate used here, when applied to the outstanding capital at the beginning of a specified period, will give the before-tax income needed to pay the interest and

taxes for that period. Since continuous discounting is used, it is understood that the period is a short one. The exemption of interest on debt for tax purposes is taken into account when the weighted average cost of money i_2 is converted to the tax-adjusted average cost of money i_{vs} .

When the annual fixed charge rate $g/(1 - k_m)$ is applied to the outstanding fuel working capital to calculate the required income over short periods, and there is no other income or investment, the result is that the outstanding fuel working capital remains stationary. The income just offsets the accumulating interest and income taxes. To retire the capital itself, additional incomes are needed. These are the direct charges, which are provided by "writing off" the fuel working capital against the electricity produced. The "write off" charge per kilowatt-hour corresponds to the direct fuel cost U_D . It is understood that the carrying charges commence immediately when the cash expenditure occurs and continue until it is written off. The fixed charges would decline during the write-off period (the exposure period), since the outstanding capital diminishes during this period.

In the definition of the fixed charge rate on fuel working capital used here, property taxes and property insurance have been omitted. There are several reasons for this. According to the basis used here, property taxes and insurance are paid during exposure on the value of the fuel determined by the expenditures made prior to exposure. On this assumption, any expenses paid or credits received after exposure would not enter into the calculation of property taxes and insurance. Therefore, if one attempted to define the fixed charge rate to include these items, the result would be that two different fixed charge rates would be necessary, one to apply before, and the other after, exposure. Worse still, either the effective inventory time t_m would have to be adjusted to take into account the time difference between each expenditure for fuel purposes and the payment of property taxes and insurance, or the fixed charge rate itself would have to be made a function of the time at which the expenditure was made. This would defeat the purpose of the fixed charge rate. By using the approach taken in this report, a single fixed charge rate applies both before and after exposure. Property taxes and insurance can be added to the fuel cycle cost by the method indicated in Sect. 2.3.

3.4 Ratio of Indirect to Direct Costs

The ratio of indirect to direct fuel cost is obtained by dividing Eq. (14) by Eq. (16). The result is

$$\frac{U_C}{U_D} = \frac{P_r - \phi_N}{(1 - k_m) \phi_N} \quad (33)$$

This may be stated in terms of the fixed charge rate as follows:

$$\frac{U_C}{U_D} = \frac{L_F t_m}{\phi_N} \quad (34)$$

The ratio is thus a function of g , t_{exp} , t_r , and the combined tax constant k_m . For a given value of k_m , U_C/U_D is a function of the same variables upon which t_m depends.

Investigation of Eq. (33) shows that payments prior to exposure have greater relative indirect costs than those made at an equal time after discharge. For example, assuming that fabrication and reprocessing costs occur 6 months before and 6 months after exposure, respectively, and using $i_{\text{vs}} = 0.0605$, $t_{\text{exp}} = 2.85$ years, and $k_m = 0.5008$, the values of U_C/U_D are:

Fabrication: $U_C/U_D = 0.2846$

Reprocessing: $U_C/U_D = -0.2520$.

If the payments occur 1 year before and 1 year after exposure, respectively, the U_C/U_D ratios are:

Fabrication: $U_C/U_D = 0.3667$

Reprocessing: $U_C/U_D = -0.3106$.

Using a constant k_m of 0.5008, values of U_C/U_D were calculated for various values of g , t_{exp} , and t_r . These values are tabulated in Table A-4. This table provides a rapid way of estimating indirect costs when the direct costs are known.

Since the value of U_C/U_D is inversely proportional to $1 - k_m$, the values given in Table A-4 can be adjusted to any desired value of k_m by multiplying by the ratio $0.4992/(1 - k_m)$.

4. CHANGE OF TIME REFERENCE POINT

Thus far in this report, the reference point for time measurement (that is, time = 0) has been taken as the start of exposure. It will now be shown that the expressions for U_C and U_C/U_D can be further simplified by changing the time reference point to t_ϕ , which was defined by Eq. (31).

When the base point for time measurement is taken as t_ϕ , the time point for the payment J'_R will be denoted by t'_R . It follows that

$$t'_R = t_R - t_\phi, \quad (35)$$

in which t_R and t_ϕ are measured as before, that is, with respect to the start of exposure.

The relationship of t'_R to t_R is shown below for an event prior to exposure (t_R negative):

and, for a post-exposure event (t_r positive):

The new discount factor for a payment J'_r will be denoted by P'_r , that is,

$$P'_r = e^{-gt'_r}. \quad (36)$$

The uniform continuous discount factor ϕ_N was derived on the assumption that a continuous series of payments was made at a uniform rate throughout the exposure period. Using the new time reference frame, each increment of money will have its discount factor multiplied by the ratio P'_r/P_r , and it can be seen from Eqs. (35) and (36) that

$$\frac{P'_r}{P_r} = e^{gt_\phi}.$$

Referring to the definition of t_ϕ ,

$$t_\phi = -\frac{\ln \phi_N}{g};$$

this can be rearranged to

$$e^{gt\phi} = \frac{1}{\phi_n} . \quad (37)$$

Since ϕ_n represents a summation of infinitesimal quantities, each of which is being multiplied by the ratio $1/\phi_n$, it follows that the new summation (that is, the new continuous discount factor) will be 1.

As a result of shifting the time frame, therefore,

$$\sum \phi_i Z_i = \phi_n \sum Z_i = \sum Z_i \quad (38)$$

$$\sum \phi_i F_i = \phi_n \sum F_i = \sum F_i \quad (39)$$

Thus, quantities continuously paid or produced throughout the exposure period have a discount factor of 1 when time is measured from t_ϕ .

Referring to Eq. (4), the expression for U_F becomes

$$U_F = \frac{\sum P'_R J'_R - k_m \sum F_i}{10^{-9} (1 - k_m) \sum Z_i} . \quad (40)$$

Applying this to a single batch and a single payment J'_R ,

$$U_F = \frac{J'_R (P'_R - k_m)}{10^{-9} (1 - k_m) \sum Z_i} , \quad (41)$$

and, since the expression for U_D is unchanged, the expression for the indirect cost becomes

$$U_C = \frac{J'_R (P'_R - 1)}{10^{-9} (1 - k_m) \sum Z_i} . \quad (42)$$

The ratio of indirect to direct cost is obtained by dividing this by Eq. (16), yielding

$$\frac{U_C}{U_D} = \frac{P'_r - 1}{1 - k_m} \quad (43)$$

Values of U_C/U_D are plotted in Figs. 4.1 and 4.2 for payments before and after exposure, using a value of 0.5000 for k_m . Table A-5 (Appendix A) gives U_C/U_D as a function of interest rate and lead or lag time measured from t_g . Values of U_C/U_D for other tax constants can be obtained by multiplying by 0.4992/(1 - k_m).

The change in indirect cost resulting from a change in the amount or timing of a fuel cycle expenditure is obtained by starting with Eq. (42) and proceeding in the same manner as in Sect. 2.1. If both amount and timing are allowed to change, the result is:

$$\Delta U_C = \frac{J'_{r2}(P'_{r2} - 1) - J'_{r1}(P'_{r1} - 1)}{10^{-9} (1 - k_m) \sum Z_i} \quad (44)$$

If only the amount is changed, this reduces to

$$\Delta U_C = \frac{\Delta J'_r (P'_r - 1)}{10^{-9} (1 - k_m) \sum Z_i} \quad (45)$$

and if only the timing is changed, the change in U_C is given by

$$\Delta U_C = \frac{J'_r (P'_{r2} - P'_{r1})}{10^{-9} (1 - k_m) \sum Z_i} \quad (46)$$

An approximate form of Eq. (46), which may be used when the change in timing is small, is

$$\Delta U_C = - \frac{g P'_r J'_r \Delta t'_r}{10^{-9} (1 - k_m) \sum Z_i} \quad (47)$$

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Fig. 4.1. Ratio of Indirect to Direct Cost as a Function of Lead Time Ahead of Effective Average Exposure Point.

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Fig. 4.2. Ratio of Indirect to Direct Cost as a Function of Lag Time After Effective Average Exposure Point.

The relationship between changes in amount and timing when the fuel cycle cost is held constant is developed in the same manner as in Sect. 2.2. The expression for U_F , Eq. (41), is differentiated, and the derivative is set equal to zero; thus,

$$d[J'_r(P'_r - k_m)] = 0.$$

Differentiating and replacing P'_r by $e^{-gt'_r}$ leads to

$$\frac{d J'_r}{J'_r} = \frac{g e^{-gt'_r} dt'_r}{e^{-gt'_r} - k_m},$$

and integration gives the resulting equation, which is valid over any range:

$$\frac{J'_{r2}}{J'_{r1}} = \frac{P'_{r1} - k_m}{P'_{r2} - k_m}. \quad (48)$$

If the change in timing is small, the following may be used, evaluating P'_r at the average time point:

$$\frac{\Delta J'_r}{J'_r} = \Delta t'_r \left[\frac{g P'_r}{P'_r - k_m} \right]. \quad (49)$$

In using these equations it is necessary to estimate the value of t_ϕ for a given exposure time. As a rough approximation, t_ϕ may be taken as the midexposure point. It was seen earlier that for an exposure time of 2.85 years and an interest rate i_{vs} of about 8%, t_ϕ was 1.40 years. Using the midexposure point of 1.425 years would have caused an error of only 0.025 years.

To permit more precise calculations, values of t_ϕ/t_{exp} were calculated for various interest rates and exposure times. These are tabulated

in Table A-6. An example of the use of Tables A-5 and A-6 is given in Sect. 5. Examination of Table A-6 shows that t_0/t_{exp} does not vary much and generally is in the range 0.48 to 0.49. It can be shown analytically that t_0/t_{exp} must be less than 0.50, and that a good estimate of the value of t_0 is given by the following approximate equation:*

$$t_0 = \frac{t_{\text{exp}}}{2} \left(1 - \frac{5}{12} \frac{t_{\text{exp}}}{t_{\text{exp}}} \right). \quad (50)$$

For example, with $i_{\text{vs}} = 5\%$ and $t_{\text{exp}} = 4.0$ years, the value of t_0/t_{exp} using Eq. (50) is 0.48717, while exact calculation gives the value 0.48718.

As previously mentioned, the REFCO code uses the start of exposure of the first batch as the time reference point. The benefits of changing to the use of t_0 as the reference point would be doubtful, since the amount of computation carried out by the code would be about the same in either case.

5. NUMERICAL EXAMPLES

This section is in three parts. The first part describes fourteen example problems that were run using the REFCO code. The purpose of this was to provide a data base of calculated fuel cycle costs against which the results of the simplified methods could be compared.

In the second part, seven numerical examples are worked out in detail to illustrate the use of the equations developed in Sects. 2, 3, and 4. The examples use input data taken from the fourteen problems mentioned above.

The third part shows the results of payout calculations made by means of the POW76 code to verify some of the REFCO results. Two of the REFCO example problems were checked by this method. Monthly time periods were used in POW76. The fuel cycle cost results produced by the two codes agreed within 0.001 mill/kWhr in both cases.

*The equation shown gives the first two terms of a series expansion of t_0 .

Because some degree of completeness was desired in the development of the theory, the number of equations presented in the previous sections is rather large. Only a few of these equations are needed for most ordinary applications. In a mathematical sense, it may be said that only one method has been presented since all the equations shown are mutually consistent. From a practical computational viewpoint, however, the equations represent several different schemes for calculating inventory charges. The user may choose among these as he sees fit, depending on what seems easiest and most logical to him. To help the user make this choice, the examples shown in this section are designed to illustrate a variety of possible methods. As a further aid, one specific approach has been condensed into a step-by-step procedure, and is summarized in Table 5.1. This procedure is based on the determination of U_i/U_d , the ratio of indirect cost to direct cost, which was given by Eq. 14. The first numerical example in Sect. 5.2 illustrates the use of this procedure and should help to clarify some of the computational questions.

The second example illustrates an alternative method based on the direct application of Eq. 14. Subsequent examples illustrate the calculation of charges in inventory charges and other procedures outlined in the preceding sections.

5.1 Examples Using REFUC

Fourteen single-batch examples were run by means of REFUC. Input data are summarized in Table 5.2. The examples were based on the light water reactor fuel cycle. The costs and other quantities used are for purposes of illustration only, and are not intended to represent estimates of current costs. The inputs that were varied include the unit costs of the various operations, the lead and lag times of expenditures, and the interest rates on debt and equity. Problems 221 through 231 include property taxes and insurance; problems 237 through 244 do not. The REFUC outputs are summarized in Table 5.3. A fuel cycle cost breakdown by components was obtained in each case. Direct costs and carrying charges are shown separately.

Table 5.1. A Procedure for the Calculation of Inventory Charges Using the Ratio of Indirect Cost to Direct Cost^a

Step 1. Calculate the basic economic parameters:

$$\begin{aligned} \text{Corporate tax rate: } & \alpha_c = 1 - (1 - \alpha_1)(1 - \alpha_2) \\ \text{Unlevered cost of money: } & i_{un} = (1 - \alpha_c) i_c = (1 - \alpha) i_c \\ \text{Leveraged interest rate: } & i = i_{un} / (1 - \alpha) \end{aligned}$$

Step 2. Calculate the usual fixed charge rate on fuel:

$$f = \frac{r}{1 - \alpha_c} \quad (5)$$

Step 3. Calculate the electricity discount factors:

$$d_t = \frac{1 - e^{-i t_{exp}}}{i t_{exp}}$$

d_t may be obtained directly from Table A-4.

t_{exp} is the entire exposure time.

Step 4. Calculate the effective inventory time:

$$t_p = \frac{t_p - \frac{C_p}{C}}{i} \quad (6)$$

t_p may be obtained directly from Table A-4.

t_p is the time from the start of exposure to the cash expenditure C_p . Note that t_p is negative for payments made prior to the start of exposure and positive for payments made after exposure.

Step 5. Calculate the ratio of indirect cost to direct cost:

$$\frac{U}{U_d} = \frac{f(1 - e^{-i t_p})}{i d_t} \quad (7)$$

$f(1 - e^{-i t_p})$ may be obtained directly from Table A-4.

Step 6. Calculate the direct cost:

$$U_d = \frac{C_p}{1 - e^{-i t_p}}$$

Step 7. Calculate the indirect cost:

$$U = \left(\frac{U}{U_d} \right) U_d$$

Step 8. Up to this point, property taxes and insurance have been omitted. If the payment C_p is a pre-exposure expense (enrichment, fabrication, etc.) it adds to the value of the core and hence may have a property tax and insurance component. If so,

a. calculate k_A :

$$k_A = \text{property tax rate} \times \text{assessed valuation factor} + \text{property insurance rate}$$

b. calculate U_A , the indirect cost due to property taxes and insurance:

$$U_A = k_A \exp U_d$$

c. add U_A to U to get the total indirect cost in mills/kwhr.

^aFor a single fuel cycle expenditure C_p (\$10⁶) and a single batch of fuel.

Table 5.2 (continued)

	Problem 1 ^a	Problem 2 ^a	Problem 3 ^a	Problem 4 ^a	Problem 5 ^a	Problem 6 ^a	Problem 7 ^a
Cost of Money ^b							
Interest rate on debt	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Earning rate on equity (after taxes)	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Prices							
^{235}U conversion to Pu	\$12.7	\$12.7	\$12.7	\$12.7	\$12.7	\$12.7	\$12.7
Separative duty	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Fabrication	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00
Reprocessing and waste disposal	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00
Pu value, \$/kg fissile	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead and Lag Times (years)							
^{235}U lead	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Enrichment lead	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fabrication lead	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reprocessing lag	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Pu credit lag	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Recovered ^{235}U credit lag	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Average cost of money ^c	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Modified average cost of money ^d	0.0847	0.0847	0.0847	0.0847	0.0847	0.0847	0.0847
Property taxes and insurance ^e	yes	yes	no	no	no	no	no
Fuel cycle cost, mills/kWh ^f							
Direct	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Carrying charges	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.50	1.50	1.50	1.50	1.50	1.50	1.50

^aCapital structure is 50% debt and 50% equity in all examples.^bWeighted average of debt and equity.^cWeighted average cost of money, with tax adjustment for interest on debt.^dProblems 1 through 4 use a property tax rate of 1.0% year on 1% of core value and an interest rate of 7.0% year on 1% of core value. Problems 5 through 7 use a property tax rate of 0.5% year on 1% of core value.^eResults of NREY's study. See Table 1.

Table 5.3. Results of Example Problems^a

	Fuel Cycle Costs, mills/kWhr		
	Direct	Inventory Charges	Total
Problem 221			
UF ₆ purchase ^b	0.7159	0.2961	1.0120
Separative duty ^c	0.5848	0.2199	0.8046
Fabrication	0.2316	0.0768	0.3084
Reprocessing	0.2213	-0.0576	0.1637
Pu credit	-0.1744	0.0464	-0.1280
U credit (feed)	-0.1533	0.0442	-0.1091
U credit (sep. duty)	-0.0302	0.0087	-0.0215
Total	1.3956	0.6345	2.0301
Problem 222			
UF ₆ purchase	0.7159	0.3130	1.0289
Separative duty	0.5848	0.2320	0.8167
Fabrication	0.2316	0.0808	0.3124
Reprocessing	0.2213	-0.0611	0.1601
Pu credit	-0.1744	0.0492	-0.1252
U credit (feed)	-0.1533	0.0469	-0.1065
U credit (sep. duty)	-0.0302	0.0092	-0.0210
Total	1.3956	0.6700	2.0656
Problem 223			
UF ₆ purchase	0.7159	0.3299	1.0458
Separative duty	0.5848	0.2441	0.8289
Fabrication	0.2316	0.0849	0.3165
Reprocessing	0.2213	-0.0646	0.1567
Pu credit	-0.1744	0.0520	-0.1224
U credit (feed)	-0.1533	0.0495	-0.1038
U credit (sep. duty)	-0.0302	0.0098	-0.0204
Total	1.3956	0.7056	2.1012
Problem 224			
UF ₆ purchase	0.7159	0.3469	1.0628
Separative duty	0.5848	0.2563	0.8411
Fabrication	0.2316	0.0889	0.3205
Reprocessing	0.2213	-0.0680	0.1532
Pu credit	-0.1744	0.0548	-0.1196
U credit (feed)	-0.1533	0.0521	-0.1012
U credit (sep. duty)	-0.0302	0.0103	-0.0199
Total	1.3956	0.7413	2.1369

Table 5.3 (continued)

	Fuel Cycle Costs, mills/kWhr		
	Direct	Inventory Charges	Total
Problem 225			
UF ₆ purchase	0.7159	0.3639	1.0799
Separative duty	0.5848	0.2685	0.8533
Fabrication	0.2316	0.0930	0.3246
Reprocessing	0.2213	-0.0714	0.1499
Pu credit	-0.1744	0.0575	-0.1169
U credit (feed)	-0.1533	0.0547	-0.0987
U credit (sep. duty)	-0.0302	0.0108	-0.0194
Total	1.3956	0.7770	2.1726
Problem 226			
UF ₆ purchase	0.7159	0.3811	1.0970
Separative duty	0.5848	0.2808	0.9556
Fabrication	0.2316	0.0971	0.3287
Reprocessing	0.2213	-0.0748	0.1465
Pu credit	-0.1744	0.0602	-0.1142
U credit (feed)	-0.1533	0.0572	-0.0961
U credit (sep. duty)	-0.0302	0.0113	-0.0189
Total	1.3956	0.8129	2.2085
Problem 227			
UF ₆ purchase	0.7159	0.3983	1.1142
Separative duty	0.5848	0.2931	0.8779
Fabrication	0.2316	0.1011	0.3327
Reprocessing	0.2213	-0.0781	0.1432
Pu credit	-0.1744	0.0628	-0.1116
U credit (feed)	-0.1533	0.0597	-0.0936
U credit (sep. duty)	-0.0302	0.0113	-0.0189
Total	1.3956	0.8488	2.2444
Problem 228			
UF ₆ purchase	1.0402	0.5040	1.5442
Separative duty	0.6822	0.2990	0.9813
Fabrication	0.2702	0.1038	0.3740
Reprocessing	0.1844	-0.0567	0.1277
Pu credit	-0.1495	0.0469	-0.1025
U credit (feed)	-0.2228	0.0757	-0.1471
U credit (sep. duty)	-0.0352	0.0120	-0.0233
Total	1.7695	0.9848	2.7543

Table 5.3 (continued)

	Fuel Cycle Costs, mills/kwhr		
	Direct	Inventory Charges	Total
Problem 229			
UF ₆ purchase	2.0131	0.9754	2.9884
Separative duty	0.7797	0.3417	1.1214
Fabrication	0.3088	0.1136	0.4224
Reprocessing	0.2582	-0.0794	0.1788
Pu credit	-0.1993	0.0626	-0.1367
U credit (feed)	-0.4312	0.1466	-0.2846
U credit (sep. duty)	-0.0403	0.0137	-0.0266
Total	2.5689	1.5792	4.1481
Problem 237			
UF ₆ purchase	0.7159	0.2923	1.0082
Separative duty	0.5848	0.2117	0.7965
Fabrication	0.2316	0.0713	0.3029
Reprocessing	0.2213	-0.0680	0.1532
Pu credit	-0.1744	0.0548	-0.1196
U credit (feed)	-0.1533	0.0521	-0.1012
U credit (sep. duty)	-0.0302	0.0103	-0.0199
Total	1.3956	0.6245	2.0201
Problem 240			
UF ₆ purchase	0.7159	0.2923	1.0082
Separative duty	0.5848	0.2117	0.7965
Fabrication	0.2316	0.0713	0.3029
Reprocessing	0.2213	-0.0680	0.1532
Pu credit	-0.1774	0.0580	-0.1194
U credit (feed)	-0.1533	0.0521	-0.1012
U credit (sep. duty)	-0.0302	0.0103	-0.0199
Total	1.3926	0.6277	2.0203
Problem 241			
UF ₆ purchase	0.7159	0.2923	1.0082
Separative duty	0.5848	0.2117	0.7965
Fabrication	0.2316	0.0713	0.3029
Reprocessing	0.2213	-0.0680	0.1532
Pu credit	-0.1779	0.0582	-0.1197
U credit (feed)	-0.1533	0.0521	-0.1012
U credit (sep. duty)	-0.0302	0.0103	-0.0199
Total	1.3921	0.6279	2.0200

Table 5.3 (continued)

	Fuel Cycle Costs, mills/kwhr		
	Direct	Inventory Charges	Total
Problem 243			
UF ₆ purchase	0.7159	0.3057	1.0216
Separative duty	0.5848	0.2225	0.8073
Fabrication	0.2316	0.0754	0.3070
Reprocessing	0.2213	-0.0709	0.1503
Pu credit	-0.1744	0.0593	-0.1151
U credit (feed)	-0.1533	0.0541	-0.0993
U credit (sep. duty)	-0.0302	0.0107	-0.0195
Total	1.3956	0.6568	2.0524
Problem 244			
UF ₆ purchase	0.7808	0.3334	1.1142
Separative duty	0.6822	0.2596	0.9418
Fabrication	0.2702	0.0880	0.3582
Reprocessing	0.2582	-0.0827	0.1754
Pu credit	-0.1794	0.0610	-0.1184
U credit (feed)	-0.1672	0.0590	-0.1082
U credit (sep. duty)	-0.0352	0.0124	-0.0228
Total	1.6095	0.7307	2.3402

^aOutput from REPCO.

^bUF₆ purchase includes procurement of U₃O₈ and conversion to UF₆, but does not include enrichment.

^cEnrichment cost.

5.2 Example Calculations

Example 1. Ratio of Indirect to Direct Cost

This example illustrates the procedure summarized in Table 5.1. The data used are based on the fabrication cost component of Problem 237. The following data are assumed to be available; most of these are shown in Table 5.2:

Data:

Fabrication cost, \$/kg U	60
Fuel fabricated, kg U	27,623
Fabrication expenditures, J_F' , $\$10^6$	1.6574
Annual interest rate on debt	0.08
After-tax earning rate on equity	0.13
Federal income tax rate k_t	0.48
State income tax rate k_s	0.04
Electricity delivered, $\int z_1$, M/yr	7.1563×10^9
Lead time t_F , year	-0.45
Exposure time, t_{exp} , years	2.85
Property tax rate	0
Property insurance	0

Following the procedure shown in Table 5.1:

Step 1. Calculate basic economic parameters:

$$\begin{aligned}
 k_m &= 1 - (1 - k_t)(1 - k_s) \\
 k_m &= 1 - (1 - 0.48)(1 - 0.04) = 0.5008 \\
 i_{vs} &= b(1 - k_m)i_b + (1 - b)i_e \\
 i_{vs} &= (0.55)(1 - 0.5008)(0.08) + (0.45)(0.13) \\
 i_{vs} &= 0.080465
 \end{aligned}$$

Continuous interest rate g :

$$g = \ln(1 + i_{vs}) = \ln(1.080465) = 0.077391$$

Step 2. Fixed charge rate on fuel:

$$L_F = \frac{g}{1 - k_m} = \frac{0.077391}{0.4992} = 0.15503 \text{ years}^{-1}$$

Step 3. Electricity discount factor ϕ_N :

From Table A-2, with $i_{vs} = 0.0805$ and $t_{exp} = 2.85$ years, $\phi_N = 0.8974$. Alternatively, ϕ_N can be calculated:

$$\phi_N = \frac{1 - e^{-gt_{exp}}}{gt_{exp}} = \frac{1 - e^{-(0.07739)(2.85)}}{(0.07739)(2.85)}$$

$$\phi_N = 0.8974$$

Step 4. Effective inventory time t_m :

The lead time for fabrication is 0.45 year. The payment J'_R is assumed to occur 0.45 year before start of exposure. Thus $t_R = -0.45$ year. Table A-3 gives t_m as a function of t_{exp} , t_R , and i_{vs} , and is a tabulation of the equation

$$t_m = \frac{e^{-gt_R} - \phi_N}{g}$$

Using $t_{exp} = 2.85$ years, $t_R = -0.45$ year, and $i_{vs} = 0.0805$, t_m is found to be 1.783 years. Alternatively, t_m can be calculated from the equation shown:

$$t_m = \frac{e^{-gt_R} - \phi_N}{g} = \frac{e^{-(0.07739)(-0.45)} - 0.8974}{0.07739}$$

$$t_m = 1.784 \text{ years}$$

Step 5. Ratio of indirect cost to direct cost:

$$\frac{U_C}{U_D} = \frac{L_F t_m}{\phi_N} = \frac{(0.15503)(1.783)}{0.8974} = 0.3080$$

Alternatively, U_C/U_D can be obtained from Table A-4, using $t_{exp} = 2.85$, $t_R = -0.45$, and $i_{vs} = 0.0805$. However, interpolation is necessary.

Step 6. Calculate the direct cost:

$$\text{Cash payment } J'_R = (60)(27,623)(10^{-6}) = 1.6574$$

$$\text{Direct cost } U_D = \frac{J'_R}{10^{-9} \sum Z_i} = \frac{1.6574}{7.1563} = 0.2316 \text{ mill/kWhr}$$

Step 7. Calculate the indirect cost:

$$U_C = U_D \left(\frac{U_C}{U_D} \right) = (0.2136)(0.3080) = 0.0713 \text{ mill/kWhr}$$

Step 8. Property taxes and insurance:

As indicated in Table 5.2, property tax and insurance rates were zero in Problem 237.

Comparison with REFCO Results. - Referring to Table 5.3, the REFCO result is seen to be 0.0713 mill/kWhr for the inventory charges on the fabrication cost in Problem 237. The direct cost of 0.2316 mill/kWhr also is confirmed.

Example 2. Fabrication Cost, Problem 237 (continued)

This example uses the same data as in the preceding example. The indirect cost component of the fabrication cost is calculated by use of Eq. (14):

$$U_C = \frac{J'_R (P_R - v_R)}{10^{-9} (1 - k_m) \phi_N \sum Z_i}$$

The only new quantity needed is P_R :

$$P_R = e^{-gt_R} = e^{-(0.07739)(-0.45)} = 1.0354$$

$$U_C = \frac{(1.6574)(1.0354 - 0.8974)}{(0.4992)(0.8974)(7.1563)} = 0.0713 \text{ mill/kWhr}$$

Some users will find this more convenient than the procedure followed in Example 1 because that procedure requires interpolation of the values in Table A-4 to determine U_C/U_D .

Example 3. Reprocessing Cost, Problem 243

This example illustrates various procedures, including the use of the shifted time scale in which time is measured from the weighted average exposure point t_0 .

Data:

J'_R (reprocessing) $\$10^6$	1.5835
Electricity delivered, $\sum Z_i$	7.1563×10^9
Lag time after discharge, years	0.80
Exposure time, t_{exp} , years	2.85
g	0.07739
$1 - k_m$	0.4992

Fixed charge rate:

$$L_F = \frac{g}{1 - k_m} = 0.15503$$

Direct cost:

$$U_D = \frac{J'_R}{10^{-9} \sum Z_i} = \frac{1.5835}{7.1563} = 0.2213 \text{ mill/kWhr}$$

Timing of payment:

$$t_r = 2.85 + 0.80 = 3.65 \text{ years after start of exposure.}$$

Discount factor:

$$P_r = e^{-gt_r} = e^{-(0.07739)(3.65)} = 0.7539 \text{ (dimensionless)}$$

Effective inventory time:

$$t_m \text{ (from Table A-3)} = -1.854 \text{ years}$$

Alternatively, t_m may be calculated from Eq. (26):

$$t_m = \frac{P_r - \phi_N}{g} = \frac{0.7539 - 0.8974}{0.07739} = -1.854 \text{ years.}$$

Indirect cost (Eq. 29):

$$U_C = \frac{L_F J'_R t_m}{10^{-9} \phi_N \sum Z_i} = \frac{(0.15503)(1.5835)(-1.854)}{(0.8974)(7.1563)}$$

$$U_C = -0.0709 \text{ mill/kWhr.}$$

Total cost:

$$U_F = U_D + U_C = 0.2213 - 0.0709 = 0.1504 \text{ mill/kWhr.}$$

The REFCO results were $U_D = 0.2213$, $U_C = -0.0709$,
 $U_F = 0.1503 \text{ mill/kWhr.}$

Alternative method:

Using the ratio of indirect to direct cost [Eq. (34)]:

$$\frac{U_C}{U_D} = \frac{L_F t_m}{\phi_N} = \frac{(0.15503)(-1.854)}{(0.8974)} = -0.3203$$

$$\text{Direct cost} = 0.2213 \text{ mill/kWhr.}$$

$$\text{Indirect cost} = (-0.3203)(0.2213) = -0.0709 \text{ mill/kWhr.}$$

Alternative method (time measured from t_ϕ):

Using Eq. (43):

$$\frac{U_C}{U_D} = \frac{P'_R - 1}{1 - k_m}$$

Estimating P'_R :

Using Table A-6, with $i_{vs} = 0.0805$ and $t_{exp} = 2.85$,
 find $t_\phi/t_{exp} = 0.4908$.

$$t_\phi = (0.4908)(2.85) = 1.400 \text{ years.}$$

$$\text{Then } t'_R = t_R - t_\phi = 3.65 - 1.40 = 2.25 \text{ years.}$$

$$P'_R = e^{-gt'_R} = e^{-(0.07739)(2.25)} = 0.8402.$$

Returning to Eq. (43), with $k_m = 0.5008$:

$$\frac{U_C}{U_D} = \frac{0.8402 - 1}{1 - 0.5008} = -0.3201$$

$$U_C = -0.3201 U_D = (-0.3201)(0.2213) = -0.0709 \text{ mil/kWhr.}$$

Example 4. Separative Duty Cost, Problems 237 and 244

This example illustrates the calculation of the change in indirect cost when both amount and timing are changed.

Calculate the direct and indirect costs for separative duty in Problems 237 and 244. Using various methods, calculate the change in indirect cost between the two problems.

Data:

	Problem 237	Problem 244	L (244-237)
Average cost of money (annual)	0.1025	0.1025	
Adjusted cost of money, i_{vs}	0.080465	0.080465	
$g = \ln(1 - i_{vs})$	0.07739	0.07739	
Separative duty cost, \$/kg SWU	36	42	6
Amount of separative duty, kg SWU	116,245	116,245	
Separative duty cost, $\$10^6$	4.18481	4.68228	0.69747
Lead time, years	0.75	0.85	
t_r	-0.75	-0.85	-0.10
Batch exposure time, years	2.85	2.85	
Electricity produced, 10^9 kWhr	7.1563	7.1563	
Federal income tax rate	0.48	0.48	
State income tax rate	0.04	0.04	
Other taxes and insurance	None	None	

It is assumed that energy production is uniformly distributed throughout the exposure time.

Average cost of money:

$$\begin{aligned} 55\% \text{ debt at } 0.08/\text{year} &= 0.0440 \\ 45\% \text{ equity at } 0.12/\text{year} &= \underline{0.0585} \\ &0.1025 \end{aligned}$$

Combined tax constant:

$$1 - k_m = (1 - 0.48)(1 - 0.04) = 0.4992 \text{ (dimensionless)}$$

Adjusted cost of money:

$$\begin{aligned} 55\% \text{ debt at } 0.08 \times 0.4992 &= 0.021965 \\ 45\% \text{ equity at } 0.12 &= \underline{0.058500} \\ i_{vs} &= 0.080465 \text{ year}^{-1} \end{aligned}$$

Average electricity discount factor:

$$\phi_{ii} = \frac{1 - e^{-\delta t_{\text{exp}}}}{\delta t_{\text{exp}}} = \frac{1 - e^{-0.07739(2.85)}}{(0.07739)(2.85)}$$

$$\phi_{ii} = 0.8974 \text{ (dimensionless)}$$

(The REFCC code calculations were based on three operating periods of 0.85 year each and two shutdown periods of 0.15 year each, giving $\phi_{ii} = 0.8975$, indicating that the error involved in ignoring the shutdown periods is insignificant insofar as ϕ_{ii} is concerned.)

Fixed charge rate on fuel:

$$L_F = \frac{k}{1 - k_m} = \frac{0.07739}{0.4992} = 0.15503 \text{ year}^{-1}$$

Effective inventory time t_m (see Table A-2):

$$\text{Problem 237: } t_m = 2.098 \text{ years.}$$

$$\text{Problem 244: } t_m = 2.204 \text{ years.}$$

Discount factors P_r :

By interpolation (see Table A-1):

$$\text{Problem 237: } P_r = 1.060 \text{ (} t_r = -0.75 \text{)}.$$

$$\text{Problem 244: } P_r = 1.068 \text{ (} t_r = -0.85 \text{)}.$$

Direct costs using Eq. (5):

$$\text{Problem 237: } U_D = \frac{4.18481}{7.1563} = 0.5848 \text{ mill/kWhr.}$$

$$\text{Problem 244: } U_D = \frac{4.88228}{7.1563} = 0.6822 \text{ mill/kWhr.}$$

Carrying charges using Eq. (29):

$$\text{Problem 237: } U_C = \frac{(0.15503)(4.18481)(2.098)}{(0.8974)(7.1563)} = 0.2119 \text{ mill/kWhr.}$$

$$\text{Problem 244: } U_C = \frac{(0.15503)(4.88228)(2.204)}{(0.8974)(7.1563)} = 0.2598 \text{ mill/kWhr.}$$

$$\Delta U_C = 0.2598 - 0.2119 = 0.0479 \text{ mill/kWhr.}$$

(REPCO gave $U_C = 0.2117$ and 0.2596 mill/kWhr, with $\Delta U_C = 0.0479$ mill/kWhr.)

Change in carrying charges:

Alternative methods:

Using Eq. (30):

$$\Delta U_C = \frac{(0.15503)(2.151 \times 0.6975 + 4.5335 \times 1.064 \times 0.10)}{(0.8974)(7.1563)}$$

$$\Delta U_C = 0.0479 \text{ mill/kWhr.}$$

Using Eq. (17):

$$\Delta U_C = \frac{J'_{r2} P_{r2} - J'_{r1} P_{r1} - \phi_N (J'_{r2} - J'_{r1})}{10^{-9} (1 - k_m) \phi_N \angle Z_1}$$

$$\Delta U_C = \frac{(4.88228)(1.068) - (4.18481)(1.060) - 0.8974 (4.88228 - 4.18481)}{(1 - 0.5008)(0.8974)(7.1563)}$$

$$\Delta U_C = 0.0476 \text{ mills/kWhr.}$$

Using Eq. (44); time measured from t_0 :

$$\Delta U_C = \frac{J'_{r2} (P'_{r2} - 1) - J'_{r1} (P'_{r1} - 1)}{10^{-9} (1 - k_m) \sum Z_i}$$

Estimating P'_{r1} and P'_{r2} :

With $i_{vs} = 0.0805$ and $t_{exp} = 2.85$, Table A-6 gives $t_0/t_{exp} = 0.4908$.

Then $t_0 = (0.4908)(2.85) = 1.40$ years.

$$t'_{r1} = t_{r1} - t_0 = -0.75 - 1.40 = -2.15 \text{ years.}$$

$$t'_{r2} = t_{r2} - t_0 = -0.85 - 1.40 = -2.25 \text{ years.}$$

$$P'_{r1} = e^{-gt'_{r1}} = e^{-(0.07739)(-2.15)} = 1.1810 \text{ (Table A-1)}$$

$$P'_{r2} = e^{-gt'_{r2}} = e^{-(0.07739)(-2.25)} = 1.1902 \text{ (Table A-1)}$$

Returning to Eq. (44):

$$\Delta U_C = \frac{(4.88228)(1.1902 - 1) - (4.16481)(1.1810 - 1)}{(1 - 0.5008)(7.15633)}$$

$$\Delta U_C = 0.0479 \text{ mills/kWhr.}$$

Example 5. Property Taxes and Insurance, Problem 224

Example 5 illustrates the calculation of property taxes and insurance and shows how these are added to the other costs:

Calculate the cost in mills per kilowatt-hour corresponding to property taxes and insurance on the U_3O_8 component of fuel cycle cost in Problem 224. The property tax rate is 0.035 per year with an assessment factor of 0.65, and the property insurance rate is 0.004 per year. The amount paid for U_3O_8 is $\$5.1234 \times 10^6$. Exposure time is 2.85 years.

The equation used is:

$$U_A = \frac{\sum A_i}{10^{-9} \sum Z_i} \quad (23)$$

The amount paid for property taxes and insurance, A_i , is given by

$$\Delta A_i = k_a t \exp \Delta J_r' \quad (24)$$

The combined constant k_a is the sum of the property tax and property insurance rates, remembering to include the 0.65 tax assessment factor:

$$k_a = (0.035)(0.65) + 0.004 = 0.02675, \text{ years}^{-1},$$

$$A_i = (0.02675)(2.85)(5.1234) = 0.3906 \text{ } (\$10^6),$$

$$U_A = \frac{0.3906}{7.1563} = 0.0546 \text{ mills/kWhr.}$$

This agrees exactly with the REFCO result.

To complete the U_3O_8 fuel cost component calculation, U_D and U_C will be calculated and added to U_A :

Direct cost:

$$U_D = \frac{J_r'}{10^{-9} \Delta Z_i} = \frac{5.1234}{7.1563} = 0.7159 \text{ mills/kWhr.}$$

Total U_3O_8 component of fuel cycle cost:

$$\begin{aligned} U_F &= U_A + U_C + U_D = 0.0546 + 0.2925 + 0.7159 \\ &= 1.063 \text{ mills/kWhr.} \end{aligned}$$

The REFCO result was 1.0628 mills/kWhr (Table 5.2, Problem 224).

Indirect cost, using Eq. (29):

$$U_C = \frac{L_F J_r' t_m}{10^{-9} \phi_N \Delta Z_i}.$$

Estimating t_m , P_r , and Q_N :

$$i_{vs} = 0.080465,$$

$$t_{exp} = 2.85,$$

$$t_r = -1.00 \text{ years},$$

$$t_m \text{ (from Table A-3)} = 2.366 \text{ years},$$

$$P_r = e^{-i_{vs} t_r} = e^{-(0.07739)(-1.00)} = 1.0805,$$

$$Q_N \text{ (Table A-6)} = 0.8974.$$

Returning to Eq. (29):

$$U_C = \frac{(0.15502)(5.1234)(2.366)}{(0.8974)(7.1533)} = 0.2920 \text{ mill/kWhr.}$$

Alternate method for U_C using Eq. 43:

$$\frac{U_C}{U_L} = \frac{P_r' - 1}{1 - P_r'}.$$

Estimating P_r' :

Using Table A-4, with $i_{vs} = 0.0805$ and $t_{exp} = 2.85$,

$$t_0/t_{exp} = 0.4908.$$

$$\text{Then } t_0 = (0.4908)(2.85) = 1.40 \text{ years},$$

$$t_r' = t_r - t_0 = -1.00 - 1.40 = -2.40 \text{ years},$$

$$P_r' = e^{-i_{vs} t_r'} = e^{-(0.07739)(-2.40)} = 1.2041.$$

Returning to Eq. (43):

$$\frac{U_C}{U_L} = \frac{1.2041 - 1}{1 - 0.5008} = 0.4069,$$

$$U_C = (0.4069)(0.7159) = 0.2927 \text{ mills/kWhr.}$$

Example 6. Plutonium Credit, Problem 237-241

This example illustrates the use of Eq. (35) to determine simultaneous changes in cost and timing needed to hold the fuel cycle cost constant:

Referring to Problem 237, a plutonium credit of \$7.00/g is received 0.75 year after discharge. If the lag time is increased to 0.85 year, what plutonium price is necessary to keep the fuel cycle cost unchanged?

Calling the second case Problem 241a, the data are as follows:

	Problem <u>237</u>	Problem <u>241a</u>
Lag time, years	-0.75	+0.85
Exposure time, years	2.85	2.85
t_r , years	-3.60	+3.70
L_p (fixed charge rate)	0.15503	0.15503
ϕ_H	0.8974	0.8974
$P_r (= e^{-\delta t_r})$	0.7568	0.7510
Average t_r , years		3.65
Average P_r		0.7539
Δt_r , years		+0.10
Time from midexposure, t_0	2.175	2.275
Correction factor, F_{t_m}	-1.1034	-1.1053
$t_m = t_0 F_{t_m}$	2.40	2.52
Average t_m , years		2.46

Using Eq. (22):

$$\frac{\Delta J'_r}{J'_r} = \Delta t_r \frac{\delta P_r}{P_r - k_m \phi_H},$$

$$\frac{\Delta J'_r}{J'_r} = 0.10 \frac{(0.07739)(0.7539)}{(0.7539) - (0.5008)(0.8974)},$$

$$\frac{\Delta J'_r}{J'_r} = 0.01916.$$

Thus, the fractional increase in the plutonium price is 0.01916, and the new price is:

$$\text{Pu price} = \$7.00 \times 1.01916 = \$7.134/\text{g.}$$

The accuracy can be verified by interpolating the results of Problems 240 and 241. The interpolated value is \$7.135/g.

Interpreting the signs rigorously, J'_r is negative since plutonium value is a credit rather than a cost; therefore, $\Delta J'_r$ in this case is also negative, and as a result, J'_r changes from $-\$7.00$ to $-\$7.134/g$.

Alternative Method, Using Eq. (48):

$$\frac{J'_{r2}}{J'_{r1}} = \frac{P'_{r1} - k_m}{P'_{r2} - k_m}$$

Estimating P'_{r1} and P'_{r2} :

$$t_\theta = 1.40 \text{ years,}$$

$$t'_{r1} = t_{r1} - t_\theta = 3.60 - 1.40 = 2.20 \text{ years,}$$

$$t'_{r2} = t_{r2} - t_\theta = 3.70 - 1.40 = 2.30 \text{ years,}$$

$$P'_{r1} = e^{-\delta t'_{r1}} = e^{-(0.07739)(2.20)} = 0.84344,$$

$$P'_{r2} = e^{-\delta t'_{r2}} = e^{-(0.07739)(2.30)} = 0.83694.$$

Returning to Eq. (48):

$$\frac{J'_{r2}}{J'_{r1}} = \frac{0.84344 - 0.5008}{0.83694 - 0.5008} = 1.0193;$$

Therefore, the new Pu value is:

$$(1.0193)(7.00) = 7.135 \text{ \$/g.}$$

This type of calculation can be used to balance increases in recovery cost against the value of earlier recovery. In the case shown here, speeding the recovery and sale of plutonium by 0.1 year is worth $\$0.134/g$.

Example 7. Fabrication Cost, Problem 237

This final example illustrates the change of the time reference point (Sect. 4) and the use of Tables A-5 and A-6. The problem selected for this illustration is the same as that used in Example 1:

Using Eq. (42) and Tables A-5 and A-6, calculate the indirect cost component of the fabrication cost in Problem 237.

Data (see Example 1):

Fabrication expenditure, J'_R , $\$10^6$	1.6574
Electricity delivered, $\angle Z_i$, 10^9 kWhr	7.1563
Tax constant, k_M	0.5008
Exposure time, t_{exp} , years	2.85
Lead time, t_R , years	0.45
i_{vs} , years ⁻¹	0.080465
$g = \ln(1 + i_{vs})$	0.077391

Referring to Eq. (42):

$$U_C = \frac{J'_R (P'_R - 1)}{10^{-9} (1 - k_M) \angle Z_i}.$$

All of the quantities except P'_R are available. To determine P'_R , the value of t'_R is required. First it is necessary to determine t_ϕ . Using Table A-6, with $i_{vs} = 0.0805$ and $t_{exp} = 2.85$ years, t_ϕ/t_{exp} is found to be 0.4908. Then

$$t_\phi = (0.4908)(t_{exp}) = (0.4908)(2.85) = 1.40 \text{ years.}$$

With a lead time of 0.45 years, $t_R = -0.45$ years, and

$$t'_R = t_R - t_\phi = -0.45 - 1.40 = -1.85 \text{ years,}$$

P'_R can now be calculated:

$$P'_R = e^{-gt'_R} = e^{-(0.077391)(-1.85)} = e^{0.14317}$$

$$P'_R = 1.15393.$$

Alternatively, P'_R can be determined from Table A-1 using $t'_R = -1.85$ years and $i_{vs} = 0.0805$. Interpolation gives the approximate value $P'_R = 1.1540$.

Inserting the data into Eq. (42),

$$U_C = \frac{1.0574 (1.1540 - 1)}{(1 - 0.5008)(7.152)} = 0.0714 \text{ mills/kWhr.}$$

The result obtained from REPCO was 0.0713 mills/kWhr.

To make use of Table A-5, the direct cost is first determined:

$$U_D = \frac{1.0574}{7.152} = 0.2310 \text{ mills/kWhr.}$$

Next, the value of U_C/U_D is estimated from Table A-5, with $i_{VC} = 0.0805$ and $t'_R = -1.05$ years. This gives $U_C/U_D = 0.3084$. Finally,

$$U_C = (0.2310)(0.3084) = 0.0714 \text{ mills/kWhr.}$$

This result can be checked by using Eq. (43):

$$\frac{U_C}{U_D} = \frac{P'_R - 1}{1 - R_m}$$

$$\frac{U_C}{U_D} = \frac{1.1540 - 1}{1 - 0.5008} = 0.3085$$

$$U_C = (0.3085) U_D = (0.3085)(0.2310) = 0.0714 \text{ mills/kWhr.}$$

Approximate Procedure. - If t_0 is taken as being approximately at the midexposure point, then

$$t_0 = \frac{t_{\text{exp}}}{2} = \frac{2.85}{2} = 1.425,$$

and

$$t'_R = -0.45 - 1.425 = -1.875 \text{ years.}$$

Referring now to Table A-5, with $t_F' = -1.875$ years and $i_{vs} = 0.0805$, the value of U_C/U_D is found to be 0.3129. Then

$$\begin{aligned} U_C &= (0.3129) U_D = (0.3129)(0.2316) \\ &= 0.0725 \text{ mills/kWhr.} \end{aligned}$$

This differs appreciably from the correct result of 0.0713 mills/kWhr, but is probably close enough for purposes of preliminary cost estimation.

5.3 Verification by Payout Calculations

The most convincing test of any proposed method for calculating fuel cycle cost is verification by means of a payout tabulation. The POW76 code was written to provide for such tests in connection with REFCO. Using subroutine POWINP, REFCO produces a set of cards that can be used as input to POW76. These cards contain the fuel expenditures and electricity production, arranged by time periods. Using one-month periods, the results of POW76 can be expected to be very close to those of REFCO.

Three of the REFCO examples were run using POW76. The first two show the calculation of the total fuel cycle cost for Problems 243 and 244. The third is the calculation of the U_3O_8 component only, for Problem 243. Tables 5.4 through 5.9 summarize the calculations.

The results are compared below:

	Fuel Cycle Cost, mills/kWhr		
	<u>REFCO</u>	<u>POW76</u>	<u>DIFFERENCE</u>
Problem 243 (total)	2.0524	2.0519	0.0005
Problem 244 (total)	2.3402	2.3399	0.0003
Problem 243 (U_3O_8 only)	1.0216	1.0222	0.0006

Table 5.4 shows the input data to POW76 for the first case. Table 5.5 shows the payout tabulation produced by the code. The final entry of the table shows that the outstanding capital has been reduced to 0.00022 ($\$10^6$), the difference from zero being due to the fact that the algorithm used is limited by the precision of the computer.

Table 5.4 Input Data for Problem 243.

INPUT DATA PROBLEM 243 TOTAL FUEL CYCLE COST

DEMO - 1 - 35

0.0	61.00000	0.0	0.50000	0.00000	0.00000	0.00000	1000.00000	0.0	0.0
0.0	12.00000	0.0	0.0	0.00000	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.00000
0.0	0.0	0.0	0.0	0.0					

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Table 5.4 (continued)

INPUT DATA		EXPENSES IN \$/KW PER PERIOD			
PO	CAPX FACTOR	FUEL PURCH	FAOR COST	ASPR COST	U-PK COST
1	0.0	5.12342	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0
4	0.0	4.10401	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	1.05741	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0
15	0.25429	0.0	0.0	0.0	0.0
16	0.32037	0.0	0.0	0.0	0.0
17	0.32037	0.0	0.0	0.0	0.0
18	0.32037	0.0	0.0	0.0	0.0
19	0.32037	0.0	0.0	0.0	0.0
20	0.32037	0.0	0.0	0.0	0.0
21	0.32037	0.0	0.0	0.0	0.0
22	0.32037	0.0	0.0	0.0	0.0
23	0.32037	0.0	0.0	0.0	0.0
24	0.32037	0.0	0.0	0.0	0.0
25	0.12014	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0
27	0.25430	0.0	0.0	0.0	0.0
28	0.32037	0.0	0.0	0.0	0.0
29	0.32037	0.0	0.0	0.0	0.0
30	0.32037	0.0	0.0	0.0	0.0
31	0.32037	0.0	0.0	0.0	0.0
32	0.32037	0.0	0.0	0.0	0.0
33	0.32037	0.0	0.0	0.0	0.0
34	0.32037	0.0	0.0	0.0	0.0
35	0.32037	0.0	0.0	0.0	0.0
36	0.32037	0.0	0.0	0.0	0.0
37	0.12014	0.0	0.0	0.0	0.0
38	0.0	0.0	0.0	0.0	0.0
39	0.25430	0.0	0.0	0.0	0.0
40	0.32037	0.0	0.0	0.0	0.0
41	0.32037	0.0	0.0	0.0	0.0
42	0.32037	0.0	0.0	0.0	0.0
43	0.32037	0.0	0.0	0.0	0.0
44	0.32037	0.0	0.0	0.0	0.0
45	0.32037	0.0	0.0	0.0	0.0
46	0.32037	0.0	0.0	0.0	0.0
47	0.32037	0.0	0.0	0.0	0.0
48	0.32037	0.0	0.0	0.0	0.0
49	0.12014	0.0	0.0	0.0	0.0
50	0.0	0.0	0.0	0.0	0.0
51	0.0	0.0	0.0	0.0	0.0
52	0.0	0.0	0.0	0.0	0.0
53	0.0	0.0	0.0	0.0	0.0
54	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0
56	0.0	0.0	0.0	0.0	0.0
57	0.0	0.0	0.0	0.0	0.0
58	0.0	0.0	0.0	1.54334	0.0
59	0.0	0.0	0.0	0.0	0.0
60	0.0	0.0	0.0	0.0	1.24009
61	0.0	0.0	0.0	0.0	1.31357

FIXED CHARGE RATES ON NONDEPRECIABLE CAPITAL
 USING CONSTANT CAPACITY FACTOR 0.01277
 USING VARIABLE CAPACITY FACTOR 0.01471

Table 5.4 (continued)

FUEL CYCLE COST, MILLS/KWH	2.651067
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SAND USING FCDD	2.095705
SAND USING FCARD	2.095705

Table 5.5 Output of Problem 243.

OF SHEETS SUBROUTINE OUTPUT

PROBLEM 243 TOTAL FUEL CYCLE COST

	CAPITAL	INCOME	FUEL EXP	INTEREST	PROPERTY	DEPRECIATION	REVENUE TAX	S INC TX	F INC TX	CASH EXP	CAPITAL
1	0.0	0.0	5.12342	0.0	0.0	0.0	0.0	0.0	0.0	5.12342	5.12342
2	5.12342	0.0	0.0	0.00173	0.0	0.0	0.0	-0.00073	-0.00035	-0.00000	5.12342
3	5.15007	0.0	0.0	0.00200	0.0	0.0	0.0	-0.00073	-0.00041	-0.00014	5.12342
4	5.18009	0.0	0.0	0.00227	0.0	0.0	0.0	-0.00073	-0.00046	-0.00019	5.12342
5	5.21008	0.0	0.0	0.00254	0.0	0.0	0.0	-0.00133	-0.00134	-0.00077	5.12342
6	5.24007	0.0	0.0	0.00281	0.0	0.0	0.0	-0.00134	-0.00134	-0.00147	5.12342
7	5.27006	0.0	0.0	0.00308	0.0	0.0	0.0	-0.00135	-0.00135	-0.00198	5.12342
8	5.30005	0.0	0.0	0.00335	0.0	0.0	0.0	-0.00136	-0.00136	-0.00259	5.12342
9	5.33004	0.0	0.0	0.00362	0.0	0.0	0.0	-0.00136	-0.00136	-0.00320	5.12342
10	5.36003	0.0	0.0	0.00389	0.0	0.0	0.0	-0.00136	-0.00136	-0.00381	5.12342
11	5.39002	0.0	0.0	0.00416	0.0	0.0	0.0	-0.00136	-0.00136	-0.00442	5.12342
12	5.42001	0.0	0.0	0.00443	0.0	0.0	0.0	-0.00136	-0.00136	-0.00503	5.12342
13	5.45000	0.0	0.0	0.00470	0.0	0.0	0.0	-0.00136	-0.00136	-0.00564	5.12342
14	5.48000	0.0	0.0	0.00497	0.0	0.0	0.0	-0.00136	-0.00136	-0.00625	5.12342
15	5.51000	0.0	0.0	0.00524	0.0	0.0	0.0	-0.00136	-0.00136	-0.00686	5.12342
16	5.54000	0.0	0.0	0.00551	0.0	0.0	0.0	-0.00136	-0.00136	-0.00747	5.12342
17	5.57000	0.0	0.0	0.00578	0.0	0.0	0.0	-0.00136	-0.00136	-0.00808	5.12342
18	5.60000	0.0	0.0	0.00605	0.0	0.0	0.0	-0.00136	-0.00136	-0.00869	5.12342
19	5.63000	0.0	0.0	0.00632	0.0	0.0	0.0	-0.00136	-0.00136	-0.00930	5.12342
20	5.66000	0.0	0.0	0.00659	0.0	0.0	0.0	-0.00136	-0.00136	-0.00991	5.12342
21	5.69000	0.0	0.0	0.00686	0.0	0.0	0.0	-0.00136	-0.00136	-0.01052	5.12342
22	5.72000	0.0	0.0	0.00713	0.0	0.0	0.0	-0.00136	-0.00136	-0.01113	5.12342
23	5.75000	0.0	0.0	0.00740	0.0	0.0	0.0	-0.00136	-0.00136	-0.01174	5.12342
24	5.78000	0.0	0.0	0.00767	0.0	0.0	0.0	-0.00136	-0.00136	-0.01235	5.12342
25	5.81000	0.0	0.0	0.00794	0.0	0.0	0.0	-0.00136	-0.00136	-0.01296	5.12342
26	5.84000	0.0	0.0	0.00821	0.0	0.0	0.0	-0.00136	-0.00136	-0.01357	5.12342
27	5.87000	0.0	0.0	0.00848	0.0	0.0	0.0	-0.00136	-0.00136	-0.01418	5.12342
28	5.90000	0.0	0.0	0.00875	0.0	0.0	0.0	-0.00136	-0.00136	-0.01479	5.12342
29	5.93000	0.0	0.0	0.00902	0.0	0.0	0.0	-0.00136	-0.00136	-0.01540	5.12342
30	5.96000	0.0	0.0	0.00929	0.0	0.0	0.0	-0.00136	-0.00136	-0.01601	5.12342
31	5.99000	0.0	0.0	0.00956	0.0	0.0	0.0	-0.00136	-0.00136	-0.01662	5.12342
32	6.02000	0.0	0.0	0.00983	0.0	0.0	0.0	-0.00136	-0.00136	-0.01723	5.12342
33	6.05000	0.0	0.0	0.01010	0.0	0.0	0.0	-0.00136	-0.00136	-0.01784	5.12342
34	6.08000	0.0	0.0	0.01037	0.0	0.0	0.0	-0.00136	-0.00136	-0.01845	5.12342
35	6.11000	0.0	0.0	0.01064	0.0	0.0	0.0	-0.00136	-0.00136	-0.01906	5.12342
36	6.14000	0.0	0.0	0.01091	0.0	0.0	0.0	-0.00136	-0.00136	-0.01967	5.12342
37	6.17000	0.0	0.0	0.01118	0.0	0.0	0.0	-0.00136	-0.00136	-0.02028	5.12342
38	6.20000	0.0	0.0	0.01145	0.0	0.0	0.0	-0.00136	-0.00136	-0.02089	5.12342
39	6.23000	0.0	0.0	0.01172	0.0	0.0	0.0	-0.00136	-0.00136	-0.02150	5.12342
40	6.26000	0.0	0.0	0.01199	0.0	0.0	0.0	-0.00136	-0.00136	-0.02211	5.12342
41	6.29000	0.0	0.0	0.01226	0.0	0.0	0.0	-0.00136	-0.00136	-0.02272	5.12342
42	6.32000	0.0	0.0	0.01253	0.0	0.0	0.0	-0.00136	-0.00136	-0.02333	5.12342
43	6.35000	0.0	0.0	0.01280	0.0	0.0	0.0	-0.00136	-0.00136	-0.02394	5.12342
44	6.38000	0.0	0.0	0.01307	0.0	0.0	0.0	-0.00136	-0.00136	-0.02455	5.12342
45	6.41000	0.0	0.0	0.01334	0.0	0.0	0.0	-0.00136	-0.00136	-0.02516	5.12342
46	6.44000	0.0	0.0	0.01361	0.0	0.0	0.0	-0.00136	-0.00136	-0.02577	5.12342
47	6.47000	0.0	0.0	0.01388	0.0	0.0	0.0	-0.00136	-0.00136	-0.02638	5.12342
48	6.50000	0.0	0.0	0.01415	0.0	0.0	0.0	-0.00136	-0.00136	-0.02699	5.12342
49	6.53000	0.0	0.0	0.01442	0.0	0.0	0.0	-0.00136	-0.00136	-0.02760	5.12342
50	6.56000	0.0	0.0	0.01469	0.0	0.0	0.0	-0.00136	-0.00136	-0.02821	5.12342
51	6.59000	0.0	0.0	0.01496	0.0	0.0	0.0	-0.00136	-0.00136	-0.02882	5.12342
52	6.62000	0.0	0.0	0.01523	0.0	0.0	0.0	-0.00136	-0.00136	-0.02943	5.12342
53	6.65000	0.0	0.0	0.01550	0.0	0.0	0.0	-0.00136	-0.00136	-0.03004	5.12342
54	6.68000	0.0	0.0	0.01577	0.0	0.0	0.0	-0.00136	-0.00136	-0.03065	5.12342
55	6.71000	0.0	0.0	0.01604	0.0	0.0	0.0	-0.00136	-0.00136	-0.03126	5.12342
56	6.74000	0.0	0.0	0.01631	0.0	0.0	0.0	-0.00136	-0.00136	-0.03187	5.12342
57	6.77000	0.0	0.0	0.01658	0.0	0.0	0.0	-0.00136	-0.00136	-0.03248	5.12342
58	6.80000	0.0	0.0	0.01685	0.0	0.0	0.0	-0.00136	-0.00136	-0.03309	5.12342
59	6.83000	0.0	0.0	0.01712	0.0	0.0	0.0	-0.00136	-0.00136	-0.03370	5.12342
60	6.86000	0.0	0.0	0.01739	0.0	0.0	0.0	-0.00136	-0.00136	-0.03431	5.12342
61	6.89000	0.0	0.0	0.01766	0.0	0.0	0.0	-0.00136	-0.00136	-0.03492	5.12342

9

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DENSE=1.35
      0.0      01.00000      0.0      7.55000      0.00043      0.01024      0.00000      1000.00000      0.0      0.0
      0.0      17.00000      0.0      0.0      0.04000      0.0      0.0      0.0      0.0      0.0
      0.0      0.0      0.0      0.0      0.0      0.0      0.0      0.0      0.0      15.00000
      0.0      0.0      0.0      0.0      0.0
COSTANT CARS (CARS) 111-1110
      0      0      0      0      0      0      0      0

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Table 5.6 (continued)

INPUT DATA		EXPENSES IN \$MM PER PERIOD			
PO	CAPY FACTOR	FUEL PURCH	FAER COST	AEPR COST	U-PL CRED
1	0.0	5.50756	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0
4	0.0	4.00220	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	1.93304	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0
15	0.25629	0.0	0.0	0.0	0.0
16	0.32037	0.0	0.0	0.0	0.0
17	0.32037	0.0	0.0	0.0	0.0
18	0.32037	0.0	0.0	0.0	0.0
19	0.32037	0.0	0.0	0.0	0.0
20	0.32037	0.0	0.0	0.0	0.0
21	0.32037	0.0	0.0	0.0	0.0
22	0.32037	0.0	0.0	0.0	0.0
23	0.32037	0.0	0.0	0.0	0.0
24	0.32037	0.0	0.0	0.0	0.0
25	0.12814	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0
27	0.25630	0.0	0.0	0.0	0.0
28	0.32037	0.0	0.0	0.0	0.0
29	0.32037	0.0	0.0	0.0	0.0
30	0.32037	0.0	0.0	0.0	0.0
31	0.32037	0.0	0.0	0.0	0.0
32	0.32037	0.0	0.0	0.0	0.0
33	0.32037	0.0	0.0	0.0	0.0
34	0.32037	0.0	0.0	0.0	0.0
35	0.32037	0.0	0.0	0.0	0.0
36	0.32037	0.0	0.0	0.0	0.0
37	0.12814	0.0	0.0	0.0	0.0
38	0.0	0.0	0.0	0.0	0.0
39	0.25630	0.0	0.0	0.0	0.0
40	0.32037	0.0	0.0	0.0	0.0
41	0.32037	0.0	0.0	0.0	0.0
42	0.32037	0.0	0.0	0.0	0.0
43	0.32037	0.0	0.0	0.0	0.0
44	0.32037	0.0	0.0	0.0	0.0
45	0.32037	0.0	0.0	0.0	0.0
46	0.32037	0.0	0.0	0.0	0.0
47	0.32037	0.0	0.0	0.0	0.0
48	0.12814	0.0	0.0	0.0	0.0
49	0.0	0.0	0.0	0.0	0.0
50	0.0	0.0	0.0	0.0	0.0
51	0.0	0.0	0.0	0.0	0.0
52	0.0	0.0	0.0	0.0	0.0
53	0.0	0.0	0.0	0.0	0.0
54	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0
56	0.0	0.0	0.0	0.0	0.0
57	0.0	0.0	0.0	0.0	0.0
58	0.0	0.0	0.0	1.00700	0.0
59	0.0	0.0	0.0	0.0	0.0
60	0.0	0.0	0.0	0.0	1.20375
61	0.0	0.0	0.0	0.0	1.44902

FIXED CHARGE RATES ON NONDEPRECIABLE CAPITAL
 USING CONSTANT CAPACITY FACTOR 0.01277
 USING VARIABLE CAPACITY FACTOR 0.01271

Table 5.6 (continued)

PUMP CYCLE COST, PER HOUR	2.339672
CASE USING PUMP	2.309923
CASE USING PUMP	2.300619

Table 5.7 Output of Problem 244.

RESULTS SUBROUTINE OUTPUT

PROBLEM 244 TOTAL FUEL CYCLE COST

	CAPITAL	INCOME	FUEL EXP	INTEREST	PROPERTY	DEDUCTBL	DEPR TAX	S INC TX	F INC TX	CASH EXP	CAPITAL
1	0.0	0.0	5.58756	0.0	0.0	0.0	0.0	0.0	0.0	5.58756	5.58756
2	5.58756	0.0	0.0	0.04551	0.0	0.0	0.0	-0.00079	-0.00911	-0.00990	5.62317
3	5.62317	0.0	0.0	0.04500	0.0	0.0	0.0	-0.00080	-0.00917	-0.00997	5.65900
4	5.65900	0.0	4.88228	0.04409	0.0	0.0	0.0	-0.00080	-0.00923	-0.01025	10.57735
5	10.57735	0.0	0.0	0.04316	0.0	0.0	0.0	-0.00150	-0.01725	-0.01875	10.64476
6	10.64476	0.0	0.0	0.04270	0.0	0.0	0.0	-0.00151	-0.01736	-0.01886	10.71268
7	10.71268	0.0	0.0	0.04176	0.0	0.0	0.0	-0.00152	-0.01747	-0.01898	10.78007
8	10.78007	0.0	1.93304	0.04081	0.0	0.0	0.0	-0.00153	-0.01750	-0.01911	12.78321
9	12.78321	0.0	0.0	0.04012	0.0	0.0	0.0	-0.00181	-0.02084	-0.02265	12.84468
10	12.84468	0.0	0.0	0.04079	0.0	0.0	0.0	-0.00182	-0.02090	-0.02270	12.94667
11	12.94667	0.0	0.0	0.04045	0.0	0.0	0.0	-0.00183	-0.02111	-0.02294	13.02910
12	13.02910	0.0	0.0	0.04013	0.0	0.0	0.0	-0.00184	-0.02125	-0.02309	13.11222
13	13.11222	0.0	0.0	0.04000	0.0	0.0	0.0	-0.00186	-0.02130	-0.02324	13.19578
14	13.19578	0.0	0.0	0.04070	0.0	0.0	0.0	-0.00187	-0.02152	-0.02339	13.27908
15	13.27908	0.43778	0.0	0.04017	0.0	0.38113	0.0	0.00399	0.04131	0.04490	12.99517
16	12.99517	0.54722	0.0	0.04005	0.0	0.37641	0.0	0.00499	0.05752	0.06251	12.46631
17	12.46631	0.54722	0.0	0.04076	0.0	0.37641	0.0	0.00505	0.05814	0.06310	12.23503
18	12.23503	0.54722	0.0	0.04006	0.0	0.37641	0.0	0.00510	0.05876	0.06380	11.95133
19	11.95133	0.54722	0.0	0.04055	0.0	0.37641	0.0	0.00515	0.05930	0.06454	11.66610
20	11.66610	0.54722	0.0	0.04039	0.0	0.37641	0.0	0.00521	0.06001	0.06522	11.37657
21	11.37657	0.54722	0.0	0.04012	0.0	0.37641	0.0	0.00526	0.06065	0.06591	10.84540
22	10.84540	0.54722	0.0	0.04070	0.0	0.37641	0.0	0.00532	0.06120	0.06660	10.29190
23	10.29190	0.54722	0.0	0.04043	0.0	0.37641	0.0	0.00538	0.06193	0.06730	9.64081
24	9.64081	0.54722	0.0	0.04000	0.0	0.37641	0.0	0.00543	0.06257	0.06800	9.45720
25	9.45720	0.21880	0.0	0.07736	0.0	0.15056	0.0	0.00139	0.01600	0.01730	9.37307
26	9.37307	0.0	0.0	0.07635	0.0	0.0	0.0	-0.00133	-0.01528	-0.01661	9.43200
27	9.43200	0.43778	0.0	0.07683	0.0	0.38113	0.0	0.00413	0.04759	0.05172	9.12357
28	9.12357	0.54722	0.0	0.07631	0.0	0.37641	0.0	0.00554	0.06303	0.06937	8.72803
29	8.72803	0.54722	0.0	0.07103	0.0	0.37641	0.0	0.00540	0.06449	0.07089	8.31393
30	8.31393	0.54722	0.0	0.06772	0.0	0.37641	0.0	0.00546	0.06515	0.07081	7.98524
31	7.98524	0.54722	0.0	0.06439	0.0	0.37641	0.0	0.00571	0.06582	0.07153	7.65394
32	7.65394	0.54722	0.0	0.06104	0.0	0.37641	0.0	0.00577	0.06644	0.07226	7.08092
33	7.08092	0.54722	0.0	0.05767	0.0	0.37641	0.0	0.00583	0.06716	0.07299	6.64346
34	6.64346	0.54722	0.0	0.05428	0.0	0.37641	0.0	0.00589	0.06784	0.07373	6.24625
35	6.24625	0.54722	0.0	0.05086	0.0	0.37641	0.0	0.00595	0.06853	0.07447	5.82236
36	5.82236	0.54722	0.0	0.04744	0.0	0.37641	0.0	0.00601	0.06921	0.07522	5.39779
37	5.39779	0.21887	0.0	0.04497	0.0	0.15056	0.0	0.00197	0.02268	0.02405	5.24753
38	5.24753	0.0	0.0	0.04274	0.0	0.0	0.0	-0.00074	-0.00056	-0.00030	5.28090
39	5.28090	0.43778	0.0	0.04302	0.0	0.38113	0.0	0.00472	0.05436	0.05968	4.94520
40	4.94520	0.54722	0.0	0.04028	0.0	0.37641	0.0	0.00613	0.07064	0.07670	4.51512
41	4.51512	0.54722	0.0	0.03678	0.0	0.37641	0.0	0.00619	0.07135	0.07754	4.08222
42	4.08222	0.54722	0.0	0.03325	0.0	0.37641	0.0	0.00625	0.07205	0.07831	3.64655
43	3.64655	0.54722	0.0	0.02970	0.0	0.37641	0.0	0.00632	0.07276	0.07908	3.20811
44	3.20811	0.54722	0.0	0.02613	0.0	0.37641	0.0	0.00638	0.07348	0.07986	2.76680
45	2.76680	0.54722	0.0	0.02254	0.0	0.37641	0.0	0.00644	0.07420	0.08064	2.32283
46	2.32283	0.54722	0.0	0.01892	0.0	0.37641	0.0	0.00650	0.07492	0.08142	1.87596
47	1.87596	0.54722	0.0	0.01528	0.0	0.37641	0.0	0.00657	0.07565	0.08222	1.42624
48	1.42624	0.54722	0.0	0.01164	0.0	0.37641	0.0	0.00663	0.07638	0.08301	0.97365
49	0.97365	0.21887	0.0	0.00793	0.0	0.15056	0.0	0.00259	0.02989	0.03249	0.79519
50	0.79519	0.0	0.0	0.00448	0.0	0.0	0.0	-0.00011	-0.00130	-0.00141	0.80826
51	0.80826	0.0	0.0	0.00452	0.0	0.0	0.0	-0.00011	-0.00138	-0.00142	0.80536
52	0.80536	0.0	0.0	0.00450	0.0	0.0	0.0	-0.00011	-0.00131	-0.00143	0.81049
53	0.81049	0.0	0.0	0.00450	0.0	0.0	0.0	-0.00011	-0.00132	-0.00144	0.81566
54	0.81566	0.0	0.0	0.00449	0.0	0.0	0.0	-0.00012	-0.00133	-0.00145	0.82086
55	0.82086	0.0	0.0	0.00449	0.0	0.0	0.0	-0.00012	-0.00134	-0.00145	0.82609
56	0.82609	0.0	0.0	0.00448	0.0	0.0	0.0	-0.00012	-0.00135	-0.00146	0.83135
57	0.83135	0.0	0.0	0.00447	0.0	0.0	0.0	-0.00012	-0.00136	-0.00147	0.83665
58	0.83665	0.0	1.04746	0.00441	0.0	0.0	0.0	-0.00012	-0.00136	1.04997	2.68944
59	2.68944	0.0	0.0	0.04191	0.0	0.0	0.0	-0.00032	-0.00439	-0.00477	2.76658
60	2.76658	0.0	-1.28379	0.02205	0.0	0.0	0.0	-0.00038	-0.00441	-1.28055	1.44008
61	1.44008	0.0	-1.44982	0.01173	0.0	0.0	0.0	-0.00020	-0.00235	-1.45157	0.00024

Table 5.8 Input Data, Problem 243, U308 Cost.

INPUT DATA PROBLEM 243 UIC8 COMPONENT OF FUEL CYCLE COST

0451-501-55

0.0	49.00000	0.0	u.55300	0.00041	0.01024	0.40000	1000.00000	0.0	0.0
0.0	12.00000	0.0	u.u	0.54000	5.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	u.0	0.0	0.0	0.0	0.0	0.0	15.00000
0.0	0.0	0.0	u.u	0.0					

CONTACT CARD SIGNALS. LL 1-LL 10

0 0 0 0 C C 0 4 0 5

Table 5.8 (continued)

INPUT DATA		EXPENSES IN \$/M PER PERIOD			
PO	CAPX FACTOR	FUEL PURCH	FAIR COST	DEPR COST	L-PN CRED
1	0.0	5.12342	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0
15	0.25429	0.0	0.0	0.0	0.0
16	0.32037	0.0	0.0	0.0	0.0
17	0.32037	0.0	0.0	0.0	0.0
18	0.32037	0.0	0.0	0.0	0.0
19	0.32037	0.0	0.0	0.0	0.0
20	0.32037	0.0	0.0	0.0	0.0
21	0.32037	0.0	0.0	0.0	0.0
22	0.32037	0.0	0.0	0.0	0.0
23	0.32037	0.0	0.0	0.0	0.0
24	0.32037	0.0	0.0	0.0	0.0
25	0.12814	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0
27	0.25430	0.0	0.0	0.0	0.0
28	0.32037	0.0	0.0	0.0	0.0
29	0.32037	0.0	0.0	0.0	0.0
30	0.32037	0.0	0.0	0.0	0.0
31	0.32037	0.0	0.0	0.0	0.0
32	0.32037	0.0	0.0	0.0	0.0
33	0.32037	0.0	0.0	0.0	0.0
34	0.32037	0.0	0.0	0.0	0.0
35	0.32037	0.0	0.0	0.0	0.0
36	0.32037	0.0	0.0	0.0	0.0
37	0.12814	0.0	0.0	0.0	0.0
38	0.0	0.0	0.0	0.0	0.0
39	0.25430	0.0	0.0	0.0	0.0
40	0.32037	0.0	0.0	0.0	0.0
41	0.32037	0.0	0.0	0.0	0.0
42	0.32037	0.0	0.0	0.0	0.0
43	0.32037	0.0	0.0	0.0	0.0
44	0.32037	0.0	0.0	0.0	0.0
45	0.32037	0.0	0.0	0.0	0.0
46	0.32037	0.0	0.0	0.0	0.0
47	0.32037	0.0	0.0	0.0	0.0
48	0.32037	0.0	0.0	0.0	0.0
49	0.12814	0.0	0.0	0.0	0.0

FIXED CHARGE RATES ON NONDEPRECIABLE CAPITAL
 USING CONSTANT CAPACITY FACTOR 0.01277
 USING VARIABLE CAPACITY FACTOR 0.01200

Table 5.8 (continued)

FUEL CYCLE COST, MILLS/KWH	1.622215
SAME USING FCAN	1.049314
SAME USING FCAMP	1.044240

Table 5.9 Output, Problem 243, U₃O₈ Cost.

RESULTS SUBROUTINE OUTPUT

PROBLEM 243 U3O8 COMPONENT OF FUEL CYCLE COST

	CAPITAL	INCOME	FUEL EXP	INTEREST	PROPERTY	DESTRUCT	REVEN TAX	S INC TX	F INC TX	CASH EXP	CAPITAL
1	0.0	0.0	5.12342	0.0	0.0	0.0	0.0	0.0	0.0	5.12342	5.12342
2	5.12342	0.0	0.0	0.004173	0.0	0.0	0.0	-0.000017	-0.000035	-0.000000	5.15007
3	5.15007	0.0	0.0	0.004200	0.0	0.0	0.0	-0.000173	-0.000041	-0.000014	5.16092
4	5.16093	0.0	0.0	0.004227	0.0	0.0	0.0	-0.000173	-0.000046	-0.000020	5.22200
5	5.22200	0.0	0.0	0.004253	0.0	0.0	0.0	-0.000174	-0.000052	-0.000025	5.22520
6	5.22520	0.0	0.0	0.004281	0.0	0.0	0.0	-0.000174	-0.000057	-0.000031	5.22877
7	5.22877	0.0	0.0	0.004308	0.0	0.0	0.0	-0.000175	-0.000062	-0.000037	5.32248
8	5.32248	0.0	0.0	0.004335	0.0	0.0	0.0	-0.000175	-0.000066	-0.000043	5.35040
9	5.35040	0.0	0.0	0.004363	0.0	0.0	0.0	-0.000176	-0.000073	-0.000049	5.39053
10	5.39053	0.0	0.0	0.004391	0.0	0.0	0.0	-0.000176	-0.000079	-0.000055	5.42409
11	5.42409	0.0	0.0	0.004419	0.0	0.0	0.0	-0.000177	-0.000085	-0.000061	5.45944
12	5.45944	0.0	0.0	0.004447	0.0	0.0	0.0	-0.000177	-0.000090	-0.000068	5.44425
13	5.44425	0.0	0.0	0.004475	0.0	0.0	0.0	-0.000178	-0.000096	-0.000074	5.52927
14	5.52927	0.0	0.0	0.004504	0.0	0.0	0.0	-0.000178	-0.000102	-0.000080	5.56451
15	5.56451	0.19125	0.0	0.004532	0.0	0.13395	0.0	0.00150	0.01773	0.01884	5.43742
16	5.43742	0.23906	0.0	0.004559	0.0	0.16743	0.0	0.00210	0.02614	0.02624	5.26008
17	5.26008	0.23906	0.0	0.004587	0.0	0.16743	0.0	0.00212	0.02642	0.02653	5.09927
18	5.09927	0.23906	0.0	0.004615	0.0	0.16743	0.0	0.00214	0.02669	0.02684	4.92057
19	4.92057	0.23906	0.0	0.004643	0.0	0.16743	0.0	0.00217	0.02697	0.02714	4.75079
20	4.75079	0.23906	0.0	0.004671	0.0	0.16743	0.0	0.00219	0.02725	0.02744	4.58392
21	4.58392	0.23906	0.0	0.004699	0.0	0.16743	0.0	0.00222	0.02753	0.02775	4.40994
22	4.40994	0.23906	0.0	0.004727	0.0	0.16743	0.0	0.00224	0.02782	0.02806	4.23404
23	4.23404	0.23906	0.0	0.004755	0.0	0.16743	0.0	0.00227	0.02810	0.02837	4.05044
24	4.05044	0.23906	0.0	0.004783	0.0	0.16743	0.0	0.00229	0.02839	0.02868	3.86133
25	3.86133	0.09562	0.0	0.004811	0.0	0.06497	0.0	0.00060	0.00607	0.00747	3.62404
26	3.62404	0.0	0.0	0.004839	0.0	0.0	0.0	-0.000054	-0.000024	-0.000070	3.46917
27	3.46917	0.19125	0.0	0.004867	0.0	0.13395	0.0	0.00175	0.02013	0.02108	3.71115
28	3.71115	0.23906	0.0	0.004895	0.0	0.16743	0.0	0.00234	0.02696	0.02793	3.53161
29	3.53161	0.23906	0.0	0.004923	0.0	0.16743	0.0	0.00237	0.02725	0.02791	3.35093
30	3.35093	0.23906	0.0	0.004951	0.0	0.16743	0.0	0.00239	0.02754	0.02793	3.16909
31	3.16909	0.23906	0.0	0.004979	0.0	0.16743	0.0	0.00242	0.02784	0.03026	2.98610
32	2.98610	0.23906	0.0	0.005007	0.0	0.16743	0.0	0.00244	0.02814	0.03058	2.80194
33	2.80194	0.23906	0.0	0.005035	0.0	0.16743	0.0	0.00247	0.02844	0.03091	2.61661
34	2.61661	0.23906	0.0	0.005063	0.0	0.16743	0.0	0.00249	0.02874	0.03124	2.43009
35	2.43009	0.23906	0.0	0.005091	0.0	0.16743	0.0	0.00252	0.02904	0.03157	2.24239
36	2.24239	0.23906	0.0	0.005119	0.0	0.16743	0.0	0.00255	0.02934	0.03190	2.05349
37	2.05349	0.09562	0.0	0.005147	0.0	0.06497	0.0	0.00060	0.00605	0.01071	1.90530
38	1.90530	0.0	0.0	0.005175	0.0	0.0	0.0	-0.000028	-0.000024	-0.000032	1.79796
39	1.79796	0.19125	0.0	0.005203	0.0	0.13395	0.0	0.00201	0.02315	0.02516	1.64613
40	1.64613	0.23906	0.0	0.005231	0.0	0.16743	0.0	0.00260	0.02999	0.03260	1.45672
41	1.45672	0.23906	0.0	0.005259	0.0	0.16743	0.0	0.00263	0.03031	0.03294	1.26405
42	1.26405	0.23906	0.0	0.005287	0.0	0.16743	0.0	0.00266	0.03062	0.03328	1.07023
43	1.07023	0.23906	0.0	0.005315	0.0	0.16743	0.0	0.00269	0.03094	0.03362	0.87514
44	0.87514	0.23906	0.0	0.005343	0.0	0.16743	0.0	0.00271	0.03125	0.03397	0.67880
45	0.67880	0.23906	0.0	0.005371	0.0	0.16743	0.0	0.00274	0.03157	0.03431	0.48121
46	0.48121	0.23906	0.0	0.005399	0.0	0.16743	0.0	0.00277	0.03190	0.03467	0.28236
47	0.28236	0.23906	0.0	0.005427	0.0	0.16743	0.0	0.00280	0.03222	0.03502	0.08225
48	0.08225	0.23906	0.0	0.005455	0.0	0.16743	0.0	0.00283	0.03255	0.03537	0.00000
49	0.00000	0.09562	0.0	0.005483	0.0	0.06497	0.0	0.00113	0.01307	0.01426	0.70013

Tables 5.6 through 5.9 show inputs and outputs for the other two examples. The results of these tests indicate that REFCO does meet the requirements of the payout calculation with adequate precision.

The conversion of annual interest rates used in REFCO to monthly interest rates needed as input to POW76 is accomplished as follows, using Problem 243 as an example:

Annual interest rate on debt (REFCO) = 0.08.

Monthly interest rate on debt (POW76) = $(1.08)^{1/12} - 1 = 0.006434$.

Annual after-tax earning rate on equity (REFCO) = 0.13.

Monthly earning rate (POW76) = $(1.13)^{1/12} - 1 = 0.010237$.

The treatment of allocated fuel expense for income tax purposes is the same in both codes when only one batch is being considered.

6. CONCLUSIONS

The discounted cash flow method provides a consistent procedure for calculating inventory charges in the fuel cycle. Inventory charges can also be calculated by fixed charge rate methods. The fixed charge rate method used in this report was based on the use of the full cash expenditure and an effective inventory time, rather than on an average fuel working capital and a full inventory time. Both the fixed charge rate and the effective inventory time must be determined by methods that ensure consistency with the discounted cash flow procedure. Whatever method is used, the fixed charge rate on fuel can and should be stated in terms of well-defined economic parameters such as debt-equity ratio, interest rate on debt, after-tax earning rate on equity, and tax rates. It is not satisfactory to base the inventory charges on some arbitrarily selected interest rate or carrying charge rate on fuel; the rate used must bear the proper mathematical relationship to the basic economic parameters (capital structure, interest rates on debt and equity, and tax rates) that apply to the actual or hypothetical firm under consideration. If the fixed charge rate or interest rate on fuel is arbitrarily selected without regard to these parameters, the resulting cost will only be an approximation.

Since some of the problems in the fuel cycle call for the calculation of small cost differentials, the results of such approximations can turn out to be quite misleading.

7. APPENDIXES

Table A-1. Values of the discounted factor P_r .

Table A-2. Values of the continuous discount factor ϕ_N .

Table A-3. Values of the effective inventory time t_m .

Table A-4. Ratio of indirect cost to direct cost, U_c/U_D .

Table A-5. Ratio of indirect to direct cost, with time measured from t_ϕ .

Table A-6. Values of t_ϕ/t_{exp} .

Table A-7. Fortran list of REFCO.

TABLE A-1. DISCOUNT FACTOR P SUB R

***** INTEREST RATE IVS *****

TR	0.060	0.061	0.062	0.063	0.064
-3.00	1.1910	1.1944	1.1978	1.2012	1.2045
-2.90	1.1861	1.1873	1.1906	1.1938	1.1971
-2.80	1.1772	1.1803	1.1834	1.1866	1.1897
-2.70	1.1704	1.1734	1.1763	1.1793	1.1823
-2.60	1.1636	1.1664	1.1693	1.1722	1.1750
-2.50	1.1568	1.1595	1.1623	1.1650	1.1678
-2.40	1.1501	1.1527	1.1553	1.1579	1.1605
-2.30	1.1434	1.1459	1.1484	1.1509	1.1534
-2.20	1.1368	1.1391	1.1415	1.1439	1.1462
-2.10	1.1302	1.1324	1.1346	1.1369	1.1391
-2.00	1.1236	1.1257	1.1278	1.1300	1.1321
-1.90	1.1171	1.1191	1.1211	1.1231	1.1251
-1.80	1.1106	1.1125	1.1144	1.1162	1.1181
-1.70	1.1041	1.1059	1.1077	1.1095	1.1112
-1.60	1.0977	1.0994	1.1010	1.1027	1.1043
-1.50	1.0913	1.0929	1.0944	1.0960	1.0975
-1.40	1.0850	1.0864	1.0879	1.0893	1.0907
-1.30	1.0787	1.0800	1.0813	1.0827	1.0840
-1.20	1.0724	1.0736	1.0749	1.0761	1.0773
-1.10	1.0662	1.0673	1.0684	1.0695	1.0706
-1.00	1.0600	1.0610	1.0620	1.0630	1.0640
-0.90	1.0538	1.0547	1.0556	1.0565	1.0574
-0.80	1.0477	1.0485	1.0493	1.0501	1.0509
-0.70	1.0416	1.0423	1.0430	1.0437	1.0444
-0.60	1.0355	1.0362	1.0368	1.0373	1.0379
-0.50	1.0294	1.0300	1.0305	1.0310	1.0315
-0.40	1.0233	1.0240	1.0244	1.0247	1.0251
-0.30	1.0172	1.0179	1.0182	1.0185	1.0188
-0.20	1.0111	1.0119	1.0121	1.0123	1.0125
-0.10	1.0050	1.0059	1.0060	1.0061	1.0062
-0.00	1.0000	1.0000	1.0000	1.0000	1.0000
1.00	0.9434	0.9425	0.9416	0.9407	0.9399
1.10	0.9379	0.9369	0.9360	0.9350	0.9340
1.20	0.9325	0.9314	0.9304	0.9293	0.9283
1.30	0.9270	0.9259	0.9248	0.9236	0.9225
1.40	0.9217	0.9204	0.9192	0.9180	0.9168
1.50	0.9163	0.9150	0.9137	0.9124	0.9111
1.60	0.9110	0.9096	0.9082	0.9069	0.9055
1.70	0.9057	0.9042	0.9028	0.9014	0.8999
1.80	0.9004	0.8989	0.8974	0.8959	0.8943
1.90	0.8952	0.8936	0.8920	0.8904	0.8888
2.00	0.8900	0.8883	0.8866	0.8850	0.8833
2.10	0.8848	0.8831	0.8812	0.8796	0.8779
2.20	0.8797	0.8779	0.8760	0.8742	0.8724
2.30	0.8746	0.8727	0.8708	0.8689	0.8670
2.40	0.8695	0.8675	0.8656	0.8636	0.8617
2.50	0.8644	0.8624	0.8604	0.8584	0.8563
2.60	0.8594	0.8573	0.8552	0.8531	0.8510
2.70	0.8544	0.8523	0.8501	0.8479	0.8458
2.80	0.8495	0.8472	0.8450	0.8428	0.8406

TABLE A-1. DISCOUNT FACTOR P SUB R

*****INTEREST RATE IVS*****

TR	0.060	0.061	0.062	0.063	0.064
2.90	0.8445	0.8422	0.8395	0.8376	0.8354
3.00	0.8396	0.8372	0.8345	0.8325	0.8302
3.10	0.8347	0.8323	0.8295	0.8275	0.8251
3.20	0.8299	0.8274	0.8245	0.8224	0.8200
3.30	0.8251	0.8225	0.8200	0.8174	0.8149
3.40	0.8203	0.8177	0.8150	0.8124	0.8098
3.50	0.8155	0.8128	0.8102	0.8075	0.8048
3.60	0.8108	0.8080	0.8053	0.8026	0.7999
3.70	0.8061	0.8033	0.8005	0.7977	0.7949
3.80	0.8014	0.7985	0.7957	0.7928	0.7900
3.90	0.7967	0.7938	0.7909	0.7880	0.7851
4.00	0.7921	0.7891	0.7861	0.7832	0.7803
4.10	0.7875	0.7845	0.7814	0.7784	0.7754
4.20	0.7829	0.7798	0.7767	0.7737	0.7706
4.30	0.7784	0.7752	0.7721	0.7690	0.7659
4.40	0.7738	0.7706	0.7675	0.7643	0.7611
4.50	0.7694	0.7661	0.7629	0.7596	0.7564
4.60	0.7649	0.7616	0.7583	0.7550	0.7517
4.70	0.7604	0.7571	0.7537	0.7504	0.7471
4.80	0.7560	0.7526	0.7492	0.7458	0.7425
4.90	0.7516	0.7482	0.7447	0.7413	0.7379
5.00	0.7473	0.7437	0.7403	0.7368	0.7333
5.10	0.7429	0.7394	0.7358	0.7323	0.7288
5.20	0.7386	0.7350	0.7314	0.7278	0.7243
5.30	0.7343	0.7307	0.7270	0.7234	0.7198
5.40	0.7300	0.7263	0.7227	0.7190	0.7153
5.50	0.7258	0.7220	0.7183	0.7146	0.7109
5.60	0.7216	0.7178	0.7140	0.7103	0.7065
5.70	0.7174	0.7135	0.7097	0.7059	0.7022
5.80	0.7132	0.7093	0.7055	0.7016	0.6978
5.90	0.7091	0.7051	0.7012	0.6974	0.6935
6.00	0.7050	0.7010	0.6970	0.6931	0.6892
6.10	0.7009	0.6968	0.6928	0.6888	0.6850
6.20	0.6968	0.6927	0.6887	0.6847	0.6807
6.30	0.6927	0.6886	0.6846	0.6805	0.6765
6.40	0.6887	0.6846	0.6805	0.6764	0.6723
6.50	0.6847	0.6805	0.6764	0.6723	0.6682
6.60	0.6807	0.6765	0.6723	0.6682	0.6640
6.70	0.6768	0.6725	0.6683	0.6641	0.6599
6.80	0.6729	0.6686	0.6643	0.6600	0.6558
6.90	0.6689	0.6646	0.6603	0.6560	0.6518
7.00	0.6651	0.6607	0.6563	0.6520	0.6478
7.10	0.6612	0.6568	0.6524	0.6481	0.6438
7.20	0.6574	0.6529	0.6485	0.6441	0.6398
7.30	0.6535	0.6491	0.6446	0.6402	0.6358
7.40	0.6497	0.6452	0.6407	0.6363	0.6319
7.50	0.6460	0.6414	0.6369	0.6324	0.6280
7.60	0.6422	0.6376	0.6331	0.6286	0.6241
7.70	0.6385	0.6339	0.6293	0.6247	0.6202
7.80	0.6348	0.6301	0.6255	0.6209	0.6164

TABLE A-1. DISCOUNT FACTOR P SUB R

*****INTEREST RATE IVS*****

TR	0.065	0.066	0.067	0.068	0.069
-3.00	1.2079	1.2114	1.2148	1.2182	1.2216
-2.90	1.2004	1.2036	1.2069	1.2102	1.2135
-2.80	1.1928	1.1960	1.1991	1.2023	1.2054
-2.70	1.1853	1.1883	1.1914	1.1944	1.1974
-2.60	1.1779	1.1808	1.1837	1.1865	1.1894
-2.50	1.1705	1.1733	1.1760	1.1788	1.1815
-2.40	1.1632	1.1658	1.1684	1.1710	1.1737
-2.30	1.1559	1.1584	1.1609	1.1634	1.1659
-2.20	1.1486	1.1510	1.1533	1.1557	1.1581
-2.10	1.1414	1.1436	1.1459	1.1481	1.1504
-2.00	1.1342	1.1364	1.1385	1.1406	1.1428
-1.90	1.1271	1.1291	1.1311	1.1331	1.1352
-1.80	1.1200	1.1219	1.1238	1.1257	1.1276
-1.70	1.1130	1.1148	1.1166	1.1183	1.1201
-1.60	1.1060	1.1077	1.1093	1.1110	1.1127
-1.50	1.0991	1.1006	1.1022	1.1037	1.1053
-1.40	1.0922	1.0936	1.0950	1.0965	1.0979
-1.30	1.0853	1.0866	1.0880	1.0893	1.0906
-1.20	1.0785	1.0797	1.0809	1.0821	1.0834
-1.10	1.0717	1.0728	1.0739	1.0750	1.0762
-1.00	1.0650	1.0660	1.0670	1.0680	1.0690
-0.90	1.0583	1.0592	1.0601	1.0610	1.0619
-0.80	1.0517	1.0525	1.0532	1.0540	1.0548
-0.70	1.0451	1.0458	1.0464	1.0471	1.0478
-0.60	1.0385	1.0391	1.0397	1.0403	1.0408
-0.50	1.0320	1.0325	1.0330	1.0334	1.0339
-0.40	1.0255	1.0259	1.0263	1.0267	1.0270
-0.30	1.0191	1.0194	1.0196	1.0199	1.0202
-0.20	1.0127	1.0129	1.0131	1.0132	1.0134
-0.10	1.0063	1.0064	1.0065	1.0066	1.0067
-0.00	1.0000	1.0000	1.0000	1.0000	1.0000
1.00	0.9390	0.9381	0.9372	0.9363	0.9355
1.10	0.9331	0.9321	0.9311	0.9302	0.9292
1.20	0.9272	0.9262	0.9251	0.9241	0.9231
1.30	0.9214	0.9203	0.9192	0.9180	0.9169
1.40	0.9156	0.9144	0.9132	0.9120	0.9108
1.50	0.9099	0.9086	0.9073	0.9060	0.9048
1.60	0.9042	0.9028	0.9014	0.9001	0.8987
1.70	0.8985	0.8970	0.8956	0.8942	0.8928
1.80	0.8928	0.8913	0.8898	0.8883	0.8868
1.90	0.8872	0.8856	0.8841	0.8825	0.8809
2.00	0.8817	0.8800	0.8784	0.8767	0.8751
2.10	0.8761	0.8744	0.8727	0.8710	0.8693
2.20	0.8706	0.8688	0.8670	0.8653	0.8635
2.30	0.8652	0.8633	0.8614	0.8596	0.8577
2.40	0.8597	0.8578	0.8559	0.8539	0.8520
2.50	0.8543	0.8523	0.8503	0.8483	0.8464
2.60	0.8490	0.8469	0.8448	0.8428	0.8407
2.70	0.8436	0.8415	0.8394	0.8373	0.8351
2.80	0.8383	0.8361	0.8340	0.8318	0.8296

TABLE A-1. DISCOUNT FACTOR P SUB R

*****INTEREST RATE IVS*****

TR	0.065	0.066	0.067	0.068	0.069
2.90	0.8331	0.8308	0.8284	0.8263	0.8241
3.00	0.8279	0.8255	0.8232	0.8209	0.8186
3.10	0.8227	0.8203	0.8179	0.8155	0.8131
3.20	0.8175	0.8150	0.8126	0.8102	0.8077
3.30	0.8124	0.8098	0.8073	0.8049	0.8024
3.40	0.8073	0.8047	0.8021	0.7996	0.7970
3.50	0.8022	0.7996	0.7969	0.7943	0.7917
3.60	0.7972	0.7945	0.7918	0.7891	0.7865
3.70	0.7922	0.7894	0.7867	0.7839	0.7812
3.80	0.7872	0.7844	0.7816	0.7788	0.7760
3.90	0.7822	0.7794	0.7765	0.7737	0.7709
4.00	0.7773	0.7744	0.7715	0.7686	0.7658
4.10	0.7724	0.7695	0.7665	0.7636	0.7607
4.20	0.7676	0.7646	0.7616	0.7586	0.7556
4.30	0.7628	0.7597	0.7566	0.7536	0.7506
4.40	0.7580	0.7549	0.7518	0.7487	0.7456
4.50	0.7532	0.7501	0.7469	0.7438	0.7406
4.60	0.7485	0.7453	0.7421	0.7389	0.7357
4.70	0.7438	0.7405	0.7373	0.7340	0.7308
4.80	0.7391	0.7358	0.7325	0.7292	0.7260
4.90	0.7345	0.7311	0.7278	0.7244	0.7211
5.00	0.7299	0.7265	0.7231	0.7197	0.7163
5.10	0.7253	0.7218	0.7184	0.7150	0.7116
5.20	0.7207	0.7172	0.7138	0.7103	0.7068
5.30	0.7162	0.7127	0.7091	0.7056	0.7021
5.40	0.7117	0.7081	0.7046	0.7010	0.6975
5.50	0.7073	0.7036	0.7000	0.6964	0.6928
5.60	0.7028	0.6991	0.6955	0.6918	0.6882
5.70	0.6984	0.6947	0.6910	0.6873	0.6836
5.80	0.6940	0.6903	0.6865	0.6828	0.6791
5.90	0.6897	0.6859	0.6821	0.6783	0.6746
6.00	0.6853	0.6815	0.6777	0.6739	0.6701
6.10	0.6810	0.6771	0.6733	0.6694	0.6656
6.20	0.6768	0.6728	0.6689	0.6651	0.6612
6.30	0.6725	0.6685	0.6646	0.6607	0.6568
6.40	0.6683	0.6643	0.6603	0.6564	0.6524
6.50	0.6641	0.6601	0.6560	0.6521	0.6481
6.60	0.6599	0.6558	0.6518	0.6478	0.6438
6.70	0.6558	0.6517	0.6476	0.6435	0.6395
6.80	0.6517	0.6475	0.6434	0.6393	0.6353
6.90	0.6476	0.6434	0.6392	0.6351	0.6310
7.00	0.6435	0.6393	0.6351	0.6310	0.6268
7.10	0.6395	0.6352	0.6310	0.6268	0.6227
7.20	0.6355	0.6312	0.6269	0.6227	0.6185
7.30	0.6315	0.6272	0.6229	0.6186	0.6144
7.40	0.6275	0.6232	0.6189	0.6146	0.6103
7.50	0.6236	0.6192	0.6149	0.6105	0.6063
7.60	0.6196	0.6152	0.6109	0.6065	0.6022
7.70	0.6158	0.6113	0.6069	0.6024	0.5982
7.80	0.6119	0.6074	0.6030	0.5986	0.5943

TABLE A-1. DISCOUNT FACTOR P SUB R

*****INTEREST RATE IVS*****

TR	0.070	0.071	0.072	0.073	0.074
-3.00	1.2250	1.2285	1.2315	1.2354	1.2388
-2.90	1.2168	1.2201	1.2234	1.2267	1.2300
-2.80	1.2086	1.2117	1.2145	1.2181	1.2213
-2.70	1.2004	1.2035	1.2065	1.2055	1.2126
-2.60	1.1923	1.1952	1.1981	1.2010	1.2040
-2.50	1.1843	1.1871	1.1898	1.1926	1.1954
-2.40	1.1763	1.1789	1.1814	1.1842	1.1869
-2.30	1.1684	1.1709	1.1734	1.1759	1.1784
-2.20	1.1605	1.1629	1.1653	1.1677	1.1701
-2.10	1.1527	1.1549	1.1572	1.1595	1.1617
-2.00	1.1449	1.1470	1.1492	1.1513	1.1535
-1.90	1.1372	1.1392	1.1412	1.1432	1.1453
-1.80	1.1295	1.1314	1.1333	1.1352	1.1371
-1.70	1.1219	1.1237	1.1255	1.1272	1.1290
-1.60	1.1143	1.1160	1.1177	1.1193	1.1210
-1.50	1.1068	1.1084	1.1099	1.1115	1.1130
-1.40	1.0994	1.1008	1.1022	1.1037	1.1051
-1.30	1.0919	1.0933	1.0946	1.0959	1.0972
-1.20	1.0846	1.0858	1.0870	1.0882	1.0894
-1.10	1.0773	1.0784	1.0795	1.0806	1.0817
-1.00	1.0700	1.0710	1.0720	1.0730	1.0740
-0.90	1.0628	1.0637	1.0646	1.0655	1.0664
-0.80	1.0556	1.0564	1.0572	1.0580	1.0588
-0.70	1.0485	1.0492	1.0499	1.0506	1.0512
-0.60	1.0414	1.0420	1.0426	1.0432	1.0438
-0.50	1.0344	1.0349	1.0354	1.0359	1.0363
-0.40	1.0274	1.0279	1.0282	1.0286	1.0290
-0.30	1.0205	1.0208	1.0211	1.0214	1.0216
-0.20	1.0136	1.0138	1.0140	1.0142	1.0144
-0.10	1.0068	1.0069	1.0070	1.0071	1.0072
-0.00	1.0000	1.0000	1.0000	1.0000	1.0000
1.00	0.9346	0.9337	0.9328	0.9320	0.9311
1.10	0.9283	0.9273	0.9264	0.9254	0.9245
1.20	0.9220	0.9210	0.9200	0.9189	0.9179
1.30	0.9158	0.9147	0.9136	0.9125	0.9114
1.40	0.9096	0.9084	0.9073	0.9061	0.9049
1.50	0.9035	0.9022	0.9010	0.8997	0.8985
1.60	0.8974	0.8961	0.8947	0.8934	0.8921
1.70	0.8913	0.8899	0.8885	0.8871	0.8857
1.80	0.8853	0.8839	0.8824	0.8809	0.8794
1.90	0.8791	0.8778	0.8763	0.8747	0.8732
2.00	0.8731	0.8718	0.8702	0.8686	0.8669
2.10	0.8671	0.8657	0.8642	0.8625	0.8608
2.20	0.8611	0.8599	0.8582	0.8564	0.8547
2.30	0.8551	0.8541	0.8522	0.8504	0.8486
2.40	0.8491	0.8482	0.8463	0.8444	0.8425
2.50	0.8434	0.8424	0.8405	0.8385	0.8365
2.60	0.8387	0.8367	0.8346	0.8326	0.8306
2.70	0.8330	0.8309	0.8288	0.8268	0.8247
2.80	0.8274	0.8253	0.8231	0.8210	0.8188

TABLE A-1. DISCOUNT FACTOR P SUB R

***** INTEREST RATE IVS*****

R	0.070	0.071	0.072	0.073	0.074
2.90	0.8218	0.8196	0.8174	0.8152	0.8130
3.00	0.8163	0.8140	0.8117	0.8095	0.8072
3.10	0.8108	0.8085	0.8061	0.8038	0.8015
3.20	0.8053	0.8029	0.8005	0.7981	0.7958
3.30	0.7999	0.7974	0.7950	0.7925	0.7901
3.40	0.7945	0.7920	0.7895	0.7870	0.7845
3.50	0.7891	0.7866	0.7841	0.7815	0.7789
3.60	0.7838	0.7812	0.7786	0.7760	0.7734
3.70	0.7785	0.7759	0.7732	0.7705	0.7679
3.80	0.7733	0.7706	0.7678	0.7651	0.7624
3.90	0.7681	0.7653	0.7625	0.7597	0.7570
4.00	0.7629	0.7601	0.7572	0.7544	0.7516
4.10	0.7578	0.7549	0.7520	0.7491	0.7462
4.20	0.7526	0.7497	0.7468	0.7438	0.7409
4.30	0.7476	0.7446	0.7416	0.7386	0.7357
4.40	0.7425	0.7395	0.7365	0.7334	0.7304
4.50	0.7375	0.7344	0.7313	0.7283	0.7252
4.60	0.7325	0.7294	0.7263	0.7232	0.7201
4.70	0.7276	0.7244	0.7213	0.7181	0.7150
4.80	0.7227	0.7195	0.7163	0.7131	0.7099
4.90	0.7178	0.7146	0.7113	0.7080	0.7048
5.00	0.7130	0.7097	0.7064	0.7031	0.6998
5.10	0.7082	0.7048	0.7015	0.6981	0.6948
5.20	0.7034	0.7000	0.6966	0.6932	0.6899
5.30	0.6987	0.6952	0.6918	0.6884	0.6850
5.40	0.6940	0.6905	0.6870	0.6835	0.6801
5.50	0.6893	0.6857	0.6822	0.6787	0.6753
5.60	0.6846	0.6811	0.6775	0.6740	0.6705
5.70	0.6800	0.6764	0.6728	0.6692	0.6657
5.80	0.6754	0.6718	0.6681	0.6645	0.6610
5.90	0.6709	0.6672	0.6635	0.6598	0.6563
6.00	0.6663	0.6626	0.6589	0.6552	0.6516
6.10	0.6619	0.6581	0.6544	0.6506	0.6470
6.20	0.6574	0.6536	0.6498	0.6461	0.6424
6.30	0.6530	0.6491	0.6453	0.6415	0.6378
6.40	0.6486	0.6447	0.6408	0.6370	0.6332
6.50	0.6442	0.6403	0.6364	0.6326	0.6287
6.60	0.6398	0.6359	0.6320	0.6281	0.6243
6.70	0.6355	0.6316	0.6276	0.6237	0.6198
6.80	0.6312	0.6272	0.6233	0.6193	0.6154
6.90	0.6270	0.6230	0.6190	0.6150	0.6110
7.00	0.6228	0.6187	0.6147	0.6107	0.6067
7.10	0.6186	0.6145	0.6104	0.6064	0.6024
7.20	0.6144	0.6103	0.6062	0.6021	0.5981
7.30	0.6102	0.6061	0.6020	0.5979	0.5938
7.40	0.6061	0.6020	0.5978	0.5937	0.5896
7.50	0.6020	0.5978	0.5937	0.5895	0.5854
7.60	0.5980	0.5938	0.5896	0.5854	0.5813
7.70	0.5939	0.5897	0.5855	0.5813	0.5771
7.80	0.5899	0.5857	0.5814	0.5772	0.5730

TABLE A-1. DISCOUNT FACTOR P SUB A

*****INTEREST RATE IVS*****

IR	0.075	0.076	0.077	0.078	0.079
-3.00	1.2423	1.2458	1.2492	1.2527	1.2562
-2.90	1.2333	1.2367	1.2400	1.2434	1.2467
-2.80	1.2245	1.2276	1.2308	1.2340	1.2373
-2.70	1.2156	1.2187	1.2217	1.2246	1.2275
-2.60	1.2069	1.2098	1.2127	1.2156	1.2186
-2.50	1.1982	1.2010	1.2038	1.2066	1.2094
-2.40	1.1895	1.1922	1.1949	1.1975	1.2002
-2.30	1.1810	1.1835	1.1860	1.1886	1.1911
-2.20	1.1725	1.1749	1.1773	1.1797	1.1821
-2.10	1.1640	1.1663	1.1686	1.1708	1.1731
-2.00	1.1556	1.1578	1.1599	1.1621	1.1642
-1.90	1.1473	1.1493	1.1514	1.1534	1.1554
-1.80	1.1390	1.1409	1.1428	1.1448	1.1467
-1.70	1.1308	1.1326	1.1344	1.1362	1.1380
-1.60	1.1227	1.1243	1.1260	1.1277	1.1294
-1.50	1.1146	1.1161	1.1177	1.1193	1.1208
-1.40	1.1066	1.1080	1.1094	1.1109	1.1123
-1.30	1.0986	1.0999	1.1012	1.1026	1.1039
-1.20	1.0907	1.0919	1.0931	1.0943	1.0955
-1.10	1.0828	1.0839	1.0850	1.0861	1.0872
-1.00	1.0750	1.0760	1.0770	1.0780	1.0790
-0.90	1.0673	1.0681	1.0690	1.0699	1.0708
-0.80	1.0596	1.0604	1.0611	1.0619	1.0627
-0.70	1.0519	1.0526	1.0533	1.0540	1.0547
-0.60	1.0443	1.0449	1.0455	1.0461	1.0467
-0.50	1.0368	1.0373	1.0378	1.0383	1.0387
-0.40	1.0294	1.0297	1.0301	1.0305	1.0309
-0.30	1.0219	1.0222	1.0225	1.0228	1.0231
-0.20	1.0146	1.0148	1.0149	1.0151	1.0153
-0.10	1.0073	1.0074	1.0074	1.0075	1.0076
-0.00	1.0000	1.0000	1.0000	1.0000	1.0000
1.00	0.9302	0.9294	0.9285	0.9276	0.9268
1.10	0.9235	0.9226	0.9216	0.9207	0.9198
1.20	0.9169	0.9159	0.9148	0.9138	0.9128
1.30	0.9103	0.9092	0.9081	0.9070	0.9059
1.40	0.9037	0.9025	0.9014	0.9002	0.8990
1.50	0.8972	0.8959	0.8947	0.8935	0.8922
1.60	0.8907	0.8894	0.8881	0.8868	0.8855
1.70	0.8843	0.8829	0.8815	0.8801	0.8787
1.80	0.8779	0.8765	0.8750	0.8735	0.8721
1.90	0.8716	0.8701	0.8685	0.8670	0.8655
2.00	0.8653	0.8637	0.8621	0.8605	0.8589
2.10	0.8591	0.8574	0.8558	0.8541	0.8524
2.20	0.8529	0.8512	0.8494	0.8477	0.8460
2.30	0.8468	0.8450	0.8431	0.8414	0.8396
2.40	0.8407	0.8388	0.8369	0.8351	0.8332
2.50	0.8346	0.8327	0.8307	0.8288	0.8269
2.60	0.8286	0.8266	0.8246	0.8226	0.8206
2.70	0.8226	0.8206	0.8185	0.8165	0.8144
2.80	0.8167	0.8146	0.8125	0.8103	0.8082

TABLE A-1. DISCOUNT FACTOR P SUB A

***** INTEREST RATE IVS*****						
TR	0.075	0.076	0.077	0.078	0.079	
2.90	0.8108	0.8060	0.8004	0.7943	0.7821	
3.00	0.8050	0.8027	0.8005	0.7983	0.7960	
3.10	0.7992	0.7969	0.7946	0.7923	0.7900	
3.20	0.7934	0.7910	0.7887	0.7864	0.7840	
3.30	0.7877	0.7853	0.7825	0.7805	0.7781	
3.40	0.7820	0.7795	0.7771	0.7746	0.7722	
3.50	0.7764	0.7735	0.7713	0.7688	0.7663	
3.60	0.7708	0.7682	0.7656	0.7631	0.7605	
3.70	0.7652	0.7626	0.7600	0.7574	0.7548	
3.80	0.7597	0.7570	0.7544	0.7517	0.7491	
3.90	0.7542	0.7515	0.7486	0.7461	0.7434	
4.00	0.7488	0.7460	0.7433	0.7405	0.7378	
4.10	0.7434	0.7406	0.7378	0.7350	0.7322	
4.20	0.7380	0.7352	0.7323	0.7295	0.7266	
4.30	0.7327	0.7298	0.7269	0.7240	0.7211	
4.40	0.7275	0.7245	0.7215	0.7186	0.7157	
4.50	0.7222	0.7192	0.7162	0.7132	0.7102	
4.60	0.7170	0.7139	0.7109	0.7079	0.7049	
4.70	0.7118	0.7087	0.7056	0.7026	0.6995	
4.80	0.7067	0.7036	0.7004	0.6973	0.6942	
4.90	0.7016	0.6984	0.6953	0.6921	0.6890	
5.00	0.6966	0.6933	0.6901	0.6869	0.6837	
5.10	0.6915	0.6883	0.6850	0.6818	0.6786	
5.20	0.6866	0.6832	0.6800	0.6767	0.6734	
5.30	0.6816	0.6783	0.6745	0.6716	0.6683	
5.40	0.6767	0.6733	0.6695	0.6666	0.6633	
5.50	0.6718	0.6684	0.6650	0.6616	0.6582	
5.60	0.6670	0.6635	0.6601	0.6567	0.6533	
5.70	0.6622	0.6587	0.6552	0.6517	0.6483	
5.80	0.6574	0.6539	0.6504	0.6469	0.6434	
5.90	0.6527	0.6491	0.6455	0.6420	0.6385	
6.00	0.6480	0.6444	0.6408	0.6372	0.6337	
6.10	0.6433	0.6397	0.6360	0.6325	0.6289	
6.20	0.6387	0.6350	0.6313	0.6277	0.6241	
6.30	0.6341	0.6304	0.6267	0.6230	0.6194	
6.40	0.6295	0.6258	0.6220	0.6184	0.6147	
6.50	0.6250	0.6212	0.6174	0.6137	0.6100	
6.60	0.6204	0.6167	0.6129	0.6091	0.6054	
6.70	0.6160	0.6122	0.6084	0.6046	0.6008	
6.80	0.6115	0.6077	0.6039	0.6001	0.5963	
6.90	0.6071	0.6033	0.5994	0.5956	0.5918	
7.00	0.6028	0.5988	0.5950	0.5911	0.5873	
7.10	0.5984	0.5945	0.5906	0.5867	0.5828	
7.20	0.5941	0.5901	0.5862	0.5823	0.5784	
7.30	0.5898	0.5858	0.5819	0.5779	0.5740	
7.40	0.5856	0.5816	0.5776	0.5736	0.5697	
7.50	0.5814	0.5773	0.5733	0.5693	0.5654	
7.60	0.5772	0.5731	0.5691	0.5651	0.5611	
7.70	0.5730	0.5689	0.5649	0.5608	0.5568	
7.80	0.5689	0.5648	0.5607	0.5566	0.5526	

TABLE A-1. DISCOUNT FACTOR P SUB R

***** INTEREST RATE IVS*****

TR	0.000	0.001	0.002	0.003	0.004
-3.00	1.2597	1.2632	1.2667	1.2702	1.2736
-2.90	1.2501	1.2534	1.2568	1.2601	1.2635
-2.80	1.2405	1.2437	1.2469	1.2501	1.2534
-2.70	1.2310	1.2340	1.2371	1.2402	1.2433
-2.60	1.2215	1.2245	1.2274	1.2304	1.2333
-2.50	1.2122	1.2150	1.2178	1.2206	1.2234
-2.40	1.2029	1.2055	1.2082	1.2109	1.2136
-2.30	1.1936	1.1962	1.1987	1.2013	1.2038
-2.20	1.1845	1.1869	1.1893	1.1917	1.1942
-2.10	1.1754	1.1777	1.1800	1.1823	1.1846
-2.00	1.1664	1.1686	1.1707	1.1729	1.1751
-1.90	1.1575	1.1595	1.1615	1.1636	1.1656
-1.80	1.1486	1.1505	1.1524	1.1543	1.1563
-1.70	1.1398	1.1416	1.1434	1.1452	1.1470
-1.60	1.1310	1.1327	1.1344	1.1361	1.1377
-1.50	1.1224	1.1239	1.1255	1.1270	1.1286
-1.40	1.1138	1.1152	1.1167	1.1181	1.1195
-1.30	1.1052	1.1066	1.1079	1.1092	1.1105
-1.20	1.0968	1.0980	1.0992	1.1004	1.1016
-1.10	1.0883	1.0895	1.0906	1.0917	1.0928
-1.00	1.0800	1.0810	1.0820	1.0830	1.0840
-0.90	1.0717	1.0726	1.0735	1.0744	1.0753
-0.80	1.0635	1.0643	1.0651	1.0659	1.0667
-0.70	1.0553	1.0560	1.0567	1.0574	1.0581
-0.60	1.0473	1.0478	1.0484	1.0490	1.0496
-0.50	1.0392	1.0397	1.0402	1.0407	1.0412
-0.40	1.0313	1.0316	1.0320	1.0324	1.0328
-0.30	1.0234	1.0236	1.0239	1.0242	1.0245
-0.20	1.0155	1.0157	1.0159	1.0161	1.0163
-0.10	1.0077	1.0078	1.0079	1.0080	1.0081
0.00	1.0000	1.0000	1.0000	1.0000	1.0000
1.00	0.9259	0.9251	0.9242	0.9234	0.9225
1.10	0.9188	0.9179	0.9170	0.9160	0.9151
1.20	0.9118	0.9108	0.9098	0.9088	0.9077
1.30	0.9048	0.9037	0.9026	0.9015	0.9005
1.40	0.8979	0.8967	0.8955	0.8944	0.8932
1.50	0.8910	0.8897	0.8885	0.8873	0.8860
1.60	0.8841	0.8828	0.8815	0.8802	0.8789
1.70	0.8774	0.8760	0.8746	0.8732	0.8719
1.80	0.8706	0.8692	0.8677	0.8663	0.8649
1.90	0.8640	0.8624	0.8609	0.8594	0.8579
2.00	0.8573	0.8558	0.8542	0.8526	0.8510
2.10	0.8508	0.8491	0.8475	0.8458	0.8442
2.20	0.8442	0.8425	0.8408	0.8391	0.8374
2.30	0.8378	0.8360	0.8342	0.8324	0.8307
2.40	0.8313	0.8295	0.8277	0.8258	0.8240
2.50	0.8250	0.8231	0.8212	0.8193	0.8174
2.60	0.8187	0.8167	0.8147	0.8128	0.8108
2.70	0.8124	0.8103	0.8083	0.8063	0.8043
2.80	0.8061	0.8041	0.8020	0.7999	0.7978

TABLE A-1. DISCOUNT FACTOR P SUB R

*****INTEREST RATE IVS*****

TR	0.080	0.081	0.082	0.083	0.084
2.90	0.8000	0.7978	0.7957	0.7936	0.7914
3.00	0.7938	0.7916	0.7894	0.7873	0.7851
3.10	0.7877	0.7855	0.7832	0.7810	0.7788
3.20	0.7817	0.7794	0.7771	0.7748	0.7725
3.30	0.7757	0.7734	0.7710	0.7686	0.7663
3.40	0.7698	0.7674	0.7649	0.7625	0.7602
3.50	0.7639	0.7614	0.7589	0.7565	0.7540
3.60	0.7580	0.7555	0.7530	0.7505	0.7480
3.70	0.7522	0.7496	0.7471	0.7445	0.7420
3.80	0.7464	0.7438	0.7412	0.7386	0.7360
3.90	0.7407	0.7380	0.7354	0.7327	0.7301
4.00	0.7350	0.7323	0.7296	0.7269	0.7242
4.10	0.7294	0.7266	0.7239	0.7211	0.7184
4.20	0.7238	0.7210	0.7182	0.7154	0.7127
4.30	0.7183	0.7154	0.7126	0.7097	0.7069
4.40	0.7127	0.7099	0.7070	0.7041	0.7012
4.50	0.7073	0.7043	0.7014	0.6985	0.6956
4.60	0.7019	0.6989	0.6959	0.6930	0.6900
4.70	0.6965	0.6935	0.6905	0.6875	0.6845
4.80	0.6911	0.6881	0.6850	0.6820	0.6790
4.90	0.6858	0.6827	0.6797	0.6766	0.6735
5.00	0.6806	0.6774	0.6743	0.6712	0.6681
5.10	0.6754	0.6722	0.6690	0.6659	0.6628
5.20	0.6702	0.6670	0.6638	0.6606	0.6574
5.30	0.6651	0.6618	0.6586	0.6553	0.6521
5.40	0.6600	0.6567	0.6534	0.6501	0.6469
5.50	0.6549	0.6516	0.6483	0.6450	0.6417
5.60	0.6499	0.6465	0.6432	0.6399	0.6366
5.70	0.6449	0.6415	0.6381	0.6348	0.6314
5.80	0.6399	0.6365	0.6331	0.6297	0.6264
5.90	0.6350	0.6316	0.6281	0.6247	0.6213
6.00	0.6302	0.6267	0.6232	0.6198	0.6163
6.10	0.6253	0.6218	0.6183	0.6149	0.6114
6.20	0.6205	0.6170	0.6135	0.6100	0.6065
6.30	0.6158	0.6122	0.6087	0.6051	0.6016
6.40	0.6111	0.6075	0.6039	0.6003	0.5968
6.50	0.6064	0.6027	0.5991	0.5955	0.5920
6.60	0.6017	0.5981	0.5944	0.5908	0.5872
6.70	0.5971	0.5934	0.5898	0.5861	0.5825
6.80	0.5925	0.5888	0.5851	0.5815	0.5778
6.90	0.5880	0.5843	0.5805	0.5769	0.5732
7.00	0.5835	0.5797	0.5760	0.5723	0.5686
7.10	0.5790	0.5752	0.5715	0.5677	0.5640
7.20	0.5746	0.5708	0.5670	0.5632	0.5595
7.30	0.5702	0.5663	0.5625	0.5587	0.5550
7.40	0.5658	0.5619	0.5581	0.5543	0.5505
7.50	0.5615	0.5576	0.5537	0.5499	0.5461
7.60	0.5572	0.5533	0.5494	0.5455	0.5417
7.70	0.5529	0.5490	0.5451	0.5412	0.5374
7.80	0.5487	0.5447	0.5408	0.5369	0.5331

TABLE A-1. DISCOUNT FACTOR P SUB R

*****INTEREST RATE IVS*****

TR	0.085	0.086	0.087	0.088	0.089
-3.00	1.2773	1.2808	1.2844	1.2875	1.2915
-2.90	1.2669	1.2703	1.2737	1.2771	1.2805
-2.80	1.2566	1.2599	1.2631	1.2664	1.2696
-2.70	1.2464	1.2495	1.2526	1.2557	1.2588
-2.60	1.2363	1.2392	1.2422	1.2452	1.2482
-2.50	1.2262	1.2291	1.2319	1.2347	1.2376
-2.40	1.2163	1.2190	1.2217	1.2244	1.2271
-2.30	1.2064	1.2089	1.2115	1.2141	1.2166
-2.20	1.1966	1.1990	1.2014	1.2039	1.2063
-2.10	1.1869	1.1892	1.1915	1.1938	1.1961
-2.00	1.1772	1.1794	1.1816	1.1837	1.1859
-1.90	1.1677	1.1697	1.1718	1.1738	1.1759
-1.80	1.1582	1.1601	1.1620	1.1639	1.1658
-1.70	1.1488	1.1506	1.1524	1.1542	1.1560
-1.60	1.1394	1.1411	1.1428	1.1445	1.1462
-1.50	1.1302	1.1317	1.1333	1.1349	1.1364
-1.40	1.1210	1.1224	1.1239	1.1253	1.1268
-1.30	1.1119	1.1132	1.1145	1.1159	1.1172
-1.20	1.1028	1.1041	1.1053	1.1065	1.1077
-1.10	1.0939	1.0950	1.0961	1.0972	1.0983
-1.00	1.0850	1.0860	1.0870	1.0880	1.0890
-0.90	1.0762	1.0771	1.0780	1.0789	1.0798
-0.80	1.0674	1.0682	1.0690	1.0698	1.0706
-0.70	1.0588	1.0595	1.0601	1.0608	1.0615
-0.60	1.0502	1.0507	1.0513	1.0519	1.0525
-0.50	1.0416	1.0421	1.0426	1.0431	1.0436
-0.40	1.0332	1.0336	1.0339	1.0343	1.0347
-0.30	1.0248	1.0251	1.0253	1.0256	1.0259
-0.20	1.0164	1.0166	1.0168	1.0170	1.0172
-0.10	1.0082	1.0083	1.0084	1.0085	1.0086
-0.00	1.0000	1.0000	1.0000	1.0000	1.0000
1.00	0.9217	0.9208	0.9200	0.9191	0.9183
1.10	0.9142	0.9132	0.9123	0.9114	0.9105
1.20	0.9067	0.9057	0.9047	0.9037	0.9027
1.30	0.8994	0.8983	0.8972	0.8962	0.8951
1.40	0.8921	0.8909	0.8898	0.8886	0.8875
1.50	0.8848	0.8836	0.8824	0.8812	0.8800
1.60	0.8776	0.8763	0.8751	0.8738	0.8725
1.70	0.8705	0.8691	0.8678	0.8664	0.8651
1.80	0.8634	0.8620	0.8606	0.8591	0.8577
1.90	0.8564	0.8549	0.8534	0.8519	0.8504
2.00	0.8495	0.8479	0.8463	0.8448	0.8432
2.10	0.8426	0.8409	0.8393	0.8377	0.8361
2.20	0.8357	0.8340	0.8323	0.8306	0.8290
2.30	0.8289	0.8272	0.8254	0.8237	0.8219
2.40	0.8222	0.8204	0.8186	0.8168	0.8150
2.50	0.8155	0.8136	0.8118	0.8099	0.8080
2.60	0.8089	0.8069	0.8050	0.8031	0.8012
2.70	0.8023	0.8003	0.7983	0.7963	0.7944
2.80	0.7958	0.7937	0.7917	0.7897	0.7876

TABLE A-1. DISCOUNT FACTOR P Sue R

INTEREST RATE IVS					
TR	0.005	0.006	0.007	0.008	0.005
2.90	0.7893	0.7872	0.7851	0.7830	0.7805
3.00	0.7829	0.7807	0.7786	0.7765	0.7743
3.10	0.7765	0.7743	0.7721	0.7699	0.7677
3.20	0.7702	0.7680	0.7657	0.7635	0.7613
3.30	0.7640	0.7617	0.7594	0.7571	0.7548
3.40	0.7578	0.7554	0.7531	0.7508	0.7485
3.50	0.7516	0.7492	0.7468	0.7444	0.7420
3.60	0.7455	0.7430	0.7406	0.7381	0.7357
3.70	0.7395	0.7369	0.7344	0.7319	0.7295
3.80	0.7334	0.7309	0.7283	0.7258	0.7233
3.90	0.7275	0.7249	0.7223	0.7197	0.7171
4.00	0.7216	0.7189	0.7163	0.7137	0.7110
4.10	0.7157	0.7130	0.7103	0.7077	0.7050
4.20	0.7099	0.7072	0.7044	0.7017	0.6990
4.30	0.7041	0.7013	0.6986	0.6958	0.6931
4.40	0.6984	0.6956	0.6928	0.6900	0.6872
4.50	0.6927	0.6899	0.6871	0.6842	0.6814
4.60	0.6871	0.6842	0.6813	0.6784	0.6756
4.70	0.6815	0.6786	0.6757	0.6727	0.6698
4.80	0.6760	0.6730	0.6700	0.6671	0.6642
4.90	0.6705	0.6675	0.6645	0.6615	0.6585
5.00	0.6650	0.6620	0.6590	0.6559	0.6529
5.10	0.6596	0.6566	0.6535	0.6504	0.6474
5.20	0.6543	0.6512	0.6481	0.6450	0.6419
5.30	0.6490	0.6458	0.6427	0.6395	0.6364
5.40	0.6437	0.6405	0.6373	0.6342	0.6310
5.50	0.6385	0.6352	0.6320	0.6288	0.6257
5.60	0.6333	0.6300	0.6268	0.6236	0.6204
5.70	0.6281	0.6248	0.6216	0.6183	0.6151
5.80	0.6230	0.6197	0.6164	0.6131	0.6099
5.90	0.6180	0.6146	0.6113	0.6080	0.6047
6.00	0.6129	0.6096	0.6062	0.6029	0.5995
6.10	0.6080	0.6046	0.6012	0.5978	0.5945
6.20	0.6030	0.5996	0.5962	0.5928	0.5894
6.30	0.5981	0.5947	0.5912	0.5878	0.5844
6.40	0.5933	0.5898	0.5863	0.5828	0.5795
6.50	0.5885	0.5849	0.5814	0.5779	0.5745
6.60	0.5837	0.5801	0.5766	0.5731	0.5697
6.70	0.5789	0.5754	0.5718	0.5683	0.5648
6.80	0.5742	0.5706	0.5671	0.5635	0.5600
6.90	0.5696	0.5659	0.5624	0.5588	0.5553
7.00	0.5649	0.5613	0.5577	0.5541	0.5506
7.10	0.5603	0.5567	0.5531	0.5495	0.5459
7.20	0.5558	0.5521	0.5485	0.5448	0.5413
7.30	0.5513	0.5476	0.5439	0.5403	0.5367
7.40	0.5468	0.5431	0.5394	0.5357	0.5321
7.50	0.5424	0.5386	0.5349	0.5312	0.5276
7.60	0.5379	0.5342	0.5305	0.5268	0.5231
7.70	0.5336	0.5298	0.5261	0.5223	0.5187
7.80	0.5292	0.5254	0.5217	0.5180	0.5143

TABLE A-1. DISCOUNT FACTOR P SUB A

*****INTEREST RATE IVS*****

TR	0.090	0.091	0.092	0.093	0.094
-3.00	1.2950	1.2985	1.3022	1.3057	1.3093
-2.90	1.2839	1.2873	1.2908	1.2942	1.2976
-2.80	1.2729	1.2762	1.2794	1.2827	1.2860
-2.70	1.2620	1.2651	1.2682	1.2714	1.2745
-2.60	1.2511	1.2541	1.2571	1.2601	1.2631
-2.50	1.2404	1.2433	1.2461	1.2490	1.2518
-2.40	1.2298	1.2325	1.2352	1.2379	1.2406
-2.30	1.2192	1.2218	1.2244	1.2269	1.2295
-2.20	1.2088	1.2112	1.2136	1.2161	1.2185
-2.10	1.1984	1.2007	1.2030	1.2053	1.2076
-2.00	1.1881	1.1903	1.1925	1.1946	1.1968
-1.90	1.1779	1.1800	1.1820	1.1841	1.1861
-1.80	1.1678	1.1697	1.1717	1.1736	1.1755
-1.70	1.1578	1.1596	1.1614	1.1632	1.1650
-1.60	1.1478	1.1495	1.1512	1.1529	1.1546
-1.50	1.1380	1.1396	1.1411	1.1427	1.1443
-1.40	1.1282	1.1297	1.1311	1.1326	1.1340
-1.30	1.1185	1.1199	1.1212	1.1226	1.1239
-1.20	1.1089	1.1102	1.1114	1.1126	1.1138
-1.10	1.0994	1.1005	1.1017	1.1028	1.1039
-1.00	1.0900	1.0910	1.0920	1.0930	1.0940
-0.90	1.0806	1.0815	1.0824	1.0833	1.0842
-0.80	1.0714	1.0722	1.0729	1.0737	1.0745
-0.70	1.0622	1.0629	1.0635	1.0642	1.0649
-0.60	1.0531	1.0536	1.0542	1.0548	1.0554
-0.50	1.0440	1.0445	1.0450	1.0455	1.0459
-0.40	1.0351	1.0355	1.0358	1.0362	1.0366
-0.30	1.0262	1.0265	1.0268	1.0270	1.0273
-0.20	1.0174	1.0176	1.0178	1.0179	1.0181
-0.10	1.0087	1.0087	1.0088	1.0089	1.0090
-0.00	1.0000	1.0000	1.0000	1.0000	1.0000
1.00	0.9174	0.9166	0.9158	0.9149	0.9141
1.10	0.9096	0.9086	0.9077	0.9068	0.9059
1.20	0.9018	0.9008	0.8998	0.8988	0.8978
1.30	0.8940	0.8930	0.8919	0.8908	0.8898
1.40	0.8863	0.8852	0.8841	0.8829	0.8818
1.50	0.8787	0.8775	0.8763	0.8751	0.8739
1.60	0.8712	0.8699	0.8686	0.8674	0.8661
1.70	0.8637	0.8624	0.8610	0.8597	0.8584
1.80	0.8563	0.8549	0.8535	0.8521	0.8507
1.90	0.8490	0.8475	0.8460	0.8445	0.8431
2.00	0.8417	0.8401	0.8386	0.8371	0.8355
2.10	0.8345	0.8329	0.8313	0.8297	0.8281
2.20	0.8273	0.8256	0.8240	0.8223	0.8207
2.30	0.8202	0.8185	0.8167	0.8150	0.8133
2.40	0.8132	0.8114	0.8096	0.8078	0.8060
2.50	0.8062	0.8043	0.8025	0.8007	0.7988
2.60	0.7993	0.7974	0.7955	0.7936	0.7917
2.70	0.7924	0.7904	0.7885	0.7866	0.7846
2.80	0.7856	0.7836	0.7816	0.7796	0.7776

TABLE A-1. DISCOUNT FACTOR P SUB R

***** INTEREST RATE IVS*****

TR	0.090	0.091	0.092	0.093	0.094
2.90	0.7789	0.7768	0.7747	0.7727	0.7706
3.00	0.7722	0.7701	0.7680	0.7658	0.7637
3.10	0.7656	0.7634	0.7612	0.7591	0.7569
3.20	0.7590	0.7568	0.7546	0.7523	0.7501
3.30	0.7525	0.7502	0.7479	0.7457	0.7434
3.40	0.7460	0.7437	0.7414	0.7391	0.7368
3.50	0.7396	0.7372	0.7349	0.7325	0.7302
3.60	0.7333	0.7309	0.7285	0.7261	0.7237
3.70	0.7270	0.7245	0.7221	0.7196	0.7172
3.80	0.7207	0.7182	0.7157	0.7133	0.7108
3.90	0.7144	0.7120	0.7095	0.7070	0.7044
4.00	0.7084	0.7058	0.7032	0.7007	0.6981
4.10	0.7023	0.6997	0.6971	0.6945	0.6919
4.20	0.6963	0.6936	0.6910	0.6883	0.6857
4.30	0.6903	0.6876	0.6849	0.6822	0.6796
4.40	0.6844	0.6817	0.6789	0.6762	0.6735
4.50	0.6785	0.6759	0.6730	0.6702	0.6675
4.60	0.6727	0.6699	0.6671	0.6643	0.6615
4.70	0.6670	0.6641	0.6612	0.6584	0.6556
4.80	0.6612	0.6583	0.6554	0.6526	0.6497
4.90	0.6556	0.6526	0.6497	0.6468	0.6439
5.00	0.6499	0.6470	0.6440	0.6411	0.6381
5.10	0.6444	0.6414	0.6384	0.6354	0.6324
5.20	0.6388	0.6358	0.6328	0.6298	0.6268
5.30	0.6333	0.6303	0.6272	0.6242	0.6212
5.40	0.6279	0.6248	0.6217	0.6187	0.6156
5.50	0.6225	0.6194	0.6162	0.6132	0.6101
5.60	0.6172	0.6140	0.6109	0.6078	0.6047
5.70	0.6119	0.6087	0.6055	0.6024	0.5992
5.80	0.6066	0.6034	0.6002	0.5970	0.5939
5.90	0.6014	0.5982	0.5950	0.5918	0.5886
6.00	0.5963	0.5930	0.5897	0.5865	0.5833
6.10	0.5912	0.5879	0.5846	0.5813	0.5781
6.20	0.5861	0.5828	0.5795	0.5762	0.5729
6.30	0.5811	0.5777	0.5744	0.5711	0.5678
6.40	0.5761	0.5727	0.5693	0.5660	0.5627
6.50	0.5711	0.5677	0.5644	0.5610	0.5577
6.60	0.5662	0.5628	0.5594	0.5560	0.5527
6.70	0.5614	0.5579	0.5545	0.5511	0.5478
6.80	0.5565	0.5531	0.5497	0.5462	0.5429
6.90	0.5516	0.5483	0.5448	0.5414	0.5380
7.00	0.5470	0.5435	0.5401	0.5366	0.5332
7.10	0.5423	0.5388	0.5353	0.5319	0.5284
7.20	0.5377	0.5342	0.5306	0.5272	0.5237
7.30	0.5331	0.5295	0.5260	0.5225	0.5190
7.40	0.5285	0.5249	0.5214	0.5179	0.5144
7.50	0.5240	0.5204	0.5168	0.5133	0.5098
7.60	0.5195	0.5159	0.5123	0.5087	0.5052
7.70	0.5150	0.5114	0.5078	0.5042	0.5007
7.80	0.5106	0.5070	0.5033	0.4996	

TABLE A-1. DISCOUNT FACTOR P SUP R

*****INTEREST RATE IVS*****

TR	0.095	0.096	0.097	0.098	0.099
-3.00	1.3129	1.3165	1.3201	1.3238	1.3274
-2.90	1.3011	1.3045	1.3080	1.3114	1.3149
-2.80	1.2893	1.2926	1.2959	1.2992	1.3025
-2.70	1.2777	1.2808	1.2840	1.2871	1.2903
-2.60	1.2661	1.2691	1.2721	1.2752	1.2782
-2.50	1.2547	1.2576	1.2604	1.2632	1.2662
-2.40	1.2433	1.2461	1.2488	1.2515	1.2543
-2.30	1.2321	1.2347	1.2373	1.2399	1.2425
-2.20	1.2210	1.2234	1.2259	1.2284	1.2308
-2.10	1.2100	1.2123	1.2146	1.2169	1.2193
-2.00	1.1990	1.2012	1.2034	1.2056	1.2078
-1.90	1.1882	1.1903	1.1923	1.1944	1.1965
-1.80	1.1775	1.1794	1.1813	1.1833	1.1852
-1.70	1.1668	1.1686	1.1704	1.1723	1.1741
-1.60	1.1563	1.1580	1.1597	1.1614	1.1630
-1.50	1.1458	1.1474	1.1490	1.1505	1.1521
-1.40	1.1355	1.1369	1.1384	1.1398	1.1413
-1.30	1.1252	1.1266	1.1279	1.1292	1.1306
-1.20	1.1151	1.1163	1.1175	1.1187	1.1199
-1.10	1.1050	1.1061	1.1072	1.1083	1.1094
-1.00	1.0950	1.0960	1.0970	1.0980	1.0990
-0.90	1.0851	1.0860	1.0869	1.0878	1.0887
-0.80	1.0753	1.0761	1.0769	1.0777	1.0784
-0.70	1.0656	1.0663	1.0669	1.0676	1.0683
-0.60	1.0560	1.0565	1.0571	1.0577	1.0583
-0.50	1.0464	1.0469	1.0474	1.0479	1.0483
-0.40	1.0370	1.0373	1.0377	1.0381	1.0385
-0.30	1.0276	1.0279	1.0282	1.0284	1.0287
-0.20	1.0183	1.0185	1.0187	1.0189	1.0191
-0.10	1.0091	1.0092	1.0093	1.0094	1.0095
-0.00	1.0000	1.0000	1.0000	1.0000	1.0000
1.00	0.9132	0.9124	0.9116	0.9107	0.9099
1.10	0.9050	0.9041	0.9032	0.9023	0.9014
1.20	0.8968	0.8958	0.8949	0.8939	0.8929
1.30	0.8887	0.8877	0.8866	0.8856	0.8845
1.40	0.8807	0.8796	0.8784	0.8773	0.8762
1.50	0.8727	0.8715	0.8703	0.8692	0.8680
1.60	0.8648	0.8636	0.8623	0.8611	0.8598
1.70	0.8570	0.8557	0.8544	0.8531	0.8517
1.80	0.8493	0.8479	0.8465	0.8451	0.8437
1.90	0.8416	0.8402	0.8387	0.8373	0.8358
2.00	0.8340	0.8325	0.8310	0.8295	0.8280
2.10	0.8265	0.8249	0.8233	0.8217	0.8202
2.20	0.8190	0.8174	0.8157	0.8141	0.8125
2.30	0.8116	0.8099	0.8082	0.8065	0.8048
2.40	0.8043	0.8025	0.8008	0.7990	0.7973
2.50	0.7970	0.7952	0.7934	0.7916	0.7898
2.60	0.7898	0.7879	0.7861	0.7842	0.7824
2.70	0.7827	0.7808	0.7788	0.7769	0.7750
2.80	0.7756	0.7736	0.7717	0.7697	0.7677

TABLE A-1. DISCOUNT FACTOR P SUB R

*****INTEREST RATE IVS*****

TR	0.095	0.096	0.097	0.098	0.099
2.90	0.7686	0.7666	0.7645	0.7625	0.7605
3.00	0.7617	0.7596	0.7575	0.7554	0.7534
3.10	0.7548	0.7526	0.7505	0.7484	0.7463
3.20	0.7480	0.7458	0.7436	0.7414	0.7393
3.30	0.7412	0.7390	0.7367	0.7345	0.7323
3.40	0.7345	0.7322	0.7300	0.7277	0.7255
3.50	0.7279	0.7255	0.7232	0.7209	0.7186
3.60	0.7213	0.7189	0.7166	0.7142	0.7119
3.70	0.7148	0.7124	0.7100	0.7076	0.7052
3.80	0.7083	0.7059	0.7034	0.7010	0.6986
3.90	0.7019	0.6994	0.6969	0.6945	0.6920
4.00	0.6956	0.6930	0.6905	0.6880	0.6855
4.10	0.6893	0.6867	0.6842	0.6816	0.6791
4.20	0.6831	0.6805	0.6779	0.6753	0.6727
4.30	0.6769	0.6742	0.6716	0.6690	0.6664
4.40	0.6708	0.6681	0.6654	0.6628	0.6601
4.50	0.6647	0.6620	0.6593	0.6566	0.6539
4.60	0.6587	0.6560	0.6532	0.6505	0.6478
4.70	0.6528	0.6500	0.6472	0.6444	0.6417
4.80	0.6469	0.6440	0.6412	0.6384	0.6356
4.90	0.6410	0.6382	0.6353	0.6325	0.6297
5.00	0.6352	0.6323	0.6295	0.6266	0.6238
5.10	0.6295	0.6266	0.6237	0.6208	0.6179
5.20	0.6238	0.6209	0.6179	0.6150	0.6121
5.30	0.6182	0.6152	0.6122	0.6093	0.6063
5.40	0.6126	0.6096	0.6066	0.6036	0.6006
5.50	0.6071	0.6040	0.6010	0.5980	0.5950
5.60	0.6016	0.5985	0.5955	0.5924	0.5894
5.70	0.5961	0.5930	0.5900	0.5869	0.5839
5.80	0.5907	0.5876	0.5845	0.5814	0.5784
5.90	0.5854	0.5823	0.5791	0.5760	0.5730
6.00	0.5801	0.5770	0.5738	0.5707	0.5676
6.10	0.5749	0.5717	0.5685	0.5654	0.5622
6.20	0.5697	0.5665	0.5633	0.5601	0.5570
6.30	0.5645	0.5613	0.5581	0.5549	0.5517
6.40	0.5594	0.5562	0.5529	0.5497	0.5465
6.50	0.5544	0.5511	0.5478	0.5446	0.5414
6.60	0.5494	0.5461	0.5428	0.5395	0.5363
6.70	0.5444	0.5411	0.5378	0.5345	0.5313
6.80	0.5395	0.5362	0.5328	0.5295	0.5263
6.90	0.5346	0.5313	0.5279	0.5246	0.5213
7.00	0.5298	0.5264	0.5231	0.5197	0.5164
7.10	0.5250	0.5216	0.5182	0.5149	0.5116
7.20	0.5203	0.5169	0.5135	0.5101	0.5068
7.30	0.5156	0.5121	0.5087	0.5054	0.5020
7.40	0.5109	0.5075	0.5041	0.5007	0.4973
7.50	0.5063	0.5028	0.4994	0.4960	0.4926
7.60	0.5017	0.4982	0.4948	0.4914	0.4880
7.70	0.4972	0.4937	0.4902	0.4868	0.4834
7.80	0.4927	0.4892	0.4857	0.4823	0.4789

TABLE A-1. DISCOUNT FACTOR P SUB R

*****INTEREST RATE IVS*****

IR	0.100	0.101	0.102	0.103	0.104
-3.00	1.3310	1.3346	1.3383	1.3415	1.3456
-2.90	1.3184	1.3219	1.3253	1.3288	1.3323
-2.80	1.3059	1.3092	1.3125	1.3159	1.3192
-2.70	1.2935	1.2967	1.2998	1.3030	1.3062
-2.60	1.2812	1.2842	1.2873	1.2903	1.2934
-2.50	1.2691	1.2719	1.2748	1.2777	1.2806
-2.40	1.2570	1.2598	1.2625	1.2653	1.2680
-2.30	1.2451	1.2477	1.2503	1.2529	1.2555
-2.20	1.2333	1.2358	1.2382	1.2407	1.2432
-2.10	1.2216	1.2239	1.2263	1.2286	1.2309
-2.00	1.2100	1.2122	1.2144	1.2166	1.2188
-1.90	1.1985	1.2006	1.2027	1.2047	1.2068
-1.80	1.1872	1.1891	1.1910	1.1930	1.1949
-1.70	1.1759	1.1777	1.1795	1.1813	1.1832
-1.60	1.1647	1.1664	1.1681	1.1698	1.1715
-1.50	1.1537	1.1553	1.1568	1.1584	1.1600
-1.40	1.1427	1.1442	1.1457	1.1471	1.1486
-1.30	1.1319	1.1332	1.1346	1.1359	1.1373
-1.20	1.1212	1.1224	1.1236	1.1248	1.1261
-1.10	1.1105	1.1116	1.1128	1.1139	1.1150
-1.00	1.1000	1.1010	1.1020	1.1030	1.1040
-0.90	1.0896	1.0905	1.0913	1.0922	1.0931
-0.80	1.0792	1.0800	1.0808	1.0816	1.0824
-0.70	1.0690	1.0697	1.0704	1.0710	1.0717
-0.60	1.0589	1.0594	1.0600	1.0606	1.0612
-0.50	1.0488	1.0493	1.0498	1.0502	1.0507
-0.40	1.0389	1.0392	1.0396	1.0400	1.0404
-0.30	1.0290	1.0293	1.0296	1.0299	1.0301
-0.20	1.0192	1.0194	1.0196	1.0198	1.0200
-0.10	1.0096	1.0097	1.0098	1.0099	1.0099
-0.00	1.0000	1.0000	1.0000	1.0000	1.0000
1.00	0.9091	0.9093	0.9094	0.9096	0.9098
1.10	0.9005	0.8996	0.8997	0.8998	0.8999
1.20	0.8919	0.8910	0.8910	0.8911	0.8911
1.30	0.8835	0.8824	0.8824	0.8825	0.8825
1.40	0.8751	0.8740	0.8740	0.8741	0.8741
1.50	0.8668	0.8656	0.8656	0.8657	0.8657
1.60	0.8586	0.8573	0.8573	0.8574	0.8574
1.70	0.8504	0.8491	0.8491	0.8492	0.8492
1.80	0.8424	0.8410	0.8410	0.8411	0.8411
1.90	0.8344	0.8329	0.8329	0.8330	0.8330
2.00	0.8264	0.8249	0.8249	0.8250	0.8250
2.10	0.8186	0.8170	0.8170	0.8171	0.8171
2.20	0.8108	0.8092	0.8092	0.8093	0.8093
2.30	0.8032	0.8015	0.8015	0.8016	0.8016
2.40	0.7955	0.7938	0.7938	0.7939	0.7939
2.50	0.7880	0.7862	0.7862	0.7863	0.7863
2.60	0.7805	0.7787	0.7787	0.7788	0.7788
2.70	0.7731	0.7712	0.7712	0.7713	0.7713
2.80	0.7658	0.7638	0.7638	0.7639	0.7639

TABLE A-1. DISCOUNT FACTOR P SUB R

TR	*****INTEREST RATE IVS*****				
	0.100	0.101	0.102	0.103	0.104
2.90	0.7585	0.7565	0.7545	0.7525	0.7506
3.00	0.7513	0.7493	0.7472	0.7452	0.7432
3.10	0.7442	0.7421	0.7400	0.7375	0.7359
3.20	0.7371	0.7350	0.7325	0.7307	0.7286
3.30	0.7301	0.7280	0.7258	0.7236	0.7214
3.40	0.7232	0.7210	0.7186	0.7165	0.7143
3.50	0.7164	0.7141	0.7116	0.7096	0.7073
3.60	0.7096	0.7072	0.7045	0.7026	0.7003
3.70	0.7028	0.7005	0.6981	0.6958	0.6935
3.80	0.6962	0.6938	0.6914	0.6890	0.6866
3.90	0.6896	0.6871	0.6847	0.6823	0.6799
4.00	0.6830	0.6805	0.6781	0.6756	0.6732
4.10	0.6765	0.6740	0.6715	0.6690	0.6665
4.20	0.6701	0.6676	0.6650	0.6625	0.6600
4.30	0.6638	0.6612	0.6586	0.6560	0.6535
4.40	0.6575	0.6548	0.6522	0.6496	0.6471
4.50	0.6512	0.6486	0.6459	0.6433	0.6407
4.60	0.6451	0.6424	0.6397	0.6370	0.6344
4.70	0.6389	0.6362	0.6335	0.6308	0.6281
4.80	0.6329	0.6301	0.6274	0.6247	0.6219
4.90	0.6269	0.6241	0.6213	0.6186	0.6158
5.00	0.6209	0.6181	0.6153	0.6125	0.6098
5.10	0.6150	0.6122	0.6094	0.6065	0.6038
5.20	0.6092	0.6063	0.6035	0.6006	0.5978
5.30	0.6034	0.6005	0.5976	0.5946	0.5919
5.40	0.5977	0.5948	0.5919	0.5890	0.5861
5.50	0.5920	0.5891	0.5861	0.5832	0.5803
5.60	0.5864	0.5834	0.5805	0.5775	0.5746
5.70	0.5809	0.5778	0.5749	0.5719	0.5690
5.80	0.5753	0.5723	0.5693	0.5663	0.5634
5.90	0.5699	0.5668	0.5638	0.5608	0.5578
6.00	0.5645	0.5614	0.5584	0.5553	0.5523
6.10	0.5591	0.5560	0.5530	0.5499	0.5469
6.20	0.5538	0.5507	0.5476	0.5445	0.5415
6.30	0.5486	0.5454	0.5423	0.5392	0.5362
6.40	0.5434	0.5402	0.5371	0.5340	0.5309
6.50	0.5382	0.5350	0.5319	0.5288	0.5257
6.60	0.5331	0.5299	0.5268	0.5236	0.5205
6.70	0.5280	0.5248	0.5217	0.5185	0.5154
6.80	0.5230	0.5198	0.5166	0.5134	0.5103
6.90	0.5181	0.5148	0.5116	0.5084	0.5053
7.00	0.5132	0.5099	0.5067	0.5035	0.5003
7.10	0.5083	0.5050	0.5018	0.4986	0.4954
7.20	0.5035	0.5002	0.4969	0.4937	0.4905
7.30	0.4987	0.4954	0.4921	0.4889	0.4857
7.40	0.4940	0.4907	0.4874	0.4841	0.4809
7.50	0.4893	0.4860	0.4827	0.4794	0.4761
7.60	0.4846	0.4813	0.4780	0.4747	0.4715
7.70	0.4800	0.4767	0.4734	0.4701	0.4668
7.80	0.4755	0.4721	0.4688	0.4655	0.4622

TABLE A-2. ELECTRICITY DISCOUNT FACTOR PH-I SUB N

*****INTEREST RATE IVS*****					
TEXP	0.060	0.061	0.062	0.063	0.064
1.00	0.9714	0.9710	0.9705	0.9701	0.9696
1.10	0.9686	0.9681	0.9676	0.9671	0.9666
1.20	0.9658	0.9653	0.9648	0.9643	0.9637
1.30	0.9631	0.9625	0.9619	0.9613	0.9607
1.40	0.9603	0.9597	0.9591	0.9584	0.9578
1.50	0.9575	0.9569	0.9562	0.9555	0.9548
1.60	0.9548	0.9541	0.9534	0.9527	0.9520
1.70	0.9521	0.9513	0.9506	0.9498	0.9491
1.80	0.9493	0.9486	0.9478	0.9470	0.9462
1.90	0.9466	0.9458	0.9450	0.9441	0.9433
2.00	0.9439	0.9431	0.9422	0.9413	0.9405
2.10	0.9412	0.9403	0.9394	0.9385	0.9376
2.20	0.9386	0.9376	0.9367	0.9357	0.9348
2.30	0.9359	0.9349	0.9339	0.9329	0.9319
2.40	0.9332	0.9322	0.9312	0.9301	0.9291
2.50	0.9306	0.9295	0.9284	0.9274	0.9263
2.60	0.9279	0.9269	0.9257	0.9246	0.9235
2.70	0.9253	0.9242	0.9230	0.9219	0.9207
2.80	0.9227	0.9215	0.9203	0.9191	0.9180
2.90	0.9201	0.9189	0.9176	0.9164	0.9152
3.00	0.9175	0.9162	0.9150	0.9137	0.9125
3.10	0.9149	0.9136	0.9123	0.9110	0.9097
3.20	0.9123	0.9110	0.9096	0.9083	0.9070
3.30	0.9097	0.9084	0.9070	0.9056	0.9043
3.40	0.9072	0.9058	0.9044	0.9030	0.9016
3.50	0.9046	0.9032	0.9017	0.9003	0.8989
3.60	0.9021	0.9006	0.8991	0.8977	0.8962
3.70	0.8996	0.8980	0.8965	0.8950	0.8935
3.80	0.8970	0.8955	0.8939	0.8924	0.8909
3.90	0.8945	0.8929	0.8914	0.8898	0.8882
4.00	0.8920	0.8904	0.8886	0.8872	0.8856
4.10	0.8895	0.8879	0.8862	0.8846	0.8830
4.20	0.8870	0.8854	0.8837	0.8820	0.8803
4.30	0.8846	0.8828	0.8811	0.8794	0.8777
4.40	0.8821	0.8803	0.8786	0.8769	0.8751
4.50	0.8796	0.8779	0.8761	0.8743	0.8726
4.60	0.8772	0.8754	0.8736	0.8718	0.8700
4.70	0.8748	0.8729	0.8711	0.8692	0.8674
4.80	0.8723	0.8705	0.8686	0.8667	0.8648
4.90	0.8699	0.8680	0.8661	0.8642	0.8623
5.00	0.8675	0.8656	0.8636	0.8617	0.8598
5.10	0.8651	0.8631	0.8612	0.8592	0.8573
5.20	0.8627	0.8607	0.8587	0.8567	0.8547
5.30	0.8603	0.8583	0.8563	0.8542	0.8522
5.40	0.8580	0.8559	0.8538	0.8518	0.8497
5.50	0.8556	0.8535	0.8514	0.8493	0.8473
5.60	0.8532	0.8511	0.8490	0.8469	0.8448
5.70	0.8509	0.8487	0.8466	0.8444	0.8423
5.80	0.8486	0.8464	0.8442	0.8420	0.8399
5.90	0.8462	0.8440	0.8418	0.8396	0.8374
6.00	0.8439	0.8417	0.8394	0.8372	0.8350

TABLE A-2. ELECTRICITY DISCOUNT FACTOR PH1 SUB N

***** INTEREST RATE IVS*****					
TEXP	0.065	0.066	0.067	0.068	0.069
1.00	0.9652	0.9667	0.9683	0.9698	0.9714
1.10	0.9661	0.9677	0.9692	0.9707	0.9722
1.20	0.9631	0.9645	0.9661	0.9675	0.9690
1.30	0.9602	0.9596	0.9590	0.9584	0.9575
1.40	0.9572	0.9566	0.9555	0.9553	0.9547
1.50	0.9542	0.9536	0.9525	0.9522	0.9516
1.60	0.9513	0.9506	0.9495	0.9492	0.9485
1.70	0.9483	0.9476	0.9466	0.9461	0.9454
1.80	0.9454	0.9446	0.9436	0.9431	0.9423
1.90	0.9425	0.9417	0.9406	0.9400	0.9392
2.00	0.9396	0.9387	0.9375	0.9370	0.9361
2.10	0.9367	0.9358	0.9345	0.9340	0.9331
2.20	0.9338	0.9329	0.9315	0.9310	0.9301
2.30	0.9310	0.9300	0.9286	0.9280	0.9270
2.40	0.9281	0.9271	0.9256	0.9251	0.9240
2.50	0.9253	0.9242	0.9231	0.9221	0.9210
2.60	0.9224	0.9213	0.9202	0.9192	0.9181
2.70	0.9196	0.9185	0.9173	0.9162	0.9151
2.80	0.9168	0.9156	0.9145	0.9133	0.9121
2.90	0.9140	0.9128	0.9116	0.9104	0.9092
3.00	0.9112	0.9100	0.9087	0.9075	0.9063
3.10	0.9084	0.9072	0.9055	0.9046	0.9034
3.20	0.9057	0.9044	0.9031	0.9018	0.9005
3.30	0.9029	0.9016	0.9002	0.8985	0.8970
3.40	0.9002	0.8988	0.8974	0.8961	0.8947
3.50	0.8975	0.8960	0.8946	0.8932	0.8918
3.60	0.8947	0.8933	0.8918	0.8904	0.8890
3.70	0.8920	0.8906	0.8891	0.8876	0.8861
3.80	0.8893	0.8878	0.8863	0.8848	0.8833
3.90	0.8867	0.8851	0.8836	0.8820	0.8805
4.00	0.8840	0.8824	0.8806	0.8792	0.8777
4.10	0.8813	0.8797	0.8781	0.8765	0.8749
4.20	0.8787	0.8770	0.8754	0.8737	0.8721
4.30	0.8760	0.8744	0.8727	0.8710	0.8693
4.40	0.8734	0.8717	0.8700	0.8683	0.8666
4.50	0.8708	0.8690	0.8673	0.8656	0.8638
4.60	0.8682	0.8664	0.8646	0.8628	0.8611
4.70	0.8656	0.8638	0.8620	0.8602	0.8584
4.80	0.8630	0.8612	0.8593	0.8575	0.8557
4.90	0.8604	0.8586	0.8567	0.8548	0.8530
5.00	0.8579	0.8560	0.8541	0.8522	0.8503
5.10	0.8553	0.8534	0.8514	0.8495	0.8476
5.20	0.8528	0.8508	0.8488	0.8468	0.8450
5.30	0.8502	0.8482	0.8463	0.8443	0.8423
5.40	0.8477	0.8457	0.8437	0.8417	0.8397
5.50	0.8452	0.8431	0.8411	0.8391	0.8370
5.60	0.8427	0.8406	0.8385	0.8365	0.8344
5.70	0.8402	0.8381	0.8360	0.8339	0.8318
5.80	0.8377	0.8356	0.8335	0.8313	0.8292
5.90	0.8352	0.8331	0.8309	0.8288	0.8266
6.00	0.8328	0.8306	0.8284	0.8262	0.8241

TABLE A-2. ELECTRICITY DISCOUNT FACTOR PHI SUB N

*****INTEREST RATE IVS*****

TEXP	0.070	0.071	0.072	0.073	0.074
1.00	0.9669	0.9665	0.9660	0.9656	0.9651
1.10	0.9637	0.9632	0.9627	0.9622	0.9617
1.20	0.9605	0.9600	0.9594	0.9589	0.9584
1.30	0.9573	0.9567	0.9561	0.9556	0.9550
1.40	0.9541	0.9535	0.9529	0.9523	0.9517
1.50	0.9509	0.9503	0.9497	0.9491	0.9485
1.60	0.9478	0.9471	0.9464	0.9457	0.9450
1.70	0.9446	0.9439	0.9432	0.9424	0.9417
1.80	0.9415	0.9407	0.9400	0.9392	0.9384
1.90	0.9384	0.9376	0.9368	0.9360	0.9351
2.00	0.9353	0.9344	0.9336	0.9327	0.9319
2.10	0.9322	0.9313	0.9304	0.9295	0.9287
2.20	0.9291	0.9282	0.9273	0.9263	0.9254
2.30	0.9261	0.9251	0.9241	0.9231	0.9222
2.40	0.9230	0.9220	0.9210	0.9200	0.9190
2.50	0.9200	0.9190	0.9179	0.9169	0.9158
2.60	0.9170	0.9159	0.9148	0.9138	0.9127
2.70	0.9140	0.9129	0.9117	0.9106	0.9095
2.80	0.9110	0.9098	0.9087	0.9075	0.9064
2.90	0.9080	0.9068	0.9056	0.9045	0.9033
3.00	0.9050	0.9038	0.9026	0.9014	0.9002
3.10	0.9021	0.9008	0.8996	0.8983	0.8971
3.20	0.8992	0.8979	0.8966	0.8953	0.8940
3.30	0.8962	0.8949	0.8936	0.8923	0.8910
3.40	0.8933	0.8920	0.8906	0.8893	0.8879
3.50	0.8914	0.8899	0.8886	0.8872	0.8859
3.60	0.8875	0.8861	0.8847	0.8833	0.8819
3.70	0.8847	0.8832	0.8817	0.8803	0.8788
3.80	0.8818	0.8803	0.8788	0.8773	0.8758
3.90	0.8789	0.8774	0.8759	0.8744	0.8729
4.00	0.8761	0.8745	0.8730	0.8714	0.8699
4.10	0.8733	0.8717	0.8701	0.8685	0.8669
4.20	0.8705	0.8688	0.8672	0.8656	0.8640
4.30	0.8677	0.8660	0.8644	0.8627	0.8611
4.40	0.8649	0.8632	0.8615	0.8598	0.8582
4.50	0.8621	0.8604	0.8587	0.8570	0.8553
4.60	0.8593	0.8576	0.8559	0.8541	0.8524
4.70	0.8566	0.8548	0.8530	0.8513	0.8495
4.80	0.8539	0.8521	0.8502	0.8485	0.8467
4.90	0.8511	0.8493	0.8475	0.8456	0.8438
5.00	0.8484	0.8466	0.8447	0.8428	0.8410
5.10	0.8457	0.8438	0.8419	0.8400	0.8382
5.20	0.8430	0.8411	0.8392	0.8373	0.8354
5.30	0.8403	0.8384	0.8364	0.8345	0.8326
5.40	0.8377	0.8357	0.8337	0.8318	0.8298
5.50	0.8350	0.8330	0.8310	0.8290	0.8270
5.60	0.8324	0.8303	0.8283	0.8263	0.8243
5.70	0.8297	0.8277	0.8256	0.8236	0.8215
5.80	0.8271	0.8250	0.8230	0.8209	0.8188
5.90	0.8245	0.8224	0.8203	0.8182	0.8161
6.00	0.8219	0.8198	0.8176	0.8155	0.8134

TABLE A-2. ELECTRICITY DISCOUNT FACTOR PHI SUB N

*****INTEREST RATE IVS*****

TEXP	0.075	0.076	0.077	0.078	0.079
1.00	0.9647	0.9643	0.9638	0.9634	0.9629
1.10	0.9613	0.9608	0.9603	0.9598	0.9593
1.20	0.9578	0.9573	0.9568	0.9563	0.9557
1.30	0.9544	0.9539	0.9532	0.9527	0.9522
1.40	0.9510	0.9504	0.9498	0.9492	0.9486
1.50	0.9477	0.9470	0.9464	0.9457	0.9451
1.60	0.9443	0.9436	0.9429	0.9423	0.9416
1.70	0.9410	0.9402	0.9395	0.9388	0.9381
1.80	0.9376	0.9369	0.9361	0.9353	0.9346
1.90	0.9343	0.9335	0.9327	0.9319	0.9311
2.00	0.9310	0.9302	0.9294	0.9285	0.9277
2.10	0.9278	0.9269	0.9260	0.9251	0.9242
2.20	0.9245	0.9236	0.9227	0.9218	0.9208
2.30	0.9213	0.9203	0.9193	0.9184	0.9174
2.40	0.9180	0.9170	0.9160	0.9151	0.9141
2.50	0.9148	0.9138	0.9128	0.9117	0.9107
2.60	0.9116	0.9105	0.9095	0.9084	0.9074
2.70	0.9084	0.9073	0.9062	0.9051	0.9040
2.80	0.9053	0.9041	0.9030	0.9018	0.9007
2.90	0.9021	0.9009	0.8998	0.8986	0.8974
3.00	0.8990	0.8978	0.8965	0.8953	0.8941
3.10	0.8958	0.8946	0.8934	0.8921	0.8909
3.20	0.8927	0.8914	0.8902	0.8889	0.8876
3.30	0.8896	0.8883	0.8870	0.8857	0.8844
3.40	0.8865	0.8852	0.8839	0.8825	0.8812
3.50	0.8835	0.8821	0.8807	0.8794	0.8780
3.60	0.8804	0.8790	0.8776	0.8762	0.8748
3.70	0.8774	0.8759	0.8745	0.8731	0.8716
3.80	0.8744	0.8729	0.8714	0.8700	0.8685
3.90	0.8713	0.8698	0.8683	0.8669	0.8654
4.00	0.8684	0.8668	0.8653	0.8638	0.8622
4.10	0.8654	0.8638	0.8622	0.8607	0.8591
4.20	0.8624	0.8608	0.8592	0.8576	0.8561
4.30	0.8594	0.8578	0.8562	0.8546	0.8530
4.40	0.8565	0.8549	0.8532	0.8516	0.8499
4.50	0.8536	0.8519	0.8502	0.8485	0.8469
4.60	0.8507	0.8490	0.8472	0.8455	0.8438
4.70	0.8478	0.8460	0.8443	0.8426	0.8408
4.80	0.8449	0.8431	0.8413	0.8396	0.8378
4.90	0.8420	0.8402	0.8384	0.8366	0.8348
5.00	0.8392	0.8373	0.8355	0.8337	0.8319
5.10	0.8363	0.8345	0.8326	0.8308	0.8289
5.20	0.8335	0.8316	0.8297	0.8278	0.8260
5.30	0.8307	0.8287	0.8268	0.8249	0.8231
5.40	0.8279	0.8259	0.8240	0.8221	0.8201
5.50	0.8251	0.8231	0.8211	0.8192	0.8172
5.60	0.8223	0.8203	0.8183	0.8163	0.8144
5.70	0.8195	0.8175	0.8155	0.8135	0.8115
5.80	0.8168	0.8147	0.8127	0.8107	0.8086
5.90	0.8140	0.8119	0.8099	0.8078	0.8058
6.00	0.8113	0.8092	0.8071	0.8050	0.8030

TABLE A-2. ELECTRICITY DISCOUNT FACTOR PHI SUB N

*****INTEREST RATE IVS*****

TEXP	0.060	0.061	0.062	0.063	0.064
1.00	0.9625	0.9620	0.9616	0.9612	0.9607
1.10	0.9588	0.9584	0.9579	0.9574	0.9569
1.20	0.9552	0.9547	0.9542	0.9536	0.9531
1.30	0.9516	0.9510	0.9505	0.9499	0.9494
1.40	0.9480	0.9474	0.9468	0.9462	0.9456
1.50	0.9444	0.9438	0.9432	0.9425	0.9419
1.60	0.9409	0.9402	0.9395	0.9388	0.9382
1.70	0.9373	0.9366	0.9359	0.9352	0.9345
1.80	0.9338	0.9331	0.9323	0.9316	0.9309
1.90	0.9303	0.9295	0.9287	0.9279	0.9271
2.00	0.9266	0.9260	0.9252	0.9243	0.9235
2.10	0.9234	0.9225	0.9216	0.9208	0.9199
2.20	0.9199	0.9190	0.9181	0.9172	0.9163
2.30	0.9165	0.9155	0.9146	0.9137	0.9127
2.40	0.9131	0.9121	0.9111	0.9101	0.9092
2.50	0.9097	0.9087	0.9076	0.9066	0.9056
2.60	0.9063	0.9053	0.9042	0.9032	0.9021
2.70	0.9029	0.9019	0.9008	0.8997	0.8986
2.80	0.8996	0.8985	0.8974	0.8962	0.8951
2.90	0.8963	0.8951	0.8940	0.8928	0.8917
3.00	0.8930	0.8918	0.8906	0.8894	0.8882
3.10	0.8897	0.8884	0.8872	0.8860	0.8848
3.20	0.8864	0.8851	0.8839	0.8826	0.8814
3.30	0.8831	0.8818	0.8805	0.8793	0.8780
3.40	0.8799	0.8785	0.8772	0.8759	0.8746
3.50	0.8766	0.8753	0.8739	0.8726	0.8712
3.60	0.8734	0.8720	0.8707	0.8693	0.8679
3.70	0.8702	0.8688	0.8674	0.8660	0.8646
3.80	0.8670	0.8656	0.8642	0.8627	0.8613
3.90	0.8639	0.8624	0.8609	0.8595	0.8580
4.00	0.8607	0.8592	0.8577	0.8562	0.8547
4.10	0.8576	0.8561	0.8545	0.8530	0.8515
4.20	0.8545	0.8529	0.8513	0.8498	0.8482
4.30	0.8514	0.8498	0.8482	0.8466	0.8450
4.40	0.8483	0.8467	0.8450	0.8434	0.8418
4.50	0.8452	0.8436	0.8419	0.8403	0.8386
4.60	0.8422	0.8405	0.8388	0.8371	0.8355
4.70	0.8391	0.8374	0.8357	0.8340	0.8323
4.80	0.8361	0.8343	0.8326	0.8309	0.8292
4.90	0.8331	0.8313	0.8295	0.8278	0.8260
5.00	0.8301	0.8283	0.8265	0.8247	0.8229
5.10	0.8271	0.8253	0.8235	0.8216	0.8198
5.20	0.8241	0.8223	0.8204	0.8186	0.8168
5.30	0.8212	0.8193	0.8174	0.8156	0.8137
5.40	0.8182	0.8163	0.8144	0.8126	0.8107
5.50	0.8153	0.8134	0.8115	0.8096	0.8077
5.60	0.8124	0.8104	0.8085	0.8066	0.8046
5.70	0.8095	0.8075	0.8056	0.8036	0.8017
5.80	0.8066	0.8046	0.8026	0.8006	0.7987
5.90	0.8038	0.8017	0.7997	0.7977	0.7957
6.00	0.8009	0.7989	0.7968	0.7948	0.7928

TABLE A-2. ELECTRICITY DISCOUNT FACTOR PHASE SUB A

***** INTEREST RATE IVS *****

TEXP	0.085	0.086	0.087	0.088	0.089
1.00	0.9603	0.9599	0.9594	0.9590	0.9586
1.10	0.9564	0.9560	0.9555	0.9551	0.9547
1.20	0.9526	0.9521	0.9516	0.9511	0.9507
1.30	0.9488	0.9482	0.9477	0.9471	0.9466
1.40	0.9450	0.9444	0.9438	0.9432	0.9426
1.50	0.9412	0.9406	0.9400	0.9394	0.9387
1.60	0.9375	0.9368	0.9361	0.9355	0.9348
1.70	0.9338	0.9330	0.9322	0.9314	0.9306
1.80	0.9300	0.9293	0.9285	0.9276	0.9267
1.90	0.9264	0.9256	0.9247	0.9238	0.9229
2.00	0.9227	0.9219	0.9210	0.9201	0.9192
2.10	0.9190	0.9182	0.9172	0.9163	0.9153
2.20	0.9154	0.9145	0.9135	0.9125	0.9115
2.30	0.9118	0.9109	0.9099	0.9089	0.9079
2.40	0.9082	0.9072	0.9062	0.9052	0.9042
2.50	0.9046	0.9036	0.9026	0.9016	0.9006
2.60	0.9011	0.9000	0.8990	0.8980	0.8969
2.70	0.8975	0.8965	0.8954	0.8943	0.8932
2.80	0.8940	0.8929	0.8918	0.8907	0.8896
2.90	0.8905	0.8894	0.8882	0.8871	0.8860
3.00	0.8870	0.8859	0.8847	0.8835	0.8824
3.10	0.8836	0.8824	0.8812	0.8800	0.8788
3.20	0.8801	0.8789	0.8777	0.8764	0.8752
3.30	0.8767	0.8754	0.8742	0.8729	0.8716
3.40	0.8733	0.8720	0.8707	0.8694	0.8681
3.50	0.8699	0.8686	0.8672	0.8659	0.8646
3.60	0.8665	0.8652	0.8638	0.8625	0.8611
3.70	0.8632	0.8618	0.8604	0.8590	0.8576
3.80	0.8598	0.8584	0.8570	0.8556	0.8542
3.90	0.8565	0.8551	0.8536	0.8522	0.8507
4.00	0.8532	0.8517	0.8502	0.8488	0.8473
4.10	0.8499	0.8484	0.8469	0.8454	0.8439
4.20	0.8467	0.8451	0.8436	0.8421	0.8405
4.30	0.8434	0.8419	0.8402	0.8387	0.8372
4.40	0.8402	0.8386	0.8370	0.8354	0.8338
4.50	0.8370	0.8354	0.8337	0.8321	0.8305
4.60	0.8338	0.8321	0.8305	0.8288	0.8272
4.70	0.8306	0.8289	0.8272	0.8256	0.8239
4.80	0.8274	0.8257	0.8240	0.8223	0.8207
4.90	0.8243	0.8226	0.8208	0.8191	0.8174
5.00	0.8212	0.8194	0.8177	0.8159	0.8142
5.10	0.8181	0.8163	0.8145	0.8127	0.8110
5.20	0.8150	0.8131	0.8112	0.8095	0.8078
5.30	0.8119	0.8100	0.8082	0.8064	0.8046
5.40	0.8088	0.8069	0.8051	0.8032	0.8014
5.50	0.8058	0.8039	0.8020	0.8001	0.7982
5.60	0.8027	0.8008	0.7989	0.7970	0.7951
5.70	0.7997	0.7978	0.7958	0.7939	0.7920
5.80	0.7967	0.7947	0.7928	0.7909	0.7889
5.90	0.7937	0.7917	0.7898	0.7878	0.7858
6.00	0.7907	0.7887	0.7867	0.7848	0.7828

TABLE A-2. ELECTRICITY DISCOUNT FACTOR PHI SUB N

*****INTEREST RATE IVS*****

TEXP	0.090	0.091	0.092	0.093	0.094
1.00	0.9581	0.9577	0.9573	0.9568	0.9564
1.10	0.9541	0.9536	0.9531	0.9526	0.9522
1.20	0.9500	0.9495	0.9490	0.9485	0.9480
1.30	0.9460	0.9455	0.9449	0.9444	0.9438
1.40	0.9420	0.9414	0.9408	0.9403	0.9397
1.50	0.9381	0.9374	0.9368	0.9362	0.9355
1.60	0.9341	0.9335	0.9328	0.9321	0.9315
1.70	0.9302	0.9295	0.9288	0.9281	0.9274
1.80	0.9263	0.9256	0.9248	0.9241	0.9233
1.90	0.9224	0.9216	0.9209	0.9201	0.9193
2.00	0.9186	0.9178	0.9169	0.9161	0.9153
2.10	0.9147	0.9139	0.9130	0.9122	0.9113
2.20	0.9109	0.9100	0.9091	0.9083	0.9074
2.30	0.9071	0.9062	0.9053	0.9044	0.9034
2.40	0.9034	0.9024	0.9014	0.9005	0.8995
2.50	0.8996	0.8986	0.8976	0.8966	0.8957
2.60	0.8959	0.8949	0.8939	0.8929	0.8918
2.70	0.8922	0.8911	0.8901	0.8890	0.8880
2.80	0.8885	0.8874	0.8863	0.8852	0.8841
2.90	0.8848	0.8837	0.8826	0.8815	0.8803
3.00	0.8812	0.8800	0.8789	0.8777	0.8766
3.10	0.8776	0.8764	0.8752	0.8740	0.8728
3.20	0.8740	0.8727	0.8715	0.8703	0.8691
3.30	0.8704	0.8691	0.8679	0.8666	0.8654
3.40	0.8668	0.8655	0.8642	0.8630	0.8617
3.50	0.8633	0.8620	0.8607	0.8593	0.8580
3.60	0.8598	0.8584	0.8571	0.8557	0.8544
3.70	0.8562	0.8549	0.8535	0.8521	0.8508
3.80	0.8528	0.8514	0.8500	0.8486	0.8472
3.90	0.8493	0.8479	0.8464	0.8450	0.8436
4.00	0.8459	0.8444	0.8429	0.8415	0.8400
4.10	0.8424	0.8409	0.8395	0.8380	0.8365
4.20	0.8390	0.8375	0.8360	0.8345	0.8330
4.30	0.8356	0.8341	0.8326	0.8310	0.8295
4.40	0.8323	0.8307	0.8291	0.8276	0.8260
4.50	0.8289	0.8273	0.8257	0.8241	0.8226
4.60	0.8256	0.8240	0.8223	0.8207	0.8191
4.70	0.8223	0.8206	0.8190	0.8173	0.8157
4.80	0.8190	0.8173	0.8156	0.8140	0.8123
4.90	0.8157	0.8140	0.8123	0.8106	0.8089
5.00	0.8124	0.8107	0.8090	0.8073	0.8056
5.10	0.8092	0.8074	0.8057	0.8040	0.8022
5.20	0.8060	0.8042	0.8024	0.8007	0.7989
5.30	0.8028	0.8010	0.7992	0.7974	0.7956
5.40	0.7996	0.7978	0.7959	0.7941	0.7923
5.50	0.7964	0.7946	0.7927	0.7909	0.7891
5.60	0.7933	0.7914	0.7895	0.7877	0.7858
5.70	0.7901	0.7882	0.7863	0.7845	0.7826
5.80	0.7870	0.7851	0.7832	0.7813	0.7794
5.90	0.7839	0.7820	0.7800	0.7781	0.7762
6.00	0.7808	0.7789	0.7769	0.7750	0.7730

TABLE A-2. ELECTRICITY DISCOUNT FACTOR PHI SUB N

*****INTEREST RATE IVS*****

TEXP	0.095	0.096	0.097	C.CSE	1.059
1.00	0.9560	0.9555	0.9551	0.9547	0.9543
1.10	0.9517	0.9512	0.9508	0.9503	0.9498
1.20	0.9475	0.9470	0.9465	0.9459	0.9454
1.30	0.9433	0.9427	0.9422	0.9416	0.9411
1.40	0.9391	0.9385	0.9379	0.9373	0.9367
1.50	0.9349	0.9343	0.9337	0.9330	0.9324
1.60	0.9308	0.9301	0.9295	0.9288	0.9281
1.70	0.9267	0.9260	0.9253	0.9246	0.9239
1.80	0.9226	0.9219	0.9211	0.9204	0.9197
1.90	0.9185	0.9178	0.9170	0.9162	0.9154
2.00	0.9145	0.9137	0.9129	0.9121	0.9113
2.10	0.9105	0.9096	0.9088	0.9080	0.9071
2.20	0.9065	0.9056	0.9047	0.9039	0.9030
2.30	0.9025	0.9016	0.9007	0.8998	0.8989
2.40	0.8986	0.8976	0.8967	0.8958	0.8948
2.50	0.8947	0.8937	0.8927	0.8917	0.8908
2.60	0.8908	0.8898	0.8888	0.8877	0.8867
2.70	0.8869	0.8859	0.8848	0.8838	0.8827
2.80	0.8831	0.8820	0.8809	0.8798	0.8788
2.90	0.8792	0.8781	0.8770	0.8759	0.8748
3.00	0.8754	0.8743	0.8731	0.8720	0.8709
3.10	0.8716	0.8705	0.8693	0.8681	0.8670
3.20	0.8679	0.8667	0.8655	0.8643	0.8631
3.30	0.8641	0.8629	0.8617	0.8605	0.8592
3.40	0.8604	0.8592	0.8579	0.8566	0.8554
3.50	0.8567	0.8554	0.8542	0.8529	0.8516
3.60	0.8531	0.8517	0.8504	0.8491	0.8478
3.70	0.8494	0.8481	0.8467	0.8454	0.8440
3.80	0.8458	0.8444	0.8430	0.8417	0.8403
3.90	0.8422	0.8408	0.8394	0.8380	0.8366
4.00	0.8386	0.8372	0.8357	0.8343	0.8329
4.10	0.8350	0.8336	0.8321	0.8307	0.8292
4.20	0.8315	0.8300	0.8285	0.8270	0.8256
4.30	0.8280	0.8264	0.8249	0.8234	0.8219
4.40	0.8245	0.8229	0.8214	0.8198	0.8183
4.50	0.8210	0.8194	0.8178	0.8163	0.8147
4.60	0.8175	0.8159	0.8142	0.8127	0.8112
4.70	0.8141	0.8125	0.8108	0.8092	0.8076
4.80	0.8107	0.8090	0.8074	0.8057	0.8041
4.90	0.8073	0.8056	0.8039	0.8023	0.8006
5.00	0.8039	0.8022	0.8005	0.7988	0.7971
5.10	0.8005	0.7988	0.7971	0.7954	0.7937
5.20	0.7972	0.7954	0.7937	0.7920	0.7902
5.30	0.7938	0.7921	0.7903	0.7886	0.7868
5.40	0.7905	0.7887	0.7870	0.7852	0.7834
5.50	0.7872	0.7854	0.7836	0.7818	0.7801
5.60	0.7840	0.7821	0.7803	0.7785	0.7767
5.70	0.7807	0.7789	0.7770	0.7752	0.7734
5.80	0.7775	0.7756	0.7738	0.7719	0.7701
5.90	0.7743	0.7724	0.7705	0.7686	0.7668
6.00	0.7711	0.7692	0.7672	0.7654	0.7635

TABLE A-2. ELECTRICITY DISCOUNT FACTOR PHI SUB N

*****INTEREST RATE IVS*****

TEXP	0.100	0.101	0.102	0.103	0.104
1.00	0.9538	0.9534	0.9530	0.9525	0.9521
1.10	0.9494	0.9489	0.9484	0.9480	0.9475
1.20	0.9449	0.9444	0.9439	0.9434	0.9429
1.30	0.9405	0.9400	0.9394	0.9389	0.9384
1.40	0.9362	0.9356	0.9350	0.9344	0.9338
1.50	0.9318	0.9312	0.9306	0.9300	0.9293
1.60	0.9275	0.9268	0.9262	0.9255	0.9249
1.70	0.9232	0.9225	0.9218	0.9211	0.9204
1.80	0.9189	0.9182	0.9175	0.9167	0.9160
1.90	0.9147	0.9139	0.9132	0.9124	0.9116
2.00	0.9105	0.9097	0.9089	0.9081	0.9073
2.10	0.9063	0.9054	0.9046	0.9038	0.9030
2.20	0.9021	0.9012	0.9004	0.8995	0.8987
2.30	0.8980	0.8971	0.8962	0.8953	0.8944
2.40	0.8939	0.8929	0.8920	0.8911	0.8901
2.50	0.8898	0.8888	0.8879	0.8869	0.8859
2.60	0.8857	0.8847	0.8837	0.8827	0.8817
2.70	0.8817	0.8807	0.8796	0.8786	0.8776
2.80	0.8777	0.8766	0.8756	0.8745	0.8734
2.90	0.8737	0.8726	0.8715	0.8704	0.8693
3.00	0.8697	0.8686	0.8675	0.8664	0.8652
3.10	0.8658	0.8646	0.8635	0.8623	0.8612
3.20	0.8619	0.8607	0.8595	0.8583	0.8572
3.30	0.8580	0.8568	0.8556	0.8544	0.8532
3.40	0.8541	0.8529	0.8517	0.8504	0.8492
3.50	0.8503	0.8490	0.8478	0.8465	0.8452
3.60	0.8465	0.8452	0.8439	0.8426	0.8413
3.70	0.8427	0.8414	0.8400	0.8387	0.8374
3.80	0.8389	0.8376	0.8362	0.8349	0.8335
3.90	0.8352	0.8338	0.8324	0.8310	0.8297
4.00	0.8315	0.8300	0.8286	0.8272	0.8258
4.10	0.8278	0.8263	0.8249	0.8235	0.8220
4.20	0.8241	0.8226	0.8212	0.8197	0.8182
4.30	0.8204	0.8189	0.8175	0.8160	0.8145
4.40	0.8168	0.8153	0.8138	0.8123	0.8108
4.50	0.8132	0.8116	0.8101	0.8086	0.8071
4.60	0.8096	0.8080	0.8065	0.8049	0.8034
4.70	0.8060	0.8044	0.8029	0.8013	0.7997
4.80	0.8025	0.8009	0.7993	0.7977	0.7961
4.90	0.7990	0.7973	0.7957	0.7941	0.7924
5.00	0.7955	0.7938	0.7921	0.7905	0.7889
5.10	0.7920	0.7903	0.7886	0.7869	0.7853
5.20	0.7885	0.7868	0.7851	0.7834	0.7817
5.30	0.7851	0.7834	0.7816	0.7799	0.7782
5.40	0.7817	0.7799	0.7782	0.7764	0.7747
5.50	0.7783	0.7765	0.7747	0.7730	0.7712
5.60	0.7749	0.7731	0.7713	0.7695	0.7678
5.70	0.7715	0.7697	0.7679	0.7661	0.7643
5.80	0.7682	0.7664	0.7645	0.7627	0.7609
5.90	0.7649	0.7630	0.7612	0.7593	0.7575
6.00	0.7616	0.7597	0.7579	0.7560	0.7541

TABLE A-3.
EFFECTIVE INVENTORY TIME FOR EXPOSURE TIME 1.000 YEARS

*****INTEREST RATE IYS*****

TI	TI	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	3.1642	3.1142	3.0658	3.0184	2.9732
-2.60	-2.60	2.8341	2.7942	2.7554	2.7177	2.6814
-2.40	-2.40	2.6662	2.6309	2.5966	2.5632	2.5307
-2.20	-2.20	2.4962	2.4654	2.4357	2.4060	2.3775
-2.00	-2.00	2.3247	2.2976	2.2716	2.2467	2.2213
-1.90	-1.90	2.2376	2.2129	2.1887	2.1651	2.1421
-1.80	-1.80	2.1504	2.1276	2.1052	2.0835	2.0622
-1.70	-1.70	2.0627	2.0417	2.0211	2.0011	1.9818
-1.60	-1.60	1.9744	1.9552	1.9364	1.9179	1.8994
-1.50	-1.50	1.8857	1.8681	1.8509	1.8341	1.8176
-1.40	-1.40	1.7964	1.7805	1.7648	1.7496	1.7346
-1.30	-1.30	1.7066	1.6922	1.6781	1.6643	1.6507
-1.20	-1.20	1.6163	1.6034	1.5907	1.5782	1.5660
-1.10	-1.10	1.5255	1.5139	1.5026	1.4915	1.4806
-1.00	-1.00	1.4341	1.4239	1.4139	1.4039	1.3943
-0.90	-0.90	1.3422	1.3332	1.3243	1.3157	1.3071
-0.80	-0.80	1.2497	1.2419	1.2342	1.2266	1.2192
-0.70	-0.70	1.1567	1.1500	1.1433	1.1368	1.1304
-0.60	-0.60	1.0632	1.0575	1.0518	1.0462	1.0407
-0.50	-0.50	0.9691	0.9643	0.9595	0.9548	0.9502
-0.40	-0.40	0.8745	0.8705	0.8665	0.8627	0.8588
-0.30	-0.30	0.7793	0.7761	0.7729	0.7697	0.7666
-0.20	-0.20	0.6836	0.6810	0.6784	0.6759	0.6734
-0.10	-0.10	0.5873	0.5853	0.5833	0.5813	0.5794
-0.00	-0.00	0.4904	0.4889	0.4874	0.4859	0.4845
0.00	1.00	-0.5099	-0.5115	-0.5131	-0.5147	-0.5163
0.10	1.10	-0.6131	-0.6153	-0.6174	-0.6196	-0.6217
0.20	1.20	-0.7170	-0.7198	-0.7226	-0.7254	-0.7281
0.30	1.30	-0.8215	-0.8250	-0.8286	-0.8321	-0.8356
0.40	1.40	-0.9266	-0.9310	-0.9352	-0.9397	-0.9441
0.50	1.50	-1.0323	-1.0376	-1.0430	-1.0483	-1.0536
0.60	1.60	-1.1386	-1.1450	-1.1514	-1.1578	-1.1641
0.70	1.70	-1.2456	-1.2531	-1.2607	-1.2682	-1.2758
0.80	1.80	-1.3531	-1.3620	-1.3709	-1.3796	-1.3885
0.90	1.90	-1.4612	-1.4715	-1.4818	-1.4920	-1.5022
1.00	2.00	-1.5702	-1.5819	-1.5936	-1.6054	-1.6171
1.10	2.10	-1.6796	-1.6929	-1.7063	-1.7197	-1.7331
1.20	2.20	-1.7897	-1.8048	-1.8199	-1.8350	-1.8501
1.30	2.30	-1.9005	-1.9174	-1.9342	-1.9513	-1.9683
1.40	2.40	-2.0119	-2.0307	-2.0497	-2.0686	-2.0877
1.50	2.50	-2.1239	-2.1449	-2.1654	-2.1870	-2.2081
1.60	2.60	-2.2366	-2.2598	-2.2830	-2.3063	-2.3298
1.70	2.70	-2.3500	-2.3754	-2.4010	-2.4267	-2.4526
1.80	2.80	-2.4640	-2.4919	-2.5200	-2.5482	-2.5765
1.90	2.90	-2.5787	-2.6092	-2.6399	-2.6706	-2.7017
2.00	3.00	-2.6941	-2.7272	-2.7606	-2.7942	-2.8280
2.20	3.20	-2.9268	-2.9657	-3.0050	-3.0445	-3.0844
2.40	3.40	-3.1623	-3.2075	-3.2531	-3.2992	-3.3456
2.60	3.60	-3.4005	-3.4525	-3.5051	-3.5582	-3.6114
3.00	4.00	-3.8854	-3.9527	-4.0209	-4.0900	-4.1600

TABLE A-3.
EFFECTIVE INVENTORY TIME TO POP EXPOSURE TIME 1.500 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	3.3642	3.3072	3.2520	3.1985	3.1459
-2.60	-2.60	3.0388	2.9928	2.9476	2.9037	2.8613
-2.40	-2.40	2.8733	2.8318	2.7916	2.7525	2.7145
-2.20	-2.20	2.7058	2.6690	2.6333	2.5986	2.5649
-2.00	-2.00	2.5363	2.5041	2.4726	2.4421	2.4123
-1.90	-1.90	2.4509	2.4207	2.3914	2.3629	2.3350
-1.80	-1.90	2.3649	2.3368	2.3098	2.2829	2.2568
-1.70	-1.70	2.2784	2.2523	2.2269	2.2021	2.1779
-1.60	-1.60	2.1914	2.1673	2.1437	2.1207	2.0983
-1.50	-1.50	2.1040	2.0817	2.0599	2.0386	2.0179
-1.40	-1.40	2.0160	1.9955	1.9758	1.9559	1.9367
-1.30	-1.30	1.9274	1.9087	1.8903	1.8724	1.8549
-1.20	-1.20	1.8384	1.8213	1.8045	1.7881	1.7721
-1.10	-1.10	1.7489	1.7333	1.7181	1.7032	1.6885
-1.00	-1.00	1.6588	1.6447	1.6310	1.6175	1.6043
-0.90	-0.90	1.5682	1.5556	1.5432	1.5311	1.5192
-0.80	-0.80	1.4771	1.4658	1.4547	1.4439	1.4333
-0.70	-0.70	1.3854	1.3754	1.3656	1.3559	1.3465
-0.60	-0.60	1.2932	1.2844	1.2757	1.2672	1.2589
-0.50	-0.50	1.2005	1.1928	1.1852	1.1778	1.1705
-0.40	-0.40	1.1072	1.1005	1.0940	1.0875	1.0812
-0.30	-0.30	1.0134	1.0077	1.0020	0.9965	0.9911
-0.20	-0.20	0.9190	0.9142	0.9094	0.9047	0.9001
-0.10	-0.10	0.8241	0.8200	0.8160	0.8121	0.8082
-0.00	-0.00	0.7286	0.7253	0.7220	0.7187	0.7155
0.00	1.50	-0.7723	-0.7760	-0.7797	-0.7834	-0.7871
0.10	1.60	-0.8771	-0.8816	-0.8861	-0.8906	-0.8951
0.20	1.70	-0.9825	-0.9880	-0.9934	-0.9987	-1.0041
0.30	1.80	-1.0886	-1.0950	-1.1014	-1.1078	-1.1142
0.40	1.90	-1.1953	-1.2028	-1.2103	-1.2178	-1.2254
0.50	2.00	-1.3025	-1.3113	-1.3200	-1.3288	-1.3376
0.60	2.10	-1.4104	-1.4205	-1.4306	-1.4407	-1.4509
0.70	2.20	-1.5190	-1.5305	-1.5421	-1.5536	-1.5652
0.80	2.30	-1.6281	-1.6412	-1.6544	-1.6675	-1.6807
0.90	2.40	-1.7379	-1.7527	-1.7675	-1.7824	-1.7972
1.00	2.50	-1.8484	-1.8650	-1.8816	-1.8982	-1.9150
1.10	2.60	-1.9595	-1.9780	-1.9965	-2.0151	-2.0338
1.20	2.70	-2.0712	-2.0917	-2.1123	-2.1330	-2.1537
1.30	2.80	-2.1836	-2.2063	-2.2290	-2.2519	-2.2748
1.40	2.90	-2.2967	-2.3216	-2.3466	-2.3718	-2.3971
1.50	3.00	-2.4104	-2.4377	-2.4651	-2.4928	-2.5205
1.60	3.10	-2.5249	-2.5546	-2.5846	-2.6148	-2.6452
1.70	3.20	-2.6399	-2.6722	-2.7049	-2.7379	-2.7710
1.80	3.30	-2.7555	-2.7907	-2.8262	-2.8619	-2.8980
1.90	3.40	-2.8719	-2.9100	-2.9484	-2.9872	-3.0262
2.00	3.50	-2.9890	-3.0301	-3.0716	-3.1134	-3.1557
2.20	3.70	-3.2252	-3.2727	-3.3208	-3.3693	-3.4183
2.40	3.90	-3.4642	-3.5187	-3.5738	-3.6296	-3.6860
2.60	4.10	-3.7060	-3.7680	-3.8308	-3.8944	-3.9589
3.00	4.50	-4.1980	-4.2768	-4.3568	-4.4380	-4.5204

TABLE A-3.
EFFECTIVE INVENTORY TIME IN FOR EXPOSURE TIME 2,000 YEARS

*****INTEREST RATE IV*****

TL	TR	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	3.5608	3.4958	3.4335	3.3732	3.3150
-2.60	-2.60	3.2396	3.1863	3.1346	3.0846	3.0361
-2.40	-2.40	3.0768	3.0283	2.9817	2.9365	2.8926
-2.20	-2.20	2.9113	2.8682	2.8264	2.7859	2.7463
-2.00	-2.00	2.7443	2.7059	2.6687	2.6325	2.5973
-1.90	-1.90	2.6600	2.6240	2.5889	2.5548	2.5217
-1.80	-1.80	2.5753	2.5414	2.5085	2.4765	2.4453
-1.70	-1.70	2.4900	2.4583	2.4275	2.3975	2.3683
-1.60	-1.60	2.4043	2.3747	2.3459	2.3178	2.2905
-1.50	-1.50	2.3181	2.2905	2.2636	2.2375	2.2119
-1.40	-1.40	2.2313	2.2057	2.1807	2.1564	2.1327
-1.30	-1.30	2.1440	2.1203	2.0972	2.0746	2.0526
-1.20	-1.20	2.0563	2.0344	2.0130	1.9921	1.9718
-1.10	-1.10	1.9680	1.9479	1.9282	1.9090	1.8902
-1.00	-1.00	1.8792	1.8607	1.8427	1.8250	1.8078
-0.90	-0.90	1.7899	1.7730	1.7565	1.7404	1.7246
-0.80	-0.80	1.7001	1.6847	1.6697	1.6550	1.6407
-0.70	-0.70	1.6097	1.5958	1.5822	1.5689	1.5559
-0.60	-0.60	1.5188	1.5063	1.4941	1.4821	1.4703
-0.50	-0.50	1.4274	1.4162	1.4052	1.3945	1.3839
-0.40	-0.40	1.3355	1.3255	1.3157	1.3061	1.2967
-0.30	-0.30	1.2430	1.2341	1.2255	1.2170	1.2087
-0.20	-0.20	1.1499	1.1422	1.1346	1.1271	1.1199
-0.10	-0.10	1.0564	1.0496	1.0429	1.0364	1.0300
-0.00	-0.00	0.9623	0.9564	0.9506	0.9449	0.9394
0.00	2.00	-1.0400	-1.0467	-1.0533	-1.0600	-1.0667
0.10	2.10	-1.1468	-1.1541	-1.1614	-1.1696	-1.1778
0.20	2.20	-1.2538	-1.2623	-1.2712	-1.2802	-1.2891
0.30	2.30	-1.3610	-1.3712	-1.3818	-1.3917	-1.4020
0.40	2.40	-1.4692	-1.4808	-1.4925	-1.5042	-1.5159
0.50	2.50	-1.5781	-1.5912	-1.6044	-1.6176	-1.6309
0.60	2.60	-1.6876	-1.7024	-1.7172	-1.7320	-1.7469
0.70	2.70	-1.7978	-1.8143	-1.8308	-1.8475	-1.8642
0.80	2.80	-1.9086	-1.9269	-1.9454	-1.9639	-1.9825
0.90	2.90	-2.0200	-2.0403	-2.0609	-2.0813	-2.1020
1.00	3.00	-2.1321	-2.1545	-2.1771	-2.1998	-2.2226
1.10	3.10	-2.2449	-2.2695	-2.2943	-2.3192	-2.3443
1.20	3.20	-2.3583	-2.3853	-2.4128	-2.4397	-2.4672
1.30	3.30	-2.4723	-2.5018	-2.5318	-2.5613	-2.5914
1.40	3.40	-2.5871	-2.6191	-2.6514	-2.6839	-2.7166
1.50	3.50	-2.7025	-2.7372	-2.7723	-2.8076	-2.8431
1.60	3.60	-2.8186	-2.8561	-2.8941	-2.9323	-2.9709
1.70	3.70	-2.9353	-2.9759	-3.0168	-3.0581	-3.0998
1.80	3.80	-3.0528	-3.0964	-3.1405	-3.1850	-3.2299
1.90	3.90	-3.1709	-3.2178	-3.2651	-3.3130	-3.3614
2.00	4.00	-3.2897	-3.3400	-3.3908	-3.4421	-3.4940
2.20	4.20	-3.5295	-3.5868	-3.6449	-3.7037	-3.7632
2.40	4.40	-3.7720	-3.8370	-3.9030	-3.9698	-4.0375
2.60	4.60	-4.0174	-4.0907	-4.1651	-4.2405	-4.3171
3.00	5.00	-4.5168	-4.6084	-4.7015	-4.7962	-4.8926

TABLE A-3.
EFFECTIVE INVENTORY TIME TH FOR EXPOSURE TIME 2.200 YEARS

*****INTEREST RATE 1%*****

TI	TR	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	3.6378	3.5701	3.5088	3.4417	3.3809
-2.60	-2.60	3.3189	3.2626	3.2082	3.1555	3.1045
-2.40	-2.40	3.1565	3.1057	3.0564	3.0086	2.9623
-2.20	-2.20	2.9924	2.9466	2.9022	2.8592	2.8178
-2.00	-2.00	2.8263	2.7858	2.7457	2.7071	2.6697
-1.90	-1.90	2.7426	2.7080	2.6665	2.6301	2.5989
-1.80	-1.80	2.6583	2.6220	2.5867	2.5525	2.5191
-1.70	-1.70	2.5735	2.5395	2.5068	2.4741	2.4429
-1.60	-1.60	2.4883	2.4568	2.4253	2.3951	2.3657
-1.50	-1.50	2.4025	2.3727	2.3437	2.3158	2.2879
-1.40	-1.40	2.3163	2.2885	2.2618	2.2350	2.2093
-1.30	-1.30	2.2295	2.2037	2.1785	2.1539	2.1300
-1.20	-1.20	2.1423	2.1183	2.0949	2.0721	2.0499
-1.10	-1.10	2.0545	2.0323	2.0107	1.9896	1.9691
-1.00	-1.00	1.9662	1.9458	1.9259	1.9068	1.8878
-0.90	-0.90	1.8778	1.8587	1.8408	1.8225	1.8050
-0.80	-0.80	1.7881	1.7709	1.7542	1.7379	1.7219
-0.70	-0.70	1.6982	1.6826	1.6678	1.6525	1.6379
-0.60	-0.60	1.6079	1.5937	1.5799	1.5663	1.5531
-0.50	-0.50	1.5170	1.5042	1.4917	1.4798	1.4675
-0.40	-0.40	1.4256	1.4141	1.4028	1.3918	1.3810
-0.30	-0.30	1.3336	1.3233	1.3133	1.3038	1.2948
-0.20	-0.20	1.2411	1.2320	1.2230	1.2143	1.2057
-0.10	-0.10	1.1481	1.1400	1.1321	1.1248	1.1168
-0.00	-0.00	1.0545	1.0478	1.0405	1.0337	1.0270
0.00	2.20	-1.1485	-1.1567	-1.1648	-1.1729	-1.1811
0.10	2.30	-1.2556	-1.2649	-1.2742	-1.2835	-1.2929
0.20	2.40	-1.3632	-1.3738	-1.3844	-1.3951	-1.4057
0.30	2.50	-1.4718	-1.4835	-1.4955	-1.5076	-1.5197
0.40	2.60	-1.5803	-1.5939	-1.6078	-1.6219	-1.6367
0.50	2.70	-1.6899	-1.7050	-1.7202	-1.7355	-1.7509
0.60	2.80	-1.8000	-1.8169	-1.8339	-1.8510	-1.8681
0.70	2.90	-1.9108	-1.9296	-1.9485	-1.9678	-1.9865
0.80	3.00	-2.0223	-2.0430	-2.0639	-2.0849	-2.1060
0.90	3.10	-2.1344	-2.1573	-2.1802	-2.2034	-2.2266
1.00	3.20	-2.2472	-2.2722	-2.2975	-2.3229	-2.3488
1.10	3.30	-2.3606	-2.3880	-2.4156	-2.4438	-2.4718
1.20	3.40	-2.4747	-2.5046	-2.5347	-2.5650	-2.5955
1.30	3.50	-2.5898	-2.6219	-2.6546	-2.6876	-2.7209
1.40	3.60	-2.7049	-2.7400	-2.7755	-2.8113	-2.8478
1.50	3.70	-2.8210	-2.8590	-2.8973	-2.9361	-2.9751
1.60	3.80	-2.9377	-2.9787	-3.0201	-3.0619	-3.1041
1.70	3.90	-3.0552	-3.0993	-3.1438	-3.1888	-3.2343
1.80	4.00	-3.1733	-3.2207	-3.2685	-3.3169	-3.3658
1.90	4.10	-3.2922	-3.3429	-3.3941	-3.4460	-3.4985
2.00	4.20	-3.4117	-3.4659	-3.5208	-3.5763	-3.6328
2.20	4.40	-3.6529	-3.7145	-3.7769	-3.8402	-3.9043
2.40	4.60	-3.8960	-3.9668	-4.0370	-4.1087	-4.1813
2.60	4.80	-4.1437	-4.2218	-4.3012	-4.3818	-4.4637
3.00	5.20	-4.6861	-4.7831	-4.8819	-4.9825	-5.0849

TABLE A-2.
EFFECTIVE INVENTORY TIME IN FOR EXPOSURE TIME 2.400 YEARS

*****TYPEST DATA IVS*****

TI	TO	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	3.7106	3.6839	3.5758	3.5095	3.4859
-2.60	-2.60	3.3975	3.3382	3.2810	3.2256	3.1720
-2.40	-2.40	3.2362	3.1928	3.1303	3.0799	3.0311
-2.20	-2.20	3.0729	3.0288	2.9773	2.9317	2.8875
-2.00	-2.00	2.9078	2.8642	2.8220	2.7810	2.7412
-1.90	-1.90	2.8285	2.7833	2.7438	2.7086	2.6670
-1.80	-1.80	2.7497	2.7019	2.6642	2.6276	2.5920
-1.70	-1.70	2.6568	2.6199	2.5888	2.5499	2.5168
-1.60	-1.60	2.5716	2.5373	2.5080	2.4715	2.4400
-1.50	-1.50	2.4868	2.4542	2.4229	2.3925	2.3629
-1.40	-1.40	2.4006	2.3705	2.3413	2.3128	2.2850
-1.30	-1.30	2.3183	2.2863	2.2590	2.2328	2.2068
-1.20	-1.20	2.2276	2.2015	2.1761	2.1512	2.1271
-1.10	-1.10	2.1403	2.1161	2.0925	2.0698	2.0470
-1.00	-1.00	2.0525	2.0301	2.0082	1.9869	1.9661
-0.90	-0.90	1.9642	1.9435	1.9238	1.9037	1.8845
-0.80	-0.80	1.8758	1.8568	1.8378	1.8197	1.8020
-0.70	-0.70	1.7861	1.7687	1.7517	1.7350	1.7188
-0.60	-0.60	1.6962	1.6803	1.6648	1.6496	1.6348
-0.50	-0.50	1.6059	1.5918	1.5773	1.5635	1.5500
-0.40	-0.40	1.5149	1.5019	1.4891	1.4766	1.4643
-0.30	-0.30	1.4235	1.4117	1.4002	1.3889	1.3779
-0.20	-0.20	1.3315	1.3210	1.3106	1.3005	1.2906
-0.10	-0.10	1.2390	1.2296	1.2204	1.2113	1.2025
-0.00	-0.00	1.1460	1.1376	1.1298	1.1218	1.1135
0.00	2.40	-1.2579	-1.2677	-1.2778	-1.2872	-1.2970
0.10	2.50	-1.3656	-1.3766	-1.3877	-1.3988	-1.4099
0.20	2.60	-1.4739	-1.4863	-1.4983	-1.5113	-1.5239
0.30	2.70	-1.5828	-1.5967	-1.6107	-1.6248	-1.6389
0.40	2.80	-1.6923	-1.7079	-1.7236	-1.7393	-1.7551
0.50	2.90	-1.8025	-1.8198	-1.8373	-1.8548	-1.8728
0.60	3.00	-1.9133	-1.9325	-1.9519	-1.9713	-1.9908
0.70	3.10	-2.0248	-2.0460	-2.0672	-2.0888	-2.1103
0.80	3.20	-2.1369	-2.1602	-2.1837	-2.2073	-2.2310
0.90	3.30	-2.2497	-2.2752	-2.3009	-2.3268	-2.3529
1.00	3.40	-2.3631	-2.3910	-2.4191	-2.4478	-2.4759
1.10	3.50	-2.4772	-2.5076	-2.5382	-2.5690	-2.6001
1.20	3.60	-2.5920	-2.6250	-2.6582	-2.6917	-2.7258
1.30	3.70	-2.7078	-2.7431	-2.7791	-2.8158	-2.8520
1.40	3.80	-2.8236	-2.8621	-2.9010	-2.9402	-2.9798
1.50	3.90	-2.9403	-2.9818	-3.0238	-3.0661	-3.1088
1.60	4.00	-3.0578	-3.1028	-3.1475	-3.1930	-3.2391
1.70	4.10	-3.1760	-3.2238	-3.2722	-3.3211	-3.3706
1.80	4.20	-3.2948	-3.3460	-3.3979	-3.4503	-3.5033
1.90	4.30	-3.4188	-3.4691	-3.5245	-3.5806	-3.6378
2.00	4.40	-3.5386	-3.5930	-3.6521	-3.7120	-3.7727
2.20	4.60	-3.7772	-3.8433	-3.9103	-3.9783	-4.0472
2.40	4.80	-4.0227	-4.0970	-4.1725	-4.2492	-4.3270
2.60	5.00	-4.2710	-4.3582	-4.4388	-4.5248	-4.6122
3.00	5.40	-4.7768	-4.8791	-4.9838	-5.0908	-5.1991

TABLE A-3.
EFFECTIVE INVENTORY TIME FOR EXPOSURE TIME 2.500 YEARS

*****INTEREST RATE 1%*****

TL	TR	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	3.7528	3.6903	3.6105	3.5831	3.4780
-2.60	-2.60	3.4366	3.3758	3.3171	3.2608	3.2058
-2.40	-2.40	3.2757	3.2205	3.1670	3.1153	3.0652
-2.20	-2.20	3.1129	3.0630	3.0106	2.9677	2.9223
-2.00	-2.00	2.9493	2.9033	2.8598	2.8176	2.7766
-1.90	-1.90	2.8652	2.8227	2.7815	2.7415	2.7027
-1.80	-1.80	2.7816	2.7415	2.7026	2.6648	2.6281
-1.70	-1.70	2.6976	2.6598	2.6231	2.5875	2.5528
-1.60	-1.60	2.6131	2.5775	2.5430	2.5098	2.4768
-1.50	-1.50	2.5281	2.4947	2.4623	2.4307	2.4000
-1.40	-1.40	2.4425	2.4113	2.3809	2.3513	2.3225
-1.30	-1.30	2.3565	2.3273	2.2989	2.2712	2.2443
-1.20	-1.20	2.2700	2.2428	2.2163	2.1905	2.1653
-1.10	-1.10	2.1830	2.1577	2.1330	2.1090	2.0856
-1.00	-1.00	2.0958	2.0720	2.0489	2.0264	2.0051
-0.90	-0.90	2.0078	1.9857	1.9645	1.9439	1.9238
-0.80	-0.80	1.9188	1.8988	1.8793	1.8603	1.8417
-0.70	-0.70	1.8297	1.8114	1.7935	1.7760	1.7589
-0.60	-0.60	1.7402	1.7238	1.7069	1.6909	1.6753
-0.50	-0.50	1.6500	1.6347	1.6197	1.6051	1.5908
-0.40	-0.40	1.5598	1.5455	1.5319	1.5186	1.5056
-0.30	-0.30	1.4682	1.4556	1.4433	1.4312	1.4195
-0.20	-0.20	1.3765	1.3652	1.3541	1.3432	1.3326
-0.10	-0.10	1.2842	1.2741	1.2642	1.2548	1.2449
-0.00	-0.00	1.1915	1.1828	1.1735	1.1649	1.1568
0.00	2.50	-1.3130	-1.3236	-1.3342	-1.3448	-1.3555
0.10	2.60	-1.4209	-1.4329	-1.4449	-1.4569	-1.4689
0.20	2.70	-1.5295	-1.5429	-1.5568	-1.5696	-1.5825
0.30	2.80	-1.6388	-1.6538	-1.6688	-1.6839	-1.6991
0.40	2.90	-1.7486	-1.7653	-1.7821	-1.7990	-1.8159
0.50	3.00	-1.8591	-1.8777	-1.8963	-1.9150	-1.9338
0.60	3.10	-1.9703	-1.9907	-2.0113	-2.0320	-2.0527
0.70	3.20	-2.0821	-2.1046	-2.1272	-2.1500	-2.1729
0.80	3.30	-2.1946	-2.2192	-2.2440	-2.2690	-2.2942
0.90	3.40	-2.3077	-2.3346	-2.3618	-2.3891	-2.4166
1.00	3.50	-2.4215	-2.4508	-2.4808	-2.5107	-2.5407
1.10	3.60	-2.5359	-2.5678	-2.5999	-2.6328	-2.6650
1.20	3.70	-2.6510	-2.6856	-2.7208	-2.7556	-2.7910
1.30	3.80	-2.7668	-2.8041	-2.8418	-2.8799	-2.9183
1.40	3.90	-2.8833	-2.9235	-2.9642	-3.0052	-3.0467
1.50	4.00	-3.0008	-3.0437	-3.0875	-3.1317	-3.1763
1.60	4.10	-3.1182	-3.1647	-3.2117	-3.2592	-3.3072
1.70	4.20	-3.2367	-3.2865	-3.3369	-3.3878	-3.4398
1.80	4.30	-3.3559	-3.4092	-3.4631	-3.5176	-3.5729
1.90	4.40	-3.4758	-3.5327	-3.5902	-3.6485	-3.7075
2.00	4.50	-3.5965	-3.6570	-3.7183	-3.7805	-3.8435
2.20	4.70	-3.8398	-3.9042	-3.9775	-4.0470	-4.1194
2.40	4.90	-4.0860	-4.1628	-4.2408	-4.3200	-4.4005
2.60	5.10	-4.3350	-4.4208	-4.5081	-4.5969	-4.6872
3.00	5.50	-4.8819	-4.9876	-5.0553	-5.1651	-5.2770

TABLE A-2.
EFFECTIVE INVENTORY TIME T_E FOR EXPOSURE TIME 2,600 YEARS

*****INTEREST RATE IVS*****

T_L	T_P	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	3.7909	3.7167	3.6853	3.5765	3.5100
-2.60	-2.60	3.8755	3.8132	3.3531	3.2989	3.2397
-2.40	-2.40	3.3151	3.2588	3.2035	3.1505	3.0991
-2.20	-2.20	3.1528	3.1018	3.0517	3.0035	2.9569
-2.00	-2.00	2.9896	2.9423	2.8975	2.8580	2.8119
-1.90	-1.90	2.9058	2.8619	2.8195	2.7782	2.7393
-1.80	-1.80	2.8228	2.7810	2.7409	2.7019	2.6640
-1.70	-1.70	2.7396	2.6996	2.6616	2.6289	2.5990
-1.60	-1.60	2.6588	2.6176	2.5819	2.5471	2.5133
-1.50	-1.50	2.5696	2.5350	2.5018	2.4697	2.4369
-1.40	-1.40	2.4883	2.4519	2.4203	2.3896	2.3598
-1.30	-1.30	2.3985	2.3682	2.3386	2.3090	2.2810
-1.20	-1.20	2.3122	2.2839	2.2563	2.2295	2.2033
-1.10	-1.10	2.2255	2.1991	2.1738	2.1483	2.1239
-1.00	-1.00	2.1382	2.1137	2.0898	2.0665	2.0439
-0.90	-0.90	2.0508	2.0277	2.0055	1.9830	1.9629
-0.80	-0.80	1.9621	1.9411	1.9206	1.9007	1.8812
-0.70	-0.70	1.8732	1.8539	1.8351	1.8167	1.7987
-0.60	-0.60	1.7839	1.7662	1.7489	1.7320	1.7155
-0.50	-0.50	1.6940	1.6778	1.6620	1.6465	1.6318
-0.40	-0.40	1.6036	1.5889	1.5745	1.5608	1.5466
-0.30	-0.30	1.5127	1.4993	1.4862	1.4738	1.4609
-0.20	-0.20	1.4213	1.4092	1.3973	1.3859	1.3748
-0.10	-0.10	1.3293	1.3188	1.3077	1.2973	1.2871
-0.00	-0.00	1.2368	1.2270	1.2175	1.2081	1.1990
0.00	2.60	-1.3682	-1.3797	-1.3912	-1.4028	-1.4148
0.10	2.70	-1.4765	-1.4898	-1.5028	-1.5158	-1.5298
0.20	2.80	-1.5858	-1.5999	-1.6188	-1.6280	-1.6375
0.30	2.90	-1.6950	-1.7111	-1.7272	-1.7438	-1.7597
0.40	3.00	-1.8052	-1.8230	-1.8409	-1.8590	-1.8771
0.50	3.10	-1.9160	-1.9357	-1.9555	-1.9755	-1.9955
0.60	3.20	-2.0275	-2.0492	-2.0710	-2.0930	-2.1151
0.70	3.30	-2.1396	-2.1635	-2.1878	-2.2116	-2.2359
0.80	3.40	-2.2524	-2.2785	-2.3087	-2.3311	-2.3577
0.90	3.50	-2.3659	-2.3983	-2.4229	-2.4517	-2.4809
1.00	3.60	-2.4800	-2.5109	-2.5420	-2.5738	-2.6050
1.10	3.70	-2.5988	-2.6293	-2.6620	-2.6961	-2.7308
1.20	3.80	-2.7103	-2.7465	-2.7830	-2.8190	-2.8571
1.30	3.90	-2.8268	-2.8658	-2.9080	-2.9487	-2.9980
1.40	4.00	-2.9432	-2.9852	-3.0277	-3.0706	-3.1180
1.50	4.10	-3.0607	-3.1058	-3.1515	-3.1976	-3.2483
1.60	4.20	-3.1789	-3.2273	-3.2762	-3.3257	-3.3759
1.70	4.30	-3.2977	-3.3495	-3.4019	-3.4580	-3.5086
1.80	4.40	-3.4173	-3.4726	-3.5296	-3.5853	-3.6427
1.90	4.50	-3.5376	-3.5965	-3.6562	-3.7167	-3.7781
2.00	4.60	-3.6585	-3.7212	-3.7880	-3.8493	-3.9187
2.20	4.80	-3.9026	-3.9733	-4.0451	-4.1180	-4.1920
2.40	5.00	-4.1495	-4.2288	-4.3098	-4.3913	-4.4786
2.60	5.20	-4.3993	-4.4878	-4.5779	-4.6698	-4.7626
3.00	5.60	-4.9077	-5.0163	-5.1271	-5.2401	-5.3558

TABLE A-3.
EFFECTIVE INVENTORY TIME TM FOR EXPOSURE TIME 2.700 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	3.8287	3.7530	3.6900	3.6097	3.5818
-2.60	-2.60	3.5183	3.4505	3.3888	3.3293	3.2717
-2.40	-2.40	3.3588	3.2961	3.2398	3.1858	3.1328
-2.20	-2.20	3.1925	3.1397	3.0886	3.0391	2.9911
-2.00	-2.00	3.0288	2.9811	2.9389	2.8902	2.8468
-1.90	-1.90	2.9862	2.9010	2.8572	2.8188	2.7736
-1.80	-1.80	2.8631	2.8203	2.7789	2.7387	2.6997
-1.70	-1.70	2.7795	2.7392	2.7000	2.6620	2.6250
-1.60	-1.60	2.6955	2.6578	2.6208	2.5886	2.5897
-1.50	-1.50	2.6109	2.5751	2.5403	2.5065	2.4736
-1.40	-1.40	2.5259	2.4923	2.4595	2.4278	2.3968
-1.30	-1.30	2.4408	2.4088	2.3782	2.3483	2.3193
-1.20	-1.20	2.3583	2.3288	2.2962	2.2682	2.2410
-1.10	-1.10	2.2678	2.2403	2.2135	2.1878	2.1620
-1.00	-1.00	2.1808	2.1552	2.1302	2.1050	2.0823
-0.90	-0.90	2.0932	2.0695	2.0463	2.0237	2.0017
-0.80	-0.80	2.0052	1.9832	1.9617	1.9408	1.9208
-0.70	-0.70	1.9166	1.8963	1.8765	1.8572	1.8383
-0.60	-0.60	1.8275	1.8088	1.7906	1.7728	1.7555
-0.50	-0.50	1.7379	1.7208	1.7040	1.6877	1.6718
-0.40	-0.40	1.6478	1.6321	1.6168	1.6019	1.5873
-0.30	-0.30	1.5571	1.5428	1.5289	1.5153	1.5020
-0.20	-0.20	1.4659	1.4530	1.4408	1.4280	1.4160
-0.10	-0.10	1.3742	1.3625	1.3511	1.3399	1.3290
-0.00	-0.00	1.2819	1.2718	1.2612	1.2511	1.2413
0.00	2.70	-1.4237	-1.4361	-1.4486	-1.4611	-1.4737
0.10	2.80	-1.5323	-1.5462	-1.5602	-1.5742	-1.5882
0.20	2.90	-1.6415	-1.6570	-1.6726	-1.6882	-1.7039
0.30	3.00	-1.7518	-1.7686	-1.7859	-1.8033	-1.8207
0.40	3.10	-1.8619	-1.8810	-1.9001	-1.9193	-1.9386
0.50	3.20	-1.9731	-1.9981	-2.0151	-2.0368	-2.0577
0.60	3.30	-2.0849	-2.1079	-2.1311	-2.1548	-2.1779
0.70	3.40	-2.1978	-2.2226	-2.2480	-2.2735	-2.2992
0.80	3.50	-2.3105	-2.3380	-2.3657	-2.3936	-2.4217
0.90	3.60	-2.4243	-2.4582	-2.4888	-2.5187	-2.5458
1.00	3.70	-2.5388	-2.5712	-2.6039	-2.6369	-2.6702
1.10	3.80	-2.6539	-2.6890	-2.7245	-2.7602	-2.7963
1.20	3.90	-2.7697	-2.8076	-2.8459	-2.8845	-2.9235
1.30	4.00	-2.8862	-2.9270	-2.9683	-3.0099	-3.0529
1.40	4.10	-3.0038	-3.0472	-3.0916	-3.1368	-3.1817
1.50	4.20	-3.1212	-3.1683	-3.2158	-3.2640	-3.3127
1.60	4.30	-3.2397	-3.2901	-3.3411	-3.3927	-3.4489
1.70	4.40	-3.3590	-3.4128	-3.4673	-3.5225	-3.5783
1.80	4.50	-3.4789	-3.5363	-3.5948	-3.6538	-3.7131
1.90	4.60	-3.5995	-3.6606	-3.7226	-3.7858	-3.8491
2.00	4.70	-3.7208	-3.7858	-3.8517	-3.9186	-3.9868
2.20	4.90	-3.9656	-4.0388	-4.1130	-4.1885	-4.2651
2.40	5.10	-4.2133	-4.2951	-4.3788	-4.4630	-4.5491
2.60	5.30	-4.4638	-4.5550	-4.6478	-4.7423	-4.8395
3.00	5.70	-4.9738	-5.0858	-5.1998	-5.3156	-5.4382

TABLE A-3.
EFFECTIVE INVENTORY TIME TH FOR EXPOSURE TIME 2.800 YEARS

*****INTEREST RATE *****						
TI	TR	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	3.8665	3.7891	3.7145	3.6427	3.5738
-2.60	-2.60	3.5530	3.4876	3.4244	3.3635	3.3046
-2.40	-2.40	3.3935	3.3337	3.2760	3.2202	3.1662
-2.20	-2.20	3.2321	3.1778	3.1253	3.0744	3.0253
-2.00	-2.00	3.0689	3.0197	2.9722	2.9262	2.8816
-1.90	-1.90	2.9864	2.9399	2.8948	2.8511	2.8087
-1.80	-1.80	2.9036	2.8595	2.8167	2.7753	2.7351
-1.70	-1.70	2.8207	2.7786	2.7381	2.6989	2.6608
-1.60	-1.60	2.7368	2.6971	2.6589	2.6218	2.5859
-1.50	-1.50	2.6521	2.6151	2.5790	2.5441	2.5101
-1.40	-1.40	2.5673	2.5325	2.4986	2.4657	2.4337
-1.30	-1.30	2.4821	2.4493	2.4175	2.3866	2.3565
-1.20	-1.20	2.3963	2.3656	2.3358	2.3068	2.2786
-1.10	-1.10	2.3100	2.2813	2.2535	2.2263	2.1999
-1.00	-1.00	2.2232	2.1965	2.1705	2.1452	2.1205
-0.90	-0.90	2.1359	2.1111	2.0869	2.0633	2.0403
-0.80	-0.80	2.0481	2.0250	2.0026	1.9807	1.9594
-0.70	-0.70	1.9597	1.9384	1.9177	1.8974	1.8777
-0.60	-0.60	1.8709	1.8513	1.8321	1.8134	1.7952
-0.50	-0.50	1.7816	1.7635	1.7459	1.7287	1.7119
-0.40	-0.40	1.6917	1.6751	1.6590	1.6432	1.6278
-0.30	-0.30	1.6013	1.5862	1.5714	1.5570	1.5429
-0.20	-0.20	1.5103	1.4966	1.4832	1.4700	1.4571
-0.10	-0.10	1.4189	1.4064	1.3942	1.3823	1.3707
-0.00	-0.00	1.3269	1.3156	1.3046	1.2939	1.2833
0.00	2.80	-1.4793	-1.4928	-1.5062	-1.5197	-1.5333
0.10	2.90	-1.5893	-1.6032	-1.6182	-1.6332	-1.6485
0.20	3.00	-1.6979	-1.7145	-1.7311	-1.7487	-1.7667
0.30	3.10	-1.8081	-1.8264	-1.8449	-1.8635	-1.8821
0.40	3.20	-1.9180	-1.9392	-1.9595	-1.9800	-2.0005
0.50	3.30	-2.0298	-2.0527	-2.0751	-2.0976	-2.1203
0.60	3.40	-2.1426	-2.1669	-2.1915	-2.2162	-2.2410
0.70	3.50	-2.2558	-2.2820	-2.3088	-2.3358	-2.3630
0.80	3.60	-2.3689	-2.3978	-2.4270	-2.4564	-2.4861
0.90	3.70	-2.4830	-2.5144	-2.5461	-2.5781	-2.6104
1.00	3.80	-2.5978	-2.6319	-2.6662	-2.7009	-2.7359
1.10	3.90	-2.7133	-2.7501	-2.7872	-2.8247	-2.8625
1.20	4.00	-2.8298	-2.8691	-2.9091	-2.9496	-2.9908
1.30	4.10	-2.9463	-2.9889	-3.0320	-3.0755	-3.1195
1.40	4.20	-3.0638	-3.1095	-3.1558	-3.2026	-3.2499
1.50	4.30	-3.1820	-3.2310	-3.2805	-3.3307	-3.3815
1.60	4.40	-3.3009	-3.3532	-3.4063	-3.4600	-3.5143
1.70	4.50	-3.4204	-3.4763	-3.5320	-3.5894	-3.6485
1.80	4.60	-3.5407	-3.6003	-3.6607	-3.7219	-3.7839
1.90	4.70	-3.6617	-3.7251	-3.7893	-3.8545	-3.9206
2.00	4.80	-3.7834	-3.8507	-3.9190	-3.9883	-4.0586
2.20	5.00	-4.0289	-4.1045	-4.1813	-4.2594	-4.3387
2.40	5.20	-4.2773	-4.3618	-4.4477	-4.5351	-4.6241
2.60	5.40	-4.5286	-4.6226	-4.7183	-4.8157	-4.9150
3.00	5.80	-5.0401	-5.1548	-5.2720	-5.3916	-5.5137

TABLE A-3.
EFFECTIVE INVENTORY TIME IN FOR EXPOSURE TIME 2.900 YEARS

*****INTEREST RATE IV*****

TL	IR	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	3.9041	3.8250	3.7459	3.6755	3.6044
-2.60	-2.60	3.5915	3.5245	3.4598	3.3974	3.3372
-2.40	-2.40	3.4324	3.3711	3.3120	3.2548	3.1995
-2.20	-2.20	3.2715	3.2157	3.1612	3.1096	3.0592
-2.00	-2.00	3.1086	3.0591	3.0093	2.9620	2.9161
-1.90	-1.90	3.0265	2.9786	2.9321	2.8872	2.8436
-1.80	-1.80	2.9439	2.8984	2.8544	2.8117	2.7703
-1.70	-1.70	2.8608	2.8178	2.7761	2.7356	2.6964
-1.60	-1.60	2.7772	2.7366	2.6971	2.6589	2.6217
-1.50	-1.50	2.6932	2.6549	2.6176	2.5814	2.5463
-1.40	-1.40	2.6086	2.5725	2.5374	2.5033	2.4702
-1.30	-1.30	2.5236	2.4896	2.4566	2.4246	2.3934
-1.20	-1.20	2.4380	2.4062	2.3752	2.3451	2.3159
-1.10	-1.10	2.3520	2.3222	2.2932	2.2650	2.2376
-1.00	-1.00	2.2654	2.2376	2.2105	2.1842	2.1585
-0.90	-0.90	2.1784	2.1525	2.1272	2.1026	2.0787
-0.80	-0.80	2.0908	2.0667	2.0433	2.0204	1.9981
-0.70	-0.70	2.0028	1.9804	1.9587	1.9375	1.9164
-0.60	-0.60	1.9142	1.8935	1.8734	1.8538	1.8347
-0.50	-0.50	1.8251	1.8060	1.7875	1.7694	1.7518
-0.40	-0.40	1.7354	1.7180	1.7009	1.6843	1.6681
-0.30	-0.30	1.6453	1.6293	1.6137	1.5984	1.5836
-0.20	-0.20	1.5546	1.5400	1.5258	1.5118	1.4982
-0.10	-0.10	1.4634	1.4501	1.4372	1.4245	1.4121
-0.00	-0.00	1.3717	1.3596	1.3479	1.3364	1.3252
0.00	2.90	-1.5352	-1.5497	-1.5642	-1.5787	-1.5934
0.10	3.00	-1.6445	-1.6605	-1.6766	-1.6928	-1.7091
0.20	3.10	-1.7544	-1.7721	-1.7900	-1.8079	-1.8259
0.30	3.20	-1.8650	-1.8845	-1.9042	-1.9240	-1.9439
0.40	3.30	-1.9761	-1.9976	-2.0193	-2.0411	-2.0630
0.50	3.40	-2.0880	-2.1115	-2.1353	-2.1592	-2.1832
0.60	3.50	-2.2005	-2.2262	-2.2522	-2.2783	-2.3046
0.70	3.60	-2.3136	-2.3417	-2.3699	-2.3984	-2.4272
0.80	3.70	-2.4274	-2.4579	-2.4886	-2.5196	-2.5509
0.90	3.80	-2.5419	-2.5749	-2.6082	-2.6419	-2.6758
1.00	3.90	-2.6571	-2.6928	-2.7288	-2.7652	-2.8019
1.10	4.00	-2.7729	-2.8114	-2.8503	-2.8895	-2.9292
1.20	4.10	-2.8894	-2.9308	-2.9727	-3.0150	-3.0577
1.30	4.20	-3.0066	-3.0510	-3.0960	-3.1415	-3.1875
1.40	4.30	-3.1244	-3.1721	-3.2203	-3.2691	-3.3185
1.50	4.40	-3.2430	-3.2940	-3.3456	-3.3978	-3.4508
1.60	4.50	-3.3622	-3.4167	-3.4718	-3.5277	-3.5843
1.70	4.60	-3.4822	-3.5402	-3.5990	-3.6587	-3.7191
1.80	4.70	-3.6028	-3.6646	-3.7272	-3.7907	-3.8552
1.90	4.80	-3.7241	-3.7898	-3.8564	-3.9240	-3.9926
2.00	4.90	-3.8462	-3.9159	-3.9866	-4.0584	-4.1313
2.20	5.10	-4.0925	-4.1706	-4.2500	-4.3307	-4.4127
2.40	5.30	-4.3416	-4.4287	-4.5174	-4.6077	-4.6996
2.60	5.50	-4.5937	-4.6904	-4.7891	-4.8895	-4.9919
3.00	5.90	-5.1067	-5.2246	-5.3450	-5.4680	-5.5936

TABLE A-3.
EFFECTIVE INVENTORY TIME FOR EXPOSURE TIME 3,000 YEARS

*****INVENTORY FACTORS*****

T1	T2	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	3.9816	3.8609	3.7830	3.7082	3.6360
-2.60	-2.60	3.6298	3.5612	3.4951	3.4312	3.3696
-2.20	-2.20	3.2717	3.2088	3.1477	3.0892	3.0325
-1.80	-1.80	2.9107	2.8535	2.7981	2.7446	2.6929
-1.40	-1.40	2.5488	2.4968	2.4462	2.3975	2.3508
-1.00	-1.00	2.1865	2.1371	2.0897	2.0439	2.0002
-0.60	-0.60	1.8241	1.7772	1.7319	1.6879	1.6452
-0.20	-0.20	1.4612	1.4168	1.3738	1.3321	1.2917
0.20	0.20	1.0979	1.0559	1.0152	0.9757	0.9374
0.60	0.60	0.7341	0.6948	0.6569	0.6204	0.5852
1.00	1.00	0.3698	0.3328	0.2971	0.2627	0.2296
1.40	1.40	0.0058	0.0024	0.0001	-0.0028	-0.0061
1.80	1.80	-0.3589	-0.3238	-0.2901	-0.2577	-0.2266
2.20	2.20	-0.7179	-0.6848	-0.6527	-0.6215	-0.5912
2.60	2.60	-1.0769	-1.0458	-1.0157	-0.9864	-0.9579
3.00	3.00	-1.4359	-1.4068	-1.3787	-1.3514	-1.3248
3.40	3.40	-1.7949	-1.7678	-1.7417	-1.7164	-1.6917
3.80	3.80	-2.1539	-2.1288	-2.1047	-2.0814	-2.0587
4.20	4.20	-2.5129	-2.4888	-2.4657	-2.4434	-2.4217
4.60	4.60	-2.8719	-2.8488	-2.8267	-2.8054	-2.7847
5.00	5.00	-3.2309	-3.2088	-3.1877	-3.1674	-3.1477
5.40	5.40	-3.5899	-3.5688	-3.5487	-3.5294	-3.5107
5.80	5.80	-3.9489	-3.9288	-3.9097	-3.8914	-3.8737
6.20	6.20	-4.3079	-4.2888	-4.2707	-4.2534	-4.2367
6.60	6.60	-4.6669	-4.6488	-4.6317	-4.6154	-4.5997
7.00	7.00	-5.0259	-5.0088	-4.9927	-4.9774	-4.9627
7.40	7.40	-5.3849	-5.3688	-5.3537	-5.3394	-5.3257
7.80	7.80	-5.7439	-5.7288	-5.7147	-5.7014	-5.6887
8.20	8.20	-6.1029	-6.0888	-6.0757	-6.0634	-6.0517
8.60	8.60	-6.4619	-6.4488	-6.4367	-6.4254	-6.4147
9.00	9.00	-6.8209	-6.8088	-6.7977	-6.7874	-6.7777
9.40	9.40	-7.1799	-7.1688	-7.1587	-7.1494	-7.1407
9.80	9.80	-7.5389	-7.5288	-7.5197	-7.5114	-7.5037
10.20	10.20	-7.8979	-7.8888	-7.8807	-7.8734	-7.8667
10.60	10.60	-8.2569	-8.2488	-8.2417	-8.2354	-8.2297
11.00	11.00	-8.6159	-8.6088	-8.6027	-8.5974	-8.5927
11.40	11.40	-8.9749	-8.9688	-8.9637	-8.9594	-8.9557
11.80	11.80	-9.3339	-9.3288	-9.3247	-9.3214	-9.3187
12.20	12.20	-9.6929	-9.6888	-9.6857	-9.6834	-9.6817
12.60	12.60	-10.0519	-10.0488	-10.0467	-10.0454	-10.0447
13.00	13.00	-10.4109	-10.4088	-10.4077	-10.4074	-10.4077

TABLE A-3.
EFFECTIVE INVENTORY TIME TH FOR EXPOSURE TIME 3.100 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	3.9789	3.8964	3.8170	3.7406	3.6671
-2.60	-2.60	3.6680	3.5978	3.5301	3.4648	3.4018
-2.40	-2.40	3.5099	3.4455	3.3833	3.3233	3.2654
-2.20	-2.20	3.3478	3.2910	3.2343	3.1794	3.1263
-2.00	-2.00	3.1879	3.1345	3.0829	3.0329	2.9846
-1.90	-1.90	3.1063	3.0555	3.0063	2.9587	2.9127
-1.80	-1.80	3.0241	2.9759	2.9292	2.8839	2.8401
-1.70	-1.70	2.9415	2.8957	2.8514	2.8085	2.7668
-1.60	-1.60	2.8584	2.8151	2.7730	2.7323	2.6928
-1.50	-1.50	2.7748	2.7338	2.6941	2.6555	2.6181
-1.40	-1.40	2.6907	2.6520	2.6145	2.5781	2.5427
-1.30	-1.30	2.6062	2.5697	2.5343	2.5000	2.4666
-1.20	-1.20	2.5211	2.4868	2.4535	2.4212	2.3897
-1.10	-1.10	2.4355	2.4034	2.3721	2.3417	2.3122
-1.00	-1.00	2.3495	2.3193	2.2900	2.2615	2.2338
-0.90	-0.90	2.2629	2.2347	2.2073	2.1807	2.1547
-0.80	-0.80	2.1758	2.1496	2.1240	2.0991	2.0749
-0.70	-0.70	2.0883	2.0638	2.0400	2.0169	1.9943
-0.60	-0.60	2.0002	1.9775	1.9554	1.9339	1.9129
-0.50	-0.50	1.9116	1.8906	1.8701	1.8502	1.8307
-0.40	-0.40	1.8225	1.8031	1.7842	1.7658	1.7478
-0.30	-0.30	1.7328	1.7150	1.6976	1.6806	1.6641
-0.20	-0.20	1.6427	1.6263	1.6103	1.5947	1.5795
-0.10	-0.10	1.5520	1.5370	1.5224	1.5081	1.4942
-0.00	-0.00	1.4607	1.4471	1.4337	1.4207	1.4080
0.00	3.10	-1.6477	-1.6643	-1.6810	-1.6978	-1.7146
0.10	3.20	-1.7576	-1.7759	-1.7944	-1.8129	-1.8315
0.20	3.30	-1.8682	-1.8883	-1.9086	-1.9290	-1.9495
0.30	3.40	-1.9794	-2.0015	-2.0237	-2.0461	-2.0687
0.40	3.50	-2.0912	-2.1154	-2.1398	-2.1643	-2.1890
0.50	3.60	-2.2038	-2.2301	-2.2567	-2.2834	-2.3104
0.60	3.70	-2.3169	-2.3456	-2.3745	-2.4036	-2.4330
0.70	3.80	-2.4304	-2.4619	-2.4932	-2.5249	-2.5568
0.80	3.90	-2.5453	-2.5789	-2.6129	-2.6472	-2.6818
0.90	4.00	-2.6604	-2.6968	-2.7334	-2.7705	-2.8079
1.00	4.10	-2.7763	-2.8154	-2.8549	-2.8949	-2.9353
1.10	4.20	-2.8928	-2.9349	-2.9774	-3.0204	-3.0639
1.20	4.30	-3.0100	-3.0551	-3.1008	-3.1470	-3.1937
1.30	4.40	-3.1279	-3.1762	-3.2251	-3.2746	-3.3248
1.40	4.50	-3.2464	-3.2981	-3.3504	-3.4034	-3.4571
1.50	4.60	-3.3657	-3.4208	-3.4767	-3.5333	-3.5907
1.60	4.70	-3.4857	-3.5444	-3.6039	-3.6643	-3.7255
1.70	4.80	-3.6033	-3.6688	-3.7322	-3.7965	-3.8617
1.80	4.90	-3.7277	-3.7940	-3.8614	-3.9297	-3.9991
1.90	5.00	-3.8498	-3.9201	-3.9916	-4.0642	-4.1379
2.00	5.10	-3.9725	-4.0471	-4.1228	-4.1998	-4.2780
2.20	5.30	-4.2203	-4.3036	-4.3883	-4.4745	-4.5623
2.40	5.50	-4.4709	-4.5636	-4.6579	-4.7541	-4.8520
2.60	5.70	-4.7245	-4.8271	-4.9317	-5.0385	-5.1473
3.00	6.10	-5.2406	-5.3650	-5.4921	-5.6221	-5.7550

TABLE A-3.
EFFECTIVE INVENTORY TIME TH FOR EXPOSURE TIME 3.200 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	4.0161	3.9318	3.8508	3.7729	3.6979
-2.60	-2.60	3.7061	3.6342	3.5650	3.4983	3.4339
-2.40	-2.40	3.5488	3.4824	3.4188	3.3573	3.2980
-2.20	-2.20	3.3888	3.3285	3.2702	3.2140	3.1596
-2.00	-2.00	3.2273	3.1725	3.1194	3.0681	3.0185
-1.90	-1.90	3.1459	3.0937	3.0431	2.9942	2.9469
-1.80	-1.80	3.0640	3.0143	2.9663	2.9197	2.8746
-1.70	-1.70	2.9816	2.9344	2.8888	2.8446	2.8017
-1.60	-1.60	2.8987	2.8540	2.8107	2.7688	2.7280
-1.50	-1.50	2.8154	2.7731	2.7321	2.6923	2.6537
-1.40	-1.40	2.7315	2.6916	2.6528	2.6151	2.5786
-1.30	-1.30	2.6472	2.6095	2.5729	2.5374	2.5028
-1.20	-1.20	2.5624	2.5269	2.4924	2.4589	2.4263
-1.10	-1.10	2.4771	2.4437	2.4112	2.3797	2.3491
-1.00	-1.00	2.3913	2.3599	2.3295	2.2999	2.2711
-0.90	-0.90	2.3049	2.2756	2.2471	2.2194	2.1924
-0.80	-0.80	2.2181	2.1907	2.1641	2.1381	2.1129
-0.70	-0.70	2.1308	2.1053	2.0804	2.0562	2.0327
-0.60	-0.60	2.0430	2.0192	1.9961	1.9736	1.9516
-0.50	-0.50	1.9546	1.9326	1.9111	1.8902	1.8699
-0.40	-0.40	1.8657	1.8454	1.8255	1.8062	1.7873
-0.30	-0.30	1.7763	1.7575	1.7392	1.7214	1.7039
-0.20	-0.20	1.6864	1.6691	1.6523	1.6358	1.6198
-0.10	-0.10	1.5960	1.5801	1.5647	1.5495	1.5344
-0.00	-0.00	1.5050	1.4905	1.4764	1.4625	1.4490
0.00	3.20	-1.7043	-1.7220	-1.7398	-1.7578	-1.7759
0.10	3.30	-1.8145	-1.8340	-1.8537	-1.8734	-1.8933
0.20	3.40	-1.9254	-1.9468	-1.9684	-1.9901	-2.0120
0.30	3.50	-2.0369	-2.0604	-2.0840	-2.1077	-2.1317
0.40	3.60	-2.1491	-2.1747	-2.2005	-2.2264	-2.2526
0.50	3.70	-2.2620	-2.2898	-2.3178	-2.3461	-2.3746
0.60	3.80	-2.3755	-2.4057	-2.4361	-2.4669	-2.4979
0.70	3.90	-2.4897	-2.5224	-2.5553	-2.5886	-2.6223
0.80	4.00	-2.6045	-2.6398	-2.6755	-2.7115	-2.7478
0.90	4.10	-2.7200	-2.7581	-2.7965	-2.8354	-2.8746
1.00	4.20	-2.8362	-2.8771	-2.9185	-2.9604	-3.0027
1.10	4.30	-2.9531	-2.9970	-3.0415	-3.0864	-3.1319
1.20	4.40	-3.0706	-3.1177	-3.1653	-3.2136	-3.2624
1.30	4.50	-3.1889	-3.2392	-3.2902	-3.3418	-3.3941
1.40	4.60	-3.3078	-3.3615	-3.4160	-3.4712	-3.5271
1.50	4.70	-3.4274	-3.4847	-3.5428	-3.6016	-3.6613
1.60	4.80	-3.5477	-3.6087	-3.6705	-3.7332	-3.7969
1.70	4.90	-3.6688	-3.7335	-3.7992	-3.8660	-3.9337
1.80	5.00	-3.7905	-3.8592	-3.9290	-3.9999	-4.0718
1.90	5.10	-3.9129	-3.9858	-4.0597	-4.1349	-4.2113
2.00	5.20	-4.0361	-4.1131	-4.1915	-4.2711	-4.3521
2.20	5.40	-4.2846	-4.3705	-4.4580	-4.5471	-4.6378
2.40	5.60	-4.5360	-4.6314	-4.7287	-4.8279	-4.9290
2.60	5.80	-4.7903	-4.8959	-5.0036	-5.1136	-5.2257
3.00	6.20	-5.3080	-5.4357	-5.5663	-5.6999	-5.8365

TABLE A-3.
EFFECTIVE INVENTORY TIME TH FOR EXPOSURE TIME 3.300 YEARS

*****INTEREST RATE IVS*****

PL	PP	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	4.0531	3.9671	3.8845	3.8050	3.7285
-2.60	-2.60	3.7840	3.6705	3.5997	3.5315	3.4657
-2.40	-2.40	3.5867	3.5191	3.4540	3.3912	3.3305
-2.20	-2.20	3.4276	3.3657	3.3060	3.2484	3.1927
-2.00	-2.00	3.2666	3.2102	3.1558	3.1031	3.0522
-1.90	-1.90	3.1854	3.1317	3.0794	3.0285	2.9809
-1.80	-1.80	3.1037	3.0526	3.0032	2.9553	2.9090
-1.70	-1.70	3.0216	2.9730	2.9260	2.8805	2.8364
-1.60	-1.60	2.9389	2.8926	2.8482	2.8050	2.7631
-1.50	-1.50	2.8558	2.8121	2.7694	2.7284	2.6890
-1.40	-1.40	2.7722	2.7309	2.6908	2.6520	2.6143
-1.30	-1.30	2.6881	2.6491	2.6112	2.5745	2.5389
-1.20	-1.20	2.6035	2.5667	2.5310	2.4964	2.4627
-1.10	-1.10	2.5184	2.4838	2.4502	2.4175	2.3858
-1.00	-1.00	2.4329	2.4003	2.3687	2.3380	2.3082
-0.90	-0.90	2.3468	2.3163	2.2867	2.2578	2.2298
-0.80	-0.80	2.2602	2.2317	2.2039	2.1770	2.1507
-0.70	-0.70	2.1731	2.1465	2.1206	2.0954	2.0704
-0.60	-0.60	2.0856	2.0607	2.0366	2.0131	1.9902
-0.50	-0.50	1.9974	1.9744	1.9519	1.9301	1.9087
-0.40	-0.40	1.9088	1.8874	1.8666	1.8463	1.8265
-0.30	-0.30	1.8197	1.7999	1.7806	1.7619	1.7436
-0.20	-0.20	1.7300	1.7118	1.6940	1.6767	1.6598
-0.10	-0.10	1.6399	1.6231	1.6067	1.5908	1.5752
-0.00	-0.00	1.5491	1.5338	1.5188	1.5041	1.4894
0.00	3.30	-1.7610	-1.7800	-1.7990	-1.8182	-1.8375
0.10	3.40	-1.8716	-1.8924	-1.9133	-1.9344	-1.9556
0.20	3.50	-1.9829	-2.0056	-2.0285	-2.0515	-2.0748
0.30	3.60	-2.0947	-2.1195	-2.1445	-2.1697	-2.1951
0.40	3.70	-2.2073	-2.2343	-2.2615	-2.2889	-2.3166
0.50	3.80	-2.3205	-2.3498	-2.3793	-2.4092	-2.4393
0.60	3.90	-2.4343	-2.4661	-2.4987	-2.5305	-2.5631
0.70	4.00	-2.5488	-2.5831	-2.6178	-2.6528	-2.6881
0.80	4.10	-2.6640	-2.7010	-2.7384	-2.7762	-2.8144
0.90	4.20	-2.7799	-2.8197	-2.8599	-2.9006	-2.9418
1.00	4.30	-2.8964	-2.9392	-2.9824	-3.0262	-3.0704
1.10	4.40	-3.0136	-3.0595	-3.1059	-3.1528	-3.2003
1.20	4.50	-3.1315	-3.1806	-3.2302	-3.2805	-3.3315
1.30	4.60	-3.2501	-3.3025	-3.3556	-3.4093	-3.4638
1.40	4.70	-3.3694	-3.4253	-3.4819	-3.5393	-3.5975
1.50	4.80	-3.4894	-3.5489	-3.6092	-3.6704	-3.7324
1.60	4.90	-3.6101	-3.6733	-3.7374	-3.8026	-3.8686
1.70	5.00	-3.7315	-3.7986	-3.8667	-3.9359	-4.0062
1.80	5.10	-3.8536	-3.9247	-3.9970	-4.0704	-4.1450
1.90	5.20	-3.9764	-4.0517	-4.1282	-4.2061	-4.2852
2.00	5.30	-4.0999	-4.1795	-4.2605	-4.3429	-4.4267
2.20	5.50	-4.3491	-4.4378	-4.5281	-4.6201	-4.7139
2.40	5.70	-4.6013	-4.6996	-4.7999	-4.9022	-5.0064
2.60	5.90	-4.8564	-4.9650	-5.0759	-5.1891	-5.3047
3.00	6.30	-5.3756	-5.5067	-5.6404	-5.7781	-5.9186

TABLE A-3.
EFFECTIVE INVENTORY TIME T_E FOR EXPOSURE TIME 3.000 YEARS

*****INTEREST RATE IVS*****

T_L	T_R	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	4.0900	4.0023	3.9180	3.8369	3.7590
-2.60	-2.60	3.7818	3.7066	3.6343	3.5645	3.4973
-2.40	-2.40	3.6249	3.5557	3.4891	3.4248	3.3627
-2.20	-2.20	3.4662	3.4028	3.3416	3.2826	3.2255
-2.00	-2.00	3.3057	3.2478	3.1919	3.1379	3.0857
-1.90	-1.90	3.2247	3.1695	3.1162	3.0646	3.0147
-1.80	-1.80	3.1433	3.0907	3.0399	2.9907	2.9431
-1.70	-1.70	3.0614	3.0114	2.9630	2.9162	2.8709
-1.60	-1.60	2.9790	2.9315	2.8855	2.8410	2.7979
-1.50	-1.50	2.8961	2.8510	2.8074	2.7651	2.7242
-1.40	-1.40	2.8127	2.7700	2.7287	2.6886	2.6498
-1.30	-1.30	2.7288	2.6885	2.6494	2.6115	2.5747
-1.20	-1.20	2.6445	2.6064	2.5695	2.5337	2.4989
-1.10	-1.10	2.5597	2.5239	2.4890	2.4551	2.4223
-1.00	-1.00	2.4743	2.4406	2.4078	2.3760	2.3450
-0.90	-0.90	2.3885	2.3568	2.3260	2.2961	2.2670
-0.80	-0.80	2.3022	2.2725	2.2436	2.2155	2.1883
-0.70	-0.70	2.2153	2.1876	2.1606	2.1343	2.1087
-0.60	-0.60	2.1280	2.1021	2.0769	2.0523	2.0284
-0.50	-0.50	2.0401	2.0160	1.9925	1.9697	1.9474
-0.40	-0.40	1.9518	1.9293	1.9075	1.8863	1.8656
-0.30	-0.30	1.8629	1.8421	1.8219	1.8022	1.7830
-0.20	-0.20	1.7735	1.7543	1.7356	1.7173	1.6995
-0.10	-0.10	1.6835	1.6658	1.6486	1.6318	1.6153
-0.00	-0.00	1.5931	1.5768	1.5609	1.5454	1.5303
0.00	3.40	-1.8181	-1.8382	-1.8585	-1.8789	-1.8995
0.10	3.50	-1.9290	-1.9510	-1.9732	-1.9956	-2.0182
0.20	3.60	-2.0405	-2.0646	-2.0889	-2.1133	-2.1380
0.30	3.70	-2.1527	-2.1790	-2.2054	-2.2321	-2.2590
0.40	3.80	-2.2656	-2.2941	-2.3228	-2.3518	-2.3811
0.50	3.90	-2.3792	-2.4100	-2.4412	-2.4726	-2.5043
0.60	4.00	-2.4933	-2.5267	-2.5604	-2.5944	-2.6288
0.70	4.10	-2.6082	-2.6442	-2.6806	-2.7173	-2.7545
0.80	4.20	-2.7237	-2.7625	-2.8017	-2.8413	-2.8813
0.90	4.30	-2.8400	-2.8816	-2.9237	-2.9663	-3.0094
1.00	4.40	-2.9568	-3.0015	-3.0467	-3.0924	-3.1387
1.10	4.50	-3.0744	-3.1222	-3.1706	-3.2196	-3.2692
1.20	4.60	-3.1927	-3.2437	-3.2955	-3.3479	-3.4010
1.30	4.70	-3.3116	-3.3661	-3.4213	-3.4773	-3.5340
1.40	4.80	-3.4313	-3.4893	-3.5481	-3.6078	-3.6684
1.50	4.90	-3.5516	-3.6133	-3.6759	-3.7395	-3.8040
1.60	5.00	-3.6727	-3.7382	-3.8047	-3.8723	-3.9409
1.70	5.10	-3.7944	-3.8639	-3.9345	-4.0062	-4.0791
1.80	5.20	-3.9169	-3.9905	-4.0653	-4.1413	-4.2186
1.90	5.30	-4.0401	-4.1179	-4.1971	-4.2776	-4.3595
2.00	5.40	-4.1640	-4.2462	-4.3290	-4.4131	-4.5018
2.20	5.60	-4.4139	-4.5054	-4.5986	-4.6936	-4.7903
2.40	5.80	-4.6668	-4.7681	-4.8715	-4.9769	-5.0844
2.60	6.00	-4.9227	-5.0345	-5.1486	-5.2651	-5.3842
3.00	6.40	-5.4435	-5.5780	-5.7154	-5.8568	-6.0011

TABLE A-3.
EFFECTIVE INVENTORY TIME TH FOR EXPOSURE TIME 3.500 YEARS

*****IN*PRST RATE IVS*****

TL	TR	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	4.1268	4.0373	3.9513	3.8687	3.7893
-2.60	-2.60	3.8194	3.7426	3.6686	3.5974	3.5288
-2.20	-2.20	3.4630	3.3922	3.3240	3.2582	3.1944
-2.20	-2.20	3.5048	3.4358	3.3771	3.3166	3.2542
-2.00	-2.00	3.3447	3.2853	3.2279	3.1725	3.1190
-1.90	-1.90	3.2639	3.2072	3.1525	3.0995	3.0484
-1.80	-1.80	3.1827	3.1287	3.0764	3.0259	2.9771
-1.70	-1.70	3.1010	3.0496	2.9998	2.9517	2.9051
-1.60	-1.60	3.0188	2.9699	2.9226	2.8768	2.8324
-1.50	-1.50	2.9362	2.8898	2.8448	2.8013	2.7591
-1.40	-1.40	2.8531	2.8090	2.7664	2.7251	2.6850
-1.30	-1.30	2.7694	2.7278	2.6874	2.6482	2.6103
-1.20	-1.20	2.6853	2.6459	2.6078	2.5707	2.5348
-1.10	-1.10	2.6007	2.5636	2.5275	2.4925	2.4586
-1.00	-1.00	2.5156	2.4806	2.4467	2.4137	2.3817
-0.90	-0.90	2.4300	2.3971	2.3652	2.3341	2.3040
-0.80	-0.80	2.3439	2.3131	2.2831	2.2539	2.2256
-0.70	-0.70	2.2574	2.2284	2.2003	2.1730	2.1464
-0.60	-0.60	2.1707	2.1432	2.1169	2.0914	2.0665
-0.50	-0.50	2.0827	2.0574	2.0329	2.0090	1.9858
-0.40	-0.40	1.9945	1.9711	1.9482	1.9260	1.9043
-0.30	-0.30	1.9059	1.8841	1.8629	1.8422	1.8221
-0.20	-0.20	1.8167	1.7966	1.7769	1.7577	1.7391
-0.10	-0.10	1.7271	1.7084	1.6902	1.6725	1.6552
-0.00	-0.00	1.6369	1.6197	1.6029	1.5866	1.5706
0.00	3.50	-1.8753	-1.8467	-1.9183	-1.9401	-1.9620
0.10	3.60	-1.9865	-2.0099	-2.0335	-2.0573	-2.0812
0.20	3.70	-2.0984	-2.1239	-2.1496	-2.1755	-2.2016
0.30	3.80	-2.2110	-2.2387	-2.2666	-2.2948	-2.3232
0.40	3.90	-2.3242	-2.3542	-2.3845	-2.4151	-2.4459
0.50	4.00	-2.4381	-2.4705	-2.5033	-2.5364	-2.5698
0.60	4.10	-2.5526	-2.5876	-2.6230	-2.6588	-2.6949
0.70	4.20	-2.6678	-2.7055	-2.7437	-2.7822	-2.8212
0.80	4.30	-2.7837	-2.8243	-2.8653	-2.9067	-2.9487
0.90	4.40	-2.9003	-2.9438	-2.9878	-3.0323	-3.0774
1.00	4.50	-3.0175	-3.0641	-3.1113	-3.1590	-3.2074
1.10	4.60	-3.1354	-3.1852	-3.2357	-3.2868	-3.3386
1.20	4.70	-3.2540	-3.3072	-3.3611	-3.4157	-3.4710
1.30	4.80	-3.3734	-3.4300	-3.4874	-3.5457	-3.6047
1.40	4.90	-3.4934	-3.5536	-3.6147	-3.6768	-3.7397
1.50	5.00	-3.6141	-3.6781	-3.7431	-3.8090	-3.8760
1.60	5.10	-3.7355	-3.8034	-3.8724	-3.9424	-4.0136
1.70	5.20	-3.8576	-3.9295	-4.0027	-4.0770	-4.1525
1.80	5.30	-3.9804	-4.0566	-4.1340	-4.2127	-4.2928
1.90	5.40	-4.1040	-4.1844	-4.2663	-4.3496	-4.4344
2.00	5.50	-4.2283	-4.3132	-4.3996	-4.4877	-4.5773
2.20	5.70	-4.4790	-4.5733	-4.6694	-4.7674	-4.8673
2.40	5.90	-4.7327	-4.8370	-4.9434	-5.0520	-5.1629
2.60	6.10	-4.9893	-5.1042	-5.2216	-5.3416	-5.4642
3.00	6.50	-5.5117	-5.6497	-5.7911	-5.9354	-6.0842

TABLE A-3.
EFFECTIVE INVENTORY TIME TH FOR EXPOSURE TIME 3.600 YEARS

*****INTEREST RATE IVS*****

TI	TR	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	4.1634	4.0721	3.9844	3.9003	3.8193
-2.60	-2.60	3.8569	3.7783	3.7028	3.6301	3.5600
-2.40	-2.40	3.7009	3.6285	3.5587	3.4914	3.4265
-2.20	-2.20	3.5431	3.4765	3.4123	3.3504	3.2906
-2.00	-2.00	3.3835	3.3225	3.2637	3.2069	3.1521
-1.90	-1.90	3.3030	3.2448	3.1885	3.1342	3.0818
-1.80	-1.80	3.2220	3.1664	3.1128	3.0609	3.0108
-1.70	-1.70	3.1405	3.0876	3.0365	2.9870	2.9391
-1.60	-1.60	3.0586	3.0082	2.9595	2.9124	2.8668
-1.50	-1.50	2.9762	2.9283	2.8820	2.8372	2.7938
-1.40	-1.40	2.8932	2.8478	2.8039	2.7613	2.7201
-1.30	-1.30	2.8099	2.7662	2.7252	2.6848	2.6456
-1.20	-1.20	2.7260	2.6853	2.6458	2.6076	2.5705
-1.10	-1.10	2.6416	2.6032	2.5659	2.5297	2.4946
-1.00	-1.00	2.5568	2.5205	2.4853	2.4512	2.4180
-0.90	-0.90	2.4714	2.4373	2.4041	2.3720	2.3407
-0.80	-0.80	2.3856	2.3535	2.3223	2.2921	2.2627
-0.70	-0.70	2.2992	2.2691	2.2399	2.2115	2.1839
-0.60	-0.60	2.2124	2.1842	2.1568	2.1302	2.1043
-0.50	-0.50	2.1250	2.0987	2.0731	2.0482	2.0240
-0.40	-0.40	2.0371	2.0126	1.9887	1.9655	1.9429
-0.30	-0.30	1.9487	1.9251	1.9037	1.8821	1.8610
-0.20	-0.20	1.8598	1.8386	1.8180	1.7979	1.7783
-0.10	-0.10	1.7704	1.7508	1.7317	1.7130	1.6949
-0.00	-0.00	1.6805	1.6623	1.6447	1.6274	1.6106
0.00	3.60	-1.9327	-1.9555	-1.9784	-2.0015	-2.0248
0.10	3.70	-2.0443	-2.0691	-2.0941	-2.1193	-2.1447
0.20	3.80	-2.1566	-2.1835	-2.2107	-2.2380	-2.2657
0.30	3.90	-2.2695	-2.2987	-2.3281	-2.3579	-2.3879
0.40	4.00	-2.3830	-2.4146	-2.4465	-2.4787	-2.5112
0.50	4.10	-2.4972	-2.5313	-2.5658	-2.6006	-2.6357
0.60	4.20	-2.6121	-2.6489	-2.6860	-2.7235	-2.7615
0.70	4.30	-2.7277	-2.7672	-2.8071	-2.8475	-2.8894
0.80	4.40	-2.8434	-2.8863	-2.9292	-2.9726	-3.0165
0.90	4.50	-2.9608	-3.0062	-3.0522	-3.0988	-3.1459
1.00	4.60	-3.0788	-3.1270	-3.1762	-3.2260	-3.2765
1.10	4.70	-3.1967	-3.2485	-3.3011	-3.3544	-3.4084
1.20	4.80	-3.3157	-3.3709	-3.4270	-3.4838	-3.5415
1.30	4.90	-3.4353	-3.4942	-3.5539	-3.6144	-3.6759
1.40	5.00	-3.5557	-3.6182	-3.6817	-3.7461	-3.8115
1.50	5.10	-3.6768	-3.7431	-3.8105	-3.8790	-3.9485
1.60	5.20	-3.7986	-3.8689	-3.9403	-4.0130	-4.0869
1.70	5.30	-3.9210	-3.9955	-4.0712	-4.1481	-4.2264
1.80	5.40	-4.0443	-4.1229	-4.2036	-4.2855	-4.3678
1.90	5.50	-4.1682	-4.2513	-4.3359	-4.4220	-4.5097
2.00	5.60	-4.2928	-4.3805	-4.4698	-4.5607	-4.6533
2.20	5.80	-4.5443	-4.6415	-4.7406	-4.8417	-4.9448
2.40	6.00	-4.7988	-4.9061	-5.0157	-5.1276	-5.2419
2.60	6.20	-5.0562	-5.1743	-5.2951	-5.4185	-5.5447
3.00	6.60	-5.5801	-5.7217	-5.8668	-6.0155	-6.1679

TABLE A-3.
EFFECTIVE INVENTORY TIME IN FOR EXPOSURE TIME 8.000 YEARS

*****INTEREST RATE 1%*****

TI	TR	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	4.3085	4.2099	4.1154	4.0248	3.9378
-2.60	-2.60	4.0054	3.9199	3.8379	3.7590	3.6831
-2.40	-2.40	3.8512	3.7720	3.6950	3.6226	3.5521
-2.20	-2.20	3.6951	3.6220	3.5516	3.4838	3.4185
-2.00	-2.00	3.5373	3.4700	3.4052	3.3427	3.2828
-1.90	-1.90	3.4576	3.3932	3.3311	3.2712	3.2133
-1.80	-1.80	3.3776	3.3159	3.2564	3.1990	3.1436
-1.70	-1.70	3.2970	3.2381	3.1812	3.1263	3.0737
-1.60	-1.60	3.2160	3.1597	3.1054	3.0529	3.0022
-1.50	-1.50	3.1345	3.0808	3.0290	2.9789	2.9305
-1.40	-1.40	3.0525	3.0014	2.9520	2.9043	2.8581
-1.30	-1.30	2.9701	2.9214	2.8744	2.8290	2.7849
-1.20	-1.20	2.8871	2.8409	2.7963	2.7530	2.7111
-1.10	-1.10	2.8037	2.7599	2.7175	2.6764	2.6366
-1.00	-1.00	2.7198	2.6783	2.6381	2.5991	2.5614
-0.90	-0.90	2.6354	2.5961	2.5581	2.5212	2.4854
-0.80	-0.80	2.5505	2.5134	2.4775	2.4426	2.4088
-0.70	-0.70	2.4651	2.4301	2.3962	2.3633	2.3314
-0.60	-0.60	2.3792	2.3463	2.3143	2.2833	2.2537
-0.50	-0.50	2.2928	2.2619	2.2318	2.2027	2.1743
-0.40	-0.40	2.2060	2.1769	2.1487	2.1213	2.0947
-0.30	-0.30	2.1185	2.0913	2.0649	2.0392	2.0142
-0.20	-0.20	2.0306	2.0052	1.9805	1.9564	1.9330
-0.10	-0.10	1.9422	1.9185	1.8954	1.8729	1.8511
-0.00	-0.00	1.8533	1.8312	1.8096	1.7887	1.7687
0.00	0.00	-2.1649	-2.1933	-2.2220	-2.2511	-2.2804
0.10	0.10	-2.2778	-2.3085	-2.3396	-2.3710	-2.4027
0.20	0.20	-2.3914	-2.4246	-2.4581	-2.4919	-2.5262
0.30	0.30	-2.5057	-2.5414	-2.5774	-2.6139	-2.6508
0.40	0.40	-2.6206	-2.6590	-2.6977	-2.7370	-2.7767
0.50	0.50	-2.7362	-2.7773	-2.8190	-2.8611	-2.9039
0.60	0.60	-2.8525	-2.8955	-2.9411	-2.9863	-3.0320
0.70	0.70	-2.9695	-3.0165	-3.0642	-3.1126	-3.1616
0.80	0.80	-3.0871	-3.1374	-3.1883	-3.2399	-3.2923
0.90	0.90	-3.2054	-3.2590	-3.3133	-3.3684	-3.4247
1.00	1.00	-3.3245	-3.3815	-3.4393	-3.4980	-3.5576
1.10	1.10	-3.4442	-3.5048	-3.5663	-3.6287	-3.6921
1.20	1.20	-3.5646	-3.6289	-3.6942	-3.7605	-3.8279
1.30	1.30	-3.6857	-3.7539	-3.8231	-3.8935	-3.9651
1.40	1.40	-3.8076	-3.8797	-3.9530	-4.0277	-4.1036
1.50	1.50	-3.9301	-4.0064	-4.0840	-4.1629	-4.2431
1.60	1.60	-4.0534	-4.1339	-4.2159	-4.2994	-4.3845
1.70	1.70	-4.1773	-4.2623	-4.3489	-4.4371	-4.5269
1.80	1.80	-4.3020	-4.3916	-4.4828	-4.5759	-4.6707
1.90	1.90	-4.4275	-4.5217	-4.6179	-4.7159	-4.8160
2.00	2.00	-4.5536	-4.6528	-4.7539	-4.8572	-4.9626
2.20	2.20	-4.8082	-4.9175	-5.0292	-5.1433	-5.2600
2.40	2.40	-5.0657	-5.1859	-5.3088	-5.4345	-5.5631
2.60	2.60	-5.3263	-5.4579	-5.5927	-5.7307	-5.8721
3.00	3.00	-5.8566	-6.0131	-6.1737	-6.3387	-6.5080

TABLE A-3.
EFFECTIVE INVENTORY TIME IN FOR EXPOSURE TIME 5.000 YEARS

*****INTEREST RATE 1%*****

TL	TR	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	4.6617	4.5440	4.4316	4.3242	4.2216
-2.60	-2.60	4.3669	4.2632	4.1639	4.0689	3.9779
-2.40	-2.40	4.2169	4.1199	4.0270	3.9379	3.8525
-2.20	-2.20	4.0652	3.9747	3.8879	3.8046	3.7247
-2.00	-2.00	3.9116	3.8274	3.7466	3.6691	3.5945
-1.90	-1.90	3.8382	3.7531	3.6752	3.6008	3.5294
-1.80	-1.80	3.7563	3.6702	3.6032	3.5311	3.4619
-1.70	-1.70	3.6780	3.6029	3.5307	3.4612	3.3948
-1.60	-1.60	3.5992	3.5270	3.4575	3.3908	3.3265
-1.50	-1.50	3.5199	3.4506	3.3839	3.3197	3.2578
-1.40	-1.40	3.4402	3.3737	3.3095	3.2480	3.1886
-1.30	-1.30	3.3600	3.2962	3.2344	3.1757	3.1196
-1.20	-1.20	3.2794	3.2183	3.1598	3.1027	3.0480
-1.10	-1.10	3.1982	3.1398	3.0838	3.0291	2.9767
-1.00	-1.00	3.1166	3.0609	3.0069	2.9549	2.9047
-0.90	-0.90	3.0345	2.9812	2.9297	2.8801	2.8321
-0.80	-0.80	2.9520	2.9011	2.8520	2.8046	2.7587
-0.70	-0.70	2.8689	2.8205	2.7736	2.7288	2.6847
-0.60	-0.60	2.7854	2.7393	2.6947	2.6516	2.6099
-0.50	-0.50	2.7014	2.6575	2.6151	2.5741	2.5344
-0.40	-0.40	2.6169	2.5752	2.5349	2.4959	2.4582
-0.30	-0.30	2.5319	2.4928	2.4541	2.4171	2.3813
-0.20	-0.20	2.4464	2.4089	2.3727	2.3376	2.3036
-0.10	-0.10	2.3604	2.3250	2.2906	2.2574	2.2252
-0.00	-0.00	2.2739	2.2404	2.2079	2.1765	2.1460
0.00	5.00	-2.7616	-2.8075	-2.8541	-2.9013	-2.9493
0.10	5.10	-2.8780	-2.9269	-2.9765	-3.0269	-3.0780
0.20	5.20	-2.9951	-3.0471	-3.0999	-3.1535	-3.2080
0.30	5.30	-3.1129	-3.1681	-3.2242	-3.2812	-3.3392
0.40	5.40	-3.2314	-3.2899	-3.3495	-3.4101	-3.4717
0.50	5.50	-3.3505	-3.4126	-3.4754	-3.5400	-3.6054
0.60	5.60	-3.4704	-3.5361	-3.6030	-3.6711	-3.7404
0.70	5.70	-3.5910	-3.6605	-3.7312	-3.8033	-3.8767
0.80	5.80	-3.7123	-3.7857	-3.8608	-3.9366	-4.0143
0.90	5.90	-3.8343	-3.9117	-3.9906	-4.0711	-4.1532
1.00	6.00	-3.9570	-4.0386	-4.1219	-4.2068	-4.2935
1.10	6.10	-4.0804	-4.1663	-4.2541	-4.3436	-4.4351
1.20	6.20	-4.2045	-4.2950	-4.3873	-4.4817	-4.5780
1.30	6.30	-4.3294	-4.4245	-4.5216	-4.6209	-4.7223
1.40	6.40	-4.4550	-4.5548	-4.6569	-4.7613	-4.8680
1.50	6.50	-4.5813	-4.6861	-4.7937	-4.9030	-5.0151
1.60	6.60	-4.7083	-4.8183	-4.9307	-5.0458	-5.1636
1.70	6.70	-4.8362	-4.9513	-5.0692	-5.1899	-5.3136
1.80	6.80	-4.9647	-5.0853	-5.2089	-5.3353	-5.4649
1.90	6.90	-5.0940	-5.2201	-5.3494	-5.4819	-5.6177
2.00	7.00	-5.2241	-5.3559	-5.4911	-5.6298	-5.7720
2.20	7.20	-5.4865	-5.6302	-5.7778	-5.9294	-6.0850
2.40	7.40	-5.7527	-5.9083	-6.0690	-6.2342	-6.4040
2.60	7.60	-6.0206	-6.1901	-6.3647	-6.5443	-6.7292
3.00	8.00	-6.5672	-6.7654	-6.9699	-7.1804	-7.3944

TABLE A-3.
EFFECTIVE INVENTORY TIME IN FOR EXPOSURE TIME 6.000 YEARS

*****INTEREST RATE VS*****

TL	TP	0.06	0.07	0.08	0.09	0.10
-3.00	-3.00	5.0017	4.8637	4.7325	4.6076	4.4885
-2.60	-2.60	4.7150	4.5917	4.4742	4.3622	4.2552
-2.40	-2.40	4.5691	4.4529	4.3421	4.2363	4.1352
-2.20	-2.20	4.4214	4.3122	4.2079	4.1087	4.0129
-2.00	-2.00	4.2721	4.1696	4.0716	3.9779	3.8882
-1.90	-1.90	4.1968	4.0976	4.0027	3.9119	3.8249
-1.80	-1.80	4.1210	4.0250	3.9332	3.8453	3.7611
-1.70	-1.70	4.0448	3.9520	3.8632	3.7782	3.6964
-1.60	-1.60	3.9681	3.8785	3.7927	3.7104	3.6316
-1.50	-1.50	3.8910	3.8045	3.7216	3.6421	3.5659
-1.40	-1.40	3.8135	3.7300	3.6499	3.5732	3.4995
-1.30	-1.30	3.7355	3.6550	3.5778	3.5037	3.4326
-1.20	-1.20	3.6570	3.5794	3.5050	3.4336	3.3650
-1.10	-1.10	3.5781	3.5034	3.4317	3.3629	3.2967
-1.00	-1.00	3.4987	3.4268	3.3578	3.2915	3.2278
-0.90	-0.90	3.4189	3.3498	3.2834	3.2196	3.1582
-0.80	-0.80	3.3386	3.2722	3.2094	3.1470	3.0860
-0.70	-0.70	3.2578	3.1940	3.1324	3.0732	3.0171
-0.60	-0.60	3.1765	3.1154	3.0566	3.0000	2.9455
-0.50	-0.50	3.0948	3.0362	2.9798	2.9255	2.8737
-0.40	-0.40	3.0126	2.9565	2.9025	2.8504	2.8007
-0.30	-0.30	2.9299	2.8762	2.8245	2.7747	2.7266
-0.20	-0.20	2.8467	2.7954	2.7459	2.6982	2.6523
-0.10	-0.10	2.7631	2.7140	2.6664	2.6212	2.5772
-0.00	-0.00	2.6789	2.6321	2.5870	2.5434	2.5014
0.00	6.00	-3.3824	-3.4507	-3.5204	-3.5915	-3.6639
0.10	6.10	-3.5025	-3.5745	-3.6480	-3.7230	-3.7995
0.20	6.20	-3.6233	-3.6991	-3.7766	-3.8556	-3.9364
0.30	6.30	-3.7447	-3.8246	-3.9061	-3.9894	-4.0745
0.40	6.40	-3.8669	-3.9509	-4.0367	-4.1244	-4.2140
0.50	6.50	-3.9894	-4.0780	-4.1683	-4.2605	-4.3549
0.60	6.60	-4.1134	-4.2060	-4.3008	-4.3978	-4.4971
0.70	6.70	-4.2377	-4.3349	-4.4345	-4.5363	-4.6406
0.80	6.80	-4.3624	-4.4647	-4.5691	-4.6760	-4.7855
0.90	6.90	-4.4886	-4.5958	-4.7044	-4.8169	-4.9314
1.00	7.00	-4.6151	-4.7269	-4.8415	-4.9590	-5.0795
1.10	7.10	-4.7423	-4.8593	-4.9797	-5.1024	-5.2277
1.20	7.20	-4.8704	-4.9926	-5.1182	-5.2470	-5.3792
1.30	7.30	-4.9991	-5.1269	-5.2581	-5.3927	-5.5312
1.40	7.40	-5.1286	-5.2620	-5.3991	-5.5399	-5.6844
1.50	7.50	-5.2589	-5.3981	-5.5412	-5.6883	-5.8396
1.60	7.60	-5.3899	-5.5351	-5.6848	-5.8380	-5.9960
1.70	7.70	-5.5217	-5.6730	-5.8287	-5.9889	-6.1534
1.80	7.80	-5.6542	-5.8119	-5.9741	-6.1412	-6.3133
1.90	7.90	-5.7876	-5.9516	-6.1207	-6.2944	-6.4787
2.00	8.00	-5.9217	-6.0924	-6.2683	-6.4497	-6.6367
2.20	8.20	-6.1923	-6.3767	-6.5671	-6.7636	-6.9663
2.40	8.40	-6.4660	-6.6650	-6.8704	-7.0929	-7.3223
2.60	8.60	-6.7430	-6.9571	-7.1786	-7.4277	-7.6844
3.00	9.00	-7.3067	-7.5534	-7.8093	-8.0745	-8.3496

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 1.000 YEARS

*****INTEREST RATE IVS*****

TL	TP	0.060	0.061	0.062	0.063	0.064
-3.00	-3.00	0.4528	0.4609	0.4691	0.4772	0.4854
-2.60	-2.60	0.3962	0.4033	0.4103	0.4173	0.4244
-2.40	-2.40	0.3684	0.3749	0.3814	0.3879	0.3944
-2.20	-2.20	0.3410	0.3469	0.3529	0.3589	0.3649
-2.00	-2.00	0.3139	0.3193	0.3247	0.3302	0.3357
-1.90	-1.90	0.3003	0.3056	0.3108	0.3160	0.3212
-1.80	-1.80	0.2870	0.2919	0.2969	0.3019	0.3069
-1.70	-1.70	0.2737	0.2784	0.2831	0.2878	0.2926
-1.60	-1.60	0.2604	0.2649	0.2694	0.2739	0.2784
-1.50	-1.50	0.2473	0.2515	0.2558	0.2600	0.2642
-1.40	-1.40	0.2342	0.2382	0.2422	0.2462	0.2502
-1.30	-1.30	0.2212	0.2250	0.2287	0.2325	0.2363
-1.20	-1.20	0.2083	0.2118	0.2154	0.2189	0.2224
-1.10	-1.10	0.1954	0.1987	0.2021	0.2054	0.2087
-1.00	-1.00	0.1827	0.1857	0.1888	0.1919	0.1950
-0.90	-0.90	0.1700	0.1728	0.1757	0.1785	0.1814
-0.80	-0.80	0.1573	0.1600	0.1626	0.1653	0.1679
-0.70	-0.70	0.1448	0.1472	0.1496	0.1520	0.1545
-0.60	-0.60	0.1323	0.1345	0.1367	0.1389	0.1411
-0.50	-0.50	0.1199	0.1219	0.1239	0.1259	0.1279
-0.40	-0.40	0.1076	0.1093	0.1111	0.1129	0.1147
-0.30	-0.30	0.0953	0.0969	0.0988	0.1000	0.1016
-0.20	-0.20	0.0831	0.0845	0.0858	0.0872	0.0886
-0.10	-0.10	0.0710	0.0721	0.0733	0.0745	0.0756
-0.00	-0.00	0.0589	0.0599	0.0609	0.0618	0.0628
0.00	1.00	-0.0578	-0.0587	-0.0596	-0.0606	-0.0615
0.10	1.10	-0.0691	-0.0702	-0.0713	-0.0724	-0.0735
0.20	1.20	-0.0803	-0.0816	-0.0829	-0.0842	-0.0854
0.30	1.30	-0.0915	-0.0930	-0.0944	-0.0959	-0.0973
0.40	1.40	-0.1026	-0.1042	-0.1059	-0.1075	-0.1091
0.50	1.50	-0.1137	-0.1154	-0.1172	-0.1190	-0.1208
0.60	1.60	-0.1246	-0.1266	-0.1285	-0.1305	-0.1324
0.70	1.70	-0.1355	-0.1377	-0.1399	-0.1419	-0.1440
0.80	1.80	-0.1464	-0.1487	-0.1510	-0.1532	-0.1555
0.90	1.90	-0.1572	-0.1596	-0.1621	-0.1645	-0.1669
1.00	2.00	-0.1679	-0.1705	-0.1731	-0.1757	-0.1783
1.10	2.10	-0.1786	-0.1813	-0.1841	-0.1868	-0.1896
1.20	2.20	-0.1892	-0.1921	-0.1950	-0.1979	-0.2009
1.30	2.30	-0.1997	-0.2028	-0.2059	-0.2089	-0.2119
1.40	2.40	-0.2102	-0.2134	-0.2166	-0.2198	-0.2230
1.50	2.50	-0.2206	-0.2240	-0.2273	-0.2307	-0.2340
1.60	2.60	-0.2310	-0.2345	-0.2380	-0.2415	-0.2450
1.70	2.70	-0.2413	-0.2449	-0.2486	-0.2522	-0.2559
1.80	2.80	-0.2515	-0.2553	-0.2591	-0.2629	-0.2666
1.90	2.90	-0.2617	-0.2656	-0.2694	-0.2733	-0.2774
2.00	3.00	-0.2718	-0.2759	-0.2800	-0.2840	-0.2881
2.20	3.20	-0.2919	-0.2962	-0.3006	-0.3049	-0.3092
2.40	3.40	-0.3117	-0.3163	-0.3209	-0.3255	-0.3301
2.60	3.60	-0.3313	-0.3362	-0.3410	-0.3459	-0.3507
3.00	4.00	-0.3699	-0.3752	-0.3806	-0.3859	-0.3912

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 1.000 YEARS

*****INTEREST RATE IVS*****

TI	TD	0.065	0.066	0.067	0.068	0.069
-3.00	-3.00	0.4936	0.5018	0.5100	0.5182	0.5265
-2.60	-2.60	0.4314	0.4385	0.4456	0.4527	0.4599
-2.40	-2.40	0.4010	0.4075	0.4141	0.4206	0.4272
-2.20	-2.20	0.3709	0.3769	0.3829	0.3889	0.3950
-2.00	-2.00	0.3412	0.3467	0.3522	0.3577	0.3632
-1.90	-1.90	0.3265	0.3317	0.3369	0.3422	0.3475
-1.80	-1.80	0.3118	0.3168	0.3218	0.3268	0.3318
-1.70	-1.70	0.2973	0.3020	0.3068	0.3115	0.3163
-1.60	-1.60	0.2829	0.2874	0.2919	0.2964	0.3009
-1.50	-1.50	0.2685	0.2728	0.2770	0.2813	0.2856
-1.40	-1.40	0.2542	0.2583	0.2623	0.2663	0.2703
-1.30	-1.30	0.2401	0.2439	0.2476	0.2514	0.2552
-1.20	-1.20	0.2260	0.2295	0.2331	0.2366	0.2402
-1.10	-1.10	0.2120	0.2153	0.2186	0.2220	0.2253
-1.00	-1.00	0.1981	0.2012	0.2043	0.2074	0.2105
-0.90	-0.90	0.1843	0.1871	0.1900	0.1929	0.1957
-0.80	-0.80	0.1705	0.1732	0.1758	0.1785	0.1811
-0.70	-0.70	0.1569	0.1593	0.1617	0.1642	0.1666
-0.60	-0.60	0.1433	0.1455	0.1477	0.1500	0.1522
-0.50	-0.50	0.1299	0.1318	0.1338	0.1358	0.1378
-0.40	-0.40	0.1165	0.1182	0.1200	0.1218	0.1236
-0.30	-0.30	0.1032	0.1047	0.1063	0.1079	0.1094
-0.20	-0.20	0.0899	0.0913	0.0927	0.0940	0.0954
-0.10	-0.10	0.0765	0.0780	0.0791	0.0803	0.0814
-0.00	-0.00	0.0637	0.0647	0.0657	0.0666	0.0676
0.00	1.00	-0.0624	-0.0633	-0.0643	-0.0652	-0.0661
0.10	1.10	-0.0746	-0.0757	-0.0768	-0.0779	-0.0790
0.20	1.20	-0.0867	-0.0880	-0.0892	-0.0905	-0.0918
0.30	1.30	-0.0987	-0.1002	-0.1016	-0.1030	-0.1045
0.40	1.40	-0.1107	-0.1123	-0.1139	-0.1155	-0.1171
0.50	1.50	-0.1226	-0.1243	-0.1261	-0.1279	-0.1296
0.60	1.60	-0.1344	-0.1363	-0.1382	-0.1402	-0.1421
0.70	1.70	-0.1461	-0.1482	-0.1503	-0.1524	-0.1545
0.80	1.80	-0.1578	-0.1600	-0.1623	-0.1645	-0.1668
0.90	1.90	-0.1694	-0.1718	-0.1742	-0.1766	-0.1790
1.00	2.00	-0.1809	-0.1834	-0.1860	-0.1886	-0.1911
1.10	2.10	-0.1923	-0.1950	-0.1977	-0.2005	-0.2032
1.20	2.20	-0.2037	-0.2066	-0.2094	-0.2123	-0.2151
1.30	2.30	-0.2150	-0.2180	-0.2210	-0.2240	-0.2270
1.40	2.40	-0.2262	-0.2294	-0.2325	-0.2357	-0.2388
1.50	2.50	-0.2374	-0.2407	-0.2440	-0.2473	-0.2506
1.60	2.60	-0.2484	-0.2519	-0.2554	-0.2588	-0.2622
1.70	2.70	-0.2595	-0.2631	-0.2667	-0.2702	-0.2738
1.80	2.80	-0.2704	-0.2741	-0.2779	-0.2816	-0.2853
1.90	2.90	-0.2813	-0.2852	-0.2890	-0.2929	-0.2967
2.00	3.00	-0.2921	-0.2961	-0.3001	-0.3041	-0.3081
2.20	3.20	-0.3135	-0.3178	-0.3221	-0.3263	-0.3306
2.40	3.40	-0.3347	-0.3392	-0.3437	-0.3482	-0.3527
2.60	3.60	-0.3555	-0.3603	-0.3651	-0.3699	-0.3746
3.00	4.00	-0.3965	-0.4018	-0.4071	-0.4123	-0.4175

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 1.000 YEARS

*****INTEREST RATE IVS*****

TL	TD	0.070	0.071	0.072	0.073	0.074
-3.00	-3.00	0.5348	0.5431	0.5514	0.5597	0.5681
-2.60	-2.60	0.4670	0.4741	0.4813	0.4885	0.4957
-2.40	-2.40	0.4338	0.4408	0.4479	0.4550	0.4621
-2.20	-2.20	0.4010	0.4071	0.4132	0.4192	0.4253
-2.00	-2.00	0.3687	0.3743	0.3798	0.3853	0.3909
-1.90	-1.90	0.3527	0.3580	0.3633	0.3686	0.3739
-1.80	-1.80	0.3368	0.3419	0.3469	0.3519	0.3570
-1.70	-1.70	0.3211	0.3258	0.3306	0.3354	0.3402
-1.60	-1.60	0.3054	0.3099	0.3144	0.3190	0.3235
-1.50	-1.50	0.2898	0.2941	0.2984	0.3027	0.3070
-1.40	-1.40	0.2744	0.2784	0.2824	0.2865	0.2905
-1.30	-1.30	0.2590	0.2628	0.2666	0.2704	0.2742
-1.20	-1.20	0.2438	0.2473	0.2509	0.2544	0.2580
-1.10	-1.10	0.2286	0.2319	0.2353	0.2386	0.2419
-1.00	-1.00	0.2136	0.2166	0.2197	0.2228	0.2259
-0.90	-0.90	0.1986	0.2015	0.2043	0.2072	0.2101
-0.80	-0.80	0.1838	0.1864	0.1890	0.1917	0.1943
-0.70	-0.70	0.1690	0.1714	0.1739	0.1763	0.1787
-0.60	-0.60	0.1544	0.1566	0.1588	0.1610	0.1632
-0.50	-0.50	0.1398	0.1419	0.1438	0.1458	0.1478
-0.40	-0.40	0.1254	0.1271	0.1289	0.1307	0.1325
-0.30	-0.30	0.1110	0.1126	0.1141	0.1157	0.1173
-0.20	-0.20	0.0968	0.0981	0.0995	0.1008	0.1022
-0.10	-0.10	0.0826	0.0838	0.0849	0.0861	0.0872
-0.00	-0.00	0.0685	0.0695	0.0704	0.0714	0.0724
0.00	1.00	-0.0670	-0.0679	-0.0688	-0.0697	-0.0707
0.10	1.10	-0.0801	-0.0811	-0.0822	-0.0833	-0.0844
0.20	1.20	-0.0930	-0.0943	-0.0955	-0.0968	-0.0980
0.30	1.30	-0.1059	-0.1073	-0.1088	-0.1102	-0.1116
0.40	1.40	-0.1187	-0.1203	-0.1219	-0.1235	-0.1251
0.50	1.50	-0.1314	-0.1332	-0.1349	-0.1367	-0.1384
0.60	1.60	-0.1440	-0.1459	-0.1479	-0.1498	-0.1517
0.70	1.70	-0.1566	-0.1586	-0.1607	-0.1628	-0.1649
0.80	1.80	-0.1690	-0.1713	-0.1735	-0.1757	-0.1779
0.90	1.90	-0.1814	-0.1838	-0.1862	-0.1885	-0.1909
1.00	2.00	-0.1937	-0.1962	-0.1988	-0.2013	-0.2038
1.10	2.10	-0.2059	-0.2086	-0.2113	-0.2139	-0.2166
1.20	2.20	-0.2180	-0.2208	-0.2237	-0.2265	-0.2293
1.30	2.30	-0.2300	-0.2330	-0.2360	-0.2390	-0.2419
1.40	2.40	-0.2420	-0.2451	-0.2482	-0.2514	-0.2545
1.50	2.50	-0.2539	-0.2571	-0.2604	-0.2637	-0.2669
1.60	2.60	-0.2657	-0.2691	-0.2725	-0.2759	-0.2793
1.70	2.70	-0.2774	-0.2809	-0.2845	-0.2880	-0.2915
1.80	2.80	-0.2890	-0.2927	-0.2964	-0.3000	-0.3037
1.90	2.90	-0.3006	-0.3044	-0.3082	-0.3120	-0.3158
2.00	3.00	-0.3120	-0.3160	-0.3199	-0.3239	-0.3278
2.20	3.20	-0.3348	-0.3390	-0.3432	-0.3474	-0.3515
2.40	3.40	-0.3572	-0.3617	-0.3661	-0.3705	-0.3750
2.60	3.60	-0.3793	-0.3840	-0.3887	-0.3934	-0.3980
3.00	4.00	-0.4227	-0.4279	-0.4330	-0.4381	-0.4432

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 1.000 YEARS

*****INTEREST RATE VS*****

TL	TR	0.075	0.076	0.077	0.078	0.079
-3.00	-3.00	0.5764	0.5848	0.5932	0.6017	0.6101
-2.60	-2.60	0.5029	0.5101	0.5173	0.5246	0.5318
-2.40	-2.40	0.4669	0.4735	0.4802	0.4869	0.4936
-2.20	-2.20	0.4314	0.4375	0.4436	0.4498	0.4559
-2.00	-2.00	0.3965	0.4020	0.4076	0.4132	0.4188
-1.90	-1.90	0.3792	0.3845	0.3898	0.3951	0.4004
-1.80	-1.80	0.3620	0.3671	0.3721	0.3772	0.3822
-1.70	-1.70	0.3450	0.3498	0.3546	0.3594	0.3642
-1.60	-1.60	0.3287	0.3326	0.3371	0.3417	0.3462
-1.50	-1.50	0.3112	0.3155	0.3198	0.3241	0.3284
-1.40	-1.40	0.2946	0.2986	0.3027	0.3067	0.3108
-1.30	-1.30	0.2780	0.2818	0.2856	0.2894	0.2933
-1.20	-1.20	0.2616	0.2651	0.2687	0.2723	0.2759
-1.10	-1.10	0.2453	0.2486	0.2519	0.2553	0.2586
-1.00	-1.00	0.2290	0.2321	0.2353	0.2384	0.2415
-0.90	-0.90	0.2130	0.2158	0.2187	0.2216	0.2245
-0.80	-0.80	0.1970	0.1996	0.2023	0.2049	0.2076
-0.70	-0.70	0.1811	0.1836	0.1860	0.1884	0.1908
-0.60	-0.60	0.1654	0.1676	0.1698	0.1720	0.1742
-0.50	-0.50	0.1498	0.1518	0.1538	0.1557	0.1577
-0.40	-0.40	0.1343	0.1360	0.1378	0.1396	0.1414
-0.30	-0.30	0.1189	0.1204	0.1220	0.1236	0.1251
-0.20	-0.20	0.1036	0.1049	0.1063	0.1076	0.1090
-0.10	-0.10	0.0884	0.0895	0.0907	0.0918	0.0930
-0.00	-0.00	0.0733	0.0743	0.0752	0.0762	0.0771
0.00	1.00	-0.0716	-0.0725	-0.0734	-0.0743	-0.0752
0.10	1.10	-0.0855	-0.0866	-0.0876	-0.0887	-0.0898
0.20	1.20	-0.0993	-0.1006	-0.1018	-0.1030	-0.1043
0.30	1.30	-0.1130	-0.1144	-0.1159	-0.1173	-0.1187
0.40	1.40	-0.1266	-0.1282	-0.1298	-0.1314	-0.1329
0.50	1.50	-0.1402	-0.1419	-0.1436	-0.1454	-0.1471
0.60	1.60	-0.1536	-0.1555	-0.1574	-0.1593	-0.1612
0.70	1.70	-0.1669	-0.1690	-0.1710	-0.1731	-0.1751
0.80	1.80	-0.1801	-0.1824	-0.1846	-0.1868	-0.1890
0.90	1.90	-0.1933	-0.1957	-0.1980	-0.2004	-0.2027
1.00	2.00	-0.2063	-0.2088	-0.2114	-0.2139	-0.2164
1.10	2.10	-0.2193	-0.2219	-0.2246	-0.2272	-0.2299
1.20	2.20	-0.2321	-0.2349	-0.2377	-0.2405	-0.2433
1.30	2.30	-0.2449	-0.2478	-0.2508	-0.2537	-0.2566
1.40	2.40	-0.2576	-0.2607	-0.2637	-0.2668	-0.2699
1.50	2.50	-0.2701	-0.2734	-0.2766	-0.2799	-0.2830
1.60	2.60	-0.2826	-0.2860	-0.2894	-0.2927	-0.2960
1.70	2.70	-0.2950	-0.2985	-0.3020	-0.3055	-0.3090
1.80	2.80	-0.3073	-0.3110	-0.3146	-0.3182	-0.3218
1.90	2.90	-0.3196	-0.3233	-0.3271	-0.3308	-0.3345
2.00	3.00	-0.3317	-0.3356	-0.3395	-0.3433	-0.3472
2.20	3.20	-0.3557	-0.3598	-0.3640	-0.3681	-0.3722
2.40	3.40	-0.3794	-0.3837	-0.3881	-0.3924	-0.3968
2.60	3.60	-0.4027	-0.4073	-0.4119	-0.4165	-0.4210
3.00	4.00	-0.4482	-0.4528	-0.4584	-0.4634	-0.4684

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 1.000 YEARS

*****INTEREST RATE VS*****

TL	TP	0.080	0.081	0.082	0.083	0.084
-3.00	-3.00	0.6186	0.6271	0.6356	0.6441	0.6527
-2.60	-2.60	0.5391	0.5468	0.5537	0.5610	0.5688
-2.40	-2.40	0.5003	0.5070	0.5137	0.5205	0.5272
-2.20	-2.20	0.4621	0.4682	0.4748	0.4805	0.4867
-2.00	-2.00	0.4248	0.4300	0.4356	0.4412	0.4469
-1.90	-1.90	0.4058	0.4111	0.4165	0.4218	0.4272
-1.80	-1.80	0.3873	0.3928	0.3975	0.4026	0.4077
-1.70	-1.70	0.3690	0.3738	0.3786	0.3835	0.3883
-1.60	-1.60	0.3508	0.3558	0.3599	0.3645	0.3691
-1.50	-1.50	0.3328	0.3371	0.3418	0.3457	0.3501
-1.40	-1.40	0.3148	0.3189	0.3230	0.3271	0.3311
-1.30	-1.30	0.2971	0.3009	0.3047	0.3085	0.3128
-1.20	-1.20	0.2798	0.2830	0.2866	0.2902	0.2938
-1.10	-1.10	0.2619	0.2653	0.2686	0.2720	0.2753
-1.00	-1.00	0.2446	0.2477	0.2508	0.2539	0.2570
-0.90	-0.90	0.2273	0.2302	0.2331	0.2360	0.2389
-0.80	-0.80	0.2102	0.2129	0.2155	0.2182	0.2208
-0.70	-0.70	0.1933	0.1957	0.1981	0.2006	0.2030
-0.60	-0.60	0.1768	0.1786	0.1808	0.1831	0.1853
-0.50	-0.50	0.1597	0.1617	0.1637	0.1657	0.1677
-0.40	-0.40	0.1431	0.1449	0.1467	0.1485	0.1502
-0.30	-0.30	0.1267	0.1282	0.1298	0.1314	0.1329
-0.20	-0.20	0.1104	0.1117	0.1131	0.1148	0.1158
-0.10	-0.10	0.0942	0.0953	0.0965	0.0976	0.0988
-0.00	-0.00	0.0781	0.0790	0.0800	0.0809	0.0819
0.00	1.00	-0.0761	-0.0770	-0.0779	-0.0788	-0.0797
0.10	1.10	-0.0909	-0.0919	-0.0930	-0.0941	-0.0952
0.20	1.20	-0.1055	-0.1068	-0.1080	-0.1092	-0.1105
0.30	1.30	-0.1201	-0.1215	-0.1229	-0.1243	-0.1257
0.40	1.40	-0.1345	-0.1361	-0.1376	-0.1392	-0.1408
0.50	1.50	-0.1488	-0.1506	-0.1523	-0.1540	-0.1557
0.60	1.60	-0.1631	-0.1649	-0.1668	-0.1687	-0.1705
0.70	1.70	-0.1772	-0.1792	-0.1812	-0.1833	-0.1853
0.80	1.80	-0.1912	-0.1938	-0.1955	-0.1977	-0.1999
0.90	1.90	-0.2051	-0.2078	-0.2097	-0.2121	-0.2148
1.00	2.00	-0.2188	-0.2213	-0.2238	-0.2263	-0.2288
1.10	2.10	-0.2325	-0.2352	-0.2378	-0.2404	-0.2430
1.20	2.20	-0.2461	-0.2489	-0.2516	-0.2548	-0.2571
1.30	2.30	-0.2596	-0.2625	-0.2658	-0.2687	-0.2712
1.40	2.40	-0.2729	-0.2760	-0.2790	-0.2821	-0.2851
1.50	2.50	-0.2862	-0.2898	-0.2926	-0.2957	-0.2989
1.60	2.60	-0.2998	-0.3027	-0.3060	-0.3093	-0.3126
1.70	2.70	-0.3128	-0.3159	-0.3193	-0.3227	-0.3262
1.80	2.80	-0.3258	-0.3290	-0.3325	-0.3361	-0.3396
1.90	2.90	-0.3383	-0.3420	-0.3456	-0.3493	-0.3530
2.00	3.00	-0.3510	-0.3548	-0.3587	-0.3625	-0.3663
2.20	3.20	-0.3763	-0.3803	-0.3848	-0.3888	-0.3925
2.40	3.40	-0.4011	-0.4058	-0.4097	-0.4140	-0.4187
2.60	3.60	-0.4256	-0.4301	-0.4346	-0.4391	-0.4436
3.00	4.00	-0.4738	-0.4788	-0.4833	-0.4882	-0.4931

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 1.000 YEARS

*****INTEREST RATE I VS*****

TL	TP	0.085	0.086	0.087	0.088	0.089
-3.00	-3.00	0.6612	0.6698	0.6785	0.6871	0.6957
-2.60	-2.60	0.5757	0.5831	0.5904	0.5978	0.6052
-2.40	-2.40	0.5340	0.5407	0.5475	0.5543	0.5611
-2.20	-2.20	0.4929	0.4991	0.5053	0.5115	0.5178
-2.00	-2.00	0.4525	0.4582	0.4639	0.4695	0.4751
-1.90	-1.90	0.4326	0.4379	0.4433	0.4487	0.4541
-1.80	-1.80	0.4128	0.4179	0.4230	0.4281	0.4332
-1.70	-1.70	0.3931	0.3980	0.4028	0.4077	0.4126
-1.60	-1.60	0.3737	0.3783	0.3829	0.3874	0.3921
-1.50	-1.50	0.3544	0.3587	0.3630	0.3674	0.3717
-1.40	-1.40	0.3352	0.3393	0.3434	0.3475	0.3516
-1.30	-1.30	0.3162	0.3200	0.3239	0.3277	0.3316
-1.20	-1.20	0.2974	0.3010	0.3045	0.3081	0.3117
-1.10	-1.10	0.2787	0.2820	0.2854	0.2887	0.2921
-1.00	-1.00	0.2601	0.2632	0.2664	0.2695	0.2726
-0.90	-0.90	0.2417	0.2446	0.2475	0.2504	0.2533
-0.80	-0.80	0.2235	0.2262	0.2289	0.2315	0.2341
-0.70	-0.70	0.2054	0.2078	0.2103	0.2127	0.2151
-0.60	-0.60	0.1875	0.1897	0.1919	0.1941	0.1963
-0.50	-0.50	0.1697	0.1717	0.1736	0.1756	0.1776
-0.40	-0.40	0.1520	0.1538	0.1556	0.1573	0.1591
-0.30	-0.30	0.1345	0.1361	0.1376	0.1392	0.1409
-0.20	-0.20	0.1171	0.1185	0.1198	0.1212	0.1226
-0.10	-0.10	0.0999	0.1011	0.1022	0.1034	0.1045
-0.00	-0.00	0.0828	0.0838	0.0847	0.0857	0.0866
0.00	1.00	-0.0806	-0.0815	-0.0824	-0.0833	-0.0842
0.10	1.10	-0.0962	-0.0973	-0.0983	-0.0994	-0.1005
0.20	1.20	-0.1117	-0.1129	-0.1142	-0.1154	-0.1166
0.30	1.30	-0.1271	-0.1285	-0.1299	-0.1313	-0.1326
0.40	1.40	-0.1423	-0.1439	-0.1454	-0.1470	-0.1485
0.50	1.50	-0.1574	-0.1592	-0.1609	-0.1626	-0.1643
0.60	1.60	-0.1724	-0.1743	-0.1762	-0.1780	-0.1799
0.70	1.70	-0.1873	-0.1893	-0.1913	-0.1934	-0.1954
0.80	1.80	-0.2021	-0.2042	-0.2064	-0.2086	-0.2107
0.90	1.90	-0.2167	-0.2190	-0.2213	-0.2236	-0.2259
1.00	2.00	-0.2312	-0.2337	-0.2361	-0.2386	-0.2410
1.10	2.10	-0.2456	-0.2482	-0.2508	-0.2534	-0.2560
1.20	2.20	-0.2599	-0.2626	-0.2654	-0.2681	-0.2708
1.30	2.30	-0.2741	-0.2769	-0.2798	-0.2827	-0.2855
1.40	2.40	-0.2881	-0.2911	-0.2941	-0.2971	-0.3001
1.50	2.50	-0.3020	-0.3052	-0.3083	-0.3114	-0.3146
1.60	2.60	-0.3159	-0.3191	-0.3224	-0.3257	-0.3289
1.70	2.70	-0.3296	-0.3330	-0.3364	-0.3397	-0.3431
1.80	2.80	-0.3432	-0.3467	-0.3502	-0.3537	-0.3572
1.90	2.90	-0.3567	-0.3603	-0.3639	-0.3676	-0.3712
2.00	3.00	-0.3700	-0.3738	-0.3776	-0.3813	-0.3850
2.20	3.20	-0.3965	-0.4005	-0.4045	-0.4084	-0.4124
2.40	3.40	-0.4225	-0.4267	-0.4309	-0.4351	-0.4393
2.60	3.60	-0.4480	-0.4525	-0.4569	-0.4613	-0.4657
3.00	4.00	-0.4980	-0.5028	-0.5077	-0.5125	-0.5173

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 1.000 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.090	0.091	0.092	0.093	0.094
-3.00	-3.00	0.7088	0.7131	0.7218	0.7305	0.7392
-2.60	-2.60	0.6126	0.6201	0.6275	0.6350	0.6428
-2.40	-2.40	0.5679	0.5748	0.5816	0.5885	0.5953
-2.20	-2.20	0.5240	0.5303	0.5365	0.5428	0.5491
-2.00	-2.00	0.4808	0.4865	0.4922	0.4979	0.5036
-1.90	-1.90	0.4595	0.4649	0.4703	0.4758	0.4812
-1.80	-1.80	0.4388	0.4435	0.4487	0.4538	0.4590
-1.70	-1.70	0.4178	0.4223	0.4272	0.4321	0.4369
-1.60	-1.60	0.3967	0.4013	0.4059	0.4105	0.4151
-1.50	-1.50	0.3761	0.3808	0.3848	0.3891	0.3935
-1.40	-1.40	0.3556	0.3597	0.3638	0.3680	0.3721
-1.30	-1.30	0.3354	0.3393	0.3431	0.3470	0.3508
-1.20	-1.20	0.3153	0.3189	0.3225	0.3262	0.3298
-1.10	-1.10	0.2954	0.2988	0.3022	0.3055	0.3099
-1.00	-1.00	0.2757	0.2788	0.2820	0.2851	0.2882
-0.90	-0.90	0.2562	0.2591	0.2619	0.2648	0.2677
-0.80	-0.80	0.2368	0.2398	0.2421	0.2448	0.2478
-0.70	-0.70	0.2176	0.2200	0.2228	0.2249	0.2272
-0.60	-0.60	0.1985	0.2007	0.2029	0.2051	0.2073
-0.50	-0.50	0.1796	0.1816	0.1836	0.1856	0.1876
-0.40	-0.40	0.1609	0.1627	0.1644	0.1662	0.1680
-0.30	-0.30	0.1423	0.1439	0.1454	0.1470	0.1486
-0.20	-0.20	0.1239	0.1253	0.1266	0.1280	0.1293
-0.10	-0.10	0.1056	0.1068	0.1079	0.1091	0.1102
-0.00	-0.00	0.0876	0.0885	0.0894	0.0904	0.0913
0.00	1.00	-0.0851	-0.0860	-0.0869	-0.0877	-0.0886
0.10	1.10	-0.1015	-0.1026	-0.1036	-0.1047	-0.1058
0.20	1.20	-0.1179	-0.1191	-0.1203	-0.1215	-0.1227
0.30	1.30	-0.1340	-0.1354	-0.1368	-0.1382	-0.1395
0.40	1.40	-0.1501	-0.1516	-0.1531	-0.1547	-0.1562
0.50	1.50	-0.1660	-0.1677	-0.1694	-0.1710	-0.1727
0.60	1.60	-0.1817	-0.1836	-0.1854	-0.1873	-0.1891
0.70	1.70	-0.1974	-0.1994	-0.2014	-0.2033	-0.2053
0.80	1.80	-0.2129	-0.2150	-0.2171	-0.2193	-0.2214
0.90	1.90	-0.2282	-0.2305	-0.2328	-0.2351	-0.2373
1.00	2.00	-0.2435	-0.2459	-0.2483	-0.2507	-0.2531
1.10	2.10	-0.2586	-0.2611	-0.2637	-0.2662	-0.2688
1.20	2.20	-0.2735	-0.2762	-0.2789	-0.2816	-0.2843
1.30	2.30	-0.2884	-0.2912	-0.2940	-0.2969	-0.2997
1.40	2.40	-0.3031	-0.3061	-0.3090	-0.3120	-0.3149
1.50	2.50	-0.3177	-0.3209	-0.3239	-0.3269	-0.3300
1.60	2.60	-0.3321	-0.3354	-0.3386	-0.3418	-0.3450
1.70	2.70	-0.3465	-0.3498	-0.3532	-0.3565	-0.3598
1.80	2.80	-0.3607	-0.3642	-0.3676	-0.3711	-0.3745
1.90	2.90	-0.3748	-0.3784	-0.3819	-0.3855	-0.3891
2.00	3.00	-0.3888	-0.3925	-0.3962	-0.3998	-0.4035
2.20	3.20	-0.4163	-0.4203	-0.4242	-0.4281	-0.4320
2.40	3.40	-0.4435	-0.4476	-0.4517	-0.4559	-0.4600
2.60	3.60	-0.4701	-0.4745	-0.4788	-0.4831	-0.4875
3.00	4.00	-0.5221	-0.5268	-0.5315	-0.5363	-0.5410

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 1.000 YEARS

*****INTEREST RATE IVS*****

PL	PR	0.095	0.096	0.097	0.098	0.099
-3.00	-3.00	0.7480	0.7568	0.7656	0.7744	0.7833
-2.60	-2.60	0.6499	0.6578	0.6659	0.6725	0.6790
-2.40	-2.40	0.6022	0.6091	0.6160	0.6229	0.6298
-2.20	-2.20	0.5553	0.5616	0.5679	0.5743	0.5806
-2.00	-2.00	0.5093	0.5150	0.5208	0.5265	0.5323
-1.90	-1.90	0.4866	0.4921	0.4975	0.5030	0.5084
-1.80	-1.80	0.4641	0.4693	0.4745	0.4797	0.4848
-1.70	-1.70	0.4418	0.4467	0.4516	0.4566	0.4615
-1.60	-1.60	0.4199	0.4244	0.4290	0.4337	0.4383
-1.50	-1.50	0.3979	0.4022	0.4066	0.4110	0.4154
-1.40	-1.40	0.3762	0.3803	0.3844	0.3885	0.3926
-1.30	-1.30	0.3547	0.3585	0.3624	0.3663	0.3701
-1.20	-1.20	0.3334	0.3370	0.3406	0.3442	0.3478
-1.10	-1.10	0.3123	0.3156	0.3190	0.3224	0.3257
-1.00	-1.00	0.2913	0.2945	0.2976	0.3007	0.3039
-0.90	-0.90	0.2706	0.2735	0.2764	0.2793	0.2822
-0.80	-0.80	0.2501	0.2527	0.2554	0.2581	0.2607
-0.70	-0.70	0.2297	0.2321	0.2346	0.2370	0.2394
-0.60	-0.60	0.2095	0.2117	0.2140	0.2162	0.2184
-0.50	-0.50	0.1895	0.1915	0.1935	0.1955	0.1975
-0.40	-0.40	0.1697	0.1715	0.1733	0.1751	0.1769
-0.30	-0.30	0.1501	0.1517	0.1532	0.1548	0.1563
-0.20	-0.20	0.1307	0.1320	0.1334	0.1347	0.1360
-0.10	-0.10	0.1114	0.1125	0.1137	0.1149	0.1159
-0.00	-0.00	0.0923	0.0932	0.0942	0.0951	0.0960
0.00	1.00	-0.0895	-0.0904	-0.0913	-0.0922	-0.0931
0.10	1.10	-0.1068	-0.1079	-0.1089	-0.1100	-0.1110
0.20	1.20	-0.1239	-0.1252	-0.1264	-0.1276	-0.1288
0.30	1.30	-0.1409	-0.1423	-0.1437	-0.1450	-0.1464
0.40	1.40	-0.1577	-0.1593	-0.1608	-0.1623	-0.1638
0.50	1.50	-0.1744	-0.1761	-0.1778	-0.1795	-0.1811
0.60	1.60	-0.1909	-0.1928	-0.1946	-0.1964	-0.1982
0.70	1.70	-0.2073	-0.2093	-0.2112	-0.2132	-0.2152
0.80	1.80	-0.2235	-0.2257	-0.2277	-0.2299	-0.2320
0.90	1.90	-0.2396	-0.2419	-0.2441	-0.2464	-0.2486
1.00	2.00	-0.2556	-0.2580	-0.2604	-0.2627	-0.2651
1.10	2.10	-0.2713	-0.2739	-0.2764	-0.2789	-0.2815
1.20	2.20	-0.2870	-0.2897	-0.2923	-0.2950	-0.2976
1.30	2.30	-0.3025	-0.3053	-0.3081	-0.3109	-0.3137
1.40	2.40	-0.3179	-0.3208	-0.3237	-0.3266	-0.3295
1.50	2.50	-0.3331	-0.3361	-0.3392	-0.3422	-0.3453
1.60	2.60	-0.3482	-0.3514	-0.3545	-0.3577	-0.3608
1.70	2.70	-0.3631	-0.3664	-0.3697	-0.3730	-0.3763
1.80	2.80	-0.3779	-0.3814	-0.3848	-0.3882	-0.3916
1.90	2.90	-0.3926	-0.3962	-0.3997	-0.4032	-0.4067
2.00	3.00	-0.4072	-0.4108	-0.4145	-0.4181	-0.4217
2.20	3.20	-0.4359	-0.4397	-0.4436	-0.4474	-0.4513
2.40	3.40	-0.4641	-0.4682	-0.4722	-0.4763	-0.4803
2.60	3.60	-0.4918	-0.4960	-0.5003	-0.5046	-0.5088
3.00	4.00	-0.5456	-0.5503	-0.5540	-0.5586	-0.5627

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 1.000 YEARS

*****INTEREST RATE 1%*****

W	L	0.100	0.101	0.102	0.103	0.104
-3.00	-3.00	0.7021	0.8010	0.8099	0.8188	0.8278
-2.60	-2.60	0.6876	0.6951	0.7027	0.7103	0.7179
-2.40	-2.40	0.6368	0.6437	0.6507	0.6576	0.6646
-2.20	-2.20	0.5869	0.5933	0.5996	0.6060	0.6123
-2.00	-2.00	0.5380	0.5438	0.5495	0.5553	0.5611
-1.90	-1.90	0.5139	0.5194	0.5249	0.5304	0.5359
-1.80	-1.80	0.4900	0.4952	0.5008	0.5056	0.5109
-1.70	-1.70	0.4668	0.4713	0.4762	0.4812	0.4861
-1.60	-1.60	0.4430	0.4476	0.4523	0.4569	0.4616
-1.50	-1.50	0.4198	0.4241	0.4285	0.4329	0.4373
-1.40	-1.40	0.3968	0.4009	0.4050	0.4092	0.4133
-1.30	-1.30	0.3740	0.3779	0.3818	0.3856	0.3895
-1.20	-1.20	0.3515	0.3551	0.3587	0.3623	0.3660
-1.10	-1.10	0.3291	0.3325	0.3359	0.3393	0.3426
-1.00	-1.00	0.3070	0.3101	0.3132	0.3164	0.3195
-0.90	-0.90	0.2851	0.2880	0.2909	0.2938	0.2967
-0.80	-0.80	0.2638	0.2660	0.2687	0.2718	0.2740
-0.70	-0.70	0.2419	0.2443	0.2467	0.2492	0.2516
-0.60	-0.60	0.2206	0.2228	0.2250	0.2272	0.2294
-0.50	-0.50	0.1995	0.2015	0.2035	0.2058	0.2078
-0.40	-0.40	0.1786	0.1808	0.1821	0.1839	0.1857
-0.30	-0.30	0.1579	0.1595	0.1610	0.1626	0.1641
-0.20	-0.20	0.1374	0.1387	0.1401	0.1418	0.1429
-0.10	-0.10	0.1171	0.1182	0.1198	0.1205	0.1217
-0.00	-0.00	0.0970	0.0979	0.0989	0.0998	0.1007
0.00	1.00	-0.0930	-0.0948	-0.0957	-0.0966	-0.0975
0.10	1.10	-0.1121	-0.1131	-0.1141	-0.1152	-0.1162
0.20	1.20	-0.1300	-0.1312	-0.1328	-0.1336	-0.1349
0.30	1.30	-0.1478	-0.1491	-0.1505	-0.1518	-0.1532
0.40	1.40	-0.1658	-0.1669	-0.1688	-0.1699	-0.1718
0.50	1.50	-0.1828	-0.1845	-0.1861	-0.1878	-0.1898
0.60	1.60	-0.2001	-0.2019	-0.2037	-0.2055	-0.2073
0.70	1.70	-0.2172	-0.2191	-0.2211	-0.2230	-0.2250
0.80	1.80	-0.2341	-0.2362	-0.2383	-0.2408	-0.2425
0.90	1.90	-0.2509	-0.2531	-0.2558	-0.2576	-0.2598
1.00	2.00	-0.2675	-0.2699	-0.2723	-0.2746	-0.2770
1.10	2.10	-0.2840	-0.2865	-0.2890	-0.2915	-0.2940
1.20	2.20	-0.3003	-0.3029	-0.3056	-0.3082	-0.3108
1.30	2.30	-0.3164	-0.3192	-0.3220	-0.3247	-0.3275
1.40	2.40	-0.3324	-0.3353	-0.3382	-0.3411	-0.3440
1.50	2.50	-0.3483	-0.3513	-0.3543	-0.3573	-0.3603
1.60	2.60	-0.3640	-0.3671	-0.3703	-0.3738	-0.3765
1.70	2.70	-0.3795	-0.3828	-0.3860	-0.3893	-0.3925
1.80	2.80	-0.3949	-0.3983	-0.4017	-0.4050	-0.4088
1.90	2.90	-0.4102	-0.4137	-0.4171	-0.4206	-0.4241
2.00	3.00	-0.4253	-0.4289	-0.4325	-0.4360	-0.4396
2.20	3.20	-0.4551	-0.4589	-0.4627	-0.4665	-0.4702
2.40	3.40	-0.4843	-0.4883	-0.4923	-0.4963	-0.5003
2.60	3.60	-0.5130	-0.5172	-0.5218	-0.5256	-0.5297
3.00	4.00	-0.5687	-0.5733	-0.5770	-0.5828	-0.5869

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR VARIOUS TIME 1.500 YEARS

*****TABLE A-8*****						
TL	TR	0.060	0.061	0.062	0.063	0.064
-3.00	-3.00	0.8988	0.8972	0.8966	0.8961	0.8959
-2.60	-2.60	0.8310	0.8287	0.8268	0.8251	0.8239
-2.20	-2.20	0.8024	0.8009	0.8171	0.8203	0.8218
-2.00	-2.00	0.7780	0.7815	0.7882	0.7908	0.7918
-1.80	-1.80	0.7578	0.7575	0.7598	0.7657	0.7718
-1.60	-1.60	0.7337	0.7396	0.7458	0.7512	0.7571
-1.40	-1.40	0.7202	0.7257	0.7313	0.7369	0.7425
-1.20	-1.20	0.7067	0.7120	0.7173	0.7226	0.7280
-1.00	-1.00	0.6927	0.6983	0.7038	0.7095	0.7155
-0.80	-0.80	0.6789	0.6847	0.6906	0.6968	0.7032
-0.60	-0.60	0.6656	0.6712	0.6769	0.6828	0.6890
-0.40	-0.40	0.6538	0.6598	0.6658	0.6719	0.6782
-0.20	-0.20	0.6427	0.6488	0.6549	0.6611	0.6674
-0.00	-0.00	0.6323	0.6385	0.6447	0.6510	0.6573
0.00	0.00	0.6223	0.6285	0.6347	0.6410	0.6473
0.10	0.10	0.6123	0.6185	0.6247	0.6310	0.6373
0.20	0.20	0.6023	0.6085	0.6147	0.6210	0.6273
0.30	0.30	0.5923	0.5985	0.6047	0.6110	0.6173
0.40	0.40	0.5823	0.5885	0.5947	0.6010	0.6073
0.50	0.50	0.5723	0.5785	0.5847	0.5910	0.5973
0.60	0.60	0.5623	0.5685	0.5747	0.5810	0.5873
0.70	0.70	0.5523	0.5585	0.5647	0.5710	0.5773
0.80	0.80	0.5423	0.5485	0.5547	0.5610	0.5673
0.90	0.90	0.5323	0.5385	0.5447	0.5510	0.5573
1.00	1.00	0.5223	0.5285	0.5347	0.5410	0.5473
1.10	1.10	0.5123	0.5185	0.5247	0.5310	0.5373
1.20	1.20	0.5023	0.5085	0.5147	0.5210	0.5273
1.30	1.30	0.4923	0.4985	0.5047	0.5110	0.5173
1.40	1.40	0.4823	0.4885	0.4947	0.5010	0.5073
1.50	1.50	0.4723	0.4785	0.4847	0.4910	0.4973
1.60	1.60	0.4623	0.4685	0.4747	0.4810	0.4873
1.70	1.70	0.4523	0.4585	0.4647	0.4710	0.4773
1.80	1.80	0.4423	0.4485	0.4547	0.4610	0.4673
1.90	1.90	0.4323	0.4385	0.4447	0.4510	0.4573
2.00	2.00	0.4223	0.4285	0.4347	0.4410	0.4473
2.10	2.10	0.4123	0.4185	0.4247	0.4310	0.4373
2.20	2.20	0.4023	0.4085	0.4147	0.4210	0.4273
2.30	2.30	0.3923	0.3985	0.4047	0.4110	0.4173
2.40	2.40	0.3823	0.3885	0.3947	0.4010	0.4073
2.50	2.50	0.3723	0.3785	0.3847	0.3910	0.3973
2.60	2.60	0.3623	0.3685	0.3747	0.3810	0.3873
2.70	2.70	0.3523	0.3585	0.3647	0.3710	0.3773
2.80	2.80	0.3423	0.3485	0.3547	0.3610	0.3673
2.90	2.90	0.3323	0.3385	0.3447	0.3510	0.3573
3.00	3.00	0.3223	0.3285	0.3347	0.3410	0.3473

71	72	7.065	7.066	7.067	7.068	7.069
-7.00	-7.00	0.5326	0.5316	0.5305	0.5295	0.5284
-2.60	-2.60	0.5066	0.5077	0.5051	0.5029	0.5007
-2.00	-2.00	0.5030	0.5050	0.5050	0.5063	0.5075
-2.20	-2.20	0.5001	0.5017	0.5010	0.5001	0.4989
-2.00	-2.00	0.4979	0.4980	0.4981	0.4967	0.4950
-1.00	-1.00	0.4629	0.4600	0.4587	0.4586	0.4588
-1.00	-1.00	0.4601	0.4577	0.4561	0.4540	0.4519
-1.70	-1.70	0.4337	0.4307	0.4280	0.4250	0.4219
-1.60	-1.60	0.4107	0.4079	0.4050	0.4020	0.3991
-1.50	-1.50	0.4001	0.3980	0.3950	0.3919	0.3889
-1.00	-1.00	0.3996	0.3982	0.3960	0.3930	0.3900
-1.30	-1.30	0.3752	0.3706	0.3670	0.3637	0.3607
-1.20	-1.20	0.3609	0.3550	0.3500	0.3473	0.3448
-1.10	-1.10	0.3457	0.3385	0.3305	0.3219	0.3137
-1.00	-1.00	0.3326	0.3242	0.3150	0.3055	0.2977
-0.00	-0.00	0.2105	0.2019	0.2020	0.2000	0.1972
-0.00	-0.00	0.2006	0.2008	0.2100	0.2101	0.2173
-0.70	-0.70	0.1907	0.1937	0.1966	0.1996	0.2026
-0.60	-0.60	0.1760	0.1707	0.1620	0.1552	0.1470
-0.50	-0.50	0.1633	0.1550	0.1487	0.1400	0.1337
-0.00	-0.00	0.1007	0.1020	0.1007	0.1066	0.1099
-0.70	-0.70	0.1361	0.1302	0.1203	0.1020	0.1005
-0.20	-0.20	0.1227	0.1206	0.1265	0.1207	0.1302
-0.10	-0.10	0.1090	0.1110	0.1127	0.1103	0.1160
-0.00	-0.00	0.0961	0.0976	0.0900	0.1005	0.1010
0.00	1.50	-0.0931	-0.0905	-0.0950	-0.0972	-0.0906
0.10	1.60	-0.1051	-0.1066	-0.1002	-0.1007	-0.1112
0.20	1.70	-0.1170	-0.1107	-0.1200	-0.1221	-0.1230
0.30	1.80	-0.1290	-0.1307	-0.1326	-0.1305	-0.1367
0.00	1.90	-0.1406	-0.1427	-0.1407	-0.1467	-0.1487
0.50	2.00	-0.1527	-0.1505	-0.1567	-0.1500	-0.1611
0.60	2.10	-0.1630	-0.1663	-0.1606	-0.1710	-0.1737
0.70	2.20	-0.1755	-0.1700	-0.1805	-0.1830	-0.1855
0.00	2.30	-0.1870	-0.1896	-0.1923	-0.1909	-0.1976
0.00	2.00	-0.1900	-0.2012	-0.2000	-0.2060	-0.2096
1.00	2.50	-0.2007	-0.2127	-0.2156	-0.2186	-0.2215
1.10	2.60	-0.2210	-0.2201	-0.2272	-0.2307	-0.2330
1.20	2.70	-0.2321	-0.2350	-0.2307	-0.2419	-0.2451
1.30	2.80	-0.2433	-0.2467	-0.2501	-0.2530	-0.2560
1.00	2.90	-0.2503	-0.2579	-0.2610	-0.2609	-0.2600
1.50	3.00	-0.2653	-0.2600	-0.2727	-0.2763	-0.2800
1.60	3.10	-0.2762	-0.2800	-0.2830	-0.2976	-0.2910
1.70	3.20	-0.2870	-0.2910	-0.2950	-0.2989	-0.3028
1.00	3.30	-0.2970	-0.3010	-0.3060	-0.3101	-0.3101
1.90	3.00	-0.3005	-0.3120	-0.3170	-0.3212	-0.3250
2.00	3.50	-0.3192	-0.3235	-0.3270	-0.3327	-0.3365
2.20	3.70	-0.3002	-0.3000	-0.3005	-0.3000	-0.3000
2.00	3.90	-0.3611	-0.3659	-0.3700	-0.3756	-0.3800
2.60	4.10	-0.3816	-0.3867	-0.3910	-0.3969	-0.4019
3.00	4.50	-0.4219	-0.4275	-0.4331	-0.4396	-0.4401

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 1.500 YEARS

*****INTEREST RATE 1%*****

PL	TR	0.070	0.071	0.072	0.073	0.074
-3.00	-3.00	0.5774	0.5865	0.5955	0.6046	0.6137
-2.60	-2.60	0.5085	0.5164	0.5242	0.5321	0.5400
-2.20	-2.20	0.4749	0.4820	0.4893	0.4966	0.5039
-2.20	-2.20	0.4415	0.4482	0.4549	0.4617	0.4684
-2.00	-2.00	0.4086	0.4148	0.4210	0.4272	0.4334
-1.90	-1.90	0.3923	0.3983	0.4042	0.4101	0.4160
-1.80	-1.80	0.3762	0.3818	0.3875	0.3932	0.3989
-1.70	-1.70	0.3601	0.3655	0.3709	0.3763	0.3817
-1.60	-1.60	0.3442	0.3493	0.3545	0.3596	0.3648
-1.50	-1.50	0.3284	0.3333	0.3381	0.3430	0.3479
-1.40	-1.40	0.3127	0.3173	0.3219	0.3266	0.3312
-1.30	-1.30	0.2970	0.3014	0.3058	0.3102	0.3146
-1.20	-1.20	0.2815	0.2857	0.2900	0.2943	0.2986
-1.10	-1.10	0.2661	0.2700	0.2739	0.2778	0.2817
-1.00	-1.00	0.2509	0.2545	0.2582	0.2618	0.2655
-0.90	-0.90	0.2356	0.2391	0.2425	0.2459	0.2493
-0.80	-0.80	0.2205	0.2237	0.2269	0.2301	0.2333
-0.70	-0.70	0.2055	0.2085	0.2115	0.2146	0.2176
-0.60	-0.60	0.1906	0.1934	0.1961	0.1989	0.2016
-0.50	-0.50	0.1759	0.1784	0.1809	0.1834	0.1859
-0.40	-0.40	0.1612	0.1635	0.1658	0.1681	0.1704
-0.30	-0.30	0.1466	0.1486	0.1507	0.1528	0.1549
-0.20	-0.20	0.1321	0.1339	0.1358	0.1377	0.1395
-0.10	-0.10	0.1177	0.1193	0.1210	0.1226	0.1243
-0.00	-0.00	0.1034	0.1048	0.1063	0.1077	0.1092
0.00	1.50	-0.0999	-0.1013	-0.1026	-0.1040	-0.1053
0.10	1.60	-0.1128	-0.1143	-0.1158	-0.1173	-0.1188
0.20	1.70	-0.1255	-0.1272	-0.1289	-0.1306	-0.1322
0.30	1.80	-0.1382	-0.1400	-0.1419	-0.1437	-0.1456
0.40	1.90	-0.1507	-0.1528	-0.1548	-0.1568	-0.1589
0.50	2.00	-0.1632	-0.1654	-0.1676	-0.1697	-0.1719
0.60	2.10	-0.1756	-0.1780	-0.1803	-0.1826	-0.1849
0.70	2.20	-0.1880	-0.1904	-0.1929	-0.1954	-0.1979
0.80	2.30	-0.2002	-0.2028	-0.2055	-0.2081	-0.2107
0.90	2.40	-0.2124	-0.2151	-0.2179	-0.2207	-0.2234
1.00	2.50	-0.2248	-0.2278	-0.2307	-0.2337	-0.2366
1.10	2.60	-0.2368	-0.2399	-0.2426	-0.2456	-0.2487
1.20	2.70	-0.2488	-0.2516	-0.2548	-0.2580	-0.2612
1.30	2.80	-0.2602	-0.2635	-0.2669	-0.2702	-0.2735
1.40	2.90	-0.2719	-0.2754	-0.2789	-0.2824	-0.2859
1.50	3.00	-0.2836	-0.2872	-0.2909	-0.2945	-0.2981
1.60	3.10	-0.2952	-0.2990	-0.3027	-0.3065	-0.3102
1.70	3.20	-0.3067	-0.3106	-0.3145	-0.3184	-0.3222
1.80	3.30	-0.3182	-0.3222	-0.3262	-0.3302	-0.3342
1.90	3.40	-0.3295	-0.3337	-0.3379	-0.3420	-0.3461
2.00	3.50	-0.3408	-0.3451	-0.3494	-0.3536	-0.3579
2.20	3.70	-0.3632	-0.3677	-0.3722	-0.3767	-0.3812
2.40	3.90	-0.3852	-0.3900	-0.3947	-0.3995	-0.4042
2.60	4.10	-0.4069	-0.4119	-0.4169	-0.4219	-0.4268
3.00	4.50	-0.4496	-0.4550	-0.4604	-0.4658	-0.4712

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 1.500 YEARS

*****INVERSE RATIO IVS*****

TL	TP	0.075	0.076	0.077	0.078	0.079
-3.00	-3.00	0.6228	0.6319	0.6411	0.6503	0.6595
-2.60	-2.60	0.5879	0.5958	0.6039	0.6117	0.6197
-2.40	-2.40	0.5113	0.5195	0.5260	0.5333	0.5407
-2.20	-2.20	0.4752	0.4819	0.4887	0.4955	0.5023
-2.00	-2.00	0.4396	0.4458	0.4520	0.4583	0.4645
-1.90	-1.90	0.4220	0.4279	0.4339	0.4399	0.4459
-1.80	-1.80	0.4045	0.4102	0.4159	0.4216	0.4273
-1.70	-1.70	0.3872	0.3926	0.3980	0.4034	0.4088
-1.60	-1.60	0.3699	0.3751	0.3803	0.3856	0.3908
-1.50	-1.50	0.3528	0.3577	0.3626	0.3676	0.3725
-1.40	-1.40	0.3359	0.3405	0.3452	0.3499	0.3545
-1.30	-1.30	0.3190	0.3234	0.3279	0.3322	0.3366
-1.20	-1.20	0.3023	0.3066	0.3106	0.3147	0.3189
-1.10	-1.10	0.2856	0.2895	0.2935	0.2974	0.3013
-1.00	-1.00	0.2692	0.2729	0.2765	0.2802	0.2839
-0.90	-0.90	0.2528	0.2562	0.2597	0.2631	0.2665
-0.80	-0.80	0.2365	0.2397	0.2429	0.2461	0.2493
-0.70	-0.70	0.2204	0.2234	0.2263	0.2293	0.2323
-0.60	-0.60	0.2044	0.2071	0.2099	0.2126	0.2153
-0.50	-0.50	0.1885	0.1910	0.1935	0.1960	0.1985
-0.40	-0.40	0.1727	0.1750	0.1773	0.1796	0.1819
-0.30	-0.30	0.1570	0.1591	0.1611	0.1632	0.1653
-0.20	-0.20	0.1414	0.1433	0.1452	0.1470	0.1489
-0.10	-0.10	0.1260	0.1276	0.1293	0.1309	0.1326
-0.00	-0.00	0.1106	0.1121	0.1135	0.1150	0.1164
0.00	1.50	-0.1067	-0.1080	-0.1094	-0.1107	-0.1121
0.10	1.60	-0.1208	-0.1219	-0.1230	-0.1249	-0.1268
0.20	1.70	-0.1339	-0.1356	-0.1373	-0.1389	-0.1406
0.30	1.80	-0.1473	-0.1492	-0.1511	-0.1529	-0.1547
0.40	1.90	-0.1608	-0.1628	-0.1647	-0.1667	-0.1687
0.50	2.00	-0.1740	-0.1762	-0.1783	-0.1805	-0.1826
0.60	2.10	-0.1872	-0.1895	-0.1919	-0.1941	-0.1964
0.70	2.20	-0.2003	-0.2028	-0.2052	-0.2076	-0.2101
0.80	2.30	-0.2133	-0.2159	-0.2185	-0.2211	-0.2237
0.90	2.40	-0.2262	-0.2289	-0.2317	-0.2344	-0.2371
1.00	2.50	-0.2390	-0.2419	-0.2449	-0.2477	-0.2505
1.10	2.60	-0.2517	-0.2547	-0.2578	-0.2608	-0.2639
1.20	2.70	-0.2643	-0.2675	-0.2707	-0.2739	-0.2770
1.30	2.80	-0.2769	-0.2802	-0.2835	-0.2868	-0.2901
1.40	2.90	-0.2893	-0.2928	-0.2962	-0.2996	-0.3030
1.50	3.00	-0.3017	-0.3052	-0.3088	-0.3124	-0.3159
1.60	3.10	-0.3139	-0.3176	-0.3213	-0.3250	-0.3287
1.70	3.20	-0.3261	-0.3299	-0.3338	-0.3376	-0.3414
1.80	3.30	-0.3382	-0.3421	-0.3461	-0.3500	-0.3539
1.90	3.40	-0.3502	-0.3543	-0.3583	-0.3624	-0.3664
2.00	3.50	-0.3621	-0.3663	-0.3705	-0.3747	-0.3789
2.20	3.70	-0.3857	-0.3901	-0.3945	-0.3990	-0.4034
2.40	3.90	-0.4089	-0.4136	-0.4182	-0.4229	-0.4275
2.60	4.10	-0.4318	-0.4367	-0.4416	-0.4464	-0.4513
2.80	4.50	-0.4766	-0.4819	-0.4872	-0.4925	-0.4978

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TYPE 1.509 VENT

*****INTEREST RATE 7%*****

PL	TR	0.000	0.001	0.002	0.003	0.004
-3.00	-3.00	0.6687	0.6700	0.6872	0.6945	0.7059
-2.60	-2.60	0.5877	0.5957	0.6037	0.6119	0.6199
-2.00	-2.00	0.5081	0.5156	0.5230	0.5302	0.5379
-2.30	-2.20	0.5092	0.5169	0.5229	0.5297	0.5366
-2.00	-2.00	0.4708	0.4771	0.4877	0.4896	0.4950
-1.90	-1.90	0.4519	0.4570	0.4630	0.4697	0.4750
-1.80	-1.80	0.4330	0.4387	0.4485	0.4522	0.4559
-1.70	-1.70	0.4183	0.4199	0.4252	0.4307	0.4362
-1.60	-1.60	0.3958	0.4010	0.4062	0.4118	0.4166
-1.50	-1.50	0.3779	0.3823	0.3873	0.3922	0.3972
-1.40	-1.40	0.3591	0.3630	0.3695	0.3732	0.3779
-1.30	-1.30	0.3419	0.3455	0.3499	0.3543	0.3587
-1.20	-1.20	0.3231	0.3272	0.3310	0.3356	0.3399
-1.10	-1.10	0.3052	0.3092	0.3137	0.3170	0.3209
-1.00	-1.00	0.2875	0.2912	0.2940	0.2986	0.3023
-0.90	-0.90	0.2700	0.2738	0.2769	0.2803	0.2838
-0.80	-0.80	0.2525	0.2550	0.2580	0.2622	0.2658
-0.70	-0.70	0.2353	0.2382	0.2412	0.2442	0.2472
-0.60	-0.60	0.2181	0.2208	0.2236	0.2263	0.2291
-0.50	-0.50	0.2011	0.2036	0.2067	0.2086	0.2111
-0.40	-0.40	0.1842	0.1865	0.1889	0.1911	0.1938
-0.30	-0.30	0.1678	0.1695	0.1716	0.1736	0.1757
-0.20	-0.20	0.1508	0.1526	0.1545	0.1567	0.1592
-0.10	-0.10	0.1342	0.1359	0.1375	0.1392	0.1408
-0.00	-0.00	0.1179	0.1193	0.1207	0.1222	0.1236
0.00	1.50	-0.1138	-0.1147	-0.1161	-0.1178	-0.1187
0.10	1.60	-0.1279	-0.1298	-0.1309	-0.1328	-0.1339
0.20	1.70	-0.1423	-0.1439	-0.1456	-0.1472	-0.1489
0.30	1.80	-0.1565	-0.1580	-0.1602	-0.1620	-0.1638
0.40	1.90	-0.1707	-0.1727	-0.1746	-0.1766	-0.1785
0.50	2.00	-0.1847	-0.1869	-0.1890	-0.1911	-0.1932
0.60	2.10	-0.1987	-0.2010	-0.2032	-0.2055	-0.2078
0.70	2.20	-0.2125	-0.2149	-0.2178	-0.2198	-0.2222
0.80	2.30	-0.2262	-0.2288	-0.2318	-0.2339	-0.2365
0.90	2.40	-0.2399	-0.2426	-0.2453	-0.2480	-0.2507
1.00	2.50	-0.2538	-0.2562	-0.2591	-0.2619	-0.2648
1.10	2.60	-0.2668	-0.2698	-0.2729	-0.2758	-0.2787
1.20	2.70	-0.2801	-0.2832	-0.2864	-0.2895	-0.2926
1.30	2.80	-0.2933	-0.2966	-0.2998	-0.3031	-0.3063
1.40	2.90	-0.3064	-0.3099	-0.3132	-0.3166	-0.3200
1.50	3.00	-0.3194	-0.3230	-0.3265	-0.3300	-0.3335
1.60	3.10	-0.3324	-0.3360	-0.3396	-0.3433	-0.3469
1.70	3.20	-0.3452	-0.3489	-0.3527	-0.3565	-0.3602
1.80	3.30	-0.3579	-0.3618	-0.3657	-0.3695	-0.3734
1.90	3.40	-0.3705	-0.3745	-0.3785	-0.3825	-0.3865
2.00	3.50	-0.3830	-0.3871	-0.3913	-0.3954	-0.3995
2.20	3.70	-0.4078	-0.4121	-0.4165	-0.4209	-0.4251
2.40	3.90	-0.4321	-0.4367	-0.4413	-0.4458	-0.4504
2.60	4.10	-0.4561	-0.4609	-0.4657	-0.4705	-0.4752
3.00	4.50	-0.5030	-0.5082	-0.5134	-0.5186	-0.5238

TABLE A-6.
 FACTOR OF INFLUENCE ON DIRECT COST FOR PROPOSED TIME 1.500 YEARS

*****INTEREST RATE 1%*****

Y1	Y2	0.085	0.086	0.087	0.088	0.089
-3.00	-3.00	0.7152	0.7206	0.7260	0.7314	0.7368
-2.60	-2.60	0.6279	0.6360	0.6441	0.6523	0.6604
-2.20	-2.20	0.5453	0.5528	0.5603	0.5678	0.5753
-2.20	-2.20	0.5435	0.5508	0.5573	0.5642	0.5711
-2.00	-2.00	0.5022	0.5086	0.5149	0.5212	0.5275
-1.80	-1.80	0.4619	0.4679	0.4738	0.4797	0.4856
-1.80	-1.80	0.4617	0.4675	0.4732	0.4790	0.4848
-1.70	-1.70	0.4417	0.4472	0.4527	0.4582	0.4637
-1.60	-1.60	0.4218	0.4270	0.4323	0.4375	0.4427
-1.50	-1.50	0.4021	0.4071	0.4121	0.4170	0.4220
-1.40	-1.40	0.3826	0.3873	0.3920	0.3967	0.4014
-1.30	-1.30	0.3632	0.3676	0.3721	0.3765	0.3810
-1.20	-1.20	0.3439	0.3481	0.3523	0.3565	0.3607
-1.10	-1.10	0.3244	0.3284	0.3326	0.3367	0.3408
-1.00	-1.00	0.3060	0.3097	0.3134	0.3171	0.3208
-0.90	-0.90	0.2872	0.2907	0.2941	0.2976	0.3011
-0.80	-0.80	0.2686	0.2718	0.2750	0.2782	0.2815
-0.70	-0.70	0.2501	0.2531	0.2561	0.2591	0.2621
-0.60	-0.60	0.2318	0.2346	0.2373	0.2401	0.2428
-0.50	-0.50	0.2137	0.2162	0.2187	0.2212	0.2238
-0.40	-0.40	0.1957	0.1980	0.2003	0.2026	0.2049
-0.30	-0.30	0.1778	0.1799	0.1820	0.1840	0.1861
-0.20	-0.20	0.1601	0.1619	0.1638	0.1657	0.1675
-0.10	-0.10	0.1425	0.1441	0.1458	0.1474	0.1491
-0.00	-0.00	0.1251	0.1265	0.1279	0.1294	0.1308
0.00	1.50	-0.1201	-0.1214	-0.1227	-0.1240	-0.1254
0.10	1.60	-0.1354	-0.1369	-0.1383	-0.1398	-0.1413
0.20	1.70	-0.1505	-0.1522	-0.1538	-0.1555	-0.1571
0.30	1.80	-0.1656	-0.1674	-0.1692	-0.1710	-0.1728
0.40	1.90	-0.1805	-0.1825	-0.1844	-0.1864	-0.1883
0.50	2.00	-0.1953	-0.1974	-0.1995	-0.2016	-0.2037
0.60	2.10	-0.2100	-0.2123	-0.2145	-0.2168	-0.2190
0.70	2.20	-0.2246	-0.2270	-0.2294	-0.2318	-0.2342
0.80	2.30	-0.2390	-0.2416	-0.2441	-0.2467	-0.2492
0.90	2.40	-0.2534	-0.2561	-0.2587	-0.2614	-0.2641
1.00	2.50	-0.2676	-0.2704	-0.2732	-0.2760	-0.2788
1.10	2.60	-0.2817	-0.2846	-0.2876	-0.2905	-0.2935
1.20	2.70	-0.2957	-0.2988	-0.3019	-0.3049	-0.3080
1.30	2.80	-0.3096	-0.3128	-0.3160	-0.3192	-0.3224
1.40	2.90	-0.3233	-0.3267	-0.3300	-0.3333	-0.3366
1.50	3.00	-0.3370	-0.3404	-0.3439	-0.3474	-0.3508
1.60	3.10	-0.3505	-0.3541	-0.3577	-0.3613	-0.3648
1.70	3.20	-0.3639	-0.3676	-0.3714	-0.3750	-0.3787
1.80	3.30	-0.3772	-0.3811	-0.3849	-0.3887	-0.3925
1.90	3.40	-0.3905	-0.3944	-0.3984	-0.4023	-0.4062
2.00	3.50	-0.4036	-0.4076	-0.4117	-0.4157	-0.4198
2.20	3.70	-0.4294	-0.4337	-0.4380	-0.4423	-0.4465
2.40	3.90	-0.4544	-0.4594	-0.4639	-0.4684	-0.4729
2.60	4.10	-0.4800	-0.4847	-0.4894	-0.4941	-0.4987
3.00	4.50	-0.5289	-0.5340	-0.5391	-0.5441	-0.5492

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 1.500 YEARS

*****TABLE A-8*****

T1	T2	0.090	0.091	0.092	0.093	1.094
-3.00	-3.00	0.7623	0.7718	0.7813	0.7908	0.8004
-2.60	-2.60	0.6686	0.6768	0.6850	0.6932	0.7014
-2.40	-2.40	0.6229	0.6305	0.6381	0.6456	0.6532
-2.20	-2.20	0.5780	0.5850	0.5920	0.5989	0.6059
-2.00	-2.00	0.5339	0.5403	0.5467	0.5531	0.5595
-1.80	-1.80	0.5122	0.5183	0.5243	0.5304	0.5366
-1.60	-1.60	0.4905	0.4964	0.5022	0.5080	0.5138
-1.40	-1.40	0.4692	0.4747	0.4802	0.4858	0.4913
-1.20	-1.20	0.4480	0.4532	0.4585	0.4637	0.4690
-1.00	-1.00	0.4269	0.4319	0.4369	0.4419	0.4469
-0.80	-0.80	0.4061	0.4108	0.4155	0.4202	0.4249
-0.60	-0.60	0.3854	0.3899	0.3943	0.3988	0.4033
-0.40	-0.40	0.3649	0.3691	0.3733	0.3775	0.3817
-0.20	-0.20	0.3446	0.3486	0.3525	0.3565	0.3604
-0.00	-0.00	0.3245	0.3282	0.3319	0.3356	0.3393
0.20	0.20	0.3045	0.3079	0.3112	0.3145	0.3178
0.40	0.40	0.2847	0.2879	0.2911	0.2943	0.2976
0.60	0.60	0.2650	0.2680	0.2710	0.2740	0.2770
0.80	0.80	0.2456	0.2483	0.2511	0.2538	0.2566
1.00	1.00	0.2263	0.2288	0.2313	0.2339	0.2364
1.20	1.20	0.2072	0.2095	0.2118	0.2141	0.2164
1.40	1.40	0.1882	0.1903	0.1923	0.1944	0.1965
1.60	1.60	0.1694	0.1712	0.1731	0.1750	0.1769
1.80	1.80	0.1507	0.1524	0.1540	0.1557	0.1573
2.00	2.00	0.1323	0.1337	0.1351	0.1366	0.1380
2.20	2.20	-0.1267	-0.1280	-0.1293	-0.1306	-0.1319
2.40	2.40	-0.1428	-0.1443	-0.1457	-0.1472	-0.1487
2.60	2.60	-0.1587	-0.1604	-0.1620	-0.1636	-0.1652
2.80	2.80	-0.1746	-0.1764	-0.1781	-0.1799	-0.1817
3.00	3.00	-0.1903	-0.1922	-0.1941	-0.1961	-0.1980
3.20	3.20	-0.2058	-0.2079	-0.2100	-0.2121	-0.2141
3.40	3.40	-0.2212	-0.2235	-0.2257	-0.2279	-0.2301
3.60	3.60	-0.2365	-0.2389	-0.2413	-0.2436	-0.2460
3.80	3.80	-0.2517	-0.2542	-0.2567	-0.2592	-0.2617
4.00	4.00	-0.2667	-0.2694	-0.2720	-0.2747	-0.2773
4.20	4.20	-0.2816	-0.2844	-0.2872	-0.2900	-0.2927
4.40	4.40	-0.2964	-0.2993	-0.3022	-0.3051	-0.3080
4.60	4.60	-0.3110	-0.3141	-0.3171	-0.3202	-0.3233
4.80	4.80	-0.3256	-0.3287	-0.3319	-0.3351	-0.3382
5.00	5.00	-0.3400	-0.3433	-0.3465	-0.3498	-0.3531
5.20	5.20	-0.3542	-0.3577	-0.3611	-0.3645	-0.3679
5.40	5.40	-0.3684	-0.3719	-0.3754	-0.3789	-0.3824
5.60	5.60	-0.3824	-0.3861	-0.3897	-0.3934	-0.3971
5.80	5.80	-0.3963	-0.4001	-0.4038	-0.4076	-0.4114
6.00	6.00	-0.4101	-0.4140	-0.4178	-0.4217	-0.4256
6.20	6.20	-0.4238	-0.4278	-0.4318	-0.4357	-0.4397
6.40	6.40	-0.4374	-0.4415	-0.4455	-0.4495	-0.4535
6.60	6.60	-0.4509	-0.4550	-0.4591	-0.4632	-0.4673
6.80	6.80	-0.4643	-0.4685	-0.4726	-0.4768	-0.4809
7.00	7.00	-0.4777	-0.4819	-0.4861	-0.4903	-0.4945
7.20	7.20	-0.4910	-0.4953	-0.4995	-0.5038	-0.5080
7.40	7.40	-0.5042	-0.5085	-0.5128	-0.5171	-0.5213
7.60	7.60	-0.5174	-0.5217	-0.5260	-0.5303	-0.5345
7.80	7.80	-0.5306	-0.5349	-0.5392	-0.5435	-0.5477
8.00	8.00	-0.5438	-0.5481	-0.5524	-0.5567	-0.5609

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 1.500 YEARS

*****INTEREST RATE 1%*****

TL	TR	0.095	0.096	0.097	0.098	0.099
-3.00	-3.00	0.8099	0.8195	0.8292	0.8388	0.8485
-2.60	-2.60	0.7096	0.7179	0.7262	0.7345	0.7428
-2.20	-2.20	0.6609	0.6685	0.6761	0.6838	0.6915
-2.20	-2.20	0.6129	0.6199	0.6270	0.6340	0.6411
-2.00	-2.00	0.5659	0.5723	0.5787	0.5852	0.5916
-1.90	-1.90	0.5427	0.5488	0.5549	0.5611	0.5672
-1.90	-1.90	0.5197	0.5255	0.5314	0.5372	0.5431
-1.70	-1.70	0.4969	0.5028	0.5088	0.5146	0.5191
-1.60	-1.60	0.4783	0.4836	0.4889	0.4942	0.4995
-1.50	-1.50	0.4519	0.4569	0.4619	0.4670	0.4720
-1.40	-1.40	0.4297	0.4345	0.4392	0.4440	0.4487
-1.30	-1.30	0.4077	0.4122	0.4167	0.4212	0.4257
-1.20	-1.20	0.3860	0.3902	0.3944	0.3986	0.4028
-1.10	-1.10	0.3648	0.3683	0.3723	0.3762	0.3801
-1.00	-1.00	0.3430	0.3467	0.3504	0.3541	0.3579
-0.90	-0.90	0.3218	0.3253	0.3287	0.3322	0.3357
-0.80	-0.80	0.3008	0.3040	0.3072	0.3105	0.3137
-0.70	-0.70	0.2800	0.2830	0.2860	0.2889	0.2919
-0.60	-0.60	0.2593	0.2621	0.2649	0.2676	0.2704
-0.50	-0.50	0.2389	0.2414	0.2440	0.2465	0.2490
-0.40	-0.40	0.2187	0.2210	0.2232	0.2255	0.2278
-0.30	-0.30	0.1986	0.2007	0.2027	0.2048	0.2069
-0.20	-0.20	0.1787	0.1805	0.1824	0.1843	0.1861
-0.10	-0.10	0.1590	0.1606	0.1623	0.1639	0.1655
-0.00	-0.00	0.1398	0.1409	0.1423	0.1437	0.1452
0.00	1.50	-0.1333	-0.1346	-0.1359	-0.1372	-0.1385
0.10	1.60	-0.1502	-0.1516	-0.1531	-0.1545	-0.1560
0.20	1.70	-0.1669	-0.1685	-0.1701	-0.1717	-0.1734
0.30	1.80	-0.1835	-0.1852	-0.1870	-0.1888	-0.1905
0.40	1.90	-0.1999	-0.2018	-0.2038	-0.2057	-0.2076
0.50	2.00	-0.2162	-0.2183	-0.2203	-0.2224	-0.2245
0.60	2.10	-0.2328	-0.2346	-0.2368	-0.2390	-0.2412
0.70	2.20	-0.2488	-0.2507	-0.2530	-0.2554	-0.2577
0.80	2.30	-0.2642	-0.2667	-0.2692	-0.2717	-0.2741
0.90	2.40	-0.2799	-0.2825	-0.2852	-0.2878	-0.2904
1.00	2.50	-0.2955	-0.2982	-0.3010	-0.3037	-0.3065
1.10	2.60	-0.3109	-0.3138	-0.3167	-0.3195	-0.3224
1.20	2.70	-0.3262	-0.3292	-0.3322	-0.3352	-0.3382
1.30	2.80	-0.3418	-0.3445	-0.3476	-0.3507	-0.3538
1.40	2.90	-0.3568	-0.3596	-0.3629	-0.3661	-0.3693
1.50	3.00	-0.3712	-0.3746	-0.3780	-0.3813	-0.3847
1.60	3.10	-0.3860	-0.3895	-0.3930	-0.3964	-0.3999
1.70	3.20	-0.4006	-0.4042	-0.4078	-0.4114	-0.4150
1.80	3.30	-0.4151	-0.4188	-0.4225	-0.4262	-0.4299
1.90	3.40	-0.4298	-0.4333	-0.4371	-0.4409	-0.4447
2.00	3.50	-0.4436	-0.4476	-0.4515	-0.4554	-0.4593
2.20	3.70	-0.4717	-0.4758	-0.4800	-0.4841	-0.4882
2.40	3.90	-0.4992	-0.5036	-0.5079	-0.5122	-0.5165
2.60	4.10	-0.5263	-0.5308	-0.5353	-0.5398	-0.5442
3.00	4.50	-0.5783	-0.5838	-0.5893	-0.5946	-0.5999

TABLE A-6.
RATIO OF TEMPERATURE TO DIRECT COST FOR EXPOSURE TIME 1.500 YEARS

*****INVERSE RATIO T/TS*****

TL	TR	0.100	0.101	0.102	0.103	0.104
-3.00	-3.00	-0.9592	-0.9679	-0.9776	-0.9878	-0.9977
-2.60	-2.60	-0.7512	-0.7595	-0.7679	-0.7763	-0.7847
-2.20	-2.20	-0.6991	-0.7069	-0.7146	-0.7223	-0.7299
-2.20	-2.20	-0.6881	-0.6952	-0.7023	-0.7098	-0.7165
-2.00	-2.00	-0.5981	-0.6085	-0.6170	-0.6275	-0.6380
-1.90	-1.90	-0.5734	-0.5796	-0.5857	-0.5919	-0.5981
-1.80	-1.80	-0.5489	-0.5548	-0.5607	-0.5666	-0.5725
-1.70	-1.70	-0.5287	-0.5303	-0.5359	-0.5415	-0.5471
-1.60	-1.60	-0.5090	-0.5061	-0.5116	-0.5167	-0.5220
-1.50	-1.50	-0.4770	-0.4820	-0.4871	-0.4921	-0.4972
-1.40	-1.40	-0.4535	-0.4582	-0.4630	-0.4678	-0.4726
-1.30	-1.30	-0.4302	-0.4347	-0.4392	-0.4437	-0.4482
-1.20	-1.20	-0.4071	-0.4113	-0.4156	-0.4198	-0.4241
-1.10	-1.10	-0.3842	-0.3882	-0.3922	-0.3962	-0.4002
-1.00	-1.00	-0.3616	-0.3653	-0.3690	-0.3728	-0.3765
-0.90	-0.90	-0.3392	-0.3426	-0.3461	-0.3496	-0.3531
-0.80	-0.80	-0.3169	-0.3202	-0.3238	-0.3274	-0.3309
-0.70	-0.70	-0.2948	-0.2979	-0.3009	-0.3039	-0.3069
-0.60	-0.60	-0.2731	-0.2759	-0.2786	-0.2818	-0.2842
-0.50	-0.50	-0.2515	-0.2541	-0.2566	-0.2591	-0.2616
-0.40	-0.40	-0.2301	-0.2328	-0.2357	-0.2370	-0.2393
-0.30	-0.30	-0.2090	-0.2110	-0.2131	-0.2152	-0.2173
-0.20	-0.20	-0.1880	-0.1898	-0.1917	-0.1935	-0.1958
-0.10	-0.10	-0.1672	-0.1688	-0.1705	-0.1721	-0.1739
-0.00	-0.00	-0.1466	-0.1480	-0.1495	-0.1509	-0.1523
0.00	1.50	-0.1298	-0.1311	-0.1328	-0.1337	-0.1350
0.10	1.60	-0.1575	-0.1589	-0.1608	-0.1618	-0.1633
0.20	1.70	-0.1750	-0.1766	-0.1792	-0.1799	-0.1818
0.30	1.80	-0.1923	-0.1941	-0.1958	-0.1976	-0.1993
0.40	1.90	-0.2095	-0.2118	-0.2133	-0.2152	-0.2171
0.50	2.00	-0.2265	-0.2285	-0.2306	-0.2326	-0.2347
0.60	2.10	-0.2438	-0.2455	-0.2477	-0.2499	-0.2521
0.70	2.20	-0.2609	-0.2628	-0.2687	-0.2670	-0.2693
0.80	2.30	-0.2766	-0.2790	-0.2815	-0.2839	-0.2868
0.90	2.40	-0.2930	-0.2956	-0.2981	-0.3007	-0.3033
1.00	2.50	-0.3092	-0.3119	-0.3146	-0.3173	-0.3200
1.10	2.60	-0.3253	-0.3281	-0.3309	-0.3338	-0.3366
1.20	2.70	-0.3412	-0.3441	-0.3471	-0.3501	-0.3530
1.30	2.80	-0.3569	-0.3600	-0.3631	-0.3662	-0.3692
1.40	2.90	-0.3726	-0.3758	-0.3790	-0.3822	-0.3853
1.50	3.00	-0.3880	-0.3913	-0.3947	-0.3980	-0.4013
1.60	3.10	-0.4033	-0.4068	-0.4102	-0.4136	-0.4170
1.70	3.20	-0.4185	-0.4221	-0.4256	-0.4291	-0.4326
1.80	3.30	-0.4335	-0.4372	-0.4409	-0.4445	-0.4481
1.90	3.40	-0.4488	-0.4522	-0.4560	-0.4597	-0.4638
2.00	3.50	-0.4632	-0.4671	-0.4709	-0.4749	-0.4786
2.20	3.70	-0.4823	-0.4863	-0.5008	-0.5048	-0.5085
2.40	3.90	-0.5208	-0.5251	-0.5292	-0.5335	-0.5377
2.60	4.10	-0.5489	-0.5532	-0.5577	-0.5621	-0.5665
3.00	4.50	-0.6032	-0.6080	-0.6127	-0.6175	-0.6222

TABLE 4-8.
DIRECT COST FOR EMPLOYEES 2,000 HRS

*****EMPLOYEES*****						
Y	W	A.061	A.062	A.063	A.064	Y
-1.00	-1.00	0.5288	0.5339	0.5438	0.5539	1.068
-2.60	-2.60	0.8661	0.8785	0.8829	0.8912	0.8997
-2.80	-2.80	0.8375	0.8453	0.8531	0.8610	0.8688
-2.20	-2.20	0.8007	0.8165	0.8237	0.8310	0.8383
-2.00	-2.00	0.3813	0.3880	0.3987	0.4015	0.4087
-1.00	-1.00	0.3678	0.3739	0.3803	0.3868	0.3931
-1.00	-1.00	0.3537	0.3599	0.3660	0.3723	0.3785
-1.70	-1.70	0.3803	0.3859	0.3910	0.3978	0.4037
-1.60	-1.60	0.3268	0.3327	0.3377	0.3428	0.3491
-1.50	-1.50	0.3129	0.3182	0.3237	0.3291	0.3346
-1.00	-1.00	0.2998	0.3065	0.3107	0.3180	0.3201
-1.30	-1.30	0.2960	0.2999	0.2958	0.2998	0.2957
-1.20	-1.20	0.2727	0.2778	0.2821	0.2868	0.2915
-1.10	-1.10	0.2585	0.2639	0.2696	0.2728	0.2773
-1.00	-1.00	0.2463	0.2505	0.2587	0.2580	0.2637
-0.90	-0.90	0.2333	0.2372	0.2407	0.2452	0.2491
-0.80	-0.80	0.2203	0.2280	0.2277	0.2315	0.2352
-0.70	-0.70	0.2073	0.2105	0.2188	0.2179	0.2218
-0.60	-0.60	0.1945	0.1979	0.2011	0.2083	0.2076
-0.50	-0.50	0.1817	0.1880	0.1879	0.1900	0.1939
-0.40	-0.40	0.1688	0.1719	0.1787	0.1775	0.1808
-0.30	-0.30	0.1568	0.1590	0.1635	0.1682	0.1668
-0.20	-0.20	0.1439	0.1463	0.1486	0.1519	0.1538
-0.10	-0.10	0.1318	0.1336	0.1357	0.1379	0.1801
-0.00	-0.00	0.1190	0.1210	0.1229	0.1289	0.1268
0.00	0.00	-0.1185	-0.1163	-0.1181	-0.1199	-0.1217
0.10	0.10	-0.1259	-0.1278	-0.1298	-0.1318	-0.1333
0.20	0.20	-0.1363	-0.1385	-0.1406	-0.1428	-0.1489
0.30	0.30	-0.1472	-0.1495	-0.1518	-0.1581	-0.1568
0.40	0.40	-0.1580	-0.1608	-0.1629	-0.1658	-0.1678
0.50	0.50	-0.1687	-0.1713	-0.1739	-0.1766	-0.1782
0.60	0.60	-0.1787	-0.1821	-0.1889	-0.1877	-0.1908
0.70	0.70	-0.1899	-0.1979	-0.1958	-0.1987	-0.2017
0.80	0.80	-0.2005	-0.2035	-0.2067	-0.2087	-0.2178
0.90	0.90	-0.2110	-0.2182	-0.2178	-0.2207	-0.2239
1.00	1.00	-0.2218	-0.2289	-0.2281	-0.2315	-0.2389
1.10	1.10	-0.2317	-0.2353	-0.2388	-0.2423	-0.2458
1.20	1.20	-0.2420	-0.2457	-0.2492	-0.2530	-0.2567
1.30	1.30	-0.2522	-0.2561	-0.2599	-0.2637	-0.2675
1.40	1.40	-0.2628	-0.2668	-0.2703	-0.2782	-0.2782
1.50	1.50	-0.2725	-0.2765	-0.2807	-0.2888	-0.2898
1.60	1.60	-0.2826	-0.2868	-0.2911	-0.2953	-0.2995
1.70	1.70	-0.2926	-0.2970	-0.3013	-0.3057	-0.3100
1.80	1.80	-0.3025	-0.3070	-0.3115	-0.3160	-0.3205
1.90	1.90	-0.3128	-0.3171	-0.3217	-0.3263	-0.3309
2.00	2.00	-0.3222	-0.3270	-0.3318	-0.3365	-0.3412
2.10	2.10	-0.3317	-0.3367	-0.3418	-0.3468	-0.3517
2.20	2.20	-0.3417	-0.3462	-0.3515	-0.3568	-0.3617
2.30	2.30	-0.3519	-0.3562	-0.3619	-0.3677	-0.3720
2.40	2.40	-0.3620	-0.3655	-0.3715	-0.3765	-0.3820
2.50	2.50	-0.3728	-0.3755	-0.3819	-0.3865	-0.3920
2.60	2.60	-0.3830	-0.3855	-0.3919	-0.3965	-0.4020
2.70	2.70	-0.3938	-0.3958	-0.4023	-0.4073	-0.4128

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.000 YEARS

*****INTEREST RATE IVS*****

TL	TP	0.065	0.066	0.067	0.068	0.069
-3.00	-3.00	0.5721	0.5818	0.5916	0.6011	0.6108
-2.60	-2.60	0.5081	0.5165	0.5250	0.5335	0.5420
-2.40	-2.40	0.4766	0.4845	0.4924	0.5003	0.5082
-2.20	-2.20	0.4456	0.4529	0.4603	0.4676	0.4750
-2.00	-2.00	0.4150	0.4217	0.4285	0.4353	0.4421
-1.90	-1.90	0.3998	0.4063	0.4128	0.4193	0.4259
-1.80	-1.80	0.3847	0.3909	0.3972	0.4034	0.4097
-1.70	-1.70	0.3697	0.3757	0.3817	0.3877	0.3937
-1.60	-1.60	0.3548	0.3605	0.3662	0.3720	0.3777
-1.50	-1.50	0.3400	0.3455	0.3509	0.3564	0.3619
-1.40	-1.40	0.3253	0.3305	0.3357	0.3409	0.3462
-1.30	-1.30	0.3107	0.3156	0.3206	0.3256	0.3305
-1.20	-1.20	0.2962	0.3009	0.3056	0.3103	0.3150
-1.10	-1.10	0.2817	0.2862	0.2906	0.2951	0.2996
-1.00	-1.00	0.2674	0.2716	0.2758	0.2801	0.2842
-0.90	-0.90	0.2531	0.2571	0.2611	0.2651	0.2691
-0.80	-0.80	0.2390	0.2427	0.2465	0.2502	0.2540
-0.70	-0.70	0.2249	0.2284	0.2319	0.2354	0.2389
-0.60	-0.60	0.2109	0.2142	0.2175	0.2208	0.2240
-0.50	-0.50	0.1970	0.2001	0.2031	0.2062	0.2092
-0.40	-0.40	0.1832	0.1860	0.1888	0.1917	0.1945
-0.30	-0.30	0.1695	0.1721	0.1747	0.1773	0.1799
-0.20	-0.20	0.1558	0.1582	0.1606	0.1630	0.1654
-0.10	-0.10	0.1423	0.1444	0.1466	0.1488	0.1510
-0.00	-0.00	0.1288	0.1308	0.1327	0.1347	0.1366
0.00	2.00	-0.1235	-0.1253	-0.1271	-0.1289	-0.1307
0.10	2.10	-0.1353	-0.1371	-0.1392	-0.1412	-0.1431
0.20	2.20	-0.1470	-0.1492	-0.1513	-0.1534	-0.1555
0.30	2.30	-0.1587	-0.1610	-0.1632	-0.1655	-0.1678
0.40	2.40	-0.1703	-0.1727	-0.1751	-0.1776	-0.1800
0.50	2.50	-0.1818	-0.1844	-0.1870	-0.1895	-0.1921
0.60	2.60	-0.1932	-0.1960	-0.1987	-0.2014	-0.2042
0.70	2.70	-0.2046	-0.2075	-0.2104	-0.2133	-0.2161
0.80	2.80	-0.2159	-0.2189	-0.2220	-0.2250	-0.2280
0.90	2.90	-0.2271	-0.2303	-0.2335	-0.2367	-0.2398
1.00	3.00	-0.2382	-0.2416	-0.2449	-0.2482	-0.2516
1.10	3.10	-0.2493	-0.2528	-0.2563	-0.2597	-0.2632
1.20	3.20	-0.2603	-0.2639	-0.2675	-0.2712	-0.2748
1.30	3.30	-0.2713	-0.2750	-0.2788	-0.2825	-0.2862
1.40	3.40	-0.2821	-0.2860	-0.2899	-0.2938	-0.2977
1.50	3.50	-0.2929	-0.2970	-0.3010	-0.3050	-0.3090
1.60	3.60	-0.3037	-0.3078	-0.3120	-0.3162	-0.3202
1.70	3.70	-0.3143	-0.3186	-0.3229	-0.3272	-0.3315
1.80	3.80	-0.3249	-0.3294	-0.3338	-0.3382	-0.3426
1.90	3.90	-0.3355	-0.3400	-0.3446	-0.3491	-0.3536
2.00	4.00	-0.3459	-0.3506	-0.3553	-0.3600	-0.3646
2.20	4.20	-0.3667	-0.3716	-0.3765	-0.3815	-0.3863
2.40	4.40	-0.3872	-0.3924	-0.3975	-0.4027	-0.4078
2.60	4.60	-0.4074	-0.4128	-0.4182	-0.4236	-0.4289
3.00	5.00	-0.4471	-0.4530	-0.4588	-0.4646	-0.4704

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2,000 YEARS

*****INTEREST RATE I VS*****

TL	TR	0.070	0.071	0.072	0.073	0.074
-3.00	-3.00	0.6206	0.6303	0.6401	0.6500	0.6599
-2.60	-2.60	0.5505	0.5591	0.5676	0.5762	0.5848
-2.40	-2.40	0.5162	0.5242	0.5321	0.5401	0.5481
-2.20	-2.20	0.4823	0.4897	0.4971	0.5045	0.5120
-2.00	-2.00	0.4489	0.4558	0.4626	0.4695	0.4763
-1.90	-1.90	0.4324	0.4390	0.4455	0.4521	0.4587
-1.80	-1.80	0.4160	0.4223	0.4286	0.4349	0.4412
-1.70	-1.70	0.3997	0.4057	0.4117	0.4177	0.4238
-1.60	-1.60	0.3835	0.3892	0.3950	0.4007	0.4065
-1.50	-1.50	0.3674	0.3729	0.3784	0.3839	0.3894
-1.40	-1.40	0.3514	0.3566	0.3619	0.3671	0.3724
-1.30	-1.30	0.3355	0.3405	0.3455	0.3505	0.3555
-1.20	-1.20	0.3197	0.3245	0.3292	0.3339	0.3387
-1.10	-1.10	0.3041	0.3086	0.3130	0.3175	0.3220
-1.00	-1.00	0.2985	0.2927	0.2970	0.3012	0.3055
-0.90	-0.90	0.2731	0.2771	0.2811	0.2851	0.2891
-0.80	-0.80	0.2577	0.2615	0.2652	0.2690	0.2728
-0.70	-0.70	0.2425	0.2460	0.2495	0.2530	0.2566
-0.60	-0.60	0.2272	0.2306	0.2339	0.2372	0.2405
-0.50	-0.50	0.2123	0.2153	0.2184	0.2215	0.2245
-0.40	-0.40	0.1973	0.2002	0.2030	0.2058	0.2087
-0.30	-0.30	0.1825	0.1851	0.1877	0.1903	0.1929
-0.20	-0.20	0.1678	0.1702	0.1725	0.1749	0.1773
-0.10	-0.10	0.1531	0.1553	0.1575	0.1596	0.1618
-0.00	-0.00	0.1386	0.1405	0.1425	0.1445	0.1464
0.00	2.00	-0.1325	-0.1343	-0.1360	-0.1378	-0.1396
0.10	2.10	-0.1451	-0.1470	-0.1487	-0.1505	-0.1523
0.20	2.20	-0.1576	-0.1597	-0.1618	-0.1639	-0.1660
0.30	2.30	-0.1701	-0.1723	-0.1744	-0.1765	-0.1786
0.40	2.40	-0.1824	-0.1848	-0.1872	-0.1897	-0.1921
0.50	2.50	-0.1947	-0.1973	-0.1999	-0.2024	-0.2050
0.60	2.60	-0.2069	-0.2096	-0.2123	-0.2150	-0.2177
0.70	2.70	-0.2190	-0.2219	-0.2247	-0.2276	-0.2304
0.80	2.80	-0.2310	-0.2341	-0.2371	-0.2401	-0.2431
0.90	2.90	-0.2430	-0.2461	-0.2492	-0.2524	-0.2556
1.00	3.00	-0.2549	-0.2582	-0.2615	-0.2648	-0.2680
1.10	3.10	-0.2666	-0.2701	-0.2735	-0.2769	-0.2804
1.20	3.20	-0.2784	-0.2819	-0.2855	-0.2891	-0.2926
1.30	3.30	-0.2900	-0.2937	-0.2974	-0.3011	-0.3048
1.40	3.40	-0.3015	-0.3054	-0.3092	-0.3130	-0.3169
1.50	3.50	-0.3130	-0.3170	-0.3210	-0.3249	-0.3289
1.60	3.60	-0.3244	-0.3285	-0.3326	-0.3367	-0.3408
1.70	3.70	-0.3357	-0.3400	-0.3442	-0.3484	-0.3526
1.80	3.80	-0.3470	-0.3513	-0.3557	-0.3600	-0.3643
1.90	3.90	-0.3581	-0.3626	-0.3671	-0.3716	-0.3760
2.00	4.00	-0.3692	-0.3738	-0.3784	-0.3830	-0.3876
2.20	4.20	-0.3912	-0.3960	-0.4009	-0.4057	-0.4105
2.40	4.40	-0.4129	-0.4179	-0.4230	-0.4280	-0.4330
2.60	4.60	-0.4342	-0.4395	-0.4448	-0.4501	-0.4553
3.00	5.00	-0.4761	-0.4819	-0.4876	-0.4932	-0.4989

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.000 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.075	0.076	0.077	0.078	0.079
-3.00	-3.00	0.6697	0.6796	0.6895	0.6995	0.7098
-2.60	-2.60	0.5935	0.6021	0.6108	0.6195	0.6282
-2.40	-2.40	0.5562	0.5642	0.5723	0.5808	0.5885
-2.20	-2.20	0.5198	0.5269	0.5348	0.5418	0.5493
-2.00	-2.00	0.4832	0.4901	0.4970	0.5039	0.5109
-1.90	-1.90	0.4653	0.4719	0.4785	0.4851	0.4919
-1.80	-1.80	0.4475	0.4538	0.4602	0.4665	0.4729
-1.70	-1.70	0.4298	0.4359	0.4420	0.4480	0.4541
-1.60	-1.60	0.4123	0.4181	0.4239	0.4297	0.4355
-1.50	-1.50	0.3949	0.4008	0.4060	0.4115	0.4170
-1.40	-1.40	0.3776	0.3829	0.3882	0.3938	0.3997
-1.30	-1.30	0.3605	0.3655	0.3705	0.3755	0.3805
-1.20	-1.20	0.3438	0.3482	0.3529	0.3577	0.3625
-1.10	-1.10	0.3265	0.3310	0.3355	0.3400	0.3445
-1.00	-1.00	0.3097	0.3140	0.3182	0.3225	0.3268
-0.90	-0.90	0.2931	0.2971	0.3011	0.3051	0.3091
-0.80	-0.80	0.2765	0.2803	0.2841	0.2878	0.2916
-0.70	-0.70	0.2601	0.2636	0.2671	0.2707	0.2742
-0.60	-0.60	0.2438	0.2471	0.2508	0.2537	0.2570
-0.50	-0.50	0.2276	0.2307	0.2337	0.2368	0.2399
-0.40	-0.40	0.2115	0.2143	0.2172	0.2200	0.2229
-0.30	-0.30	0.1956	0.1982	0.2008	0.2034	0.2060
-0.20	-0.20	0.1797	0.1821	0.1845	0.1869	0.1893
-0.10	-0.10	0.1640	0.1661	0.1683	0.1705	0.1727
-0.00	-0.00	0.1484	0.1503	0.1523	0.1542	0.1562
0.00	2.00	-0.1418	-0.1432	-0.1449	-0.1467	-0.1485
0.10	2.10	-0.1548	-0.1567	-0.1587	-0.1606	-0.1625
0.20	2.20	-0.1681	-0.1702	-0.1723	-0.1744	-0.1764
0.30	2.30	-0.1813	-0.1836	-0.1858	-0.1881	-0.1903
0.40	2.40	-0.1945	-0.1969	-0.1993	-0.2016	-0.2040
0.50	2.50	-0.2075	-0.2100	-0.2126	-0.2151	-0.2176
0.60	2.60	-0.2208	-0.2231	-0.2258	-0.2285	-0.2312
0.70	2.70	-0.2333	-0.2361	-0.2390	-0.2418	-0.2446
0.80	2.80	-0.2460	-0.2490	-0.2520	-0.2550	-0.2579
0.90	2.90	-0.2587	-0.2618	-0.2649	-0.2680	-0.2711
1.00	3.00	-0.2713	-0.2745	-0.2778	-0.2810	-0.2842
1.10	3.10	-0.2838	-0.2871	-0.2905	-0.2939	-0.2973
1.20	3.20	-0.2961	-0.2997	-0.3032	-0.3067	-0.3102
1.30	3.30	-0.3084	-0.3121	-0.3158	-0.3194	-0.3230
1.40	3.40	-0.3207	-0.3244	-0.3282	-0.3320	-0.3357
1.50	3.50	-0.3329	-0.3367	-0.3406	-0.3445	-0.3484
1.60	3.60	-0.3448	-0.3489	-0.3529	-0.3569	-0.3609
1.70	3.70	-0.3568	-0.3609	-0.3651	-0.3692	-0.3733
1.80	3.80	-0.3686	-0.3729	-0.3772	-0.3814	-0.3857
1.90	3.90	-0.3804	-0.3848	-0.3892	-0.3936	-0.3979
2.00	4.00	-0.3921	-0.3966	-0.4011	-0.4056	-0.4101
2.20	4.20	-0.4152	-0.4200	-0.4247	-0.4294	-0.4341
2.40	4.40	-0.4380	-0.4430	-0.4480	-0.4529	-0.4578
2.60	4.60	-0.4605	-0.4657	-0.4709	-0.4760	-0.4811
3.00	5.00	-0.5085	-0.5101	-0.5157	-0.5212	-0.5267

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.000 YEARS

*****INTEREST RATE 1%*****

TI	TD	0.080	0.081	0.082	0.083	0.088
-3.00	-3.00	0.7198	0.7295	0.7395	0.7496	0.7597
-2.50	-2.50	0.6369	0.6456	0.6544	0.6632	0.6720
-2.40	-2.40	0.5966	0.6047	0.6129	0.6210	0.6292
-2.20	-2.20	0.5569	0.5644	0.5719	0.5795	0.5871
-2.00	-2.00	0.5178	0.5247	0.5317	0.5386	0.5456
-1.90	-1.90	0.4988	0.5051	0.5118	0.5185	0.5252
-1.80	-1.80	0.4793	0.4856	0.4920	0.4984	0.5049
-1.70	-1.70	0.4602	0.4663	0.4724	0.4786	0.4847
-1.60	-1.60	0.4413	0.4472	0.4530	0.4589	0.4647
-1.50	-1.50	0.4226	0.4282	0.4337	0.4393	0.4449
-1.40	-1.40	0.4040	0.4093	0.4146	0.4199	0.4252
-1.30	-1.30	0.3855	0.3906	0.3956	0.4007	0.4057
-1.20	-1.20	0.3672	0.3720	0.3768	0.3816	0.3864
-1.10	-1.10	0.3491	0.3536	0.3581	0.3626	0.3672
-1.00	-1.00	0.3310	0.3353	0.3396	0.3438	0.3481
-0.90	-0.90	0.3131	0.3172	0.3212	0.3252	0.3292
-0.80	-0.80	0.2954	0.2991	0.3029	0.3067	0.3105
-0.70	-0.70	0.2779	0.2813	0.2848	0.2884	0.2919
-0.60	-0.60	0.2603	0.2636	0.2669	0.2702	0.2735
-0.50	-0.50	0.2429	0.2460	0.2490	0.2521	0.2552
-0.40	-0.40	0.2257	0.2285	0.2314	0.2342	0.2370
-0.30	-0.30	0.2086	0.2112	0.2138	0.2164	0.2190
-0.20	-0.20	0.1916	0.1940	0.1964	0.1988	0.2012
-0.10	-0.10	0.1748	0.1770	0.1792	0.1813	0.1835
-0.00	-0.00	0.1581	0.1601	0.1620	0.1640	0.1659
0.00	2.00	-0.1502	-0.1520	-0.1537	-0.1555	-0.1572
0.10	2.10	-0.1644	-0.1663	-0.1682	-0.1702	-0.1721
0.20	2.20	-0.1785	-0.1806	-0.1827	-0.1847	-0.1868
0.30	2.30	-0.1925	-0.1947	-0.1969	-0.1992	-0.2014
0.40	2.40	-0.2064	-0.2088	-0.2111	-0.2135	-0.2158
0.50	2.50	-0.2202	-0.2227	-0.2252	-0.2277	-0.2302
0.60	2.60	-0.2339	-0.2365	-0.2391	-0.2418	-0.2444
0.70	2.70	-0.2474	-0.2502	-0.2530	-0.2558	-0.2586
0.80	2.80	-0.2609	-0.2638	-0.2667	-0.2697	-0.2726
0.90	2.90	-0.2742	-0.2773	-0.2804	-0.2834	-0.2865
1.00	3.00	-0.2875	-0.2907	-0.2939	-0.2971	-0.3003
1.10	3.10	-0.3006	-0.3040	-0.3073	-0.3106	-0.3140
1.20	3.20	-0.3137	-0.3172	-0.3206	-0.3241	-0.3275
1.30	3.30	-0.3266	-0.3302	-0.3338	-0.3374	-0.3410
1.40	3.40	-0.3395	-0.3432	-0.3469	-0.3506	-0.3543
1.50	3.50	-0.3522	-0.3561	-0.3599	-0.3638	-0.3676
1.60	3.60	-0.3649	-0.3689	-0.3728	-0.3768	-0.3807
1.70	3.70	-0.3775	-0.3816	-0.3856	-0.3897	-0.3938
1.80	3.80	-0.3899	-0.3941	-0.3983	-0.4025	-0.4067
1.90	3.90	-0.4023	-0.4066	-0.4109	-0.4152	-0.4195
2.00	4.00	-0.4146	-0.4190	-0.4234	-0.4278	-0.4322
2.20	4.20	-0.4388	-0.4435	-0.4481	-0.4528	-0.4574
2.40	4.40	-0.4627	-0.4676	-0.4725	-0.4773	-0.4821
2.60	4.60	-0.4863	-0.4913	-0.4964	-0.5014	-0.5065
3.00	5.00	-0.5322	-0.5377	-0.5432	-0.5486	-0.5540

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.000 YEARS

*****INTEREST RATE 1%*****

TI	TR	0.085	0.086	0.087	0.088	0.089
-3.00	-3.00	0.7699	0.7800	0.7902	0.8005	0.8107
-2.60	-2.60	0.6808	0.6997	0.6986	0.7074	0.7168
-2.40	-2.40	0.6374	0.6456	0.6539	0.6621	0.6708
-2.20	-2.20	0.5947	0.6023	0.6099	0.6175	0.6252
-2.00	-2.00	0.5526	0.5596	0.5667	0.5737	0.5807
-1.90	-1.90	0.5319	0.5386	0.5453	0.5520	0.5588
-1.80	-1.80	0.5113	0.5177	0.5241	0.5306	0.5370
-1.70	-1.70	0.4908	0.4970	0.5031	0.5093	0.5155
-1.60	-1.60	0.4706	0.4764	0.4823	0.4882	0.4941
-1.50	-1.50	0.4505	0.4561	0.4617	0.4673	0.4729
-1.40	-1.40	0.4305	0.4359	0.4412	0.4465	0.4519
-1.30	-1.30	0.4108	0.4158	0.4209	0.4260	0.4310
-1.20	-1.20	0.3911	0.3959	0.4009	0.4056	0.4108
-1.10	-1.10	0.3717	0.3762	0.3809	0.3853	0.3899
-1.00	-1.00	0.3524	0.3567	0.3610	0.3653	0.3696
-0.90	-0.90	0.3333	0.3373	0.3413	0.3454	0.3498
-0.80	-0.80	0.3142	0.3181	0.3219	0.3256	0.3298
-0.70	-0.70	0.2954	0.2990	0.3025	0.3061	0.3096
-0.60	-0.60	0.2768	0.2801	0.2834	0.2867	0.2900
-0.50	-0.50	0.2582	0.2613	0.2644	0.2675	0.2705
-0.40	-0.40	0.2399	0.2427	0.2456	0.2484	0.2512
-0.30	-0.30	0.2217	0.2243	0.2269	0.2295	0.2321
-0.20	-0.20	0.2036	0.2060	0.2083	0.2107	0.2131
-0.10	-0.10	0.1856	0.1879	0.1900	0.1921	0.1942
-0.00	-0.00	0.1679	0.1698	0.1718	0.1737	0.1756
0.00	2.00	-0.1590	-0.1607	-0.1625	-0.1642	-0.1659
0.10	2.10	-0.1780	-0.1759	-0.1778	-0.1796	-0.1815
0.20	2.20	-0.1898	-0.1909	-0.1929	-0.1950	-0.1970
0.30	2.30	-0.2036	-0.2058	-0.2080	-0.2102	-0.2123
0.40	2.40	-0.2182	-0.2205	-0.2229	-0.2252	-0.2275
0.50	2.50	-0.2327	-0.2352	-0.2377	-0.2401	-0.2426
0.60	2.60	-0.2471	-0.2497	-0.2523	-0.2549	-0.2576
0.70	2.70	-0.2613	-0.2641	-0.2669	-0.2696	-0.2728
0.80	2.80	-0.2755	-0.2788	-0.2813	-0.2842	-0.2871
0.90	2.90	-0.2895	-0.2926	-0.2956	-0.2986	-0.3016
1.00	3.00	-0.3035	-0.3066	-0.3098	-0.3129	-0.3161
1.10	3.10	-0.3173	-0.3206	-0.3239	-0.3271	-0.3308
1.20	3.20	-0.3310	-0.3344	-0.3378	-0.3412	-0.3446
1.30	3.30	-0.3445	-0.3481	-0.3516	-0.3552	-0.3587
1.40	3.40	-0.3580	-0.3617	-0.3654	-0.3690	-0.3727
1.50	3.50	-0.3714	-0.3752	-0.3790	-0.3827	-0.3865
1.60	3.60	-0.3846	-0.3886	-0.3925	-0.3964	-0.4002
1.70	3.70	-0.3978	-0.4018	-0.4058	-0.4098	-0.4138
1.80	3.80	-0.4108	-0.4150	-0.4191	-0.4232	-0.4273
1.90	3.90	-0.4238	-0.4280	-0.4323	-0.4365	-0.4407
2.00	4.00	-0.4366	-0.4410	-0.4453	-0.4497	-0.4540
2.20	4.20	-0.4622	-0.4665	-0.4711	-0.4756	-0.4802
2.40	4.40	-0.4869	-0.4917	-0.4965	-0.5012	-0.5059
2.60	4.60	-0.5114	-0.5164	-0.5214	-0.5262	-0.5312
3.00	5.00	-0.5593	-0.5647	-0.5700	-0.5753	-0.5806

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.000 YEARS

*****INTEREST RATE 7%*****

TL	TP	0.090	0.091	0.092	0.093	0.094
-3.00	-3.00	0.8210	0.8313	0.8416	0.8520	0.8624
-2.60	-2.60	0.7253	0.7342	0.7432	0.7522	0.7612
-2.40	-2.40	0.5787	0.6470	0.6953	0.7036	0.7120
-2.20	-2.20	0.6324	0.6405	0.6482	0.6559	0.6636
-2.00	-2.00	0.5878	0.5949	0.6019	0.6090	0.6161
-1.90	-1.90	0.5656	0.5723	0.5791	0.5859	0.5927
-1.80	-1.80	0.5435	0.5500	0.5565	0.5630	0.5695
-1.70	-1.70	0.5217	0.5279	0.5341	0.5403	0.5465
-1.60	-1.60	0.5000	0.5059	0.5118	0.5177	0.5237
-1.50	-1.50	0.4785	0.4842	0.4899	0.4958	0.5011
-1.40	-1.40	0.4572	0.4626	0.4679	0.4732	0.4787
-1.30	-1.30	0.4361	0.4412	0.4463	0.4514	0.4565
-1.20	-1.20	0.4152	0.4200	0.4248	0.4297	0.4345
-1.10	-1.10	0.3944	0.3990	0.4035	0.4081	0.4127
-1.00	-1.00	0.3739	0.3782	0.3825	0.3868	0.3911
-0.90	-0.90	0.3535	0.3575	0.3616	0.3656	0.3697
-0.80	-0.80	0.3332	0.3370	0.3408	0.3446	0.3484
-0.70	-0.70	0.3132	0.3167	0.3203	0.3239	0.3274
-0.60	-0.60	0.2933	0.2966	0.2999	0.3033	0.3066
-0.50	-0.50	0.2736	0.2767	0.2798	0.2829	0.2859
-0.40	-0.40	0.2541	0.2569	0.2598	0.2626	0.2654
-0.30	-0.30	0.2347	0.2373	0.2399	0.2425	0.2451
-0.20	-0.20	0.2155	0.2179	0.2203	0.2227	0.2250
-0.10	-0.10	0.1965	0.1986	0.2008	0.2029	0.2051
-0.00	-0.00	0.1776	0.1795	0.1815	0.1834	0.1854
0.00	2.00	-0.1677	-0.1698	-0.1711	-0.1729	-0.1746
0.10	2.10	-0.1838	-0.1853	-0.1872	-0.1891	-0.1909
0.20	2.20	-0.1999	-0.2011	-0.2031	-0.2051	-0.2071
0.30	2.30	-0.2145	-0.2167	-0.2189	-0.2210	-0.2232
0.40	2.40	-0.2290	-0.2322	-0.2345	-0.2368	-0.2391
0.50	2.50	-0.2435	-0.2475	-0.2500	-0.2525	-0.2549
0.60	2.60	-0.2602	-0.2628	-0.2658	-0.2680	-0.2705
0.70	2.70	-0.2751	-0.2779	-0.2806	-0.2833	-0.2860
0.80	2.80	-0.2900	-0.2928	-0.2957	-0.2985	-0.3014
0.90	2.90	-0.3047	-0.3077	-0.3107	-0.3136	-0.3166
1.00	3.00	-0.3192	-0.3224	-0.3255	-0.3286	-0.3317
1.10	3.10	-0.3337	-0.3369	-0.3402	-0.3434	-0.3467
1.20	3.20	-0.3480	-0.3514	-0.3548	-0.3581	-0.3615
1.30	3.30	-0.3622	-0.3657	-0.3692	-0.3727	-0.3762
1.40	3.40	-0.3763	-0.3799	-0.3835	-0.3871	-0.3907
1.50	3.50	-0.3902	-0.3940	-0.3977	-0.4014	-0.4051
1.60	3.60	-0.4041	-0.4079	-0.4118	-0.4156	-0.4194
1.70	3.70	-0.4178	-0.4218	-0.4257	-0.4297	-0.4336
1.80	3.80	-0.4314	-0.4355	-0.4395	-0.4436	-0.4476
1.90	3.90	-0.4449	-0.4491	-0.4532	-0.4574	-0.4615
2.00	4.00	-0.4583	-0.4626	-0.4668	-0.4711	-0.4753
2.20	4.20	-0.4887	-0.4932	-0.4976	-0.5021	-0.5065
2.40	4.40	-0.5106	-0.5153	-0.5200	-0.5246	-0.5293
2.60	4.60	-0.5361	-0.5410	-0.5459	-0.5507	-0.5555
3.00	5.00	-0.5858	-0.5911	-0.5963	-0.6014	-0.6066

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.000 YEARS

*****INTEREST RATE %*****						
TL	TD	0.095	0.096	0.097	0.098	0.099
-3.00	-3.00	0.8722	0.8832	0.8937	0.9042	0.9147
-2.60	-2.60	0.7702	0.7793	0.7888	0.7975	0.8066
-2.40	-2.40	0.7204	0.7287	0.7371	0.7456	0.7540
-2.20	-2.20	0.6718	0.6791	0.6869	0.6947	0.7028
-2.00	-2.00	0.6233	0.6304	0.6375	0.6447	0.6518
-1.90	-1.90	0.5995	0.6064	0.6132	0.6200	0.6269
-1.80	-1.80	0.5761	0.5825	0.5891	0.5956	0.6022
-1.70	-1.70	0.5527	0.5589	0.5652	0.5718	0.5777
-1.60	-1.60	0.5296	0.5356	0.5415	0.5475	0.5535
-1.50	-1.50	0.5067	0.5124	0.5181	0.5238	0.5298
-1.40	-1.40	0.4841	0.4895	0.4948	0.5002	0.5056
-1.30	-1.30	0.4616	0.4667	0.4718	0.4769	0.4821
-1.20	-1.20	0.4393	0.4442	0.4490	0.4539	0.4587
-1.10	-1.10	0.4173	0.4219	0.4268	0.4310	0.4356
-1.00	-1.00	0.3954	0.3997	0.4040	0.4084	0.4127
-0.90	-0.90	0.3737	0.3778	0.3818	0.3859	0.3900
-0.80	-0.80	0.3522	0.3561	0.3599	0.3637	0.3675
-0.70	-0.70	0.3310	0.3345	0.3381	0.3417	0.3452
-0.60	-0.60	0.3099	0.3132	0.3165	0.3198	0.3232
-0.50	-0.50	0.2890	0.2921	0.2951	0.2982	0.3013
-0.40	-0.40	0.2683	0.2711	0.2740	0.2769	0.2796
-0.30	-0.30	0.2478	0.2504	0.2530	0.2556	0.2582
-0.20	-0.20	0.2274	0.2299	0.2322	0.2346	0.2369
-0.10	-0.10	0.2073	0.2094	0.2116	0.2137	0.2159
-0.00	-0.00	0.1873	0.1892	0.1912	0.1931	0.1950
0.00	2.00	-0.1763	-0.1780	-0.1797	-0.1814	-0.1832
0.10	2.10	-0.1928	-0.1947	-0.1965	-0.1984	-0.2002
0.20	2.20	-0.2092	-0.2112	-0.2132	-0.2152	-0.2172
0.30	2.30	-0.2258	-0.2275	-0.2297	-0.2318	-0.2340
0.40	2.40	-0.2414	-0.2437	-0.2460	-0.2483	-0.2506
0.50	2.50	-0.2573	-0.2599	-0.2622	-0.2646	-0.2671
0.60	2.60	-0.2731	-0.2757	-0.2783	-0.2808	-0.2834
0.70	2.70	-0.2888	-0.2915	-0.2942	-0.2969	-0.2995
0.80	2.80	-0.3042	-0.3071	-0.3099	-0.3127	-0.3155
0.90	2.90	-0.3196	-0.3226	-0.3255	-0.3285	-0.3314
1.00	3.00	-0.3348	-0.3379	-0.3410	-0.3440	-0.3471
1.10	3.10	-0.3499	-0.3531	-0.3563	-0.3595	-0.3627
1.20	3.20	-0.3648	-0.3681	-0.3715	-0.3748	-0.3781
1.30	3.30	-0.3796	-0.3831	-0.3865	-0.3899	-0.3933
1.40	3.40	-0.3943	-0.3978	-0.4014	-0.4049	-0.4085
1.50	3.50	-0.4088	-0.4125	-0.4162	-0.4198	-0.4235
1.60	3.60	-0.4232	-0.4270	-0.4308	-0.4345	-0.4383
1.70	3.70	-0.4375	-0.4414	-0.4453	-0.4491	-0.4530
1.80	3.80	-0.4516	-0.4556	-0.4596	-0.4636	-0.4676
1.90	3.90	-0.4657	-0.4698	-0.4739	-0.4779	-0.4820
2.00	4.00	-0.4795	-0.4839	-0.4879	-0.4921	-0.4963
2.20	4.20	-0.5070	-0.5114	-0.5157	-0.5201	-0.5245
2.40	4.40	-0.5339	-0.5385	-0.5430	-0.5476	-0.5521
2.60	4.60	-0.5603	-0.5651	-0.5698	-0.5746	-0.5793
3.00	5.00	-0.6117	-0.6168	-0.6219	-0.6270	-0.6320

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.000 YEARS

*****INTEREST RATE 1%*****

TL	TR	0.100	0.101	0.102	0.103	0.104
-3.00	-3.00	0.9252	0.9358	0.9464	0.9571	0.9677
-2.60	-2.60	0.8157	0.8269	0.8380	0.8492	0.8604
-2.40	-2.40	0.7625	0.7710	0.7794	0.7880	0.7965
-2.20	-2.20	0.7103	0.7181	0.7259	0.7338	0.7416
-2.00	-2.00	0.6597	0.6662	0.6738	0.6806	0.6879
-1.90	-1.90	0.6338	0.6407	0.6475	0.6544	0.6618
-1.80	-1.80	0.6088	0.6153	0.6219	0.6285	0.6351
-1.70	-1.70	0.5847	0.5903	0.5966	0.6028	0.6092
-1.60	-1.60	0.5598	0.5658	0.5718	0.5778	0.5838
-1.50	-1.50	0.5351	0.5408	0.5465	0.5523	0.5580
-1.40	-1.40	0.5111	0.5165	0.5219	0.5273	0.5328
-1.30	-1.30	0.4872	0.4923	0.4975	0.5026	0.5078
-1.20	-1.20	0.4636	0.4688	0.4733	0.4782	0.4831
-1.10	-1.10	0.4402	0.4448	0.4498	0.4540	0.4596
-1.00	-1.00	0.4170	0.4213	0.4257	0.4300	0.4348
-0.90	-0.90	0.3940	0.3981	0.4022	0.4063	0.4108
-0.80	-0.80	0.3713	0.3751	0.3789	0.3828	0.3866
-0.70	-0.70	0.3488	0.3524	0.3559	0.3595	0.3631
-0.60	-0.60	0.3265	0.3298	0.3331	0.3368	0.3398
-0.50	-0.50	0.3044	0.3075	0.3105	0.3136	0.3167
-0.40	-0.40	0.2825	0.2853	0.2882	0.2910	0.2939
-0.30	-0.30	0.2608	0.2634	0.2660	0.2686	0.2712
-0.20	-0.20	0.2393	0.2417	0.2441	0.2465	0.2489
-0.10	-0.10	0.2181	0.2202	0.2224	0.2245	0.2267
-0.00	-0.00	0.1970	0.1989	0.2009	0.2028	0.2047
0.00	2.00	-0.1889	-0.1866	-0.1843	-0.1820	-0.1817
0.10	2.10	-0.2021	-0.2040	-0.2058	-0.2077	-0.2095
0.20	2.20	-0.2192	-0.2212	-0.2232	-0.2252	-0.2272
0.30	2.30	-0.2361	-0.2383	-0.2404	-0.2425	-0.2446
0.40	2.40	-0.2529	-0.2552	-0.2574	-0.2597	-0.2620
0.50	2.50	-0.2695	-0.2719	-0.2743	-0.2767	-0.2791
0.60	2.60	-0.2859	-0.2885	-0.2910	-0.2935	-0.2961
0.70	2.70	-0.3022	-0.3049	-0.3076	-0.3102	-0.3129
0.80	2.80	-0.3184	-0.3212	-0.3240	-0.3267	-0.3295
0.90	2.90	-0.3343	-0.3373	-0.3402	-0.3431	-0.3460
1.00	3.00	-0.3502	-0.3532	-0.3563	-0.3593	-0.3623
1.10	3.10	-0.3658	-0.3690	-0.3722	-0.3753	-0.3785
1.20	3.20	-0.3814	-0.3847	-0.3879	-0.3912	-0.3945
1.30	3.30	-0.3968	-0.4002	-0.4036	-0.4069	-0.4103
1.40	3.40	-0.4120	-0.4155	-0.4190	-0.4225	-0.4260
1.50	3.50	-0.4271	-0.4307	-0.4343	-0.4379	-0.4415
1.60	3.60	-0.4420	-0.4458	-0.4495	-0.4532	-0.4569
1.70	3.70	-0.4569	-0.4607	-0.4645	-0.4683	-0.4721
1.80	3.80	-0.4715	-0.4755	-0.4794	-0.4833	-0.4872
1.90	3.90	-0.4860	-0.4901	-0.4941	-0.4981	-0.5021
2.00	4.00	-0.5004	-0.5046	-0.5087	-0.5128	-0.5169
2.20	4.20	-0.5288	-0.5331	-0.5374	-0.5417	-0.5460
2.40	4.40	-0.5567	-0.5612	-0.5656	-0.5701	-0.5746
2.60	4.60	-0.5840	-0.5886	-0.5933	-0.5979	-0.6026
3.00	5.00	-0.6371	-0.6421	-0.6470	-0.6520	-0.6569

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.200 YEARS

*****INTEREST RATE IVS*****

FL	TP	0.060	0.061	0.062	0.063	0.064
-3.00	-3.00	0.5388	0.5486	0.5584	0.5683	0.5781
-2.60	-2.60	0.4803	0.4889	0.4975	0.5062	0.5149
-2.40	-2.40	0.4515	0.4596	0.4676	0.4757	0.4838
-2.20	-2.20	0.4231	0.4306	0.4381	0.4456	0.4532
-2.00	-2.00	0.3949	0.4019	0.4089	0.4159	0.4229
-1.90	-1.90	0.3810	0.3877	0.3944	0.4011	0.4079
-1.80	-1.80	0.3672	0.3736	0.3800	0.3865	0.3930
-1.70	-1.70	0.3534	0.3596	0.3657	0.3719	0.3781
-1.60	-1.60	0.3397	0.3456	0.3515	0.3575	0.3634
-1.50	-1.50	0.3261	0.3317	0.3374	0.3431	0.3488
-1.40	-1.40	0.3125	0.3180	0.3234	0.3288	0.3342
-1.30	-1.30	0.2991	0.3043	0.3094	0.3146	0.3198
-1.20	-1.20	0.2857	0.2906	0.2956	0.3005	0.3054
-1.10	-1.10	0.2724	0.2771	0.2818	0.2865	0.2911
-1.00	-1.00	0.2592	0.2636	0.2681	0.2725	0.2770
-0.90	-0.90	0.2461	0.2503	0.2548	0.2592	0.2637
-0.80	-0.80	0.2330	0.2369	0.2409	0.2448	0.2488
-0.70	-0.70	0.2200	0.2237	0.2274	0.2312	0.2349
-0.60	-0.60	0.2071	0.2106	0.2141	0.2176	0.2211
-0.50	-0.50	0.1942	0.1975	0.2008	0.2040	0.2073
-0.40	-0.40	0.1815	0.1845	0.1876	0.1906	0.1936
-0.30	-0.30	0.1688	0.1716	0.1744	0.1772	0.1801
-0.20	-0.20	0.1562	0.1588	0.1614	0.1640	0.1666
-0.10	-0.10	0.1436	0.1460	0.1484	0.1508	0.1531
-0.00	-0.00	0.1311	0.1333	0.1355	0.1376	0.1398
0.00	2.20	-0.1257	-0.1276	-0.1296	-0.1316	-0.1336
0.10	2.30	-0.1366	-0.1387	-0.1409	-0.1430	-0.1451
0.20	2.40	-0.1474	-0.1497	-0.1520	-0.1543	-0.1566
0.30	2.50	-0.1582	-0.1607	-0.1631	-0.1656	-0.1681
0.40	2.60	-0.1689	-0.1715	-0.1742	-0.1768	-0.1794
0.50	2.70	-0.1796	-0.1824	-0.1851	-0.1879	-0.1907
0.60	2.80	-0.1902	-0.1931	-0.1960	-0.1990	-0.2019
0.70	2.90	-0.2007	-0.2038	-0.2069	-0.2100	-0.2130
0.80	3.00	-0.2112	-0.2144	-0.2177	-0.2209	-0.2241
0.90	3.10	-0.2216	-0.2250	-0.2284	-0.2317	-0.2351
1.00	3.20	-0.2319	-0.2355	-0.2390	-0.2425	-0.2460
1.10	3.30	-0.2422	-0.2459	-0.2496	-0.2533	-0.2569
1.20	3.40	-0.2525	-0.2563	-0.2601	-0.2639	-0.2677
1.30	3.50	-0.2626	-0.2666	-0.2706	-0.2745	-0.2784
1.40	3.60	-0.2727	-0.2768	-0.2809	-0.2850	-0.2891
1.50	3.70	-0.2828	-0.2870	-0.2913	-0.2955	-0.2997
1.60	3.80	-0.2929	-0.2972	-0.3015	-0.3059	-0.3102
1.70	3.90	-0.3027	-0.3072	-0.3117	-0.3162	-0.3207
1.80	4.00	-0.3126	-0.3173	-0.3219	-0.3265	-0.3311
1.90	4.10	-0.3224	-0.3272	-0.3320	-0.3367	-0.3415
2.00	4.20	-0.3322	-0.3371	-0.3420	-0.3469	-0.3517
2.20	4.40	-0.3515	-0.3567	-0.3619	-0.3670	-0.3721
2.40	4.60	-0.3707	-0.3761	-0.3815	-0.3869	-0.3922
2.60	4.80	-0.3896	-0.3953	-0.4009	-0.4065	-0.4121
3.00	5.20	-0.4268	-0.4329	-0.4390	-0.4450	-0.4511

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.200 YEARS

*****INTEREST RATE 1%*****

PL	PR	0.065	0.066	0.067	0.068	0.069
-3.00	-3.00	0.5881	0.5900	0.6079	0.6179	0.6279
-2.60	-2.60	0.5236	0.5323	0.5811	0.5898	0.5585
-2.40	-2.40	0.4920	0.5001	0.5083	0.5165	0.5247
-2.20	-2.20	0.4607	0.4683	0.4759	0.4835	0.4912
-2.00	-2.00	0.4299	0.4369	0.4440	0.4510	0.4581
-1.90	-1.90	0.4186	0.4218	0.4282	0.4389	0.4417
-1.80	-1.80	0.3995	0.4059	0.4128	0.4190	0.4255
-1.70	-1.70	0.3888	0.3906	0.3968	0.4031	0.4093
-1.60	-1.60	0.3654	0.3753	0.3813	0.3873	0.3933
-1.50	-1.50	0.3585	0.3602	0.3659	0.3716	0.3773
-1.40	-1.40	0.3397	0.3451	0.3506	0.3560	0.3615
-1.30	-1.30	0.3250	0.3302	0.3358	0.3406	0.3458
-1.20	-1.20	0.3108	0.3153	0.3203	0.3252	0.3302
-1.10	-1.10	0.2958	0.3005	0.3052	0.3099	0.3146
-1.00	-1.00	0.2818	0.2859	0.2903	0.2948	0.2992
-0.90	-0.90	0.2671	0.2713	0.2755	0.2797	0.2839
-0.80	-0.80	0.2529	0.2568	0.2609	0.2647	0.2687
-0.70	-0.70	0.2386	0.2428	0.2461	0.2499	0.2536
-0.60	-0.60	0.2246	0.2281	0.2316	0.2351	0.2386
-0.50	-0.50	0.2106	0.2139	0.2171	0.2208	0.2237
-0.40	-0.40	0.1967	0.1997	0.2028	0.2058	0.2099
-0.30	-0.30	0.1829	0.1857	0.1885	0.1913	0.1942
-0.20	-0.20	0.1692	0.1719	0.1748	0.1770	0.1796
-0.10	-0.10	0.1555	0.1579	0.1603	0.1627	0.1650
-0.00	-0.00	0.1420	0.1441	0.1463	0.1485	0.1506
0.00	2.20	-0.1356	-0.1375	-0.1395	-0.1415	-0.1438
0.10	2.30	-0.1473	-0.1498	-0.1515	-0.1537	-0.1558
0.20	2.40	-0.1589	-0.1612	-0.1635	-0.1658	-0.1681
0.30	2.50	-0.1705	-0.1730	-0.1758	-0.1779	-0.1803
0.40	2.60	-0.1820	-0.1846	-0.1872	-0.1898	-0.1928
0.50	2.70	-0.1935	-0.1962	-0.1990	-0.2017	-0.2045
0.60	2.80	-0.2048	-0.2077	-0.2105	-0.2135	-0.2168
0.70	2.90	-0.2161	-0.2192	-0.2222	-0.2253	-0.2283
0.80	3.00	-0.2273	-0.2305	-0.2337	-0.2369	-0.2401
0.90	3.10	-0.2385	-0.2418	-0.2452	-0.2485	-0.2518
1.00	3.20	-0.2495	-0.2530	-0.2565	-0.2600	-0.2635
1.10	3.30	-0.2606	-0.2642	-0.2678	-0.2718	-0.2750
1.20	3.40	-0.2715	-0.2753	-0.2790	-0.2828	-0.2865
1.30	3.50	-0.2824	-0.2863	-0.2902	-0.2941	-0.2979
1.40	3.60	-0.2932	-0.2972	-0.3013	-0.3053	-0.3093
1.50	3.70	-0.3039	-0.3081	-0.3123	-0.3168	-0.3206
1.60	3.80	-0.3146	-0.3189	-0.3232	-0.3275	-0.3317
1.70	3.90	-0.3252	-0.3296	-0.3340	-0.3385	-0.3429
1.80	4.00	-0.3357	-0.3403	-0.3448	-0.3498	-0.3539
1.90	4.10	-0.3462	-0.3509	-0.3556	-0.3602	-0.3649
2.00	4.20	-0.3566	-0.3618	-0.3662	-0.3710	-0.3758
2.20	4.40	-0.3772	-0.3823	-0.3873	-0.3923	-0.3971
2.40	4.60	-0.3975	-0.4028	-0.4081	-0.4138	-0.4186
2.60	4.80	-0.4176	-0.4232	-0.4287	-0.4342	-0.4396
3.00	5.20	-0.4571	-0.4631	-0.4690	-0.4749	-0.4808

TABLE A-1.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.200 YEARS

*****INVERSE RATIO *****

FL	W	0.070	0.071	0.072	0.073	0.074
-3.00	-3.00	0.6389	0.6480	0.6581	0.6683	0.6788
-2.60	-2.60	0.5678	0.5763	0.5851	0.5940	0.6029
-2.40	-2.40	0.5329	0.5411	0.5498	0.5577	0.5660
-2.20	-2.20	0.4988	0.5065	0.5141	0.5218	0.5295
-2.00	-2.00	0.4652	0.4723	0.4798	0.4865	0.4936
-1.90	-1.90	0.4485	0.4554	0.4622	0.4690	0.4759
-1.80	-1.80	0.4320	0.4385	0.4451	0.4517	0.4582
-1.70	-1.70	0.4156	0.4219	0.4281	0.4348	0.4407
-1.60	-1.60	0.3993	0.4053	0.4113	0.4173	0.4233
-1.50	-1.50	0.3831	0.3888	0.3946	0.4003	0.4061
-1.40	-1.40	0.3670	0.3725	0.3780	0.3835	0.3889
-1.30	-1.30	0.3510	0.3562	0.3615	0.3667	0.3719
-1.20	-1.20	0.3351	0.3401	0.3451	0.3501	0.3550
-1.10	-1.10	0.3194	0.3241	0.3288	0.3335	0.3383
-1.00	-1.00	0.3037	0.3082	0.3126	0.3171	0.3216
-0.90	-0.90	0.2881	0.2928	0.2966	0.3008	0.3051
-0.80	-0.80	0.2727	0.2767	0.2807	0.2847	0.2886
-0.70	-0.70	0.2573	0.2611	0.2648	0.2686	0.2723
-0.60	-0.60	0.2421	0.2456	0.2491	0.2526	0.2562
-0.50	-0.50	0.2270	0.2302	0.2335	0.2368	0.2401
-0.40	-0.40	0.2119	0.2150	0.2180	0.2211	0.2241
-0.30	-0.30	0.1970	0.1998	0.2026	0.2055	0.2083
-0.20	-0.20	0.1822	0.1848	0.1878	0.1900	0.1926
-0.10	-0.10	0.1678	0.1699	0.1722	0.1746	0.1769
0.00	0.00	0.1528	0.1549	0.1571	0.1593	0.1618
0.10	2.30	-0.1854	-0.1873	-0.1893	-0.1912	-0.1932
0.20	2.30	-0.1579	-0.1600	-0.1621	-0.1643	-0.1658
0.30	2.30	-0.1704	-0.1726	-0.1748	-0.1772	-0.1798
0.40	2.50	-0.1827	-0.1851	-0.1876	-0.1900	-0.1928
0.50	2.60	-0.1950	-0.1976	-0.2001	-0.2027	-0.2053
0.60	2.70	-0.2072	-0.2099	-0.2126	-0.2158	-0.2181
0.70	2.80	-0.2193	-0.2222	-0.2250	-0.2278	-0.2308
0.80	2.90	-0.2313	-0.2343	-0.2378	-0.2408	-0.2438
0.90	3.00	-0.2433	-0.2464	-0.2495	-0.2527	-0.2559
1.00	3.10	-0.2551	-0.2584	-0.2617	-0.2650	-0.2683
1.10	3.20	-0.2663	-0.2708	-0.2739	-0.2772	-0.2807
1.20	3.30	-0.2786	-0.2822	-0.2858	-0.2898	-0.2929
1.30	3.40	-0.2903	-0.2940	-0.2977	-0.3018	-0.3051
1.40	3.50	-0.3018	-0.3057	-0.3095	-0.3133	-0.3172
1.50	3.70	-0.3247	-0.3288	-0.3324	-0.3352	-0.3381
1.60	3.80	-0.3360	-0.3402	-0.3440	-0.3487	-0.3529
1.70	3.90	-0.3472	-0.3516	-0.3560	-0.3603	-0.3646
1.80	4.00	-0.3588	-0.3629	-0.3678	-0.3718	-0.3761
1.90	4.10	-0.3695	-0.3741	-0.3787	-0.3833	-0.3878
2.00	4.20	-0.3805	-0.3852	-0.3900	-0.3947	-0.3993
2.20	4.40	-0.4023	-0.4073	-0.4122	-0.4172	-0.4221
2.40	4.60	-0.4238	-0.4290	-0.4342	-0.4398	-0.4445
2.60	4.80	-0.4451	-0.4505	-0.4559	-0.4612	-0.4666
3.00	5.20	-0.4867	-0.4925	-0.4983	-0.5041	-0.5099

TABLE 1-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.700 YEARS

*****INTEREST RATE 1 VS*****						
1L	1P	0.075	0.076	0.077	0.078	0.079
-3.00	-3.00	0.6896	0.6989	0.7090	0.7193	0.7296
-2.60	-2.60	0.6118	0.6208	0.6297	0.6387	0.6477
-2.80	-2.80	0.5783	0.5826	0.5900	0.5993	0.6077
-2.20	-2.20	0.5373	0.5450	0.5528	0.5605	0.5682
-2.00	-2.00	0.5009	0.5079	0.5151	0.5223	0.5295
-1.90	-1.90	0.4827	0.4896	0.4965	0.5038	0.5103
-1.90	-1.80	0.4688	0.4718	0.4780	0.4885	0.4913
-1.70	-1.70	0.4670	0.4834	0.4897	0.4860	0.4778
-1.60	-1.60	0.4298	0.4358	0.4415	0.4476	0.4536
-1.50	-1.50	0.4119	0.4176	0.4238	0.4292	0.4350
-1.40	-1.40	0.3985	0.4000	0.4055	0.4110	0.4166
-1.30	-1.30	0.3772	0.3828	0.3877	0.3930	0.3992
-1.20	-1.20	0.3600	0.3650	0.3700	0.3750	0.3800
-1.10	-1.10	0.3430	0.3477	0.3525	0.3572	0.3620
-1.00	-1.00	0.3261	0.3306	0.3351	0.3396	0.3441
-0.90	-0.90	0.3093	0.3135	0.3178	0.3220	0.3263
-0.80	-0.80	0.2926	0.2966	0.3006	0.3046	0.3086
-0.70	-0.70	0.2761	0.2799	0.2836	0.2874	0.2911
-0.60	-0.60	0.2597	0.2632	0.2667	0.2702	0.2738
-0.50	-0.50	0.2438	0.2467	0.2499	0.2532	0.2565
-0.40	-0.40	0.2272	0.2302	0.2333	0.2362	0.2398
-0.30	-0.30	0.2111	0.2139	0.2168	0.2196	0.2228
-0.20	-0.20	0.1952	0.1978	0.2003	0.2029	0.2055
-0.10	-0.10	0.1793	0.1817	0.1841	0.1868	0.1898
-0.00	-0.00	0.1636	0.1657	0.1679	0.1701	0.1722
0.00	2.20	-0.1551	-0.1571	-0.1590	-0.1609	-0.1629
0.10	2.30	-0.1685	-0.1705	-0.1726	-0.1747	-0.1768
0.20	2.40	-0.1817	-0.1839	-0.1862	-0.1884	-0.1906
0.30	2.50	-0.1948	-0.1972	-0.1996	-0.2020	-0.2048
0.40	2.60	-0.2078	-0.2108	-0.2129	-0.2155	-0.2180
0.50	2.70	-0.2208	-0.2235	-0.2262	-0.2288	-0.2315
0.60	2.80	-0.2336	-0.2365	-0.2391	-0.2421	-0.2449
0.70	2.90	-0.2468	-0.2493	-0.2523	-0.2553	-0.2583
0.80	3.00	-0.2590	-0.2621	-0.2653	-0.2684	-0.2715
0.90	3.10	-0.2716	-0.2749	-0.2781	-0.2818	-0.2846
1.00	3.20	-0.2841	-0.2875	-0.2909	-0.2942	-0.2976
1.10	3.30	-0.2965	-0.3000	-0.3035	-0.3070	-0.3105
1.20	3.40	-0.3088	-0.3128	-0.3161	-0.3197	-0.3238
1.30	3.50	-0.3210	-0.3248	-0.3285	-0.3323	-0.3361
1.40	3.60	-0.3331	-0.3370	-0.3409	-0.3448	-0.3487
1.50	3.70	-0.3451	-0.3492	-0.3532	-0.3572	-0.3612
1.60	3.80	-0.3571	-0.3612	-0.3654	-0.3695	-0.3737
1.70	3.90	-0.3689	-0.3732	-0.3775	-0.3818	-0.3860
1.80	4.00	-0.3807	-0.3851	-0.3895	-0.3939	-0.3983
1.90	4.10	-0.3924	-0.3969	-0.4018	-0.4059	-0.4108
2.00	4.20	-0.4040	-0.4087	-0.4133	-0.4179	-0.4225
2.20	4.40	-0.4270	-0.4318	-0.4367	-0.4415	-0.4463
2.40	4.60	-0.4496	-0.4547	-0.4598	-0.4648	-0.4698
2.60	4.80	-0.4719	-0.4772	-0.4825	-0.4877	-0.4930
3.00	5.20	-0.5156	-0.5213	-0.5270	-0.5326	-0.5382

TABLE A-8.
RATIO OF LIABILITY TO DIRECT COST FOR EXPOSURE TIME 2.200 YEARS

*****EXPOSURE TIME 2.200 YEARS*****						
W1	TR	C.087	C.081	C.082	C.083	C.084
-3.00	-3.00	0.7390	0.7503	0.7606	0.7710	0.7815
-2.60	-2.60	0.5568	0.6658	0.6789	0.6880	0.6971
-2.00	-2.00	0.6161	0.5285	0.6330	0.6418	0.6509
-2.20	-2.20	0.5761	0.5879	0.5998	0.5906	0.6075
-2.00	-2.00	0.5367	0.5839	0.5512	0.5588	0.5657
-1.00	-1.00	0.5172	0.5282	0.5311	0.5381	0.5451
-1.80	-1.80	0.8979	0.5986	0.5112	0.5170	0.5286
-1.70	-1.70	0.8787	0.8851	0.8915	0.8970	0.9081
-1.60	-1.60	0.8597	0.8658	0.8719	0.8780	0.8881
-1.50	-1.50	0.8409	0.8465	0.8525	0.8583	0.8681
-1.40	-1.40	0.8221	0.8276	0.8332	0.8388	0.8483
-1.30	-1.30	0.8035	0.8088	0.8141	0.8198	0.8287
-1.20	-1.20	0.7851	0.7901	0.7951	0.8001	0.8052
-1.10	-1.10	0.7667	0.7715	0.7761	0.7810	0.7858
-1.00	-1.00	0.7486	0.7531	0.7576	0.7621	0.7666
-0.90	-0.90	0.7305	0.7348	0.7391	0.7433	0.7476
-0.80	-0.80	0.7127	0.7167	0.7207	0.7247	0.7287
-0.70	-0.70	0.6949	0.6987	0.7028	0.7062	0.7101
-0.60	-0.60	0.6773	0.6808	0.6841	0.6879	0.6918
-0.50	-0.50	0.6598	0.6631	0.6664	0.6697	0.6730
-0.40	-0.40	0.6428	0.6455	0.6486	0.6516	0.6547
-0.30	-0.30	0.6257	0.6281	0.6308	0.6337	0.6365
-0.20	-0.20	0.6081	0.6107	0.6133	0.6159	0.6185
-0.10	-0.10	0.5912	0.5936	0.5959	0.5983	0.6007
-0.00	-0.00	0.5748	0.5765	0.5787	0.5808	0.5830
0.00	2.20	-0.1688	-0.1667	-0.1695	-0.1716	-0.1725
0.10	2.30	-0.1789	-0.1910	-0.1831	-0.1851	-0.1872
0.20	2.40	-0.1929	-0.1851	-0.1873	-0.1896	-0.1918
0.30	2.50	-0.2068	-0.2091	-0.2115	-0.2139	-0.2162
0.40	2.60	-0.2205	-0.2231	-0.2256	-0.2281	-0.2306
0.50	2.70	-0.2342	-0.2369	-0.2395	-0.2422	-0.2448
0.60	2.80	-0.2478	-0.2505	-0.2538	-0.2562	-0.2590
0.70	2.90	-0.2612	-0.2642	-0.2671	-0.2700	-0.2730
0.80	3.00	-0.2746	-0.2777	-0.2807	-0.2838	-0.2869
0.90	3.10	-0.2878	-0.2910	-0.2941	-0.2975	-0.3007
1.00	3.20	-0.3010	-0.3043	-0.3077	-0.3110	-0.3143
1.10	3.30	-0.3140	-0.3175	-0.3210	-0.3245	-0.3279
1.20	3.40	-0.3270	-0.3306	-0.3341	-0.3379	-0.3418
1.30	3.50	-0.3398	-0.3436	-0.3471	-0.3510	-0.3547
1.40	3.60	-0.3526	-0.3564	-0.3603	-0.3641	-0.3680
1.50	3.70	-0.3652	-0.3692	-0.3732	-0.3771	-0.3811
1.60	3.80	-0.3778	-0.3819	-0.3860	-0.3901	-0.3941
1.70	3.90	-0.3903	-0.3945	-0.3987	-0.4029	-0.4071
1.80	4.00	-0.4026	-0.4070	-0.4113	-0.4156	-0.4199
1.90	4.10	-0.4149	-0.4193	-0.4238	-0.4282	-0.4326
2.00	4.20	-0.4271	-0.4316	-0.4362	-0.4407	-0.4452
2.20	4.40	-0.4511	-0.4559	-0.4607	-0.4654	-0.4701
2.40	4.60	-0.4749	-0.4798	-0.4848	-0.4897	-0.4947
2.60	4.80	-0.4982	-0.5034	-0.5085	-0.5137	-0.5188
3.00	5.20	-0.5438	-0.5488	-0.5539	-0.5588	-0.5659

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.200 YEARS

*****INDIRECT RATIO*****

TL	TS	0.085	0.086	0.087	0.088	0.089
-3.00	-3.00	0.7919	0.8028	0.8130	0.8235	0.8341
-2.60	-2.60	0.7022	0.7118	0.7205	0.7297	0.7389
-2.40	-2.40	0.6588	0.6669	0.6755	0.6840	0.6926
-2.20	-2.20	0.6153	0.6232	0.6311	0.6391	0.6472
-2.00	-2.00	0.5730	0.5803	0.5876	0.5949	0.6022
-1.90	-1.90	0.5520	0.5590	0.5660	0.5730	0.5801
-1.80	-1.80	0.5313	0.5380	0.5447	0.5518	0.5589
-1.70	-1.70	0.5107	0.5171	0.5235	0.5302	0.5368
-1.60	-1.60	0.4903	0.4968	0.5025	0.5087	0.5149
-1.50	-1.50	0.4700	0.4759	0.4817	0.4876	0.4935
-1.40	-1.40	0.4499	0.4555	0.4611	0.4667	0.4723
-1.30	-1.30	0.4290	0.4353	0.4406	0.4459	0.4513
-1.20	-1.20	0.4082	0.4152	0.4203	0.4258	0.4308
-1.10	-1.10	0.3896	0.3958	0.4002	0.4059	0.4109
-1.00	-1.00	0.3711	0.3757	0.3802	0.3847	0.3892
-0.90	-0.90	0.3519	0.3561	0.3608	0.3647	0.3693
-0.80	-0.80	0.3327	0.3367	0.3408	0.3448	0.3489
-0.70	-0.70	0.3137	0.3175	0.3213	0.3251	0.3290
-0.60	-0.60	0.2948	0.2984	0.3020	0.3055	0.3091
-0.50	-0.50	0.2762	0.2795	0.2829	0.2861	0.2896
-0.40	-0.40	0.2577	0.2608	0.2638	0.2669	0.2700
-0.30	-0.30	0.2392	0.2422	0.2450	0.2479	0.2507
-0.20	-0.20	0.2211	0.2237	0.2263	0.2289	0.2315
-0.10	-0.10	0.2031	0.2058	0.2079	0.2102	0.2125
-0.00	-0.00	0.1851	0.1873	0.1898	0.1916	0.1937
0.00	2.20	-0.1788	-0.1763	-0.1787	-0.1801	-0.1820
0.10	2.30	-0.1892	-0.1913	-0.1938	-0.1958	-0.1975
0.20	2.40	-0.2000	-0.2062	-0.2088	-0.2106	-0.2129
0.30	2.50	-0.2106	-0.2210	-0.2233	-0.2257	-0.2280
0.40	2.60	-0.2331	-0.2356	-0.2381	-0.2406	-0.2431
0.50	2.70	-0.2475	-0.2501	-0.2528	-0.2558	-0.2580
0.60	2.80	-0.2617	-0.2645	-0.2673	-0.2701	-0.2729
0.70	2.90	-0.2759	-0.2789	-0.2817	-0.2846	-0.2875
0.80	3.00	-0.2899	-0.2930	-0.2960	-0.2991	-0.3021
0.90	3.10	-0.3039	-0.3070	-0.3102	-0.3138	-0.3165
1.00	3.20	-0.3177	-0.3210	-0.3243	-0.3276	-0.3308
1.10	3.30	-0.3318	-0.3349	-0.3382	-0.3416	-0.3450
1.20	3.40	-0.3460	-0.3485	-0.3520	-0.3556	-0.3591
1.30	3.50	-0.3598	-0.3621	-0.3658	-0.3698	-0.3731
1.40	3.60	-0.3718	-0.3756	-0.3798	-0.3831	-0.3869
1.50	3.70	-0.3850	-0.3889	-0.3929	-0.3968	-0.4006
1.60	3.80	-0.3982	-0.4022	-0.4062	-0.4102	-0.4142
1.70	3.90	-0.4112	-0.4158	-0.4195	-0.4236	-0.4277
1.80	4.00	-0.4241	-0.4288	-0.4327	-0.4369	-0.4411
1.90	4.10	-0.4370	-0.4413	-0.4457	-0.4500	-0.4548
2.00	4.20	-0.4497	-0.4542	-0.4586	-0.4631	-0.4675
2.20	4.40	-0.4788	-0.4795	-0.4842	-0.4889	-0.4935
2.40	4.60	-0.4906	-0.5045	-0.5093	-0.5142	-0.5190
2.60	4.80	-0.5239	-0.5260	-0.5381	-0.5391	-0.5481
3.00	5.20	-0.5718	-0.5768	-0.5823	-0.5877	-0.5930

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.200 YEARS

*****INTEREST RATE IVS*****

*L	*R	0.090	0.091	0.092	0.093	0.094
-3.00	-3.00	0.8447	0.8553	0.8660	0.8767	0.8874
-2.60	-2.60	0.7482	0.7575	0.7667	0.7760	0.7854
-2.40	-2.40	0.7012	0.7098	0.7184	0.7270	0.7357
-2.20	-2.20	0.6550	0.6629	0.6709	0.6789	0.6869
-2.00	-2.00	0.6095	0.6169	0.6243	0.6316	0.6390
-1.90	-1.90	0.5871	0.5942	0.6012	0.6083	0.6154
-1.80	-1.80	0.5649	0.5716	0.5784	0.5852	0.5920
-1.70	-1.70	0.5429	0.5493	0.5558	0.5623	0.5688
-1.60	-1.60	0.5210	0.5272	0.5334	0.5396	0.5458
-1.50	-1.50	0.4993	0.5052	0.5111	0.5171	0.5230
-1.40	-1.40	0.4779	0.4835	0.4891	0.4947	0.5004
-1.30	-1.30	0.4566	0.4619	0.4673	0.4726	0.4780
-1.20	-1.20	0.4355	0.4406	0.4456	0.4507	0.4558
-1.10	-1.10	0.4146	0.4194	0.4242	0.4290	0.4338
-1.00	-1.00	0.3938	0.3984	0.4029	0.4074	0.4120
-0.90	-0.90	0.3732	0.3775	0.3818	0.3861	0.3904
-0.80	-0.80	0.3528	0.3569	0.3609	0.3650	0.3690
-0.70	-0.70	0.3326	0.3364	0.3402	0.3440	0.3478
-0.60	-0.60	0.3126	0.3161	0.3197	0.3232	0.3268
-0.50	-0.50	0.2927	0.2960	0.2993	0.3026	0.3059
-0.40	-0.40	0.2730	0.2761	0.2791	0.2822	0.2853
-0.30	-0.30	0.2535	0.2563	0.2591	0.2620	0.2648
-0.20	-0.20	0.2341	0.2367	0.2393	0.2419	0.2445
-0.10	-0.10	0.2149	0.2173	0.2197	0.2220	0.2244
-0.00	-0.00	0.1959	0.1980	0.2002	0.2023	0.2045
0.00	2.20	-0.1839	-0.1858	-0.1877	-0.1896	-0.1914
0.10	2.30	-0.1995	-0.2015	-0.2036	-0.2056	-0.2077
0.20	2.40	-0.2150	-0.2172	-0.2194	-0.2215	-0.2237
0.30	2.50	-0.2303	-0.2327	-0.2350	-0.2373	-0.2396
0.40	2.60	-0.2455	-0.2480	-0.2505	-0.2529	-0.2554
0.50	2.70	-0.2606	-0.2632	-0.2658	-0.2684	-0.2710
0.60	2.80	-0.2756	-0.2783	-0.2811	-0.2838	-0.2865
0.70	2.90	-0.2904	-0.2933	-0.2962	-0.2990	-0.3019
0.80	3.00	-0.3051	-0.3081	-0.3111	-0.3141	-0.3171
0.90	3.10	-0.3197	-0.3228	-0.3259	-0.3291	-0.3322
1.00	3.20	-0.3341	-0.3374	-0.3406	-0.3439	-0.3471
1.10	3.30	-0.3484	-0.3518	-0.3552	-0.3586	-0.3619
1.20	3.40	-0.3626	-0.3661	-0.3696	-0.3731	-0.3766
1.30	3.50	-0.3767	-0.3803	-0.3840	-0.3876	-0.3912
1.40	3.60	-0.3907	-0.3944	-0.3981	-0.4019	-0.4056
1.50	3.70	-0.4045	-0.4084	-0.4122	-0.4160	-0.4199
1.60	3.80	-0.4182	-0.4222	-0.4261	-0.4301	-0.4340
1.70	3.90	-0.4318	-0.4359	-0.4400	-0.4440	-0.4481
1.80	4.00	-0.4453	-0.4495	-0.4537	-0.4578	-0.4620
1.90	4.10	-0.4587	-0.4630	-0.4672	-0.4715	-0.4758
2.00	4.20	-0.4719	-0.4763	-0.4807	-0.4851	-0.4894
2.20	4.40	-0.4981	-0.5027	-0.5073	-0.5118	-0.5164
2.40	4.60	-0.5238	-0.5286	-0.5334	-0.5381	-0.5429
2.60	4.80	-0.5491	-0.5541	-0.5590	-0.5639	-0.5689
3.00	5.20	-0.5984	-0.6037	-0.6090	-0.6142	-0.6195

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.200 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.095	0.096	0.097	0.098	0.099
-3.00	-3.00	0.8982	0.9089	0.9197	0.9306	0.9414
-2.60	-2.60	0.7947	0.8041	0.8135	0.8229	0.8323
-2.40	-2.40	0.7444	0.7531	0.7618	0.7705	0.7793
-2.20	-2.20	0.6950	0.7030	0.7111	0.7192	0.7273
-2.00	-2.00	0.6464	0.6539	0.6612	0.6687	0.6762
-1.90	-1.90	0.6225	0.6296	0.6367	0.6439	0.6510
-1.80	-1.80	0.5988	0.6056	0.6124	0.6192	0.6261
-1.70	-1.70	0.5753	0.5818	0.5883	0.5948	0.6014
-1.60	-1.60	0.5520	0.5582	0.5644	0.5707	0.5769
-1.50	-1.50	0.5289	0.5348	0.5408	0.5467	0.5527
-1.40	-1.40	0.5060	0.5117	0.5173	0.5230	0.5286
-1.30	-1.30	0.4833	0.4887	0.4941	0.4995	0.5049
-1.20	-1.20	0.4609	0.4660	0.4711	0.4762	0.4813
-1.10	-1.10	0.4386	0.4434	0.4483	0.4531	0.4580
-1.00	-1.00	0.4166	0.4211	0.4257	0.4303	0.4348
-0.90	-0.90	0.3947	0.3990	0.4033	0.4076	0.4119
-0.80	-0.80	0.3730	0.3771	0.3811	0.3852	0.3892
-0.70	-0.70	0.3516	0.3554	0.3592	0.3630	0.3668
-0.60	-0.60	0.3303	0.3338	0.3374	0.3409	0.3445
-0.50	-0.50	0.3092	0.3125	0.3158	0.3191	0.3224
-0.40	-0.40	0.2883	0.2914	0.2944	0.2975	0.3006
-0.30	-0.30	0.2676	0.2704	0.2733	0.2761	0.2789
-0.20	-0.20	0.2471	0.2497	0.2523	0.2549	0.2575
-0.10	-0.10	0.2268	0.2291	0.2315	0.2339	0.2362
-0.00	-0.00	0.2066	0.2087	0.2109	0.2131	0.2152
0.00	2.20	-0.1933	-0.1952	-0.1971	-0.1990	-0.2008
0.10	2.30	-0.2097	-0.2117	-0.2137	-0.2157	-0.2178
0.20	2.40	-0.2259	-0.2281	-0.2302	-0.2324	-0.2345
0.30	2.50	-0.2419	-0.2442	-0.2466	-0.2489	-0.2511
0.40	2.60	-0.2579	-0.2603	-0.2627	-0.2652	-0.2676
0.50	2.70	-0.2736	-0.2762	-0.2788	-0.2813	-0.2839
0.60	2.80	-0.2892	-0.2920	-0.2947	-0.2974	-0.3001
0.70	2.90	-0.3047	-0.3076	-0.3104	-0.3132	-0.3161
0.80	3.00	-0.3201	-0.3230	-0.3260	-0.3290	-0.3319
0.90	3.10	-0.3353	-0.3384	-0.3415	-0.3446	-0.3476
1.00	3.20	-0.3503	-0.3536	-0.3568	-0.3600	-0.3632
1.10	3.30	-0.3653	-0.3686	-0.3720	-0.3753	-0.3786
1.20	3.40	-0.3801	-0.3835	-0.3870	-0.3904	-0.3939
1.30	3.50	-0.3947	-0.3983	-0.4019	-0.4054	-0.4090
1.40	3.60	-0.4093	-0.4130	-0.4166	-0.4203	-0.4240
1.50	3.70	-0.4237	-0.4275	-0.4313	-0.4350	-0.4388
1.60	3.80	-0.4379	-0.4418	-0.4457	-0.4496	-0.4535
1.70	3.90	-0.4521	-0.4561	-0.4601	-0.4641	-0.4680
1.80	4.00	-0.4661	-0.4702	-0.4743	-0.4784	-0.4825
1.90	4.10	-0.4800	-0.4842	-0.4884	-0.4926	-0.4968
2.00	4.20	-0.4937	-0.4981	-0.5024	-0.5066	-0.5109
2.20	4.40	-0.5209	-0.5254	-0.5299	-0.5344	-0.5388
2.40	4.60	-0.5476	-0.5523	-0.5569	-0.5616	-0.5662
2.60	4.80	-0.5737	-0.5786	-0.5835	-0.5883	-0.5931
3.00	5.20	-0.6247	-0.6299	-0.6351	-0.6402	-0.6453

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2,200 YEARS

*****INTEREST RATE IVC*****

TI	TP	0.100	0.101	0.102	0.103	0.104
-3.00	-3.00	0.9524	0.9633	0.9742	0.9852	0.9962
-2.60	-2.60	0.8418	0.8513	0.8608	0.8703	0.8799
-2.40	-2.40	0.7881	0.7969	0.8057	0.8145	0.8234
-2.20	-2.20	0.7354	0.7435	0.7516	0.7598	0.7680
-2.00	-2.00	0.6837	0.6912	0.6986	0.7062	0.7137
-1.90	-1.90	0.6582	0.6654	0.6725	0.6797	0.6869
-1.80	-1.80	0.6325	0.6398	0.6467	0.6536	0.6604
-1.70	-1.70	0.6079	0.6145	0.6211	0.6276	0.6342
-1.60	-1.60	0.5832	0.5898	0.5957	0.6020	0.6083
-1.50	-1.50	0.5586	0.5646	0.5706	0.5766	0.5825
-1.40	-1.40	0.5343	0.5400	0.5457	0.5514	0.5571
-1.30	-1.30	0.5103	0.5157	0.5211	0.5265	0.5319
-1.20	-1.20	0.4864	0.4915	0.4967	0.5018	0.5069
-1.10	-1.10	0.4628	0.4676	0.4725	0.4774	0.4822
-1.00	-1.00	0.4394	0.4440	0.4486	0.4532	0.4577
-0.90	-0.90	0.4162	0.4206	0.4249	0.4292	0.4335
-0.80	-0.80	0.3933	0.3973	0.4014	0.4055	0.4095
-0.70	-0.70	0.3706	0.3744	0.3782	0.3820	0.3858
-0.60	-0.60	0.3480	0.3516	0.3551	0.3587	0.3623
-0.50	-0.50	0.3257	0.3290	0.3323	0.3357	0.3390
-0.40	-0.40	0.3036	0.3067	0.3098	0.3128	0.3159
-0.30	-0.30	0.2819	0.2846	0.2874	0.2902	0.2931
-0.20	-0.20	0.2601	0.2627	0.2653	0.2679	0.2705
-0.10	-0.10	0.2386	0.2410	0.2433	0.2457	0.2481
-0.00	-0.00	0.2174	0.2195	0.2216	0.2238	0.2259
0.00	2.20	-0.2027	-0.2045	-0.2064	-0.2083	-0.2101
0.10	2.30	-0.2198	-0.2218	-0.2238	-0.2258	-0.2278
0.20	2.40	-0.2367	-0.2388	-0.2410	-0.2431	-0.2452
0.30	2.50	-0.2534	-0.2557	-0.2580	-0.2603	-0.2626
0.40	2.60	-0.2700	-0.2725	-0.2749	-0.2773	-0.2797
0.50	2.70	-0.2865	-0.2890	-0.2916	-0.2941	-0.2967
0.60	2.80	-0.3028	-0.3054	-0.3081	-0.3108	-0.3135
0.70	2.90	-0.3189	-0.3217	-0.3245	-0.3273	-0.3301
0.80	3.00	-0.3349	-0.3378	-0.3407	-0.3437	-0.3466
0.90	3.10	-0.3507	-0.3538	-0.3568	-0.3598	-0.3629
1.00	3.20	-0.3664	-0.3695	-0.3727	-0.3759	-0.3790
1.10	3.30	-0.3819	-0.3852	-0.3885	-0.3917	-0.3950
1.20	3.40	-0.3973	-0.4007	-0.4041	-0.4075	-0.4109
1.30	3.50	-0.4125	-0.4160	-0.4195	-0.4230	-0.4265
1.40	3.60	-0.4276	-0.4312	-0.4348	-0.4385	-0.4420
1.50	3.70	-0.4425	-0.4463	-0.4500	-0.4537	-0.4574
1.60	3.80	-0.4573	-0.4612	-0.4650	-0.4688	-0.4726
1.70	3.90	-0.4720	-0.4760	-0.4799	-0.4838	-0.4877
1.80	4.00	-0.4865	-0.4906	-0.4946	-0.4986	-0.5026
1.90	4.10	-0.5009	-0.5051	-0.5092	-0.5133	-0.5174
2.00	4.20	-0.5152	-0.5194	-0.5236	-0.5278	-0.5320
2.20	4.40	-0.5433	-0.5477	-0.5521	-0.5565	-0.5609
2.40	4.60	-0.5708	-0.5754	-0.5800	-0.5846	-0.5891
2.60	4.80	-0.5979	-0.6026	-0.6074	-0.6121	-0.6168
3.00	5.20	-0.6504	-0.6555	-0.6606	-0.6656	-0.6706

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.400 YEARS

*****INTERPST PATP I VS*****

TL	TP	0.060	0.061	0.062	0.063	0.064
-3.00	-3.00	0.5538	0.5638	0.5735	0.5837	0.5938
-2.60	-2.60	0.4985	0.5038	0.5123	0.5212	0.5302
-2.40	-2.40	0.4655	0.4738	0.4827	0.4906	0.4989
-2.20	-2.20	0.4369	0.4447	0.4525	0.4603	0.4681
-2.00	-2.00	0.4086	0.4159	0.4231	0.4304	0.4376
-1.90	-1.90	0.3946	0.4016	0.4086	0.4155	0.4225
-1.80	-1.80	0.3807	0.3874	0.3941	0.4008	0.4075
-1.70	-1.70	0.3668	0.3733	0.3797	0.3862	0.3926
-1.60	-1.60	0.3531	0.3592	0.3654	0.3716	0.3778
-1.50	-1.50	0.3394	0.3453	0.3512	0.3571	0.3631
-1.40	-1.40	0.3258	0.3314	0.3371	0.3428	0.3484
-1.30	-1.30	0.3122	0.3177	0.3231	0.3285	0.3339
-1.20	-1.20	0.2988	0.3039	0.3091	0.3143	0.3194
-1.10	-1.10	0.2854	0.2903	0.2952	0.3002	0.3051
-1.00	-1.00	0.2721	0.2768	0.2815	0.2861	0.2908
-0.90	-0.90	0.2589	0.2633	0.2678	0.2722	0.2766
-0.80	-0.80	0.2458	0.2499	0.2541	0.2583	0.2625
-0.70	-0.70	0.2327	0.2366	0.2406	0.2446	0.2485
-0.60	-0.60	0.2197	0.2234	0.2271	0.2309	0.2346
-0.50	-0.50	0.2068	0.2103	0.2139	0.2173	0.2207
-0.40	-0.40	0.1940	0.1972	0.2005	0.2037	0.2070
-0.30	-0.30	0.1812	0.1842	0.1873	0.1903	0.1933
-0.20	-0.20	0.1685	0.1713	0.1741	0.1769	0.1797
-0.10	-0.10	0.1559	0.1585	0.1611	0.1636	0.1662
-0.00	-0.00	0.1433	0.1457	0.1481	0.1505	0.1528
0.00	2.40	-0.1368	-0.1390	-0.1411	-0.1433	-0.1454
0.10	2.50	-0.1476	-0.1500	-0.1523	-0.1546	-0.1569
0.20	2.60	-0.1584	-0.1609	-0.1634	-0.1659	-0.1683
0.30	2.70	-0.1691	-0.1718	-0.1744	-0.1771	-0.1797
0.40	2.80	-0.1798	-0.1826	-0.1854	-0.1882	-0.1910
0.50	2.90	-0.1904	-0.1933	-0.1963	-0.1992	-0.2022
0.60	3.00	-0.2009	-0.2040	-0.2071	-0.2102	-0.2133
0.70	3.10	-0.2114	-0.2147	-0.2179	-0.2211	-0.2244
0.80	3.20	-0.2218	-0.2252	-0.2286	-0.2320	-0.2354
0.90	3.30	-0.2322	-0.2357	-0.2392	-0.2428	-0.2463
1.00	3.40	-0.2428	-0.2461	-0.2498	-0.2535	-0.2572
1.10	3.50	-0.2527	-0.2565	-0.2603	-0.2642	-0.2680
1.20	3.60	-0.2628	-0.2668	-0.2708	-0.2748	-0.2787
1.30	3.70	-0.2730	-0.2771	-0.2812	-0.2853	-0.2894
1.40	3.80	-0.2830	-0.2873	-0.2915	-0.2957	-0.3000
1.50	3.90	-0.2930	-0.2974	-0.3018	-0.3061	-0.3105
1.60	4.00	-0.3029	-0.3075	-0.3120	-0.3165	-0.3210
1.70	4.10	-0.3128	-0.3175	-0.3221	-0.3268	-0.3314
1.80	4.20	-0.3226	-0.3274	-0.3322	-0.3370	-0.3417
1.90	4.30	-0.3324	-0.3373	-0.3422	-0.3471	-0.3520
2.00	4.40	-0.3421	-0.3472	-0.3522	-0.3572	-0.3622
2.20	4.60	-0.3614	-0.3667	-0.3719	-0.3772	-0.3824
2.40	4.80	-0.3808	-0.3859	-0.3914	-0.3969	-0.4024
2.60	5.00	-0.3997	-0.4050	-0.4107	-0.4164	-0.4221
3.00	5.40	-0.4361	-0.4424	-0.4486	-0.4549	-0.4609

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.400 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.065	0.066	0.067	0.068	0.069
-3.00	-3.00	0.6140	0.6143	0.6245	0.6348	0.6451
-2.60	-2.60	0.5392	0.5482	0.5572	0.5663	0.5753
-2.40	-2.40	0.5074	0.5158	0.5242	0.5327	0.5412
-2.20	-2.20	0.4759	0.4838	0.4916	0.4995	0.5074
-2.00	-2.00	0.4449	0.4522	0.4595	0.4668	0.4742
-1.90	-1.90	0.4295	0.4366	0.4436	0.4506	0.4577
-1.80	-1.80	0.4143	0.4210	0.4278	0.4345	0.4413
-1.70	-1.70	0.3991	0.4056	0.4121	0.4186	0.4251
-1.60	-1.60	0.3840	0.3902	0.3964	0.4027	0.4089
-1.50	-1.50	0.3690	0.3750	0.3809	0.3869	0.3929
-1.40	-1.40	0.3541	0.3598	0.3655	0.3712	0.3769
-1.30	-1.30	0.3393	0.3448	0.3502	0.3557	0.3611
-1.20	-1.20	0.3246	0.3299	0.3350	0.3402	0.3454
-1.10	-1.10	0.3100	0.3149	0.3199	0.3248	0.3298
-1.00	-1.00	0.2955	0.3002	0.3049	0.3096	0.3143
-0.90	-0.90	0.2811	0.2855	0.2899	0.2944	0.2988
-0.80	-0.80	0.2667	0.2709	0.2751	0.2793	0.2835
-0.70	-0.70	0.2525	0.2564	0.2604	0.2644	0.2683
-0.60	-0.60	0.2383	0.2420	0.2458	0.2495	0.2532
-0.50	-0.50	0.2242	0.2277	0.2312	0.2347	0.2382
-0.40	-0.40	0.2103	0.2135	0.2168	0.2200	0.2233
-0.30	-0.30	0.1964	0.1994	0.2024	0.2055	0.2085
-0.20	-0.20	0.1825	0.1854	0.1882	0.1910	0.1938
-0.10	-0.10	0.1688	0.1714	0.1740	0.1766	0.1792
-0.00	-0.00	0.1552	0.1576	0.1599	0.1623	0.1647
0.00	2.40	-0.1476	-0.1497	-0.1518	-0.1540	-0.1561
0.10	2.50	-0.1592	-0.1615	-0.1638	-0.1661	-0.1684
0.20	2.60	-0.1708	-0.1733	-0.1757	-0.1782	-0.1806
0.30	2.70	-0.1823	-0.1849	-0.1875	-0.1901	-0.1927
0.40	2.80	-0.1937	-0.1965	-0.1993	-0.2020	-0.2048
0.50	2.90	-0.2051	-0.2080	-0.2109	-0.2138	-0.2167
0.60	3.00	-0.2164	-0.2194	-0.2225	-0.2256	-0.2286
0.70	3.10	-0.2276	-0.2308	-0.2340	-0.2372	-0.2404
0.80	3.20	-0.2387	-0.2421	-0.2454	-0.2488	-0.2521
0.90	3.30	-0.2498	-0.2533	-0.2568	-0.2603	-0.2638
1.00	3.40	-0.2608	-0.2645	-0.2681	-0.2717	-0.2753
1.10	3.50	-0.2718	-0.2755	-0.2793	-0.2831	-0.2868
1.20	3.60	-0.2826	-0.2866	-0.2905	-0.2944	-0.2982
1.30	3.70	-0.2934	-0.2975	-0.3015	-0.3056	-0.3096
1.40	3.80	-0.3042	-0.3084	-0.3125	-0.3167	-0.3208
1.50	3.90	-0.3148	-0.3192	-0.3235	-0.3278	-0.3320
1.60	4.00	-0.3254	-0.3299	-0.3343	-0.3387	-0.3431
1.70	4.10	-0.3360	-0.3405	-0.3451	-0.3497	-0.3542
1.80	4.20	-0.3464	-0.3511	-0.3558	-0.3605	-0.3651
1.90	4.30	-0.3568	-0.3617	-0.3665	-0.3713	-0.3760
2.00	4.40	-0.3672	-0.3721	-0.3771	-0.3820	-0.3869
2.20	4.60	-0.3876	-0.3928	-0.3980	-0.4032	-0.4083
2.40	4.80	-0.4079	-0.4133	-0.4187	-0.4241	-0.4294
2.60	5.00	-0.4278	-0.4335	-0.4391	-0.4447	-0.4503
3.00	5.40	-0.4670	-0.4731	-0.4792	-0.4852	-0.4912

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.400 VPA'S

*****INTEREST RATE IVS*****

TL	TR	0.070	0.071	0.072	0.073	0.074
-3.00	-3.00	0.6554	0.6659	0.6762	0.6866	0.6971
-2.60	-2.60	0.5844	0.5936	0.6027	0.6119	0.6211
-2.40	-2.40	0.5497	0.5582	0.5667	0.5753	0.5839
-2.20	-2.20	0.5154	0.5233	0.5312	0.5392	0.5472
-2.00	-2.00	0.4815	0.4889	0.4962	0.5036	0.5110
-1.90	-1.90	0.4648	0.4718	0.4789	0.4860	0.4932
-1.80	-1.80	0.4481	0.4549	0.4617	0.4686	0.4758
-1.70	-1.70	0.4316	0.4381	0.4447	0.4512	0.4578
-1.60	-1.60	0.4152	0.4214	0.4277	0.4340	0.4403
-1.50	-1.50	0.3989	0.4048	0.4108	0.4169	0.4229
-1.40	-1.40	0.3827	0.3884	0.3941	0.3999	0.4056
-1.30	-1.30	0.3666	0.3720	0.3775	0.3830	0.3885
-1.20	-1.20	0.3506	0.3558	0.3610	0.3662	0.3715
-1.10	-1.10	0.3347	0.3397	0.3446	0.3496	0.3546
-1.00	-1.00	0.3190	0.3237	0.3284	0.3331	0.3378
-0.90	-0.90	0.3033	0.3078	0.3122	0.3167	0.3212
-0.80	-0.80	0.2877	0.2920	0.2962	0.3004	0.3046
-0.70	-0.70	0.2723	0.2763	0.2802	0.2842	0.2882
-0.60	-0.60	0.2570	0.2607	0.2644	0.2682	0.2719
-0.50	-0.50	0.2417	0.2452	0.2487	0.2522	0.2557
-0.40	-0.40	0.2266	0.2298	0.2331	0.2364	0.2396
-0.30	-0.30	0.2115	0.2146	0.2176	0.2207	0.2237
-0.20	-0.20	0.1966	0.1994	0.2022	0.2050	0.2079
-0.10	-0.10	0.1818	0.1844	0.1869	0.1895	0.1921
-0.00	-0.00	0.1670	0.1694	0.1718	0.1741	0.1765
0.00	2.40	-0.1582	-0.1604	-0.1625	-0.1646	-0.1667
0.10	2.50	-0.1707	-0.1730	-0.1752	-0.1775	-0.1798
0.20	2.60	-0.1830	-0.1855	-0.1879	-0.1903	-0.1927
0.30	2.70	-0.1953	-0.1979	-0.2005	-0.2031	-0.2056
0.40	2.80	-0.2075	-0.2102	-0.2130	-0.2157	-0.2184
0.50	2.90	-0.2196	-0.2225	-0.2254	-0.2282	-0.2311
0.60	3.00	-0.2316	-0.2347	-0.2377	-0.2407	-0.2437
0.70	3.10	-0.2436	-0.2468	-0.2499	-0.2531	-0.2562
0.80	3.20	-0.2554	-0.2588	-0.2621	-0.2654	-0.2687
0.90	3.30	-0.2672	-0.2707	-0.2741	-0.2776	-0.2810
1.00	3.40	-0.2789	-0.2825	-0.2861	-0.2897	-0.2932
1.10	3.50	-0.2906	-0.2943	-0.2980	-0.3017	-0.3054
1.20	3.60	-0.3021	-0.3060	-0.3098	-0.3137	-0.3175
1.30	3.70	-0.3136	-0.3176	-0.3216	-0.3255	-0.3295
1.40	3.80	-0.3250	-0.3291	-0.3332	-0.3373	-0.3414
1.50	3.90	-0.3363	-0.3405	-0.3448	-0.3490	-0.3532
1.60	4.00	-0.3475	-0.3519	-0.3563	-0.3606	-0.3649
1.70	4.10	-0.3587	-0.3632	-0.3677	-0.3721	-0.3766
1.80	4.20	-0.3698	-0.3744	-0.3790	-0.3836	-0.3882
1.90	4.30	-0.3808	-0.3855	-0.3903	-0.3950	-0.3997
2.00	4.40	-0.3917	-0.3966	-0.4014	-0.4063	-0.4111
2.20	4.60	-0.4134	-0.4185	-0.4236	-0.4286	-0.4336
2.40	4.80	-0.4348	-0.4401	-0.4454	-0.4506	-0.4559
2.60	5.00	-0.4558	-0.4614	-0.4669	-0.4724	-0.4778
3.00	5.40	-0.4972	-0.5031	-0.5090	-0.5149	-0.5208

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.00 YEARS

*****INTEREST RATE %*****

TL	TR	0.075	0.076	0.077	0.078	0.079
-3.00	-3.00	0.7076	0.7181	0.7286	0.7392	0.7499
-2.60	-2.60	0.6303	0.6395	0.6488	0.6581	0.6678
-2.40	-2.40	0.5925	0.6011	0.6097	0.6184	0.6271
-2.20	-2.20	0.5552	0.5632	0.5712	0.5793	0.5878
-2.00	-2.00	0.5185	0.5259	0.5333	0.5408	0.5483
-1.90	-1.90	0.5003	0.5078	0.5156	0.5218	0.5289
-1.80	-1.80	0.4822	0.4891	0.4960	0.5029	0.5099
-1.70	-1.70	0.4643	0.4709	0.4775	0.4841	0.4907
-1.60	-1.60	0.4466	0.4529	0.4592	0.4655	0.4719
-1.50	-1.50	0.4289	0.4349	0.4410	0.4470	0.4531
-1.40	-1.40	0.4114	0.4171	0.4229	0.4287	0.4345
-1.30	-1.30	0.3940	0.3995	0.4050	0.4105	0.4160
-1.20	-1.20	0.3767	0.3819	0.3872	0.3924	0.3977
-1.10	-1.10	0.3596	0.3645	0.3695	0.3745	0.3795
-1.00	-1.00	0.3425	0.3473	0.3520	0.3567	0.3615
-0.90	-0.90	0.3256	0.3301	0.3346	0.3391	0.3435
-0.80	-0.80	0.3088	0.3131	0.3173	0.3215	0.3258
-0.70	-0.70	0.2922	0.2962	0.3002	0.3041	0.3081
-0.60	-0.60	0.2756	0.2794	0.2831	0.2869	0.2906
-0.50	-0.50	0.2592	0.2627	0.2662	0.2697	0.2732
-0.40	-0.40	0.2429	0.2462	0.2495	0.2527	0.2560
-0.30	-0.30	0.2267	0.2298	0.2328	0.2359	0.2389
-0.20	-0.20	0.2107	0.2135	0.2163	0.2191	0.2219
-0.10	-0.10	0.1947	0.1973	0.1999	0.2025	0.2051
-0.00	-0.00	0.1789	0.1812	0.1836	0.1860	0.1883
0.00	2.40	-0.1688	-0.1709	-0.1730	-0.1751	-0.1772
0.10	2.50	-0.1820	-0.1843	-0.1866	-0.1888	-0.1911
0.20	2.60	-0.1952	-0.1976	-0.2000	-0.2024	-0.2048
0.30	2.70	-0.2082	-0.2107	-0.2133	-0.2159	-0.2184
0.40	2.80	-0.2211	-0.2238	-0.2265	-0.2292	-0.2319
0.50	2.90	-0.2340	-0.2368	-0.2397	-0.2425	-0.2453
0.60	3.00	-0.2467	-0.2497	-0.2527	-0.2557	-0.2586
0.70	3.10	-0.2594	-0.2625	-0.2656	-0.2688	-0.2719
0.80	3.20	-0.2719	-0.2752	-0.2785	-0.2817	-0.2850
0.90	3.30	-0.2844	-0.2878	-0.2912	-0.2946	-0.2980
1.00	3.40	-0.2968	-0.3003	-0.3039	-0.3074	-0.3109
1.10	3.50	-0.3091	-0.3128	-0.3164	-0.3201	-0.3237
1.20	3.60	-0.3213	-0.3251	-0.3289	-0.3327	-0.3364
1.30	3.70	-0.3334	-0.3374	-0.3413	-0.3452	-0.3491
1.40	3.80	-0.3455	-0.3495	-0.3534	-0.3576	-0.3616
1.50	3.90	-0.3574	-0.3616	-0.3657	-0.3699	-0.3740
1.60	4.00	-0.3693	-0.3736	-0.3778	-0.3821	-0.3864
1.70	4.10	-0.3810	-0.3855	-0.3899	-0.3942	-0.3986
1.80	4.20	-0.3927	-0.3973	-0.4018	-0.4063	-0.4108
1.90	4.30	-0.4043	-0.4090	-0.4136	-0.4182	-0.4228
2.00	4.40	-0.4159	-0.4206	-0.4254	-0.4301	-0.4348
2.20	4.60	-0.4386	-0.4436	-0.4486	-0.4535	-0.4585
2.40	4.80	-0.4611	-0.4663	-0.4715	-0.4767	-0.4818
2.60	5.00	-0.4833	-0.4887	-0.4941	-0.4994	-0.5048
3.00	5.40	-0.5266	-0.5324	-0.5382	-0.5439	-0.5496

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.400 YEARS

*****INTEREST RATE IV*****

TL	TP	0.080	0.081	0.082	0.083	0.084
-3.00	-3.00	0.7605	0.7711	0.7818	0.7926	0.8033
-2.60	-2.60	0.6767	0.6860	0.6958	0.7048	0.7142
-2.40	-2.40	0.6358	0.6445	0.6532	0.6620	0.6707
-2.20	-2.20	0.5955	0.6035	0.6117	0.6198	0.6280
-2.00	-2.00	0.5558	0.5633	0.5708	0.5783	0.5858
-1.90	-1.90	0.5361	0.5433	0.5506	0.5578	0.5650
-1.80	-1.80	0.5167	0.5236	0.5305	0.5375	0.5444
-1.70	-1.70	0.4978	0.5040	0.5106	0.5173	0.5240
-1.60	-1.60	0.4782	0.4845	0.4909	0.4973	0.5036
-1.50	-1.50	0.4592	0.4652	0.4713	0.4774	0.4835
-1.40	-1.40	0.4403	0.4461	0.4519	0.4577	0.4635
-1.30	-1.30	0.4215	0.4271	0.4326	0.4382	0.4437
-1.20	-1.20	0.4030	0.4082	0.4135	0.4188	0.4241
-1.10	-1.10	0.3845	0.3895	0.3945	0.3995	0.4046
-1.00	-1.00	0.3662	0.3710	0.3757	0.3805	0.3852
-0.90	-0.90	0.3480	0.3525	0.3570	0.3615	0.3660
-0.80	-0.80	0.3300	0.3343	0.3385	0.3427	0.3470
-0.70	-0.70	0.3121	0.3161	0.3201	0.3241	0.3281
-0.60	-0.60	0.2944	0.2981	0.3019	0.3056	0.3094
-0.50	-0.50	0.2768	0.2803	0.2838	0.2873	0.2908
-0.40	-0.40	0.2593	0.2626	0.2658	0.2691	0.2724
-0.30	-0.30	0.2419	0.2450	0.2480	0.2511	0.2541
-0.20	-0.20	0.2247	0.2275	0.2303	0.2332	0.2360
-0.10	-0.10	0.2076	0.2102	0.2128	0.2154	0.2180
-0.00	-0.00	0.1907	0.1931	0.1954	0.1978	0.2001
0.00	2.40	-0.1793	-0.1818	-0.1835	-0.1856	-0.1876
0.10	2.50	-0.1932	-0.1955	-0.1978	-0.2000	-0.2022
0.20	2.60	-0.2072	-0.2096	-0.2119	-0.2143	-0.2167
0.30	2.70	-0.2209	-0.2235	-0.2260	-0.2285	-0.2310
0.40	2.80	-0.2346	-0.2373	-0.2400	-0.2426	-0.2453
0.50	2.90	-0.2482	-0.2510	-0.2538	-0.2566	-0.2594
0.60	3.00	-0.2616	-0.2646	-0.2675	-0.2705	-0.2734
0.70	3.10	-0.2750	-0.2781	-0.2812	-0.2842	-0.2873
0.80	3.20	-0.2882	-0.2914	-0.2947	-0.2979	-0.3011
0.90	3.30	-0.3014	-0.3047	-0.3081	-0.3114	-0.3148
1.00	3.40	-0.3148	-0.3179	-0.3214	-0.3249	-0.3283
1.10	3.50	-0.3278	-0.3310	-0.3346	-0.3382	-0.3418
1.20	3.60	-0.3402	-0.3440	-0.3477	-0.3514	-0.3551
1.30	3.70	-0.3530	-0.3568	-0.3607	-0.3645	-0.3684
1.40	3.80	-0.3656	-0.3696	-0.3736	-0.3775	-0.3815
1.50	3.90	-0.3782	-0.3823	-0.3864	-0.3905	-0.3945
1.60	4.00	-0.3906	-0.3948	-0.3991	-0.4033	-0.4075
1.70	4.10	-0.4030	-0.4073	-0.4117	-0.4160	-0.4203
1.80	4.20	-0.4153	-0.4197	-0.4242	-0.4286	-0.4330
1.90	4.30	-0.4278	-0.4322	-0.4365	-0.4411	-0.4456
2.00	4.40	-0.4395	-0.4442	-0.4488	-0.4535	-0.4581
2.20	4.60	-0.4634	-0.4683	-0.4732	-0.4780	-0.4828
2.40	4.80	-0.4869	-0.4920	-0.4971	-0.5021	-0.5072
2.60	5.00	-0.5101	-0.5154	-0.5206	-0.5259	-0.5311
3.00	5.40	-0.5553	-0.5610	-0.5666	-0.5723	-0.5778

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.400 YEARS

*****INTEREST RATE IVS*****

PL	PP	0.085	0.086	0.087	0.088	0.089
-3.00	-3.00	0.8141	0.8249	0.8358	0.8467	0.8576
-2.60	-2.60	0.7237	0.7331	0.7426	0.7521	0.7617
-2.40	-2.40	0.6795	0.6883	0.6972	0.7060	0.7149
-2.20	-2.20	0.6361	0.6443	0.6525	0.6607	0.6690
-2.00	-2.00	0.5934	0.6010	0.6086	0.6162	0.6238
-1.90	-1.90	0.5723	0.5796	0.5869	0.5942	0.6015
-1.80	-1.80	0.5514	0.5584	0.5653	0.5723	0.5794
-1.70	-1.70	0.5306	0.5373	0.5440	0.5507	0.5574
-1.60	-1.60	0.5100	0.5164	0.5229	0.5293	0.5357
-1.50	-1.50	0.4896	0.4957	0.5019	0.5080	0.5141
-1.40	-1.40	0.4694	0.4752	0.4811	0.4869	0.4928
-1.30	-1.30	0.4493	0.4548	0.4604	0.4660	0.4716
-1.20	-1.20	0.4293	0.4346	0.4399	0.4453	0.4506
-1.10	-1.10	0.4096	0.4146	0.4197	0.4247	0.4297
-1.00	-1.00	0.3900	0.3948	0.3995	0.4043	0.4091
-0.90	-0.90	0.3705	0.3750	0.3796	0.3841	0.3886
-0.80	-0.80	0.3513	0.3555	0.3599	0.3640	0.3683
-0.70	-0.70	0.3321	0.3361	0.3401	0.3441	0.3482
-0.60	-0.60	0.3131	0.3169	0.3207	0.3244	0.3282
-0.50	-0.50	0.2943	0.2978	0.3014	0.3049	0.3084
-0.40	-0.40	0.2757	0.2789	0.2822	0.2855	0.2888
-0.30	-0.30	0.2571	0.2602	0.2632	0.2663	0.2693
-0.20	-0.20	0.2388	0.2416	0.2444	0.2472	0.2500
-0.10	-0.10	0.2206	0.2232	0.2257	0.2283	0.2309
-0.00	-0.00	0.2025	0.2049	0.2072	0.2096	0.2119
0.00	2.40	-0.1897	-0.1918	-0.1938	-0.1959	-0.1980
0.10	2.50	-0.2084	-0.2067	-0.2089	-0.2111	-0.2133
0.20	2.60	-0.2191	-0.2214	-0.2238	-0.2261	-0.2285
0.30	2.70	-0.2336	-0.2361	-0.2386	-0.2411	-0.2436
0.40	2.80	-0.2479	-0.2506	-0.2532	-0.2559	-0.2585
0.50	2.90	-0.2622	-0.2650	-0.2678	-0.2705	-0.2733
0.60	3.00	-0.2763	-0.2793	-0.2822	-0.2851	-0.2880
0.70	3.10	-0.2904	-0.2934	-0.2965	-0.2995	-0.3026
0.80	3.20	-0.3043	-0.3075	-0.3107	-0.3138	-0.3170
0.90	3.30	-0.3181	-0.3214	-0.3247	-0.3280	-0.3312
1.00	3.40	-0.3318	-0.3352	-0.3387	-0.3421	-0.3455
1.10	3.50	-0.3454	-0.3489	-0.3525	-0.3560	-0.3596
1.20	3.60	-0.3588	-0.3625	-0.3662	-0.3699	-0.3735
1.30	3.70	-0.3722	-0.3760	-0.3798	-0.3836	-0.3874
1.40	3.80	-0.3854	-0.3894	-0.3933	-0.3972	-0.4011
1.50	3.90	-0.3986	-0.4026	-0.4067	-0.4107	-0.4147
1.60	4.00	-0.4116	-0.4158	-0.4199	-0.4241	-0.4282
1.70	4.10	-0.4246	-0.4288	-0.4331	-0.4373	-0.4415
1.80	4.20	-0.4374	-0.4418	-0.4461	-0.4505	-0.4548
1.90	4.30	-0.4501	-0.4546	-0.4591	-0.4635	-0.4679
2.00	4.40	-0.4627	-0.4673	-0.4719	-0.4762	-0.4810
2.20	4.60	-0.4876	-0.4924	-0.4972	-0.5020	-0.5067
2.40	4.80	-0.5122	-0.5172	-0.5221	-0.5271	-0.5320
2.60	5.00	-0.5363	-0.5415	-0.5466	-0.5518	-0.5569
3.00	5.40	-0.5834	-0.5889	-0.5944	-0.5999	-0.6054

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2,400 YEARS

*****INTEREST RATE IVS*****

TL	TF	0.090	0.091	0.092	0.093	0.094
-3.00	-3.00	0.8685	0.8795	0.8905	0.9015	0.9126
-2.60	-2.60	0.7712	0.7808	0.7904	0.8000	0.8097
-2.40	-2.40	0.7238	0.7327	0.7416	0.7506	0.7596
-2.20	-2.20	0.6772	0.6855	0.6938	0.7021	0.7104
-2.00	-2.00	0.6314	0.6390	0.6467	0.6544	0.6621
-1.90	-1.90	0.6088	0.6161	0.6235	0.6308	0.6382
-1.80	-1.80	0.5864	0.5934	0.6005	0.6075	0.6146
-1.70	-1.70	0.5642	0.5709	0.5776	0.5844	0.5912
-1.60	-1.60	0.5421	0.5486	0.5550	0.5615	0.5680
-1.50	-1.50	0.5203	0.5265	0.5326	0.5388	0.5450
-1.40	-1.40	0.4986	0.5045	0.5104	0.5163	0.5222
-1.30	-1.30	0.4772	0.4828	0.4884	0.4940	0.4996
-1.20	-1.20	0.4559	0.4612	0.4665	0.4719	0.4772
-1.10	-1.10	0.4348	0.4398	0.4449	0.4500	0.4550
-1.00	-1.00	0.4139	0.4187	0.4234	0.4282	0.4330
-0.90	-0.90	0.3931	0.3977	0.4022	0.4067	0.4113
-0.80	-0.80	0.3726	0.3768	0.3811	0.3854	0.3897
-0.70	-0.70	0.3522	0.3562	0.3602	0.3642	0.3683
-0.60	-0.60	0.3320	0.3357	0.3395	0.3433	0.3471
-0.50	-0.50	0.3119	0.3155	0.3190	0.3225	0.3260
-0.40	-0.40	0.2921	0.2953	0.2986	0.3019	0.3052
-0.30	-0.30	0.2724	0.2754	0.2785	0.2815	0.2846
-0.20	-0.20	0.2528	0.2557	0.2585	0.2613	0.2641
-0.10	-0.10	0.2335	0.2361	0.2386	0.2412	0.2438
-0.00	-0.00	0.2143	0.2167	0.2190	0.2214	0.2237
0.00	2.40	-0.2000	-0.2021	-0.2041	-0.2062	-0.2082
0.10	2.50	-0.2155	-0.2177	-0.2199	-0.2221	-0.2243
0.20	2.60	-0.2308	-0.2332	-0.2355	-0.2378	-0.2402
0.30	2.70	-0.2460	-0.2485	-0.2510	-0.2535	-0.2559
0.40	2.80	-0.2611	-0.2637	-0.2664	-0.2690	-0.2716
0.50	2.90	-0.2761	-0.2788	-0.2816	-0.2843	-0.2871
0.60	3.00	-0.2909	-0.2938	-0.2967	-0.2995	-0.3024
0.70	3.10	-0.3056	-0.3086	-0.3116	-0.3146	-0.3176
0.80	3.20	-0.3201	-0.3233	-0.3264	-0.3296	-0.3327
0.90	3.30	-0.3346	-0.3379	-0.3411	-0.3444	-0.3476
1.00	3.40	-0.3489	-0.3523	-0.3557	-0.3591	-0.3624
1.10	3.50	-0.3631	-0.3666	-0.3701	-0.3736	-0.3771
1.20	3.60	-0.3772	-0.3808	-0.3844	-0.3881	-0.3917
1.30	3.70	-0.3911	-0.3949	-0.3986	-0.4024	-0.4061
1.40	3.80	-0.4050	-0.4088	-0.4127	-0.4165	-0.4204
1.50	3.90	-0.4187	-0.4227	-0.4266	-0.4306	-0.4345
1.60	4.00	-0.4323	-0.4364	-0.4404	-0.4445	-0.4485
1.70	4.10	-0.4457	-0.4499	-0.4541	-0.4583	-0.4624
1.80	4.20	-0.4591	-0.4634	-0.4677	-0.4720	-0.4762
1.90	4.30	-0.4724	-0.4768	-0.4812	-0.4855	-0.4899
2.00	4.40	-0.4855	-0.4900	-0.4945	-0.4990	-0.5034
2.20	4.60	-0.5114	-0.5161	-0.5208	-0.5255	-0.5301
2.40	4.80	-0.5369	-0.5418	-0.5467	-0.5515	-0.5564
2.60	5.00	-0.5620	-0.5670	-0.5721	-0.5771	-0.5821
3.00	5.40	-0.6104	-0.6162	-0.6216	-0.6270	-0.6323

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2,400 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.095	0.096	0.097	0.098	0.099
-3.00	-3.00	0.9237	0.9348	0.9460	0.9571	0.9684
-2.60	-2.60	0.8193	0.8290	0.8387	0.8485	0.8592
-2.40	-2.40	0.7625	0.7776	0.7866	0.7957	0.8047
-2.20	-2.20	0.7187	0.7271	0.7354	0.7438	0.7522
-2.00	-2.00	0.6697	0.6775	0.6852	0.6929	0.7007
-1.90	-1.90	0.6456	0.6530	0.6604	0.6678	0.6753
-1.80	-1.80	0.6217	0.6288	0.6359	0.6430	0.6501
-1.70	-1.70	0.5980	0.6047	0.6115	0.6184	0.6252
-1.60	-1.60	0.5745	0.5810	0.5875	0.5940	0.6005
-1.50	-1.50	0.5512	0.5574	0.5636	0.5698	0.5760
-1.40	-1.40	0.5281	0.5340	0.5399	0.5459	0.5518
-1.30	-1.30	0.5052	0.5109	0.5165	0.5221	0.5278
-1.20	-1.20	0.4826	0.4879	0.4933	0.4986	0.5040
-1.10	-1.10	0.4601	0.4652	0.4703	0.4754	0.4804
-1.00	-1.00	0.4379	0.4427	0.4475	0.4523	0.4571
-0.90	-0.90	0.4158	0.4203	0.4249	0.4294	0.4340
-0.80	-0.80	0.3939	0.3982	0.4025	0.4068	0.4111
-0.70	-0.70	0.3723	0.3763	0.3803	0.3844	0.3884
-0.60	-0.60	0.3508	0.3546	0.3584	0.3622	0.3659
-0.50	-0.50	0.3296	0.3331	0.3366	0.3402	0.3437
-0.40	-0.40	0.3085	0.3118	0.3151	0.3183	0.3216
-0.30	-0.30	0.2876	0.2906	0.2937	0.2967	0.2998
-0.20	-0.20	0.2669	0.2697	0.2725	0.2753	0.2782
-0.10	-0.10	0.2464	0.2490	0.2516	0.2541	0.2567
-0.00	-0.00	0.2261	0.2284	0.2308	0.2331	0.2355
0.00	2.40	-0.2102	-0.2123	-0.2143	-0.2163	-0.2184
0.10	2.50	-0.2264	-0.2286	-0.2308	-0.2330	-0.2351
0.20	2.60	-0.2425	-0.2448	-0.2471	-0.2494	-0.2517
0.30	2.70	-0.2584	-0.2609	-0.2633	-0.2658	-0.2682
0.40	2.80	-0.2742	-0.2768	-0.2793	-0.2819	-0.2845
0.50	2.90	-0.2898	-0.2925	-0.2952	-0.2979	-0.3006
0.60	3.00	-0.3053	-0.3081	-0.3110	-0.3138	-0.3166
0.70	3.10	-0.3206	-0.3236	-0.3266	-0.3295	-0.3325
0.80	3.20	-0.3358	-0.3389	-0.3420	-0.3451	-0.3482
0.90	3.30	-0.3509	-0.3541	-0.3573	-0.3605	-0.3637
1.00	3.40	-0.3659	-0.3691	-0.3725	-0.3758	-0.3791
1.10	3.50	-0.3806	-0.3841	-0.3875	-0.3910	-0.3944
1.20	3.60	-0.3952	-0.3988	-0.4024	-0.4060	-0.4095
1.30	3.70	-0.4098	-0.4135	-0.4172	-0.4208	-0.4245
1.40	3.80	-0.4242	-0.4280	-0.4318	-0.4356	-0.4393
1.50	3.90	-0.4384	-0.4424	-0.4463	-0.4501	-0.4540
1.60	4.00	-0.4526	-0.4566	-0.4606	-0.4646	-0.4686
1.70	4.10	-0.4666	-0.4707	-0.4748	-0.4789	-0.4830
1.80	4.20	-0.4805	-0.4847	-0.4889	-0.4931	-0.4973
1.90	4.30	-0.4942	-0.4985	-0.5029	-0.5071	-0.5114
2.00	4.40	-0.5079	-0.5123	-0.5167	-0.5211	-0.5254
2.20	4.60	-0.5348	-0.5394	-0.5439	-0.5485	-0.5531
2.40	4.80	-0.5612	-0.5660	-0.5707	-0.5755	-0.5802
2.60	5.00	-0.5871	-0.5921	-0.5970	-0.6019	-0.6068
3.00	5.40	-0.6376	-0.6429	-0.6481	-0.6534	-0.6586

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.400 YEARS

*****INTEREST RATE IVS*****

TI	TR	0.100	0.101	0.102	0.103	0.104
-3.00	-3.00	0.9796	0.9909	1.0022	1.0136	1.0249
-2.60	-2.60	0.8680	0.8779	0.8877	0.8975	0.9074
-2.40	-2.40	0.8138	0.8229	0.8321	0.8412	0.8504
-2.20	-2.20	0.7606	0.7691	0.7775	0.7860	0.7945
-2.00	-2.00	0.7085	0.7162	0.7240	0.7318	0.7397
-1.90	-1.90	0.5827	0.6902	0.6977	0.7052	0.7127
-1.80	-1.80	0.6573	0.6644	0.6716	0.6787	0.6859
-1.70	-1.70	0.6320	0.6389	0.6457	0.6526	0.6595
-1.60	-1.60	0.6070	0.6136	0.6201	0.6267	0.6332
-1.50	-1.50	0.5823	0.5885	0.5948	0.6010	0.6073
-1.40	-1.40	0.5577	0.5637	0.5696	0.5756	0.5816
-1.30	-1.30	0.5334	0.5391	0.5448	0.5505	0.5561
-1.20	-1.20	0.5094	0.5148	0.5201	0.5255	0.5309
-1.10	-1.10	0.4855	0.4907	0.4958	0.5009	0.5060
-1.00	-1.00	0.4619	0.4668	0.4715	0.4764	0.4813
-0.90	-0.90	0.4386	0.4431	0.4477	0.4523	0.4568
-0.80	-0.80	0.4154	0.4197	0.4240	0.4283	0.4326
-0.70	-0.70	0.3925	0.3965	0.4005	0.4046	0.4086
-0.60	-0.60	0.3697	0.3735	0.3773	0.3811	0.3849
-0.50	-0.50	0.3472	0.3508	0.3543	0.3578	0.3614
-0.40	-0.40	0.3249	0.3282	0.3315	0.3348	0.3381
-0.30	-0.30	0.3028	0.3059	0.3089	0.3120	0.3150
-0.20	-0.20	0.2810	0.2838	0.2866	0.2894	0.2922
-0.10	-0.10	0.2593	0.2619	0.2645	0.2670	0.2696
-0.00	-0.00	0.2378	0.2402	0.2425	0.2449	0.2472
0.00	2.40	-0.2204	-0.2224	-0.2244	-0.2264	-0.2284
0.10	2.50	-0.2373	-0.2395	-0.2416	-0.2438	-0.2459
0.20	2.60	-0.2540	-0.2563	-0.2586	-0.2609	-0.2632
0.30	2.70	-0.2706	-0.2731	-0.2755	-0.2779	-0.2803
0.40	2.80	-0.2871	-0.2896	-0.2922	-0.2947	-0.2973
0.50	2.90	-0.3034	-0.3060	-0.3087	-0.3114	-0.3141
0.60	3.00	-0.3195	-0.3223	-0.3251	-0.3279	-0.3307
0.70	3.10	-0.3354	-0.3384	-0.3413	-0.3443	-0.3472
0.80	3.20	-0.3512	-0.3543	-0.3574	-0.3604	-0.3635
0.90	3.30	-0.3669	-0.3701	-0.3733	-0.3765	-0.3796
1.00	3.40	-0.3825	-0.3858	-0.3891	-0.3923	-0.3956
1.10	3.50	-0.3978	-0.4013	-0.4047	-0.4081	-0.4114
1.20	3.60	-0.4131	-0.4166	-0.4201	-0.4236	-0.4271
1.30	3.70	-0.4281	-0.4318	-0.4354	-0.4390	-0.4426
1.40	3.80	-0.4431	-0.4468	-0.4506	-0.4543	-0.4580
1.50	3.90	-0.4579	-0.4617	-0.4656	-0.4694	-0.4732
1.60	4.00	-0.4725	-0.4765	-0.4804	-0.4844	-0.4883
1.70	4.10	-0.4871	-0.4911	-0.4952	-0.4992	-0.5032
1.80	4.20	-0.5014	-0.5056	-0.5097	-0.5139	-0.5180
1.90	4.30	-0.5157	-0.5199	-0.5242	-0.5284	-0.5326
2.00	4.40	-0.5299	-0.5341	-0.5385	-0.5428	-0.5471
2.20	4.60	-0.5576	-0.5621	-0.5666	-0.5711	-0.5756
2.40	4.80	-0.5846	-0.5896	-0.5947	-0.5989	-0.6036
2.60	5.00	-0.6117	-0.6165	-0.6214	-0.6262	-0.6310
3.00	5.40	-0.6637	-0.6689	-0.6740	-0.6791	-0.6842

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.600 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.060	0.061	0.062	0.063	0.064
-3.00	-3.00	0.5679	0.5783	0.5887	0.5991	0.6096
-2.60	-2.60	0.5087	0.5179	0.5271	0.5363	0.5455
-2.40	-2.40	0.4796	0.4882	0.4968	0.5055	0.5141
-2.20	-2.20	0.4509	0.4589	0.4669	0.4750	0.4831
-2.00	-2.00	0.4224	0.4299	0.4374	0.4449	0.4524
-1.90	-1.90	0.4083	0.4155	0.4227	0.4300	0.4372
-1.80	-1.80	0.3943	0.4012	0.4082	0.4152	0.4221
-1.70	-1.70	0.3804	0.3870	0.3937	0.4004	0.4071
-1.60	-1.60	0.3665	0.3729	0.3794	0.3858	0.3922
-1.50	-1.50	0.3527	0.3589	0.3651	0.3712	0.3774
-1.40	-1.40	0.3391	0.3450	0.3509	0.3568	0.3627
-1.30	-1.30	0.3254	0.3311	0.3367	0.3424	0.3481
-1.20	-1.20	0.3119	0.3173	0.3227	0.3281	0.3335
-1.10	-1.10	0.2985	0.3036	0.3088	0.3139	0.3191
-1.00	-1.00	0.2851	0.2900	0.2949	0.2998	0.3047
-0.90	-0.90	0.2718	0.2765	0.2811	0.2858	0.2904
-0.80	-0.80	0.2586	0.2630	0.2674	0.2718	0.2763
-0.70	-0.70	0.2454	0.2496	0.2538	0.2580	0.2622
-0.60	-0.60	0.2324	0.2363	0.2403	0.2442	0.2481
-0.50	-0.50	0.2194	0.2231	0.2268	0.2305	0.2342
-0.40	-0.40	0.2065	0.2100	0.2134	0.2169	0.2204
-0.30	-0.30	0.1936	0.1969	0.2001	0.2034	0.2066
-0.20	-0.20	0.1809	0.1839	0.1869	0.1899	0.1930
-0.10	-0.10	0.1682	0.1710	0.1738	0.1766	0.1794
-0.00	-0.00	0.1556	0.1582	0.1607	0.1633	0.1659
0.00	2.60	-0.1479	-0.1502	-0.1526	-0.1549	-0.1572
0.10	2.70	-0.1587	-0.1612	-0.1637	-0.1661	-0.1686
0.20	2.80	-0.1694	-0.1721	-0.1747	-0.1773	-0.1800
0.30	2.90	-0.1801	-0.1829	-0.1857	-0.1885	-0.1912
0.40	3.00	-0.1907	-0.1936	-0.1966	-0.1995	-0.2024
0.50	3.10	-0.2012	-0.2043	-0.2074	-0.2105	-0.2136
0.60	3.20	-0.2117	-0.2149	-0.2182	-0.2214	-0.2247
0.70	3.30	-0.2221	-0.2255	-0.2289	-0.2323	-0.2357
0.80	3.40	-0.2324	-0.2360	-0.2395	-0.2431	-0.2466
0.90	3.50	-0.2427	-0.2464	-0.2501	-0.2538	-0.2574
1.00	3.60	-0.2529	-0.2568	-0.2606	-0.2644	-0.2682
1.10	3.70	-0.2631	-0.2671	-0.2711	-0.2750	-0.2790
1.20	3.80	-0.2732	-0.2773	-0.2814	-0.2855	-0.2896
1.30	3.90	-0.2833	-0.2875	-0.2918	-0.2960	-0.3002
1.40	4.00	-0.2932	-0.2977	-0.3020	-0.3064	-0.3108
1.50	4.10	-0.3032	-0.3077	-0.3122	-0.3167	-0.3212
1.60	4.20	-0.3131	-0.3177	-0.3224	-0.3270	-0.3316
1.70	4.30	-0.3229	-0.3277	-0.3325	-0.3372	-0.3420
1.80	4.40	-0.3326	-0.3376	-0.3425	-0.3474	-0.3522
1.90	4.50	-0.3423	-0.3474	-0.3524	-0.3575	-0.3625
2.00	4.60	-0.3520	-0.3572	-0.3623	-0.3675	-0.3726
2.20	4.80	-0.3711	-0.3766	-0.3820	-0.3873	-0.3927
2.40	5.00	-0.3900	-0.3957	-0.4012	-0.4070	-0.4126
2.60	5.20	-0.4087	-0.4146	-0.4205	-0.4264	-0.4322
3.00	5.60	-0.4455	-0.4518	-0.4581	-0.4644	-0.4707

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.600 YEARS

*****INTEREST RATE IVS*****

TI	TP	0.065	0.066	0.067	0.068	0.069
-3.00	-3.00	0.6201	0.6306	0.6411	0.6517	0.6623
-2.60	-2.60	0.5588	0.5681	0.5772	0.5828	0.5921
-2.40	-2.40	0.5228	0.5315	0.5402	0.5490	0.5577
-2.20	-2.20	0.4912	0.4993	0.5078	0.5156	0.5238
-2.00	-2.00	0.4600	0.4675	0.4751	0.4827	0.4903
-1.90	-1.90	0.4485	0.4518	0.4591	0.4668	0.4737
-1.80	-1.80	0.4291	0.4361	0.4432	0.4502	0.4572
-1.70	-1.70	0.4139	0.4206	0.4273	0.4341	0.4409
-1.60	-1.60	0.3987	0.4052	0.4116	0.4181	0.4246
-1.50	-1.50	0.3836	0.3898	0.3960	0.4022	0.4085
-1.40	-1.40	0.3686	0.3746	0.3805	0.3865	0.3924
-1.30	-1.30	0.3537	0.3594	0.3651	0.3708	0.3765
-1.20	-1.20	0.3389	0.3444	0.3498	0.3552	0.3607
-1.10	-1.10	0.3242	0.3294	0.3346	0.3398	0.3449
-1.00	-1.00	0.3096	0.3145	0.3195	0.3244	0.3293
-0.90	-0.90	0.2951	0.2998	0.3045	0.3091	0.3138
-0.80	-0.80	0.2807	0.2851	0.2895	0.2940	0.2984
-0.70	-0.70	0.2663	0.2705	0.2747	0.2789	0.2831
-0.60	-0.60	0.2521	0.2560	0.2600	0.2640	0.2679
-0.50	-0.50	0.2379	0.2417	0.2454	0.2491	0.2528
-0.40	-0.40	0.2239	0.2274	0.2308	0.2343	0.2378
-0.30	-0.30	0.2099	0.2131	0.2164	0.2196	0.2229
-0.20	-0.20	0.1960	0.1990	0.2020	0.2051	0.2081
-0.10	-0.10	0.1822	0.1850	0.1878	0.1906	0.1934
-0.00	-0.00	0.1685	0.1710	0.1736	0.1762	0.1788
0.00	2.60	-0.1595	-0.1618	-0.1641	-0.1664	-0.1687
0.10	2.70	-0.1711	-0.1736	-0.1760	-0.1785	-0.1809
0.20	2.80	-0.1826	-0.1852	-0.1878	-0.1904	-0.1931
0.30	2.90	-0.1940	-0.1968	-0.1996	-0.2023	-0.2051
0.40	3.00	-0.2054	-0.2083	-0.2112	-0.2141	-0.2170
0.50	3.10	-0.2167	-0.2197	-0.2228	-0.2259	-0.2289
0.60	3.20	-0.2279	-0.2311	-0.2343	-0.2375	-0.2407
0.70	3.30	-0.2390	-0.2424	-0.2458	-0.2491	-0.2524
0.80	3.40	-0.2501	-0.2536	-0.2571	-0.2606	-0.2641
0.90	3.50	-0.2611	-0.2648	-0.2684	-0.2720	-0.2757
1.00	3.60	-0.2720	-0.2758	-0.2796	-0.2834	-0.2871
1.10	3.70	-0.2829	-0.2868	-0.2908	-0.2947	-0.2986
1.20	3.80	-0.2937	-0.2978	-0.3018	-0.3059	-0.3099
1.30	3.90	-0.3044	-0.3086	-0.3128	-0.3170	-0.3212
1.40	4.00	-0.3151	-0.3194	-0.3238	-0.3281	-0.3323
1.50	4.10	-0.3257	-0.3302	-0.3346	-0.3390	-0.3434
1.60	4.20	-0.3362	-0.3408	-0.3454	-0.3500	-0.3545
1.70	4.30	-0.3467	-0.3514	-0.3561	-0.3608	-0.3655
1.80	4.40	-0.3571	-0.3619	-0.3668	-0.3716	-0.3763
1.90	4.50	-0.3674	-0.3724	-0.3773	-0.3823	-0.3872
2.00	4.60	-0.3777	-0.3828	-0.3878	-0.3929	-0.3979
2.20	4.80	-0.3980	-0.4034	-0.4087	-0.4139	-0.4192
2.40	5.00	-0.4181	-0.4237	-0.4292	-0.4347	-0.4402
2.60	5.20	-0.4380	-0.4438	-0.4495	-0.4552	-0.4609
3.00	5.60	-0.4769	-0.4831	-0.4893	-0.4954	-0.5015

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.600 YEARS

*****INTEREST RATE IVS*****

TI	TP	0.070	0.071	0.072	0.073	0.074
-3.00	-3.00	0.6730	0.6836	0.6944	0.7051	0.7159
-2.60	-2.60	0.6015	0.6109	0.6204	0.6298	0.6393
-2.40	-2.40	0.5665	0.5753	0.5841	0.5930	0.6019
-2.20	-2.20	0.5320	0.5402	0.5484	0.5567	0.5649
-2.00	-2.00	0.4970	0.5055	0.5132	0.5208	0.5285
-1.80	-1.80	0.4610	0.4694	0.4757	0.4831	0.4905
-1.60	-1.60	0.4243	0.4313	0.4378	0.4455	0.4526
-1.40	-1.40	0.3876	0.3944	0.4012	0.4080	0.4149
-1.20	-1.20	0.3511	0.3576	0.3642	0.3707	0.3772
-1.00	-1.00	0.3147	0.3209	0.3272	0.3335	0.3397
-0.80	-0.80	0.2784	0.2844	0.2904	0.2964	0.3024
-0.60	-0.60	0.2422	0.2479	0.2536	0.2594	0.2651
-0.40	-0.40	0.2061	0.2116	0.2170	0.2225	0.2280
-0.20	-0.20	0.1701	0.1753	0.1805	0.1857	0.1909
0.00	0.00	0.1343	0.1392	0.1442	0.1491	0.1541
0.20	0.20	0.0985	0.1032	0.1079	0.1126	0.1173
0.40	0.40	0.0627	0.0673	0.0719	0.0765	0.0811
0.60	0.60	0.0270	0.0314	0.0358	0.0402	0.0446
0.80	0.80	-0.0088	-0.0130	-0.0172	-0.0214	-0.0256
1.00	1.00	-0.0446	-0.0486	-0.0527	-0.0567	-0.0607
1.20	1.20	-0.0804	-0.0843	-0.0883	-0.0923	-0.0963
1.40	1.40	-0.1162	-0.1200	-0.1239	-0.1278	-0.1317
1.60	1.60	-0.1520	-0.1557	-0.1595	-0.1634	-0.1672
1.80	1.80	-0.1878	-0.1914	-0.1951	-0.1988	-0.2025
2.00	2.00	-0.2236	-0.2271	-0.2307	-0.2343	-0.2379
2.20	2.20	-0.2594	-0.2628	-0.2663	-0.2698	-0.2733
2.40	2.40	-0.2952	-0.2985	-0.3019	-0.3053	-0.3087
2.60	2.60	-0.3310	-0.3342	-0.3375	-0.3408	-0.3441
2.80	2.80	-0.3668	-0.3699	-0.3731	-0.3763	-0.3795
3.00	3.00	-0.4026	-0.4056	-0.4087	-0.4118	-0.4149
3.20	3.20	-0.4384	-0.4413	-0.4443	-0.4473	-0.4503
3.40	3.40	-0.4742	-0.4770	-0.4799	-0.4828	-0.4857
3.60	3.60	-0.5100	-0.5127	-0.5155	-0.5183	-0.5211
3.80	3.80	-0.5458	-0.5484	-0.5511	-0.5538	-0.5565
4.00	4.00	-0.5816	-0.5841	-0.5867	-0.5893	-0.5919
4.20	4.20	-0.6174	-0.6198	-0.6223	-0.6248	-0.6273
4.40	4.40	-0.6532	-0.6555	-0.6579	-0.6603	-0.6627
4.60	4.60	-0.6890	-0.6912	-0.6935	-0.6958	-0.6981
4.80	4.80	-0.7248	-0.7269	-0.7291	-0.7313	-0.7335
5.00	5.00	-0.7606	-0.7626	-0.7647	-0.7668	-0.7689
5.20	5.20	-0.7964	-0.7983	-0.8003	-0.8023	-0.8043
5.40	5.40	-0.8322	-0.8341	-0.8361	-0.8381	-0.8401
5.60	5.60	-0.8680	-0.8698	-0.8717	-0.8736	-0.8755
5.80	5.80	-0.9038	-0.9056	-0.9075	-0.9094	-0.9113
6.00	6.00	-0.9396	-0.9413	-0.9431	-0.9449	-0.9467
6.20	6.20	-0.9754	-0.9771	-0.9789	-0.9806	-0.9824
6.40	6.40	-1.0112	-1.0128	-1.0145	-1.0162	-1.0179
6.60	6.60	-1.0470	-1.0486	-1.0502	-1.0518	-1.0534
6.80	6.80	-1.0828	-1.0843	-1.0859	-1.0875	-1.0891
7.00	7.00	-1.1186	-1.1199	-1.1215	-1.1231	-1.1247
7.20	7.20	-1.1544	-1.1557	-1.1572	-1.1588	-1.1604
7.40	7.40	-1.1902	-1.1914	-1.1929	-1.1944	-1.1959
7.60	7.60	-1.2260	-1.2271	-1.2286	-1.2301	-1.2316
7.80	7.80	-1.2618	-1.2628	-1.2643	-1.2658	-1.2673
8.00	8.00	-1.2976	-1.2985	-1.2999	-1.3014	-1.3029
8.20	8.20	-1.3334	-1.3343	-1.3357	-1.3372	-1.3387
8.40	8.40	-1.3692	-1.3700	-1.3714	-1.3729	-1.3744
8.60	8.60	-1.4050	-1.4057	-1.4071	-1.4086	-1.4101
8.80	8.80	-1.4408	-1.4415	-1.4429	-1.4443	-1.4458
9.00	9.00	-1.4766	-1.4772	-1.4786	-1.4799	-1.4814
9.20	9.20	-1.5124	-1.5129	-1.5143	-1.5157	-1.5171
9.40	9.40	-1.5482	-1.5486	-1.5499	-1.5513	-1.5527
9.60	9.60	-1.5840	-1.5843	-1.5856	-1.5869	-1.5883
9.80	9.80	-1.6198	-1.6199	-1.6212	-1.6225	-1.6238
10.00	10.00	-1.6556	-1.6557	-1.6569	-1.6582	-1.6595

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.600 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.075	0.076	0.077	0.078	0.079
-3.00	-3.00	0.7267	0.7375	0.7488	0.7592	0.7702
-2.60	-2.60	0.6488	0.6584	0.6679	0.6775	0.6871
-2.40	-2.40	0.6107	0.6196	0.6286	0.6375	0.6465
-2.20	-2.20	0.5732	0.5815	0.5898	0.5982	0.6065
-2.00	-2.00	0.5362	0.5439	0.5516	0.5594	0.5671
-1.90	-1.90	0.5179	0.5253	0.5328	0.5402	0.5477
-1.80	-1.80	0.4997	0.5069	0.5140	0.5212	0.5283
-1.70	-1.70	0.4817	0.4885	0.4954	0.5023	0.5092
-1.60	-1.60	0.4638	0.4704	0.4769	0.4835	0.4901
-1.50	-1.50	0.4460	0.4523	0.4586	0.4649	0.4712
-1.40	-1.40	0.4284	0.4344	0.4404	0.4465	0.4525
-1.30	-1.30	0.4109	0.4166	0.4224	0.4281	0.4339
-1.20	-1.20	0.3935	0.3989	0.4044	0.4099	0.4154
-1.10	-1.10	0.3762	0.3814	0.3866	0.3919	0.3971
-1.00	-1.00	0.3590	0.3640	0.3690	0.3740	0.3789
-0.90	-0.90	0.3420	0.3467	0.3514	0.3562	0.3609
-0.80	-0.80	0.3251	0.3296	0.3340	0.3385	0.3430
-0.70	-0.70	0.3083	0.3126	0.3168	0.3210	0.3252
-0.60	-0.60	0.2917	0.2957	0.2996	0.3036	0.3076
-0.50	-0.50	0.2751	0.2789	0.2826	0.2863	0.2901
-0.40	-0.40	0.2587	0.2622	0.2657	0.2692	0.2727
-0.30	-0.30	0.2424	0.2457	0.2489	0.2522	0.2555
-0.20	-0.20	0.2262	0.2293	0.2323	0.2353	0.2384
-0.10	-0.10	0.2102	0.2130	0.2158	0.2186	0.2214
-0.00	-0.00	0.1942	0.1968	0.1994	0.2020	0.2045
0.00	2.60	-0.1824	-0.1847	-0.1870	-0.1892	-0.1915
0.10	2.70	-0.1956	-0.1980	-0.2004	-0.2028	-0.2052
0.20	2.80	-0.2086	-0.2112	-0.2137	-0.2163	-0.2188
0.30	2.90	-0.2215	-0.2242	-0.2269	-0.2296	-0.2323
0.40	3.00	-0.2344	-0.2372	-0.2401	-0.2429	-0.2458
0.50	3.10	-0.2471	-0.2501	-0.2531	-0.2561	-0.2591
0.60	3.20	-0.2598	-0.2629	-0.2660	-0.2692	-0.2723
0.70	3.30	-0.2723	-0.2756	-0.2789	-0.2821	-0.2854
0.80	3.40	-0.2848	-0.2882	-0.2916	-0.2950	-0.2984
0.90	3.50	-0.2972	-0.3007	-0.3043	-0.3078	-0.3113
1.00	3.60	-0.3095	-0.3131	-0.3168	-0.3205	-0.3241
1.10	3.70	-0.3217	-0.3255	-0.3293	-0.3331	-0.3369
1.20	3.80	-0.3338	-0.3377	-0.3417	-0.3456	-0.3495
1.30	3.90	-0.3458	-0.3499	-0.3539	-0.3580	-0.3620
1.40	4.00	-0.3578	-0.3619	-0.3661	-0.3703	-0.3744
1.50	4.10	-0.3696	-0.3739	-0.3782	-0.3825	-0.3868
1.60	4.20	-0.3814	-0.3858	-0.3902	-0.3946	-0.3990
1.70	4.30	-0.3931	-0.3976	-0.4022	-0.4067	-0.4112
1.80	4.40	-0.4047	-0.4093	-0.4140	-0.4186	-0.4232
1.90	4.50	-0.4162	-0.4210	-0.4257	-0.4305	-0.4352
2.00	4.60	-0.4276	-0.4325	-0.4374	-0.4422	-0.4471
2.20	4.80	-0.4503	-0.4554	-0.4604	-0.4655	-0.4706
2.40	5.00	-0.4726	-0.4779	-0.4832	-0.4884	-0.4937
2.60	5.20	-0.4945	-0.5001	-0.5055	-0.5110	-0.5165
3.00	5.60	-0.5376	-0.5435	-0.5493	-0.5552	-0.5610

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2,600 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.080	0.081	0.082	0.083	0.084
-3.00	-3.00	0.7811	0.7821	0.8031	0.8142	0.8253
-2.60	-2.60	0.6967	0.7068	0.7161	0.7258	0.7355
-2.40	-2.40	0.6555	0.6645	0.6735	0.6826	0.6917
-2.20	-2.20	0.6149	0.6233	0.6317	0.6401	0.6485
-2.00	-2.00	0.5749	0.5827	0.5905	0.5983	0.6061
-1.90	-1.90	0.5551	0.5625	0.5701	0.5776	0.5851
-1.80	-1.80	0.5355	0.5427	0.5499	0.5571	0.5644
-1.70	-1.70	0.5161	0.5230	0.5299	0.5368	0.5437
-1.60	-1.60	0.4967	0.5034	0.5100	0.5166	0.5233
-1.50	-1.50	0.4776	0.4839	0.4903	0.4966	0.5030
-1.40	-1.40	0.4586	0.4646	0.4707	0.4767	0.4828
-1.30	-1.30	0.4397	0.4455	0.4513	0.4571	0.4629
-1.20	-1.20	0.4210	0.4265	0.4320	0.4375	0.4431
-1.10	-1.10	0.4024	0.4076	0.4129	0.4181	0.4234
-1.00	-1.00	0.3839	0.3889	0.3939	0.3989	0.4039
-0.90	-0.90	0.3656	0.3704	0.3751	0.3798	0.3846
-0.80	-0.80	0.3475	0.3519	0.3564	0.3609	0.3654
-0.70	-0.70	0.3294	0.3337	0.3379	0.3421	0.3464
-0.60	-0.60	0.3116	0.3155	0.3195	0.3235	0.3275
-0.50	-0.50	0.2938	0.2975	0.3013	0.3050	0.3088
-0.40	-0.40	0.2762	0.2797	0.2832	0.2867	0.2902
-0.30	-0.30	0.2587	0.2620	0.2652	0.2685	0.2718
-0.20	-0.20	0.2414	0.2444	0.2474	0.2505	0.2535
-0.10	-0.10	0.2242	0.2270	0.2298	0.2326	0.2354
-0.00	-0.00	0.2071	0.2097	0.2122	0.2148	0.2174
0.00	2.60	-0.1937	-0.1960	-0.1982	-0.2005	-0.2027
0.10	2.70	-0.2076	-0.2100	-0.2124	-0.2148	-0.2172
0.20	2.80	-0.2214	-0.2239	-0.2265	-0.2290	-0.2315
0.30	2.90	-0.2350	-0.2377	-0.2404	-0.2431	-0.2458
0.40	3.00	-0.2486	-0.2514	-0.2542	-0.2571	-0.2599
0.50	3.10	-0.2620	-0.2650	-0.2680	-0.2709	-0.2739
0.60	3.20	-0.2754	-0.2785	-0.2816	-0.2847	-0.2878
0.70	3.30	-0.2886	-0.2919	-0.2951	-0.2983	-0.3015
0.80	3.40	-0.3018	-0.3052	-0.3085	-0.3119	-0.3152
0.90	3.50	-0.3148	-0.3183	-0.3218	-0.3253	-0.3288
1.00	3.60	-0.3278	-0.3314	-0.3350	-0.3386	-0.3422
1.10	3.70	-0.3406	-0.3444	-0.3481	-0.3518	-0.3556
1.20	3.80	-0.3534	-0.3572	-0.3611	-0.3650	-0.3688
1.30	3.90	-0.3660	-0.3700	-0.3740	-0.3780	-0.3819
1.40	4.00	-0.3786	-0.3827	-0.3868	-0.3909	-0.3950
1.50	4.10	-0.3910	-0.3953	-0.3995	-0.4037	-0.4079
1.60	4.20	-0.4034	-0.4077	-0.4121	-0.4164	-0.4207
1.70	4.30	-0.4156	-0.4201	-0.4246	-0.4290	-0.4334
1.80	4.40	-0.4278	-0.4324	-0.4370	-0.4415	-0.4460
1.90	4.50	-0.4399	-0.4446	-0.4492	-0.4539	-0.4585
2.00	4.60	-0.4519	-0.4567	-0.4614	-0.4662	-0.4709
2.20	4.80	-0.4756	-0.4806	-0.4856	-0.4905	-0.4955
2.40	5.00	-0.4989	-0.5041	-0.5093	-0.5144	-0.5196
2.60	5.20	-0.5219	-0.5273	-0.5327	-0.5380	-0.5433
3.00	5.60	-0.5668	-0.5726	-0.5783	-0.5840	-0.5897

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.500 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.085	0.086	0.087	0.088	0.089
-3.00	-3.00	0.8368	0.8476	0.8587	0.8699	0.8812
-2.60	-2.60	0.7852	0.7550	0.7648	0.7746	0.7845
-2.40	-2.40	0.7008	0.7099	0.7190	0.7282	0.7378
-2.20	-2.20	0.6570	0.6655	0.6740	0.6825	0.6910
-2.00	-2.00	0.6139	0.6219	0.6297	0.6376	0.6455
-1.90	-1.90	0.5927	0.6002	0.6078	0.6154	0.6230
-1.80	-1.80	0.5716	0.5788	0.5861	0.5934	0.6007
-1.70	-1.70	0.5507	0.5576	0.5646	0.5716	0.5786
-1.60	-1.60	0.5299	0.5366	0.5433	0.5500	0.5567
-1.50	-1.50	0.5093	0.5157	0.5221	0.5285	0.5349
-1.40	-1.40	0.4889	0.4950	0.5011	0.5073	0.5134
-1.30	-1.30	0.4687	0.4745	0.4803	0.4862	0.4920
-1.20	-1.20	0.4486	0.4541	0.4597	0.4653	0.4708
-1.10	-1.10	0.4287	0.4340	0.4392	0.4445	0.4498
-1.00	-1.00	0.4089	0.4139	0.4190	0.4240	0.4290
-0.90	-0.90	0.3893	0.3941	0.3988	0.4036	0.4084
-0.80	-0.80	0.3699	0.3744	0.3789	0.3834	0.3879
-0.70	-0.70	0.3506	0.3548	0.3591	0.3633	0.3676
-0.60	-0.60	0.3315	0.3355	0.3395	0.3435	0.3475
-0.50	-0.50	0.3125	0.3163	0.3200	0.3237	0.3275
-0.40	-0.40	0.2937	0.2972	0.3007	0.3042	0.3077
-0.30	-0.30	0.2750	0.2783	0.2816	0.2848	0.2881
-0.20	-0.20	0.2565	0.2595	0.2626	0.2656	0.2686
-0.10	-0.10	0.2382	0.2410	0.2438	0.2466	0.2493
-0.00	-0.00	0.2199	0.2225	0.2251	0.2277	0.2302
0.00	2.60	-0.2049	-0.2072	-0.2094	-0.2116	-0.2138
0.10	2.70	-0.2196	-0.2219	-0.2243	-0.2267	-0.2290
0.20	2.80	-0.2340	-0.2366	-0.2391	-0.2416	-0.2441
0.30	2.90	-0.2488	-0.2511	-0.2537	-0.2564	-0.2590
0.40	3.00	-0.2627	-0.2655	-0.2683	-0.2710	-0.2738
0.50	3.10	-0.2768	-0.2798	-0.2827	-0.2856	-0.2885
0.60	3.20	-0.2908	-0.2939	-0.2970	-0.3000	-0.3031
0.70	3.30	-0.3048	-0.3080	-0.3111	-0.3142	-0.3175
0.80	3.40	-0.3186	-0.3219	-0.3252	-0.3285	-0.3318
0.90	3.50	-0.3322	-0.3357	-0.3391	-0.3426	-0.3460
1.00	3.60	-0.3458	-0.3494	-0.3530	-0.3565	-0.3601
1.10	3.70	-0.3593	-0.3630	-0.3667	-0.3704	-0.3740
1.20	3.80	-0.3726	-0.3765	-0.3803	-0.3841	-0.3879
1.30	3.90	-0.3859	-0.3898	-0.3938	-0.3977	-0.4016
1.40	4.00	-0.3990	-0.4031	-0.4071	-0.4111	-0.4152
1.50	4.10	-0.4121	-0.4162	-0.4204	-0.4245	-0.4286
1.60	4.20	-0.4250	-0.4293	-0.4335	-0.4378	-0.4420
1.70	4.30	-0.4378	-0.4422	-0.4466	-0.4509	-0.4553
1.80	4.40	-0.4505	-0.4550	-0.4595	-0.4640	-0.4684
1.90	4.50	-0.4631	-0.4677	-0.4723	-0.4769	-0.4814
2.00	4.60	-0.4757	-0.4804	-0.4850	-0.4897	-0.4944
2.20	4.80	-0.5004	-0.5053	-0.5102	-0.5150	-0.5199
2.40	5.00	-0.5247	-0.5298	-0.5349	-0.5399	-0.5449
2.60	5.20	-0.5486	-0.5539	-0.5592	-0.5644	-0.5696
3.00	5.60	-0.5953	-0.6010	-0.6066	-0.6121	-0.6177

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.600 YEARS

*****INTEREST RATE VS*****

TL	TE	0.090	0.091	0.092	0.093	0.094
-3.00	-3.00	0.8925	0.9338	0.9151	0.9265	0.9379
-2.60	-2.60	0.7984	0.8083	0.8182	0.8281	0.8381
-2.40	-2.40	0.7466	0.7558	0.7650	0.7743	0.7836
-2.20	-2.20	0.6996	0.7081	0.7167	0.7253	0.7339
-2.00	-2.00	0.6534	0.6613	0.6693	0.6772	0.6852
-1.90	-1.90	0.6306	0.6382	0.6458	0.6535	0.6612
-1.80	-1.80	0.6080	0.6153	0.6226	0.6300	0.6373
-1.70	-1.70	0.5856	0.5926	0.5996	0.6067	0.6137
-1.60	-1.60	0.5634	0.5701	0.5768	0.5836	0.5903
-1.50	-1.50	0.5413	0.5478	0.5542	0.5607	0.5671
-1.40	-1.40	0.5195	0.5257	0.5318	0.5380	0.5441
-1.30	-1.30	0.4979	0.5037	0.5096	0.5155	0.5213
-1.20	-1.20	0.4764	0.4820	0.4876	0.4932	0.4988
-1.10	-1.10	0.4551	0.4608	0.4665	0.4711	0.4768
-1.00	-1.00	0.4340	0.4397	0.4454	0.4511	0.4568
-0.90	-0.90	0.4131	0.4179	0.4227	0.4274	0.4322
-0.80	-0.80	0.3924	0.3969	0.4014	0.4059	0.4104
-0.70	-0.70	0.3718	0.3761	0.3803	0.3846	0.3889
-0.60	-0.60	0.3514	0.3555	0.3595	0.3635	0.3675
-0.50	-0.50	0.3312	0.3350	0.3387	0.3425	0.3463
-0.40	-0.40	0.3112	0.3147	0.3182	0.3217	0.3252
-0.30	-0.30	0.2914	0.2946	0.2979	0.3012	0.3044
-0.20	-0.20	0.2717	0.2747	0.2777	0.2808	0.2838
-0.10	-0.10	0.2521	0.2549	0.2577	0.2605	0.2633
-0.00	-0.00	0.2328	0.2354	0.2379	0.2405	0.2431
0.00	2.60	-0.2160	-0.2183	-0.2205	-0.2227	-0.2249
0.10	2.70	-0.2318	-0.2337	-0.2361	-0.2384	-0.2408
0.20	2.80	-0.2466	-0.2491	-0.2516	-0.2540	-0.2565
0.30	2.90	-0.2617	-0.2643	-0.2669	-0.2695	-0.2721
0.4	3.00	-0.2766	-0.2794	-0.2821	-0.2849	-0.2876
0.50	3.10	-0.2914	-0.2943	-0.2972	-0.3001	-0.3030
0.60	3.20	-0.3061	-0.3091	-0.3122	-0.3152	-0.3182
0.70	3.30	-0.3207	-0.3238	-0.3270	-0.3301	-0.3333
0.80	3.40	-0.3351	-0.3384	-0.3417	-0.3449	-0.3482
0.90	3.50	-0.3498	-0.3528	-0.3562	-0.3596	-0.3630
1.00	3.60	-0.3636	-0.3671	-0.3707	-0.3742	-0.3777
1.10	3.70	-0.3777	-0.3813	-0.3850	-0.3886	-0.3922
1.20	3.80	-0.3916	-0.3954	-0.3991	-0.4029	-0.4066
1.30	3.90	-0.4055	-0.4093	-0.4132	-0.4170	-0.4209
1.40	4.00	-0.4192	-0.4232	-0.4271	-0.4311	-0.4350
1.50	4.10	-0.4328	-0.4369	-0.4409	-0.4450	-0.4491
1.60	4.20	-0.4462	-0.4504	-0.4546	-0.4588	-0.4630
1.70	4.30	-0.4596	-0.4639	-0.4682	-0.4725	-0.4767
1.80	4.40	-0.4728	-0.4772	-0.4816	-0.4860	-0.4904
1.90	4.50	-0.4860	-0.4905	-0.4950	-0.4995	-0.5039
2.00	4.60	-0.4990	-0.5036	-0.5082	-0.5128	-0.5173
2.20	4.80	-0.5247	-0.5295	-0.5343	-0.5390	-0.5438
2.40	5.00	-0.5500	-0.5549	-0.5599	-0.5649	-0.5698
2.60	5.20	-0.5748	-0.5800	-0.5851	-0.5902	-0.5953
3.00	5.60	-0.6232	-0.6287	-0.6341	-0.6396	-0.6450

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2,600 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.095	0.096	0.097	0.098	0.099
-3.00	-3.00	0.9893	0.9608	0.9723	0.9839	0.9958
-2.60	-2.60	0.8881	0.8581	0.8682	0.8782	0.8883
-2.40	-2.40	0.7929	0.8022	0.8115	0.8209	0.8303
-2.20	-2.20	0.7826	0.7512	0.7599	0.7686	0.7773
-2.00	-2.00	0.6932	0.7012	0.7092	0.7173	0.7253
-1.90	-1.90	0.6688	0.6765	0.6842	0.6919	0.6997
-1.80	-1.80	0.6447	0.6521	0.6595	0.6669	0.6743
-1.70	-1.70	0.6208	0.6278	0.6349	0.6420	0.6491
-1.60	-1.60	0.5971	0.6038	0.6106	0.6174	0.6242
-1.50	-1.50	0.5736	0.5800	0.5865	0.5930	0.5995
-1.40	-1.40	0.5503	0.5565	0.5627	0.5689	0.5751
-1.30	-1.30	0.5272	0.5331	0.5390	0.5449	0.5508
-1.20	-1.20	0.5044	0.5100	0.5156	0.5212	0.5268
-1.10	-1.10	0.4817	0.4870	0.4928	0.4977	0.5031
-1.00	-1.00	0.4593	0.4643	0.4698	0.4745	0.4795
-0.90	-0.90	0.4370	0.4418	0.4466	0.4514	0.4562
-0.80	-0.80	0.4150	0.4195	0.4240	0.4286	0.4331
-0.70	-0.70	0.3931	0.3974	0.4017	0.4059	0.4102
-0.60	-0.60	0.3715	0.3755	0.3795	0.3835	0.3875
-0.50	-0.50	0.3500	0.3539	0.3575	0.3613	0.3651
-0.40	-0.40	0.3288	0.3323	0.3358	0.3393	0.3428
-0.30	-0.30	0.3077	0.3110	0.3142	0.3175	0.3208
-0.20	-0.20	0.2868	0.2898	0.2929	0.2959	0.2989
-0.10	-0.10	0.2661	0.2689	0.2717	0.2745	0.2773
-0.00	-0.00	0.2456	0.2482	0.2508	0.2533	0.2559
0.00	2.60	-0.2271	-0.2292	-0.2318	-0.2336	-0.2358
0.10	2.70	-0.2431	-0.2454	-0.2478	-0.2501	-0.2524
0.20	2.80	-0.2590	-0.2615	-0.2639	-0.2664	-0.2688
0.30	2.90	-0.2748	-0.2774	-0.2800	-0.2826	-0.2851
0.40	3.00	-0.2908	-0.2931	-0.2958	-0.2986	-0.3013
0.50	3.10	-0.3058	-0.3087	-0.3116	-0.3144	-0.3173
0.60	3.20	-0.3212	-0.3242	-0.3272	-0.3301	-0.3331
0.70	3.30	-0.3364	-0.3395	-0.3426	-0.3457	-0.3488
0.80	3.40	-0.3514	-0.3547	-0.3579	-0.3611	-0.3643
0.90	3.50	-0.3664	-0.3697	-0.3731	-0.3764	-0.3797
1.00	3.60	-0.3811	-0.3846	-0.3881	-0.3916	-0.3950
1.10	3.70	-0.3958	-0.3994	-0.4030	-0.4065	-0.4101
1.20	3.80	-0.4103	-0.4140	-0.4177	-0.4214	-0.4251
1.30	3.90	-0.4247	-0.4285	-0.4323	-0.4361	-0.4399
1.40	4.00	-0.4390	-0.4429	-0.4468	-0.4507	-0.4546
1.50	4.10	-0.4531	-0.4571	-0.4611	-0.4652	-0.4691
1.60	4.20	-0.4671	-0.4712	-0.4754	-0.4795	-0.4836
1.70	4.30	-0.4810	-0.4852	-0.4894	-0.4936	-0.4978
1.80	4.40	-0.4947	-0.4991	-0.5034	-0.5077	-0.5120
1.90	4.50	-0.5084	-0.5128	-0.5172	-0.5216	-0.5260
2.00	4.60	-0.5219	-0.5264	-0.5309	-0.5354	-0.5399
2.20	4.80	-0.5485	-0.5532	-0.5579	-0.5626	-0.5672
2.40	5.00	-0.5747	-0.5796	-0.5844	-0.5893	-0.5941
2.60	5.20	-0.6004	-0.6054	-0.6105	-0.6155	-0.6204
3.00	5.60	-0.6504	-0.6558	-0.6611	-0.6664	-0.6717

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2,600 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.100	0.101	0.102	0.103	0.104
-3.00	-3.00	1.0070	1.0187	1.0303	1.0421	1.0538
-2.60	-2.60	0.9934	0.9046	0.9164	0.9250	0.9352
-2.40	-2.40	0.9397	0.8492	0.8586	0.8681	0.8776
-2.20	-2.20	0.7861	0.7948	0.8036	0.8123	0.8211
-2.00	-2.00	0.7334	0.7415	0.7496	0.7577	0.7659
-1.90	-1.90	0.7074	0.7152	0.7230	0.7308	0.7385
-1.80	-1.80	0.6817	0.6892	0.6966	0.7041	0.7116
-1.70	-1.70	0.6562	0.6634	0.6705	0.6777	0.6848
-1.60	-1.60	0.6310	0.6379	0.6447	0.6515	0.6584
-1.50	-1.50	0.6060	0.6126	0.6191	0.6256	0.6322
-1.40	-1.40	0.5813	0.5875	0.5937	0.6000	0.6062
-1.30	-1.30	0.5568	0.5627	0.5686	0.5746	0.5805
-1.20	-1.20	0.5325	0.5381	0.5438	0.5494	0.5551
-1.10	-1.10	0.5084	0.5138	0.5192	0.5245	0.5299
-1.00	-1.00	0.4846	0.4897	0.4948	0.4999	0.5050
-0.90	-0.90	0.4610	0.4658	0.4706	0.4755	0.4803
-0.80	-0.80	0.4376	0.4422	0.4467	0.4513	0.4559
-0.70	-0.70	0.4145	0.4189	0.4233	0.4277	0.4321
-0.60	-0.60	0.3915	0.3956	0.3996	0.4036	0.4076
-0.50	-0.50	0.3688	0.3726	0.3764	0.3801	0.3839
-0.40	-0.40	0.3463	0.3498	0.3534	0.3569	0.3604
-0.30	-0.30	0.3240	0.3273	0.3306	0.3339	0.3371
-0.20	-0.20	0.3020	0.3050	0.3080	0.3111	0.3141
-0.10	-0.10	0.2801	0.2829	0.2857	0.2885	0.2913
-0.00	-0.00	0.2584	0.2610	0.2636	0.2661	0.2687
0.00	2.60	-0.2380	-0.2401	-0.2423	-0.2445	-0.2466
0.10	2.70	-0.2547	-0.2570	-0.2592	-0.2616	-0.2639
0.20	2.80	-0.2713	-0.2737	-0.2762	-0.2786	-0.2810
0.30	2.90	-0.2877	-0.2903	-0.2929	-0.2954	-0.2980
0.40	3.00	-0.3040	-0.3067	-0.3094	-0.3121	-0.3148
0.50	3.10	-0.3201	-0.3229	-0.3258	-0.3286	-0.3314
0.60	3.20	-0.3361	-0.3390	-0.3420	-0.3449	-0.3479
0.70	3.30	-0.3519	-0.3550	-0.3580	-0.3611	-0.3642
0.80	3.40	-0.3676	-0.3708	-0.3739	-0.3771	-0.3803
0.90	3.50	-0.3831	-0.3864	-0.3897	-0.3930	-0.3963
1.00	3.60	-0.3984	-0.4019	-0.4053	-0.4087	-0.4121
1.10	3.70	-0.4137	-0.4172	-0.4207	-0.4243	-0.4278
1.20	3.80	-0.4287	-0.4324	-0.4360	-0.4397	-0.4433
1.30	3.90	-0.4437	-0.4474	-0.4512	-0.4549	-0.4586
1.40	4.00	-0.4585	-0.4623	-0.4662	-0.4700	-0.4738
1.50	4.10	-0.4731	-0.4771	-0.4810	-0.4850	-0.4889
1.60	4.20	-0.4876	-0.4917	-0.4957	-0.4998	-0.5038
1.70	4.30	-0.5020	-0.5062	-0.5103	-0.5144	-0.5186
1.80	4.40	-0.5162	-0.5205	-0.5247	-0.5290	-0.5332
1.90	4.50	-0.5304	-0.5347	-0.5390	-0.5433	-0.5476
2.00	4.60	-0.5443	-0.5488	-0.5532	-0.5576	-0.5620
2.20	4.80	-0.5719	-0.5765	-0.5811	-0.5857	-0.5902
2.40	5.00	-0.5989	-0.6037	-0.6084	-0.6132	-0.6179
2.60	5.20	-0.6254	-0.6304	-0.6353	-0.6402	-0.6450
3.00	5.60	-0.6769	-0.6822	-0.6874	-0.6926	-0.6977

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.000 YEARS

*****INTEREST RATE 1%*****

FL	FR	0.060	0.061	0.062	0.063	0.064
-3.00	-3.00	0.5826	0.5932	0.6039	0.6146	0.6254
-2.60	-2.60	0.5230	0.5328	0.5419	0.5518	0.5610
-2.40	-2.40	0.4937	0.5026	0.5115	0.5204	0.5293
-2.20	-2.20	0.4644	0.4731	0.4818	0.4908	0.4995
-2.00	-2.00	0.4362	0.4439	0.4517	0.4595	0.4673
-1.90	-1.90	0.4220	0.4295	0.4370	0.4445	0.4520
-1.80	-1.80	0.4079	0.4151	0.4223	0.4296	0.4368
-1.70	-1.70	0.3939	0.4009	0.4078	0.4148	0.4217
-1.60	-1.60	0.3800	0.3867	0.3933	0.4000	0.4067
-1.50	-1.50	0.3662	0.3726	0.3790	0.3854	0.3918
-1.40	-1.40	0.3524	0.3585	0.3647	0.3708	0.3770
-1.30	-1.30	0.3387	0.3446	0.3505	0.3564	0.3623
-1.20	-1.20	0.3251	0.3307	0.3364	0.3420	0.3477
-1.10	-1.10	0.3116	0.3169	0.3223	0.3277	0.3331
-1.00	-1.00	0.2981	0.3032	0.3084	0.3135	0.3187
-0.90	-0.90	0.2847	0.2896	0.2945	0.2994	0.3043
-0.80	-0.80	0.2715	0.2761	0.2807	0.2854	0.2900
-0.70	-0.70	0.2582	0.2626	0.2670	0.2715	0.2759
-0.60	-0.60	0.2451	0.2493	0.2538	0.2576	0.2614
-0.50	-0.50	0.2320	0.2360	0.2399	0.2438	0.2478
-0.40	-0.40	0.2191	0.2227	0.2264	0.2301	0.2338
-0.30	-0.30	0.2061	0.2096	0.2131	0.2165	0.2200
-0.20	-0.20	0.1933	0.1965	0.1998	0.2030	0.2063
-0.10	-0.10	0.1805	0.1836	0.1866	0.1896	0.1926
-0.00	-0.00	0.1679	0.1706	0.1734	0.1762	0.1790
0.00	2.80	-0.1590	-0.1615	-0.1640	-0.1665	-0.1689
0.10	2.90	-0.1697	-0.1723	-0.1750	-0.1776	-0.1803
0.20	3.00	-0.1803	-0.1832	-0.1860	-0.1888	-0.1916
0.30	3.10	-0.1909	-0.1939	-0.1969	-0.1998	-0.2028
0.40	3.20	-0.2015	-0.2046	-0.2077	-0.2108	-0.2139
0.50	3.30	-0.2119	-0.2152	-0.2185	-0.2217	-0.2250
0.60	3.40	-0.2223	-0.2258	-0.2292	-0.2326	-0.2360
0.70	3.50	-0.2327	-0.2362	-0.2398	-0.2434	-0.2469
0.80	3.60	-0.2430	-0.2467	-0.2504	-0.2541	-0.2577
0.90	3.70	-0.2532	-0.2570	-0.2609	-0.2647	-0.2685
1.00	3.80	-0.2634	-0.2674	-0.2713	-0.2753	-0.2793
1.10	3.90	-0.2735	-0.2776	-0.2817	-0.2858	-0.2899
1.20	4.00	-0.2835	-0.2878	-0.2921	-0.2963	-0.3005
1.30	4.10	-0.2935	-0.2979	-0.3023	-0.3067	-0.3111
1.40	4.20	-0.3034	-0.3080	-0.3125	-0.3170	-0.3215
1.50	4.30	-0.3133	-0.3180	-0.3227	-0.3273	-0.3319
1.60	4.40	-0.3231	-0.3279	-0.3327	-0.3375	-0.3423
1.70	4.50	-0.3329	-0.3378	-0.3427	-0.3477	-0.3525
1.80	4.60	-0.3426	-0.3477	-0.3527	-0.3577	-0.3627
1.90	4.70	-0.3523	-0.3574	-0.3626	-0.3678	-0.3729
2.00	4.80	-0.3618	-0.3672	-0.3724	-0.3777	-0.3830
2.20	5.00	-0.3809	-0.3864	-0.3919	-0.3975	-0.4029
2.40	5.20	-0.3997	-0.4055	-0.4112	-0.4170	-0.4227
2.60	5.40	-0.4182	-0.4243	-0.4303	-0.4362	-0.4422
3.00	5.80	-0.4547	-0.4612	-0.4676	-0.4741	-0.4808

TABLE A-3.
PARTIAL CORRELATION COEFFICIENTS FOR PREGNANT WOMEN 2.000 YEARS

*****PARTIAL CORRELATION COEFFICIENTS*****

PI	PO	0.065	0.066	0.067	0.068	0.069
-3.00	-3.00	0.6362	0.6370	0.6378	0.6387	0.6396
-2.60	-2.60	0.5705	0.5701	0.5697	0.5693	0.5689
-2.80	-2.80	0.5382	0.5373	0.5362	0.5352	0.5348
-2.20	-2.20	0.5065	0.5189	0.5232	0.5317	0.5382
-2.00	-2.00	0.4751	0.4829	0.4907	0.4986	0.5065
-1.90	-1.90	0.4595	0.4671	0.4746	0.4822	0.4898
-1.80	-1.80	0.4441	0.4513	0.4586	0.4659	0.4732
-1.70	-1.70	0.4287	0.4357	0.4427	0.4497	0.4567
-1.60	-1.60	0.4138	0.4202	0.4269	0.4336	0.4408
-1.50	-1.50	0.3982	0.4047	0.4112	0.4176	0.4241
-1.40	-1.40	0.3832	0.3898	0.3956	0.4018	0.4082
-1.30	-1.30	0.3682	0.3741	0.3801	0.3860	0.3919
-1.20	-1.20	0.3532	0.3590	0.3647	0.3703	0.3760
-1.10	-1.10	0.3385	0.3439	0.3492	0.3548	0.3602
-1.00	-1.00	0.3238	0.3290	0.3341	0.3393	0.3445
-0.90	-0.90	0.3092	0.3141	0.3190	0.3240	0.3289
-0.80	-0.80	0.2947	0.2998	0.3049	0.3097	0.3148
-0.70	-0.70	0.2802	0.2857	0.2901	0.2945	0.2989
-0.60	-0.60	0.2659	0.2701	0.2743	0.2785	0.2827
-0.50	-0.50	0.2517	0.2556	0.2596	0.2635	0.2678
-0.40	-0.40	0.2375	0.2412	0.2449	0.2486	0.2523
-0.30	-0.30	0.2235	0.2269	0.2304	0.2339	0.2378
-0.20	-0.20	0.2095	0.2127	0.2160	0.2192	0.2225
-0.10	-0.10	0.1956	0.1986	0.2016	0.2046	0.2076
-0.00	-0.00	0.1818	0.1846	0.1878	0.1902	0.1929
0.00	2.80	-0.1718	-0.1739	-0.1768	-0.1788	-0.1813
0.10	2.90	-0.1829	-0.1856	-0.1882	-0.1908	-0.1938
0.20	3.00	-0.1943	-0.1971	-0.1999	-0.2027	-0.2055
0.30	3.10	-0.2057	-0.2086	-0.2116	-0.2145	-0.2178
0.40	3.20	-0.2170	-0.2201	-0.2232	-0.2262	-0.2293
0.50	3.30	-0.2282	-0.2318	-0.2347	-0.2379	-0.2411
0.60	3.40	-0.2393	-0.2427	-0.2461	-0.2498	-0.2528
0.70	3.50	-0.2504	-0.2539	-0.2578	-0.2609	-0.2648
0.80	3.60	-0.2618	-0.2651	-0.2687	-0.2724	-0.2760
0.90	3.70	-0.2724	-0.2762	-0.2799	-0.2837	-0.2875
1.00	3.80	-0.2832	-0.2872	-0.2911	-0.2950	-0.2989
1.10	3.90	-0.2940	-0.2981	-0.3021	-0.3062	-0.3102
1.20	4.00	-0.3047	-0.3090	-0.3131	-0.3173	-0.3215
1.30	4.10	-0.3158	-0.3197	-0.3241	-0.3284	-0.3327
1.40	4.20	-0.3260	-0.3305	-0.3349	-0.3398	-0.3438
1.50	4.30	-0.3365	-0.3411	-0.3457	-0.3503	-0.3548
1.60	4.40	-0.3470	-0.3517	-0.3564	-0.3611	-0.3658
1.70	4.50	-0.3578	-0.3622	-0.3671	-0.3719	-0.3767
1.80	4.60	-0.3677	-0.3727	-0.3776	-0.3826	-0.3875
1.90	4.70	-0.3780	-0.3831	-0.3882	-0.3932	-0.3982
2.00	4.80	-0.3882	-0.3938	-0.3986	-0.4038	-0.4089
2.20	5.00	-0.4084	-0.4139	-0.4193	-0.4247	-0.4300
2.40	5.20	-0.4284	-0.4340	-0.4397	-0.4453	-0.4509
2.60	5.40	-0.4481	-0.4540	-0.4598	-0.4657	-0.4715
3.00	5.80	-0.4868	-0.4931	-0.4992	-0.5056	-0.5118

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.800 YEARS

*****INVEST DATE 1/5*****

TL	TR	0.070	0.071	0.072	0.073	0.074
-3.00	-3.00	0.6906	0.7016	0.7126	0.7236	0.7347
-2.60	-2.60	0.6187	0.6288	0.6381	0.6479	0.6576
-2.40	-2.40	0.5838	0.5925	0.6014	0.6108	0.6199
-2.20	-2.20	0.5487	0.5571	0.5657	0.5742	0.5827
-2.00	-2.00	0.5188	0.5223	0.5302	0.5381	0.5461
-1.90	-1.90	0.4978	0.5050	0.5126	0.5203	0.5279
-1.80	-1.80	0.4805	0.4878	0.4952	0.5026	0.5099
-1.70	-1.70	0.4638	0.4709	0.4779	0.4850	0.4920
-1.60	-1.60	0.4471	0.4539	0.4607	0.4675	0.4743
-1.50	-1.50	0.4306	0.4371	0.4436	0.4502	0.4567
-1.40	-1.40	0.4142	0.4208	0.4273	0.4339	0.4402
-1.30	-1.30	0.3979	0.4039	0.4099	0.4158	0.4218
-1.20	-1.20	0.3817	0.3878	0.3931	0.3988	0.4046
-1.10	-1.10	0.3656	0.3711	0.3765	0.3820	0.3878
-1.00	-1.00	0.3497	0.3548	0.3600	0.3652	0.3708
-0.90	-0.90	0.3338	0.3387	0.3437	0.3486	0.3535
-0.80	-0.80	0.3180	0.3227	0.3278	0.3321	0.3369
-0.70	-0.70	0.3028	0.3068	0.3112	0.3157	0.3201
-0.60	-0.60	0.2868	0.2910	0.2952	0.2998	0.3036
-0.50	-0.50	0.2718	0.2753	0.2792	0.2832	0.2872
-0.40	-0.40	0.2561	0.2598	0.2635	0.2672	0.2709
-0.30	-0.30	0.2408	0.2443	0.2478	0.2512	0.2547
-0.20	-0.20	0.2257	0.2289	0.2322	0.2358	0.2397
-0.10	-0.10	0.2107	0.2137	0.2167	0.2197	0.2227
-0.00	-0.00	0.1957	0.1985	0.2013	0.2041	0.2069
0.00	2.80	-0.1838	-0.1862	-0.1897	-0.1911	-0.1935
0.10	2.90	-0.1960	-0.1986	-0.2012	-0.2038	-0.2068
0.20	3.00	-0.2082	-0.2110	-0.2137	-0.2165	-0.2192
0.30	3.10	-0.2203	-0.2232	-0.2261	-0.2290	-0.2319
0.40	3.20	-0.2323	-0.2358	-0.2388	-0.2415	-0.2445
0.50	3.30	-0.2443	-0.2475	-0.2507	-0.2538	-0.2570
0.60	3.40	-0.2561	-0.2595	-0.2628	-0.2661	-0.2698
0.70	3.50	-0.2679	-0.2718	-0.2750	-0.2783	-0.2819
0.80	3.60	-0.2796	-0.2832	-0.2868	-0.2904	-0.2940
0.90	3.70	-0.2912	-0.2950	-0.2987	-0.3028	-0.3062
1.00	3.80	-0.3028	-0.3067	-0.3105	-0.3144	-0.3182
1.10	3.90	-0.3143	-0.3183	-0.3223	-0.3262	-0.3302
1.20	4.00	-0.3256	-0.3298	-0.3339	-0.3380	-0.3421
1.30	4.10	-0.3370	-0.3412	-0.3455	-0.3497	-0.3539
1.40	4.20	-0.3482	-0.3526	-0.3570	-0.3613	-0.3657
1.50	4.30	-0.3593	-0.3639	-0.3688	-0.3724	-0.3773
1.60	4.40	-0.3708	-0.3751	-0.3797	-0.3842	-0.3889
1.70	4.50	-0.3818	-0.3862	-0.3909	-0.3957	-0.4008
1.80	4.60	-0.3928	-0.3973	-0.4021	-0.4069	-0.4119
1.90	4.70	-0.4032	-0.4082	-0.4132	-0.4182	-0.4231
2.00	4.80	-0.4140	-0.4191	-0.4242	-0.4293	-0.4343
2.20	5.00	-0.4358	-0.4407	-0.4460	-0.4513	-0.4566
2.40	5.20	-0.4565	-0.4620	-0.4675	-0.4730	-0.4785
2.60	5.40	-0.4773	-0.4830	-0.4887	-0.4948	-0.5001
3.00	5.80	-0.5180	-0.5241	-0.5302	-0.5368	-0.5428

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.800 YEARS

*****INTERPOLATED VALUES*****

TI	TR	0.075	0.076	0.077	0.078	0.079
-3.00	-3.00	0.7858	0.7570	0.7682	0.7798	0.7906
-2.60	-2.60	0.6678	0.6773	0.6871	0.6970	0.7068
-2.40	-2.40	0.6291	0.6383	0.6475	0.6568	0.6660
-2.20	-2.20	0.5913	0.5999	0.6085	0.6171	0.6257
-2.00	-2.00	0.5540	0.5620	0.5700	0.5780	0.5861
-1.80	-1.80	0.5356	0.5437	0.5518	0.5597	0.5675
-1.60	-1.60	0.5173	0.5247	0.5321	0.5395	0.5470
-1.40	-1.40	0.4992	0.5063	0.5134	0.5205	0.5277
-1.20	-1.20	0.4811	0.4879	0.4948	0.5016	0.5085
-1.00	-1.00	0.4632	0.4698	0.4767	0.4829	0.4895
-0.80	-0.80	0.4458	0.4517	0.4578	0.4643	0.4706
-0.60	-0.60	0.4278	0.4338	0.4398	0.4458	0.4519
-0.40	-0.40	0.4103	0.4160	0.4218	0.4275	0.4333
-0.20	-0.20	0.3929	0.3983	0.4038	0.4092	0.4146
0.00	0.00	0.3756	0.3808	0.3860	0.3913	0.3965
0.20	0.20	0.3585	0.3638	0.3690	0.3733	0.3783
0.40	0.40	0.3415	0.3467	0.3509	0.3556	0.3603
0.60	0.60	0.3246	0.3297	0.3335	0.3379	0.3428
0.80	0.80	0.3078	0.3127	0.3162	0.3208	0.3256
1.00	1.00	0.2911	0.2951	0.2991	0.3030	0.3070
1.20	1.20	0.2746	0.2783	0.2820	0.2859	0.2895
1.40	1.40	0.2582	0.2617	0.2652	0.2686	0.2721
1.60	1.60	0.2419	0.2451	0.2488	0.2516	0.2549
1.80	1.80	0.2257	0.2287	0.2317	0.2348	0.2378
2.00	2.00	0.2097	0.2128	0.2152	0.2180	0.2208
2.20	2.20	-0.1960	-0.1988	-0.2008	-0.2037	-0.2057
2.40	2.40	-0.2090	-0.2116	-0.2142	-0.2167	-0.2193
2.60	2.60	-0.2219	-0.2247	-0.2278	-0.2301	-0.2328
2.80	2.80	-0.2348	-0.2376	-0.2405	-0.2438	-0.2462
3.00	3.00	-0.2475	-0.2505	-0.2535	-0.2565	-0.2595
3.20	3.20	-0.2602	-0.2633	-0.2665	-0.2696	-0.2727
3.40	3.40	-0.2727	-0.2760	-0.2792	-0.2825	-0.2858
3.60	3.60	-0.2852	-0.2886	-0.2920	-0.2958	-0.2988
3.80	3.80	-0.2976	-0.3011	-0.3047	-0.3082	-0.3118
4.00	4.00	-0.3099	-0.3136	-0.3172	-0.3209	-0.3246
4.20	4.20	-0.3221	-0.3259	-0.3297	-0.3335	-0.3373
4.40	4.40	-0.3342	-0.3381	-0.3421	-0.3460	-0.3499
4.60	4.60	-0.3462	-0.3503	-0.3542	-0.3588	-0.3628
4.80	4.80	-0.3581	-0.3623	-0.3665	-0.3707	-0.3749
5.00	5.00	-0.3700	-0.3743	-0.3786	-0.3829	-0.3872
5.20	5.20	-0.3818	-0.3862	-0.3906	-0.3950	-0.3998
5.40	5.40	-0.3935	-0.3980	-0.4025	-0.4071	-0.4116
5.60	5.60	-0.4051	-0.4097	-0.4148	-0.4190	-0.4236
5.80	5.80	-0.4166	-0.4218	-0.4261	-0.4309	-0.4356
6.00	6.00	-0.4280	-0.4329	-0.4378	-0.4426	-0.4475
6.20	6.20	-0.4394	-0.4448	-0.4493	-0.4547	-0.4592
6.40	6.40	-0.4518	-0.4570	-0.4622	-0.4674	-0.4726
6.60	6.60	-0.4630	-0.4688	-0.4740	-0.4791	-0.4845
6.80	6.80	-0.4758	-0.4818	-0.4870	-0.4926	-0.4981
7.00	7.00	-0.4885	-0.4945	-0.4998	-0.5053	-0.5108

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.000 YEARS

*****FIRST PART VS*****

TL	TO	0.080	0.081	0.082	0.083	0.084
-3.00	-3.00	0.8019	0.8132	0.8246	0.8359	0.8474
-2.60	-2.60	0.7159	0.7268	0.7368	0.7468	0.7569
-2.40	-2.40	0.6753	0.6846	0.6940	0.7033	0.7127
-2.20	-2.20	0.6333	0.6431	0.6518	0.6605	0.6692
-2.00	-2.00	0.5941	0.6022	0.6103	0.6184	0.6265
-1.90	-1.90	0.5747	0.5820	0.5897	0.5975	0.6053
-1.80	-1.80	0.5544	0.5619	0.5694	0.5769	0.5844
-1.70	-1.70	0.5344	0.5420	0.5497	0.5568	0.5636
-1.60	-1.60	0.5154	0.5223	0.5292	0.5361	0.5430
-1.50	-1.50	0.4961	0.5027	0.5093	0.5159	0.5225
-1.40	-1.40	0.4769	0.4832	0.4896	0.4959	0.5022
-1.30	-1.30	0.4579	0.4639	0.4700	0.4760	0.4821
-1.20	-1.20	0.4391	0.4448	0.4506	0.4564	0.4621
-1.10	-1.10	0.4203	0.4258	0.4313	0.4368	0.4423
-1.00	-1.00	0.4017	0.4070	0.4122	0.4174	0.4227
-0.90	-0.90	0.3833	0.3883	0.3932	0.3982	0.4032
-0.80	-0.80	0.3650	0.3697	0.3744	0.3791	0.3839
-0.70	-0.70	0.3468	0.3513	0.3559	0.3602	0.3647
-0.60	-0.60	0.3288	0.3330	0.3372	0.3415	0.3457
-0.50	-0.50	0.3109	0.3149	0.3189	0.3228	0.3268
-0.40	-0.40	0.2932	0.2969	0.3006	0.3044	0.3081
-0.30	-0.30	0.2756	0.2791	0.2826	0.2860	0.2895
-0.20	-0.20	0.2581	0.2614	0.2646	0.2679	0.2711
-0.10	-0.10	0.2408	0.2438	0.2468	0.2498	0.2528
-0.00	-0.00	0.2236	0.2264	0.2291	0.2319	0.2347
0.00	2.80	-0.2041	-0.2105	-0.2129	-0.2153	-0.2177
0.10	2.90	-0.2219	-0.2244	-0.2270	-0.2295	-0.2320
0.20	3.00	-0.2355	-0.2382	-0.2409	-0.2436	-0.2463
0.30	3.10	-0.2491	-0.2519	-0.2547	-0.2576	-0.2604
0.40	3.20	-0.2625	-0.2655	-0.2685	-0.2714	-0.2744
0.50	3.30	-0.2759	-0.2790	-0.2821	-0.2852	-0.2883
0.60	3.40	-0.2891	-0.2923	-0.2956	-0.2988	-0.3020
0.70	3.50	-0.3022	-0.3056	-0.3090	-0.3124	-0.3157
0.80	3.60	-0.3153	-0.3188	-0.3223	-0.3258	-0.3293
0.90	3.70	-0.3282	-0.3319	-0.3355	-0.3391	-0.3427
1.00	3.80	-0.3411	-0.3448	-0.3486	-0.3523	-0.3561
1.10	3.90	-0.3538	-0.3577	-0.3616	-0.3654	-0.3693
1.20	4.00	-0.3664	-0.3705	-0.3745	-0.3784	-0.3824
1.30	4.10	-0.3790	-0.3831	-0.3872	-0.3913	-0.3954
1.40	4.20	-0.3914	-0.3957	-0.3999	-0.4041	-0.4083
1.50	4.30	-0.4038	-0.4082	-0.4125	-0.4168	-0.4212
1.60	4.40	-0.4161	-0.4205	-0.4250	-0.4294	-0.4339
1.70	4.50	-0.4282	-0.4328	-0.4374	-0.4419	-0.4465
1.80	4.60	-0.4403	-0.4450	-0.4497	-0.4543	-0.4590
1.90	4.70	-0.4523	-0.4571	-0.4619	-0.4666	-0.4714
2.00	4.80	-0.4642	-0.4691	-0.4740	-0.4788	-0.4837
2.20	5.00	-0.4877	-0.4928	-0.4979	-0.5030	-0.5080
2.40	5.20	-0.5108	-0.5161	-0.5214	-0.5267	-0.5319
2.60	5.40	-0.5336	-0.5391	-0.5446	-0.5501	-0.5555
3.00	5.80	-0.5782	-0.5840	-0.5899	-0.5957	-0.6014

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.000 YEARS

*****INTEREST RATE 1%*****

TI	TD	0.005	0.006	0.007	0.008	0.009
-3.00	-3.00	0.8588	0.8703	0.8818	0.8934	0.9050
-2.60	-2.60	0.7669	0.7779	0.7871	0.7973	0.8078
-2.20	-2.20	0.7221	0.7315	0.7410	0.7508	0.7599
-2.00	-2.20	0.6787	0.6868	0.6956	0.7048	0.7137
-2.00	-2.00	0.6386	0.6427	0.6509	0.6591	0.6672
-1.90	-1.90	0.6132	0.6210	0.6289	0.6367	0.6446
-1.80	-1.80	0.5919	0.5998	0.6070	0.6145	0.6221
-1.70	-1.70	0.5708	0.5781	0.5857	0.5926	0.5999
-1.60	-1.60	0.5499	0.5568	0.5639	0.5708	0.5777
-1.50	-1.50	0.5297	0.5358	0.5425	0.5491	0.5558
-1.40	-1.40	0.5086	0.5150	0.5217	0.5277	0.5338
-1.30	-1.30	0.4882	0.4943	0.5008	0.5068	0.5128
-1.20	-1.20	0.4679	0.4737	0.4796	0.4858	0.4912
-1.10	-1.10	0.4479	0.4534	0.4589	0.4645	0.4700
-1.00	-1.00	0.4279	0.4332	0.4385	0.4437	0.4490
-0.90	-0.90	0.4082	0.4132	0.4182	0.4232	0.4282
-0.80	-0.80	0.3886	0.3933	0.3981	0.4028	0.4076
-0.70	-0.70	0.3692	0.3736	0.3781	0.3826	0.3871
-0.60	-0.60	0.3499	0.3541	0.3583	0.3626	0.3668
-0.50	-0.50	0.3308	0.3349	0.3387	0.3427	0.3467
-0.40	-0.40	0.3118	0.3155	0.3192	0.3230	0.3267
-0.30	-0.30	0.2930	0.2965	0.3000	0.3035	0.3070
-0.20	-0.20	0.2743	0.2776	0.2808	0.2841	0.2873
-0.10	-0.10	0.2558	0.2589	0.2619	0.2649	0.2679
-0.00	-0.00	0.2375	0.2403	0.2431	0.2458	0.2486
0.00	2.80	-0.2201	-0.2225	-0.2249	-0.2272	-0.2296
0.10	2.90	-0.2386	-0.2371	-0.2396	-0.2421	-0.2447
0.20	3.00	-0.2489	-0.2516	-0.2543	-0.2569	-0.2596
0.30	3.10	-0.2632	-0.2660	-0.2688	-0.2716	-0.2744
0.40	3.20	-0.2773	-0.2803	-0.2832	-0.2861	-0.2891
0.50	3.30	-0.2918	-0.2948	-0.2975	-0.3006	-0.3036
0.60	3.40	-0.3057	-0.3085	-0.3117	-0.3149	-0.3181
0.70	3.50	-0.3191	-0.3224	-0.3257	-0.3290	-0.3324
0.80	3.60	-0.3327	-0.3362	-0.3397	-0.3431	-0.3465
0.90	3.70	-0.3463	-0.3499	-0.3535	-0.3570	-0.3606
1.00	3.80	-0.3598	-0.3635	-0.3672	-0.3709	-0.3746
1.10	3.90	-0.3731	-0.3770	-0.3808	-0.3846	-0.3884
1.20	4.00	-0.3868	-0.3903	-0.3943	-0.3982	-0.4021
1.30	4.10	-0.3995	-0.4036	-0.4076	-0.4117	-0.4157
1.40	4.20	-0.4125	-0.4167	-0.4209	-0.4250	-0.4291
1.50	4.30	-0.4255	-0.4297	-0.4340	-0.4383	-0.4425
1.60	4.40	-0.4383	-0.4427	-0.4471	-0.4514	-0.4558
1.70	4.50	-0.4510	-0.4555	-0.4600	-0.4645	-0.4689
1.80	4.60	-0.4636	-0.4682	-0.4728	-0.4774	-0.4819
1.90	4.70	-0.4761	-0.4808	-0.4855	-0.4902	-0.4949
2.00	4.80	-0.4885	-0.4933	-0.4981	-0.5029	-0.5077
2.20	5.00	-0.5130	-0.5180	-0.5230	-0.5280	-0.5329
2.40	5.20	-0.5372	-0.5423	-0.5475	-0.5527	-0.5578
2.60	5.40	-0.5609	-0.5663	-0.5716	-0.5769	-0.5822
3.00	5.80	-0.6072	-0.6129	-0.6186	-0.6242	-0.6299

TABLE 4-4.
RATIO OF INDIRECT TO DIRECT COST AND EXPENSES BY 2,000 VOLS

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PI	W	0.000	0.501	0.012	0.093	0.000
-3.00	-3.00	0.9164	0.9282	0.9396	0.9516	0.9638
-2.60	-2.60	0.8176	0.8278	0.8381	0.8488	0.8597
-2.20	-2.20	0.7408	0.7490	0.7585	0.7681	0.7777
-2.20	-2.20	0.7220	0.7309	0.7398	0.7487	0.7576
-2.00	-2.00	0.6755	0.6837	0.6919	0.7002	0.7085
-1.90	-1.90	0.6525	0.6608	0.6691	0.6773	0.6857
-1.80	-1.80	0.6297	0.6373	0.6450	0.6525	0.6602
-1.70	-1.70	0.6071	0.6148	0.6227	0.6302	0.6378
-1.50	-1.60	0.5887	0.5917	0.5987	0.6057	0.6128
-1.50	-1.50	0.5625	0.5692	0.5759	0.5826	0.5898
-1.40	-1.40	0.5405	0.5469	0.5533	0.5597	0.5661
-1.30	-1.30	0.5187	0.5248	0.5309	0.5371	0.5432
-1.20	-1.20	0.4970	0.5029	0.5087	0.5146	0.5206
-1.10	-1.10	0.4756	0.4811	0.4867	0.4923	0.4979
-1.00	-1.00	0.4543	0.4596	0.4650	0.4702	0.4755
-0.90	-0.90	0.4332	0.4382	0.4433	0.4483	0.4533
-0.80	-0.80	0.4123	0.4171	0.4218	0.4266	0.4313
-0.70	-0.70	0.3916	0.3961	0.4006	0.4051	0.4096
-0.60	-0.60	0.3710	0.3753	0.3795	0.3837	0.3880
-0.50	-0.50	0.3507	0.3546	0.3586	0.3626	0.3666
-0.40	-0.40	0.3305	0.3342	0.3379	0.3417	0.3458
-0.30	-0.30	0.3108	0.3139	0.3178	0.3209	0.3248
-0.20	-0.20	0.2906	0.2939	0.2971	0.3003	0.3035
-0.10	-0.10	0.2709	0.2739	0.2769	0.2799	0.2829
-0.00	-0.00	0.2518	0.2542	0.2569	0.2597	0.2625
0.10	0.10	-0.2320	-0.2343	-0.2367	-0.2391	-0.2418
0.20	0.20	-0.2122	-0.2147	-0.2172	-0.2197	-0.2222
0.30	0.30	-0.1927	-0.1950	-0.1975	-0.1999	-0.2024
0.40	0.40	-0.1732	-0.1753	-0.1777	-0.1801	-0.1826
0.50	0.50	-0.1537	-0.1557	-0.1581	-0.1605	-0.1629
0.60	0.60	-0.1342	-0.1361	-0.1385	-0.1409	-0.1433
0.70	0.70	-0.1147	-0.1165	-0.1189	-0.1213	-0.1237
0.80	0.80	-0.0952	-0.0969	-0.0993	-0.1017	-0.1041
0.90	0.90	-0.0757	-0.0773	-0.0797	-0.0821	-0.0845
1.00	1.00	-0.0562	-0.0577	-0.0591	-0.0615	-0.0639
1.10	1.10	-0.0367	-0.0381	-0.0395	-0.0419	-0.0443
1.20	1.20	-0.0172	-0.0185	-0.0199	-0.0213	-0.0227
1.30	1.30	-0.0077	-0.0089	-0.0103	-0.0117	-0.0131
1.40	1.40	0.0018	0.0029	0.0043	0.0057	0.0071
1.50	1.50	0.0123	0.0134	0.0148	0.0162	0.0176
1.60	1.60	0.0228	0.0238	0.0252	0.0266	0.0280
1.70	1.70	0.0333	0.0343	0.0357	0.0371	0.0385
1.80	1.80	0.0438	0.0448	0.0462	0.0476	0.0490
1.90	1.90	0.0543	0.0553	0.0567	0.0581	0.0595
2.00	2.00	0.0648	0.0658	0.0672	0.0686	0.0700
2.20	2.20	0.0853	0.0863	0.0877	0.0891	0.0905
2.40	2.40	0.1058	0.1068	0.1082	0.1096	0.1110
2.60	2.60	0.1263	0.1273	0.1287	0.1301	0.1315
2.80	2.80	0.1468	0.1478	0.1492	0.1506	0.1520

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.800 YEARS

*****INTEGRATED RATIO VS*****

TI	TR	0.095	0.096	0.097	0.098	0.099
-3.00	-3.00	0.9752	0.9870	0.9989	1.0107	1.0227
-2.60	-2.60	0.8650	0.8793	0.8897	0.9001	0.9105
-2.40	-2.40	0.8173	0.8270	0.8366	0.8463	0.8560
-2.20	-2.20	0.7666	0.7756	0.7845	0.7935	0.8026
-2.00	-2.00	0.7165	0.7257	0.7338	0.7417	0.7501
-1.90	-1.90	0.6922	0.7002	0.7082	0.7162	0.7242
-1.80	-1.80	0.6678	0.6755	0.6832	0.6909	0.6986
-1.70	-1.70	0.6437	0.6511	0.6588	0.6658	0.6732
-1.60	-1.60	0.6198	0.6269	0.6339	0.6410	0.6481
-1.50	-1.50	0.5961	0.6027	0.6096	0.6164	0.6232
-1.40	-1.40	0.5726	0.5791	0.5855	0.5920	0.5985
-1.30	-1.30	0.5493	0.5555	0.5617	0.5679	0.5740
-1.20	-1.20	0.5263	0.5322	0.5380	0.5439	0.5499
-1.10	-1.10	0.5034	0.5090	0.5146	0.5202	0.5258
-1.00	-1.00	0.4808	0.4861	0.4918	0.4967	0.5021
-0.90	-0.90	0.4583	0.4638	0.4688	0.4735	0.4785
-0.80	-0.80	0.4361	0.4409	0.4457	0.4504	0.4552
-0.70	-0.70	0.4141	0.4186	0.4231	0.4276	0.4321
-0.60	-0.60	0.3922	0.3965	0.4007	0.4050	0.4092
-0.50	-0.50	0.3706	0.3746	0.3786	0.3826	0.3866
-0.40	-0.40	0.3491	0.3529	0.3566	0.3604	0.3641
-0.30	-0.30	0.3279	0.3314	0.3349	0.3384	0.3419
-0.20	-0.20	0.3068	0.3101	0.3133	0.3166	0.3198
-0.10	-0.10	0.2860	0.2890	0.2920	0.2950	0.2980
-0.00	-0.00	0.2653	0.2681	0.2708	0.2736	0.2764
0.00	2.80	-0.2437	-0.2461	-0.2484	-0.2508	-0.2531
0.10	2.90	-0.2596	-0.2621	-0.2646	-0.2671	-0.2695
0.20	3.00	-0.2754	-0.2780	-0.2806	-0.2832	-0.2858
0.30	3.10	-0.2910	-0.2938	-0.2965	-0.2992	-0.3020
0.40	3.20	-0.3065	-0.3094	-0.3122	-0.3151	-0.3179
0.50	3.30	-0.3218	-0.3248	-0.3278	-0.3308	-0.3338
0.60	3.40	-0.3370	-0.3401	-0.3432	-0.3464	-0.3495
0.70	3.50	-0.3520	-0.3553	-0.3585	-0.3618	-0.3650
0.80	3.60	-0.3670	-0.3703	-0.3737	-0.3771	-0.3804
0.90	3.70	-0.3817	-0.3852	-0.3887	-0.3922	-0.3956
1.00	3.80	-0.3964	-0.4000	-0.4036	-0.4072	-0.4107
1.10	3.90	-0.4109	-0.4146	-0.4183	-0.4220	-0.4257
1.20	4.00	-0.4253	-0.4291	-0.4329	-0.4367	-0.4405
1.30	4.10	-0.4396	-0.4435	-0.4474	-0.4513	-0.4552
1.40	4.20	-0.4537	-0.4577	-0.4617	-0.4658	-0.4698
1.50	4.30	-0.4677	-0.4718	-0.4759	-0.4801	-0.4842
1.60	4.40	-0.4816	-0.4858	-0.4900	-0.4942	-0.4984
1.70	4.50	-0.4953	-0.4996	-0.5040	-0.5083	-0.5126
1.80	4.60	-0.5089	-0.5134	-0.5178	-0.5222	-0.5266
1.90	4.70	-0.5224	-0.5270	-0.5315	-0.5360	-0.5405
2.00	4.80	-0.5358	-0.5404	-0.5450	-0.5496	-0.5542
2.20	5.00	-0.5622	-0.5670	-0.5718	-0.5766	-0.5813
2.40	5.20	-0.5881	-0.5931	-0.5980	-0.6030	-0.6079
2.60	5.40	-0.6136	-0.6187	-0.6238	-0.6289	-0.6340
3.00	5.80	-0.6631	-0.6686	-0.6740	-0.6794	-0.6847

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 2.000 YEARS

*****INTEREST RATE 1%*****

FL	TP	0.100	0.101	0.102	0.103	0.104
-3.00	-3.00	1.0346	1.0466	1.0587	1.0707	1.0828
-2.60	-2.60	0.9210	0.9315	0.9420	0.9525	0.9631
-2.40	-2.40	0.8658	0.8755	0.8853	0.8951	0.9050
-2.20	-2.20	0.8116	0.8207	0.8298	0.8389	0.8480
-2.00	-2.00	0.7585	0.7669	0.7753	0.7837	0.7921
-1.90	-1.90	0.7323	0.7403	0.7484	0.7565	0.7646
-1.80	-1.80	0.7063	0.7141	0.7218	0.7296	0.7373
-1.70	-1.70	0.6806	0.6880	0.6955	0.7029	0.7104
-1.60	-1.60	0.6552	0.6623	0.6694	0.6765	0.6836
-1.50	-1.50	0.6299	0.6367	0.6435	0.6504	0.6572
-1.40	-1.40	0.6050	0.6115	0.6180	0.6245	0.6310
-1.30	-1.30	0.5802	0.5864	0.5926	0.5988	0.6051
-1.20	-1.20	0.5557	0.5616	0.5675	0.5735	0.5794
-1.10	-1.10	0.5314	0.5371	0.5427	0.5483	0.5540
-1.00	-1.00	0.5074	0.5127	0.5181	0.5234	0.5288
-0.90	-0.90	0.4835	0.4887	0.4937	0.4988	0.5039
-0.80	-0.80	0.4600	0.4648	0.4696	0.4744	0.4792
-0.70	-0.70	0.4366	0.4412	0.4457	0.4502	0.4547
-0.60	-0.60	0.4135	0.4178	0.4220	0.4263	0.4305
-0.50	-0.50	0.3906	0.3946	0.3986	0.4026	0.4066
-0.40	-0.40	0.3679	0.3716	0.3754	0.3791	0.3829
-0.30	-0.30	0.3454	0.3489	0.3524	0.3559	0.3594
-0.20	-0.20	0.3231	0.3263	0.3296	0.3329	0.3361
-0.10	-0.10	0.3010	0.3040	0.3070	0.3101	0.3131
-0.00	-0.00	0.2792	0.2819	0.2847	0.2875	0.2903
0.00	2.80	-0.2554	-0.2577	-0.2601	-0.2624	-0.2647
0.10	2.90	-0.2720	-0.2745	-0.2769	-0.2792	-0.2815
0.20	3.00	-0.2884	-0.2910	-0.2936	-0.2962	-0.2987
0.30	3.10	-0.3047	-0.3074	-0.3101	-0.3128	-0.3155
0.40	3.20	-0.3208	-0.3236	-0.3265	-0.3293	-0.3321
0.50	3.30	-0.3368	-0.3397	-0.3427	-0.3456	-0.3486
0.60	3.40	-0.3526	-0.3557	-0.3587	-0.3618	-0.3649
0.70	3.50	-0.3682	-0.3714	-0.3746	-0.3778	-0.3810
0.80	3.60	-0.3837	-0.3871	-0.3904	-0.3937	-0.3970
0.90	3.70	-0.3991	-0.4025	-0.4060	-0.4094	-0.4128
1.00	3.80	-0.4143	-0.4179	-0.4214	-0.4249	-0.4285
1.10	3.90	-0.4294	-0.4330	-0.4367	-0.4403	-0.4440
1.20	4.00	-0.4443	-0.4481	-0.4518	-0.4556	-0.4593
1.30	4.10	-0.4591	-0.4630	-0.4668	-0.4707	-0.4745
1.40	4.20	-0.4737	-0.4777	-0.4817	-0.4856	-0.4896
1.50	4.30	-0.4883	-0.4923	-0.4964	-0.5004	-0.5045
1.60	4.40	-0.5026	-0.5068	-0.5109	-0.5151	-0.5192
1.70	4.50	-0.5169	-0.5211	-0.5254	-0.5296	-0.5338
1.80	4.60	-0.5310	-0.5353	-0.5397	-0.5440	-0.5483
1.90	4.70	-0.5449	-0.5494	-0.5538	-0.5582	-0.5626
2.00	4.80	-0.5588	-0.5633	-0.5678	-0.5723	-0.5768
2.20	5.00	-0.5860	-0.5907	-0.5954	-0.6001	-0.6047
2.40	5.20	-0.6128	-0.6177	-0.6225	-0.6273	-0.6321
2.60	5.40	-0.6390	-0.6441	-0.6491	-0.6541	-0.6590
3.00	5.80	-0.6901	-0.6954	-0.7007	-0.7059	-0.7112

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 3.000 YEARS

*****INTEREST RATE VS*****

TL	TR	0.060	0.061	0.062	0.063	0.064
-3.00	-3.00	0.5972	0.6082	0.6192	0.6302	0.6412
-2.60	-2.60	0.5373	0.5471	0.5568	0.5666	0.5764
-2.40	-2.40	0.5079	0.5170	0.5262	0.5354	0.5446
-2.20	-2.20	0.4788	0.4878	0.4960	0.5046	0.5132
-2.00	-2.00	0.4500	0.4581	0.4661	0.4741	0.4822
-1.90	-1.90	0.4358	0.4435	0.4513	0.4590	0.4668
-1.80	-1.80	0.4216	0.4291	0.4366	0.4440	0.4515
-1.70	-1.70	0.4075	0.4147	0.4219	0.4291	0.4364
-1.60	-1.60	0.3935	0.4008	0.4078	0.4148	0.4219
-1.50	-1.50	0.3796	0.3863	0.3929	0.3996	0.4063
-1.40	-1.40	0.3658	0.3722	0.3785	0.3850	0.3914
-1.30	-1.30	0.3520	0.3581	0.3643	0.3704	0.3766
-1.20	-1.20	0.3383	0.3442	0.3501	0.3560	0.3618
-1.10	-1.10	0.3247	0.3303	0.3360	0.3416	0.3472
-1.00	-1.00	0.3112	0.3166	0.3219	0.3273	0.3327
-0.90	-0.90	0.2977	0.3029	0.3080	0.3131	0.3182
-0.80	-0.80	0.2844	0.2892	0.2941	0.2990	0.3039
-0.70	-0.70	0.2711	0.2757	0.2803	0.2850	0.2896
-0.60	-0.60	0.2579	0.2623	0.2666	0.2710	0.2754
-0.50	-0.50	0.2447	0.2489	0.2530	0.2572	0.2613
-0.40	-0.40	0.2317	0.2356	0.2395	0.2434	0.2473
-0.30	-0.30	0.2187	0.2224	0.2261	0.2297	0.2334
-0.20	-0.20	0.2058	0.2092	0.2127	0.2161	0.2196
-0.10	-0.10	0.1929	0.1962	0.1994	0.2026	0.2058
-0.00	-0.00	0.1802	0.1832	0.1862	0.1892	0.1922
0.00	3.00	-0.1700	-0.1727	-0.1753	-0.1780	-0.1806
0.10	3.10	-0.1806	-0.1835	-0.1863	-0.1891	-0.1919
0.20	3.20	-0.1912	-0.1942	-0.1972	-0.2001	-0.2031
0.30	3.30	-0.2018	-0.2049	-0.2080	-0.2111	-0.2142
0.40	3.40	-0.2122	-0.2155	-0.2188	-0.2220	-0.2253
0.50	3.50	-0.2226	-0.2261	-0.2295	-0.2329	-0.2363
0.60	3.60	-0.2330	-0.2365	-0.2401	-0.2437	-0.2472
0.70	3.70	-0.2433	-0.2470	-0.2507	-0.2544	-0.2581
0.80	3.80	-0.2535	-0.2573	-0.2612	-0.2650	-0.2689
0.90	3.90	-0.2636	-0.2677	-0.2716	-0.2756	-0.2796
1.00	4.00	-0.2738	-0.2779	-0.2820	-0.2861	-0.2903
1.10	4.10	-0.2838	-0.2881	-0.2923	-0.2966	-0.3008
1.20	4.20	-0.2938	-0.2982	-0.3026	-0.3070	-0.3114
1.30	4.30	-0.3037	-0.3083	-0.3128	-0.3173	-0.3218
1.40	4.40	-0.3136	-0.3183	-0.3229	-0.3274	-0.3322
1.50	4.50	-0.3234	-0.3282	-0.3330	-0.3378	-0.3426
1.60	4.60	-0.3332	-0.3381	-0.3430	-0.3479	-0.3528
1.70	4.70	-0.3429	-0.3479	-0.3530	-0.3580	-0.3630
1.80	4.80	-0.3525	-0.3577	-0.3629	-0.3681	-0.3732
1.90	4.90	-0.3621	-0.3674	-0.3727	-0.3780	-0.3833
2.00	5.00	-0.3716	-0.3771	-0.3825	-0.3879	-0.3933
2.20	5.20	-0.3905	-0.3962	-0.4019	-0.4075	-0.4131
2.40	5.40	-0.4092	-0.4152	-0.4210	-0.4269	-0.4327
2.60	5.60	-0.4277	-0.4338	-0.4400	-0.4460	-0.4521
3.00	6.00	-0.4640	-0.4706	-0.4771	-0.4836	-0.4901

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIMES 3.000 YEARS

*****INTEREST RATE IVS*****

TL	TD	0.065	0.066	0.067	0.068	0.069
-3.00	-3.00	0.6523	0.6535	0.6706	0.6858	0.6970
-2.60	-2.60	0.5863	0.5961	0.6060	0.6160	0.6259
-2.80	-2.80	0.5539	0.5631	0.5728	0.5817	0.5910
-2.20	-2.20	0.5219	0.5305	0.5397	0.5479	0.5567
-2.00	-2.00	0.4903	0.4988	0.5065	0.5146	0.5227
-1.90	-1.90	0.4785	0.4828	0.4902	0.4981	0.5059
-1.80	-1.80	0.4590	0.4566	0.4781	0.4817	0.4892
-1.70	-1.70	0.4436	0.4508	0.4581	0.4658	0.4727
-1.60	-1.60	0.4282	0.4352	0.4422	0.4492	0.4562
-1.50	-1.50	0.4130	0.4197	0.4268	0.4331	0.4399
-1.40	-1.40	0.3978	0.4042	0.4107	0.4171	0.4236
-1.30	-1.30	0.3827	0.3889	0.3951	0.4013	0.4075
-1.20	-1.20	0.3677	0.3737	0.3796	0.3855	0.3918
-1.10	-1.10	0.3529	0.3585	0.3642	0.3698	0.3755
-1.00	-1.00	0.3381	0.3435	0.3489	0.3543	0.3597
-0.90	-0.90	0.3234	0.3285	0.3337	0.3389	0.3440
-0.80	-0.80	0.3088	0.3137	0.3186	0.3235	0.3288
-0.70	-0.70	0.2943	0.2989	0.3036	0.3082	0.3129
-0.60	-0.60	0.2798	0.2842	0.2886	0.2931	0.2975
-0.50	-0.50	0.2655	0.2697	0.2738	0.2780	0.2822
-0.40	-0.40	0.2513	0.2552	0.2591	0.2630	0.2670
-0.30	-0.30	0.2371	0.2408	0.2445	0.2482	0.2519
-0.20	-0.20	0.2230	0.2265	0.2300	0.2338	0.2369
-0.10	-0.10	0.2091	0.2123	0.2155	0.2187	0.2220
-0.00	-0.00	0.1952	0.1982	0.2012	0.2042	0.2072
0.00	3.00	-0.1833	-0.1859	-0.1885	-0.1912	-0.1938
0.10	3.10	-0.1947	-0.1975	-0.2003	-0.2031	-0.2058
0.20	3.20	-0.2060	-0.2090	-0.2119	-0.2149	-0.2178
0.30	3.30	-0.2173	-0.2208	-0.2235	-0.2266	-0.2297
0.40	3.40	-0.2285	-0.2318	-0.2350	-0.2382	-0.2415
0.50	3.50	-0.2397	-0.2431	-0.2464	-0.2498	-0.2532
0.60	3.60	-0.2508	-0.2543	-0.2578	-0.2613	-0.2648
0.70	3.70	-0.2618	-0.2658	-0.2691	-0.2727	-0.2764
0.80	3.80	-0.2727	-0.2765	-0.2803	-0.2841	-0.2879
0.90	3.90	-0.2836	-0.2875	-0.2914	-0.2954	-0.2993
1.00	4.00	-0.2943	-0.2988	-0.3025	-0.3066	-0.3106
1.10	4.10	-0.3051	-0.3093	-0.3135	-0.3177	-0.3219
1.20	4.20	-0.3157	-0.3201	-0.3244	-0.3287	-0.3330
1.30	4.30	-0.3263	-0.3308	-0.3352	-0.3397	-0.3441
1.40	4.40	-0.3369	-0.3415	-0.3460	-0.3506	-0.3552
1.50	4.50	-0.3473	-0.3520	-0.3568	-0.3615	-0.3661
1.60	4.60	-0.3577	-0.3626	-0.3674	-0.3722	-0.3770
1.70	4.70	-0.3680	-0.3730	-0.3780	-0.3829	-0.3878
1.80	4.80	-0.3783	-0.3838	-0.3885	-0.3935	-0.3986
1.90	4.90	-0.3885	-0.3937	-0.3989	-0.4041	-0.4092
2.00	5.00	-0.3986	-0.4040	-0.4093	-0.4146	-0.4198
2.20	5.20	-0.4187	-0.4243	-0.4298	-0.4353	-0.4408
2.40	5.40	-0.4386	-0.4443	-0.4501	-0.4558	-0.4615
2.60	5.60	-0.4581	-0.4641	-0.4701	-0.4761	-0.4820
3.00	6.00	-0.4966	-0.5030	-0.5094	-0.5157	-0.5220

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 3.000 YEARS

*****INTEREST RATE 1%*****

PL	TR	0.070	0.071	0.072	0.073	0.074
-3.00	-3.00	0.7083	0.7196	0.7309	0.7423	0.7537
-2.60	-2.60	0.6359	0.6459	0.6559	0.6660	0.6760
-2.40	-2.40	0.6008	0.6098	0.6192	0.6286	0.6381
-2.20	-2.20	0.5658	0.5742	0.5830	0.5918	0.6006
-2.00	-2.00	0.5309	0.5391	0.5473	0.5555	0.5637
-1.90	-1.90	0.5138	0.5217	0.5296	0.5375	0.5454
-1.80	-1.80	0.4968	0.5044	0.5120	0.5197	0.5273
-1.70	-1.70	0.4800	0.4873	0.4946	0.5020	0.5093
-1.60	-1.60	0.4632	0.4703	0.4773	0.4844	0.4913
-1.50	-1.50	0.4466	0.4534	0.4601	0.4669	0.4737
-1.40	-1.40	0.4301	0.4366	0.4431	0.4496	0.4561
-1.30	-1.30	0.4137	0.4199	0.4261	0.4323	0.4386
-1.20	-1.20	0.3974	0.4033	0.4093	0.4152	0.4212
-1.10	-1.10	0.3812	0.3869	0.3926	0.3983	0.4040
-1.00	-1.00	0.3651	0.3705	0.3760	0.3814	0.3868
-0.90	-0.90	0.3491	0.3543	0.3595	0.3647	0.3698
-0.80	-0.80	0.3333	0.3382	0.3431	0.3480	0.3530
-0.70	-0.70	0.3175	0.3222	0.3269	0.3315	0.3362
-0.60	-0.60	0.3019	0.3063	0.3107	0.3151	0.3196
-0.50	-0.50	0.2863	0.2905	0.2947	0.2989	0.3031
-0.40	-0.40	0.2709	0.2748	0.2788	0.2827	0.2866
-0.30	-0.30	0.2556	0.2592	0.2629	0.2666	0.2703
-0.20	-0.20	0.2403	0.2438	0.2472	0.2507	0.2542
-0.10	-0.10	0.2252	0.2284	0.2317	0.2349	0.2381
-0.00	-0.00	0.2102	0.2132	0.2162	0.2192	0.2222
0.00	3.00	-0.1964	-0.1990	-0.2017	-0.2043	-0.2069
0.10	3.10	-0.2086	-0.2114	-0.2141	-0.2169	-0.2196
0.20	3.20	-0.2207	-0.2236	-0.2265	-0.2294	-0.2323
0.30	3.30	-0.2327	-0.2358	-0.2389	-0.2419	-0.2449
0.40	3.40	-0.2447	-0.2479	-0.2511	-0.2543	-0.2574
0.50	3.50	-0.2565	-0.2599	-0.2632	-0.2665	-0.2698
0.60	3.60	-0.2683	-0.2718	-0.2753	-0.2787	-0.2822
0.70	3.70	-0.2800	-0.2836	-0.2872	-0.2908	-0.2944
0.80	3.80	-0.2916	-0.2954	-0.2991	-0.3029	-0.3066
0.90	3.90	-0.3032	-0.3070	-0.3109	-0.3148	-0.3186
1.00	4.00	-0.3146	-0.3186	-0.3227	-0.3266	-0.3306
1.10	4.10	-0.3260	-0.3302	-0.3343	-0.3384	-0.3425
1.20	4.20	-0.3373	-0.3416	-0.3459	-0.3501	-0.3543
1.30	4.30	-0.3486	-0.3530	-0.3573	-0.3617	-0.3661
1.40	4.40	-0.3597	-0.3642	-0.3687	-0.3732	-0.3777
1.50	4.50	-0.3708	-0.3754	-0.3801	-0.3847	-0.3893
1.60	4.60	-0.3818	-0.3866	-0.3913	-0.3960	-0.4008
1.70	4.70	-0.3927	-0.3976	-0.4025	-0.4073	-0.4122
1.80	4.80	-0.4036	-0.4086	-0.4136	-0.4185	-0.4235
1.90	4.90	-0.4144	-0.4195	-0.4246	-0.4297	-0.4347
2.00	5.00	-0.4251	-0.4303	-0.4355	-0.4407	-0.4459
2.20	5.20	-0.4463	-0.4517	-0.4572	-0.4626	-0.4679
2.40	5.40	-0.4672	-0.4729	-0.4785	-0.4841	-0.4897
2.60	5.60	-0.4879	-0.4937	-0.4996	-0.5054	-0.5112
3.00	6.00	-0.5283	-0.5346	-0.5408	-0.5470	-0.5532

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 3.000 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.075	0.076	0.077	0.078	0.079
-3.00	-3.00	0.7651	0.7765	0.7881	0.7996	0.8112
-2.60	-2.60	0.6862	0.6963	0.7068	0.7166	0.7268
-2.40	-2.40	0.6475	0.6570	0.6665	0.6761	0.6856
-2.20	-2.20	0.6095	0.6183	0.6272	0.6361	0.6451
-2.00	-2.00	0.5719	0.5807	0.5895	0.5968	0.6051
-1.90	-1.90	0.5538	0.5618	0.5693	0.5773	0.5853
-1.80	-1.80	0.5350	0.5426	0.5503	0.5580	0.5657
-1.70	-1.70	0.5167	0.5241	0.5315	0.5389	0.5463
-1.60	-1.60	0.4985	0.5056	0.5127	0.5198	0.5270
-1.50	-1.50	0.4805	0.4873	0.4941	0.5010	0.5078
-1.40	-1.40	0.4626	0.4691	0.4757	0.4822	0.4888
-1.30	-1.30	0.4448	0.4511	0.4574	0.4636	0.4699
-1.20	-1.20	0.4272	0.4332	0.4392	0.4452	0.4512
-1.10	-1.10	0.4097	0.4158	0.4217	0.4268	0.4326
-1.00	-1.00	0.3923	0.3977	0.4032	0.4087	0.4141
-0.90	-0.90	0.3750	0.3802	0.3854	0.3906	0.3958
-0.80	-0.80	0.3579	0.3628	0.3678	0.3727	0.3777
-0.70	-0.70	0.3409	0.3456	0.3502	0.3549	0.3596
-0.60	-0.60	0.3240	0.3284	0.3328	0.3373	0.3417
-0.50	-0.50	0.3072	0.3114	0.3156	0.3198	0.3240
-0.40	-0.40	0.2906	0.2945	0.2984	0.3024	0.3063
-0.30	-0.30	0.2740	0.2777	0.2814	0.2851	0.2888
-0.20	-0.20	0.2576	0.2611	0.2645	0.2680	0.2715
-0.10	-0.10	0.2413	0.2446	0.2478	0.2510	0.2542
-0.00	-0.00	0.2252	0.2282	0.2312	0.2341	0.2371
0.00	3.00	-0.2095	-0.2120	-0.2146	-0.2172	-0.2198
0.10	3.10	-0.2228	-0.2251	-0.2279	-0.2306	-0.2333
0.20	3.20	-0.2352	-0.2381	-0.2410	-0.2438	-0.2467
0.30	3.30	-0.2480	-0.2510	-0.2540	-0.2570	-0.2600
0.40	3.40	-0.2606	-0.2638	-0.2669	-0.2701	-0.2732
0.50	3.50	-0.2732	-0.2765	-0.2798	-0.2830	-0.2863
0.60	3.60	-0.2856	-0.2891	-0.2925	-0.2959	-0.2993
0.70	3.70	-0.2980	-0.3016	-0.3051	-0.3087	-0.3122
0.80	3.80	-0.3103	-0.3140	-0.3177	-0.3214	-0.3250
0.90	3.90	-0.3225	-0.3263	-0.3301	-0.3339	-0.3377
1.00	4.00	-0.3346	-0.3386	-0.3425	-0.3464	-0.3504
1.10	4.10	-0.3466	-0.3507	-0.3548	-0.3588	-0.3629
1.20	4.20	-0.3586	-0.3628	-0.3670	-0.3711	-0.3753
1.30	4.30	-0.3704	-0.3747	-0.3791	-0.3834	-0.3876
1.40	4.40	-0.3822	-0.3866	-0.3911	-0.3955	-0.3999
1.50	4.50	-0.3939	-0.3984	-0.4030	-0.4075	-0.4120
1.60	4.60	-0.4055	-0.4101	-0.4148	-0.4194	-0.4241
1.70	4.70	-0.4170	-0.4218	-0.4265	-0.4313	-0.4360
1.80	4.80	-0.4284	-0.4333	-0.4382	-0.4431	-0.4479
1.90	4.90	-0.4397	-0.4448	-0.4498	-0.4547	-0.4597
2.00	5.00	-0.4510	-0.4561	-0.4612	-0.4663	-0.4714
2.20	5.20	-0.4733	-0.4786	-0.4839	-0.4892	-0.4945
2.40	5.40	-0.4953	-0.5008	-0.5063	-0.5118	-0.5173
2.60	5.60	-0.5169	-0.5227	-0.5284	-0.5340	-0.5397
3.00	6.00	-0.5593	-0.5654	-0.5715	-0.5775	-0.5835

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 3.000 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.080	0.081	0.082	0.083	0.084
-3.00	-3.00	0.8228	0.8348	0.8461	0.8578	0.8695
-2.60	-2.60	0.7371	0.7478	0.7577	0.7680	0.7782
-2.80	-2.80	0.6952	0.7088	0.7185	0.7281	0.7338
-2.20	-2.20	0.6580	0.6630	0.6720	0.6810	0.6900
-2.00	-2.00	0.6138	0.6218	0.6301	0.6385	0.6469
-1.90	-1.90	0.5938	0.6018	0.6095	0.6175	0.6256
-1.90	-1.90	0.5735	0.5812	0.5890	0.5967	0.6045
-1.70	-1.70	0.5537	0.5612	0.5686	0.5761	0.5836
-1.60	-1.60	0.5381	0.5413	0.5488	0.5556	0.5628
-1.50	-1.50	0.5187	0.5215	0.5288	0.5352	0.5422
-1.80	-1.80	0.4958	0.5019	0.5085	0.5151	0.5217
-1.30	-1.30	0.4762	0.4825	0.4888	0.4951	0.5018
-1.20	-1.20	0.4572	0.4632	0.4692	0.4752	0.4813
-1.10	-1.10	0.4383	0.4441	0.4499	0.4556	0.4618
-1.00	-1.00	0.4196	0.4251	0.4306	0.4361	0.4416
-0.90	-0.90	0.4010	0.4063	0.4115	0.4167	0.4219
-0.80	-0.80	0.3826	0.3876	0.3925	0.3975	0.4025
-0.70	-0.70	0.3643	0.3690	0.3737	0.3784	0.3831
-0.60	-0.60	0.3462	0.3506	0.3551	0.3595	0.3640
-0.50	-0.50	0.3282	0.3323	0.3365	0.3407	0.3449
-0.40	-0.40	0.3103	0.3142	0.3182	0.3221	0.3261
-0.30	-0.30	0.2925	0.2962	0.2999	0.3037	0.3078
-0.20	-0.20	0.2749	0.2784	0.2819	0.2852	0.2888
-0.10	-0.10	0.2575	0.2607	0.2639	0.2672	0.2708
-0.00	-0.00	0.2401	0.2431	0.2461	0.2491	0.2521
0.00	3.00	-0.2228	-0.2289	-0.2275	-0.2310	-0.2326
0.10	3.10	-0.2360	-0.2387	-0.2418	-0.2441	-0.2468
0.20	3.20	-0.2496	-0.2528	-0.2553	-0.2581	-0.2609
0.30	3.30	-0.2630	-0.2660	-0.2690	-0.2721	-0.2749
0.40	3.40	-0.2762	-0.2795	-0.2826	-0.2857	-0.2888
0.50	3.50	-0.2896	-0.2928	-0.2961	-0.2992	-0.3026
0.60	3.60	-0.3027	-0.3061	-0.3095	-0.3129	-0.3162
0.70	3.70	-0.3158	-0.3193	-0.3228	-0.3263	-0.3298
0.80	3.80	-0.3287	-0.3323	-0.3360	-0.3396	-0.3432
0.90	3.90	-0.3415	-0.3453	-0.3491	-0.3528	-0.3566
1.00	4.00	-0.3543	-0.3582	-0.3621	-0.3659	-0.3698
1.10	4.10	-0.3669	-0.3709	-0.3749	-0.3789	-0.3829
1.20	4.20	-0.3795	-0.3836	-0.3877	-0.3919	-0.3959
1.30	4.30	-0.3919	-0.3962	-0.4008	-0.4046	-0.4089
1.40	4.40	-0.4043	-0.4086	-0.4130	-0.4173	-0.4217
1.50	4.50	-0.4165	-0.4210	-0.4255	-0.4299	-0.4348
1.60	4.60	-0.4287	-0.4333	-0.4379	-0.4424	-0.4470
1.70	4.70	-0.4408	-0.4455	-0.4501	-0.4548	-0.4595
1.80	4.80	-0.4527	-0.4575	-0.4623	-0.4671	-0.4719
1.90	4.90	-0.4646	-0.4695	-0.4744	-0.4792	-0.4842
2.00	5.00	-0.4764	-0.4818	-0.4868	-0.4918	-0.4968
2.20	5.20	-0.4997	-0.5050	-0.5102	-0.5153	-0.5205
2.40	5.40	-0.5227	-0.5281	-0.5335	-0.5389	-0.5442
2.60	5.60	-0.5453	-0.5509	-0.5565	-0.5620	-0.5676
3.00	6.00	-0.5895	-0.5955	-0.6018	-0.6073	-0.6131

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 3.000 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.085	0.086	0.087	0.088	0.089
-3.00	-3.00	0.8813	0.8931	0.9050	0.9169	0.9288
-2.60	-2.60	0.7887	0.7991	0.8096	0.8200	0.8305
-2.40	-2.40	0.7435	0.7533	0.7630	0.7728	0.7826
-2.20	-2.20	0.6991	0.7082	0.7173	0.7264	0.7355
-2.00	-2.00	0.6553	0.6638	0.6722	0.6807	0.6892
-1.90	-1.90	0.6337	0.6419	0.6500	0.6582	0.6663
-1.80	-1.80	0.6123	0.6201	0.6280	0.6358	0.6437
-1.70	-1.70	0.5911	0.5986	0.6061	0.6136	0.6212
-1.60	-1.60	0.5700	0.5772	0.5844	0.5917	0.5989
-1.50	-1.50	0.5491	0.5560	0.5629	0.5699	0.5768
-1.40	-1.40	0.5283	0.5350	0.5416	0.5483	0.5549
-1.30	-1.30	0.5078	0.5141	0.5205	0.5268	0.5332
-1.20	-1.20	0.4878	0.4938	0.4995	0.5056	0.5117
-1.10	-1.10	0.4671	0.4729	0.4787	0.4845	0.4903
-1.00	-1.00	0.4471	0.4526	0.4581	0.4636	0.4692
-0.90	-0.90	0.4272	0.4324	0.4377	0.4429	0.4482
-0.80	-0.80	0.4078	0.4128	0.4178	0.4228	0.4278
-0.70	-0.70	0.3878	0.3926	0.3973	0.4020	0.4067
-0.60	-0.60	0.3684	0.3729	0.3773	0.3818	0.3863
-0.50	-0.50	0.3491	0.3533	0.3576	0.3619	0.3660
-0.40	-0.40	0.3300	0.3340	0.3379	0.3419	0.3459
-0.30	-0.30	0.3111	0.3148	0.3185	0.3222	0.3259
-0.20	-0.20	0.2923	0.2957	0.2992	0.3027	0.3061
-0.10	-0.10	0.2736	0.2769	0.2801	0.2833	0.2865
-0.00	-0.00	0.2551	0.2581	0.2611	0.2641	0.2671
0.00	0.00	-0.2351	-0.2377	-0.2402	-0.2428	-0.2453
0.10	0.10	-0.2495	-0.2522	-0.2549	-0.2575	-0.2602
0.20	0.20	-0.2638	-0.2666	-0.2694	-0.2722	-0.2750
0.30	0.30	-0.2779	-0.2808	-0.2838	-0.2867	-0.2897
0.40	0.40	-0.2919	-0.2950	-0.2981	-0.3012	-0.3043
0.50	0.50	-0.3058	-0.3090	-0.3122	-0.3154	-0.3186
0.60	0.60	-0.3196	-0.3229	-0.3262	-0.3296	-0.3329
0.70	0.70	-0.3333	-0.3368	-0.3402	-0.3437	-0.3471
0.80	0.80	-0.3468	-0.3504	-0.3540	-0.3576	-0.3612
0.90	0.90	-0.3603	-0.3640	-0.3677	-0.3714	-0.3751
1.00	1.00	-0.3737	-0.3775	-0.3813	-0.3851	-0.3889
1.10	1.10	-0.3869	-0.3909	-0.3948	-0.3987	-0.4027
1.20	1.20	-0.4000	-0.4041	-0.4082	-0.4122	-0.4162
1.30	1.30	-0.4130	-0.4172	-0.4214	-0.4256	-0.4297
1.40	1.40	-0.4260	-0.4303	-0.4346	-0.4388	-0.4431
1.50	1.50	-0.4388	-0.4432	-0.4476	-0.4520	-0.4563
1.60	1.60	-0.4515	-0.4560	-0.4605	-0.4650	-0.4694
1.70	1.70	-0.4641	-0.4687	-0.4733	-0.4779	-0.4825
1.80	1.80	-0.4766	-0.4813	-0.4860	-0.4907	-0.4954
1.90	1.90	-0.4890	-0.4938	-0.4986	-0.5034	-0.5082
2.00	2.00	-0.5013	-0.5062	-0.5111	-0.5160	-0.5209
2.20	2.20	-0.5256	-0.5307	-0.5358	-0.5409	-0.5459
2.40	2.40	-0.5495	-0.5548	-0.5601	-0.5653	-0.5706
2.60	2.60	-0.5731	-0.5785	-0.5840	-0.5894	-0.5948
3.00	3.00	-0.6190	-0.6248	-0.6306	-0.6363	-0.6420

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 3.000 YEARS

*****INTEREST RATE IVS*****

TI	TR	0.090	0.091	0.092	0.093	0.094
-3.00	-3.00	0.9308	0.9529	0.9688	0.9769	0.9890
-2.60	-2.60	0.8410	0.9516	0.8621	0.8727	0.8838
-2.40	-2.40	0.7924	0.8023	0.8121	0.8220	0.8320
-2.20	-2.20	0.7446	0.7538	0.7630	0.7722	0.7815
-2.00	-2.00	0.6977	0.7062	0.7148	0.7233	0.7319
-1.90	-1.90	0.6745	0.6827	0.6909	0.6992	0.7074
-1.80	-1.80	0.6515	0.6594	0.6673	0.6752	0.6832
-1.70	-1.70	0.6288	0.6363	0.6439	0.6515	0.6592
-1.60	-1.60	0.6062	0.6135	0.6207	0.6280	0.6353
-1.50	-1.50	0.5839	0.5908	0.5977	0.6047	0.6117
-1.40	-1.40	0.5616	0.5683	0.5750	0.5816	0.5884
-1.30	-1.30	0.5396	0.5460	0.5524	0.5588	0.5652
-1.20	-1.20	0.5178	0.5239	0.5300	0.5361	0.5422
-1.10	-1.10	0.4961	0.5020	0.5078	0.5136	0.5194
-1.00	-1.00	0.4747	0.4802	0.4858	0.4913	0.4965
-0.90	-0.90	0.4534	0.4587	0.4640	0.4692	0.4745
-0.80	-0.80	0.4323	0.4373	0.4423	0.4473	0.4524
-0.70	-0.70	0.4114	0.4162	0.4209	0.4257	0.4304
-0.60	-0.60	0.3907	0.3952	0.3997	0.4042	0.4086
-0.50	-0.50	0.3702	0.3744	0.3786	0.3828	0.3871
-0.40	-0.40	0.3498	0.3538	0.3577	0.3617	0.3657
-0.30	-0.30	0.3296	0.3333	0.3371	0.3408	0.3445
-0.20	-0.20	0.3096	0.3131	0.3166	0.3200	0.3235
-0.10	-0.10	0.2898	0.2930	0.2962	0.2995	0.3027
-0.00	-0.00	0.2701	0.2731	0.2761	0.2791	0.2821
0.00	3.00	-0.2478	-0.2503	-0.2528	-0.2553	-0.2578
0.10	3.10	-0.2629	-0.2655	-0.2682	-0.2708	-0.2735
0.20	3.20	-0.2778	-0.2806	-0.2834	-0.2861	-0.2889
0.30	3.30	-0.2926	-0.2955	-0.2984	-0.3014	-0.3043
0.40	3.40	-0.3073	-0.3103	-0.3134	-0.3164	-0.3194
0.50	3.50	-0.3218	-0.3250	-0.3282	-0.3314	-0.3345
0.60	3.60	-0.3363	-0.3396	-0.3429	-0.3462	-0.3494
0.70	3.70	-0.3506	-0.3540	-0.3574	-0.3608	-0.3642
0.80	3.80	-0.3647	-0.3683	-0.3718	-0.3754	-0.3789
0.90	3.90	-0.3788	-0.3825	-0.3861	-0.3898	-0.3934
1.00	4.00	-0.3927	-0.3965	-0.4003	-0.4041	-0.4078
1.10	4.10	-0.4066	-0.4105	-0.4143	-0.4182	-0.4221
1.20	4.20	-0.4203	-0.4243	-0.4283	-0.4322	-0.4362
1.30	4.30	-0.4338	-0.4380	-0.4421	-0.4462	-0.4502
1.40	4.40	-0.4473	-0.4515	-0.4557	-0.4599	-0.4641
1.50	4.50	-0.4607	-0.4650	-0.4693	-0.4736	-0.4779
1.60	4.60	-0.4739	-0.4783	-0.4827	-0.4871	-0.4915
1.70	4.70	-0.4870	-0.4916	-0.4961	-0.5006	-0.5051
1.80	4.80	-0.5000	-0.5047	-0.5093	-0.5139	-0.5184
1.90	4.90	-0.5129	-0.5177	-0.5224	-0.5271	-0.5317
2.00	5.00	-0.5257	-0.5305	-0.5353	-0.5401	-0.5449
2.20	5.20	-0.5510	-0.5560	-0.5609	-0.5659	-0.5709
2.40	5.40	-0.5758	-0.5810	-0.5861	-0.5913	-0.5964
2.60	5.60	-0.6002	-0.6055	-0.6108	-0.6161	-0.6214
3.00	6.00	-0.6477	-0.6534	-0.6590	-0.6646	-0.6702

TABLE 1-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 3.000 YEARS

*****INTERPST RATE TVS*****

TV	TD	0.005	0.006	0.007	0.008	0.009
-3.00	-3.00	1.0011	1.0133	1.0255	1.0378	1.0500
-2.60	-2.60	0.8980	0.9087	0.9158	0.9261	0.9360
-2.40	-2.40	0.8819	0.8519	0.8619	0.8719	0.8819
-2.20	-2.20	0.7907	0.8000	0.8093	0.8186	0.8280
-2.00	-2.00	0.7405	0.7491	0.7577	0.7668	0.7750
-1.90	-1.90	0.7157	0.7240	0.7323	0.7406	0.7489
-1.80	-1.80	0.6911	0.6991	0.7071	0.7150	0.7230
-1.70	-1.70	0.6668	0.6748	0.6821	0.6898	0.6978
-1.60	-1.60	0.6427	0.6500	0.6573	0.6647	0.6721
-1.50	-1.50	0.6188	0.6258	0.6328	0.6399	0.6469
-1.40	-1.40	0.5951	0.6018	0.6085	0.6153	0.6220
-1.30	-1.30	0.5716	0.5780	0.5845	0.5909	0.5978
-1.20	-1.20	0.5483	0.5545	0.5606	0.5668	0.5729
-1.10	-1.10	0.5253	0.5311	0.5370	0.5429	0.5487
-1.00	-1.00	0.5028	0.5080	0.5136	0.5192	0.5247
-0.90	-0.90	0.4798	0.4851	0.4908	0.4957	0.5010
-0.80	-0.80	0.4574	0.4624	0.4678	0.4728	0.4775
-0.70	-0.70	0.4351	0.4399	0.4446	0.4498	0.4542
-0.60	-0.60	0.4131	0.4176	0.4221	0.4266	0.4311
-0.50	-0.50	0.3913	0.3955	0.3997	0.4040	0.4082
-0.40	-0.40	0.3696	0.3736	0.3776	0.3816	0.3855
-0.30	-0.30	0.3482	0.3519	0.3557	0.3594	0.3631
-0.20	-0.20	0.3270	0.3308	0.3339	0.3378	0.3409
-0.10	-0.10	0.3059	0.3091	0.3128	0.3156	0.3188
-0.00	-0.00	0.2851	0.2881	0.2910	0.2980	0.2970
0.00	3.00	-0.2603	-0.2628	-0.2653	-0.2678	-0.2703
0.10	3.10	-0.2761	-0.2787	-0.2812	-0.2880	-0.2866
0.20	3.20	-0.2917	-0.2944	-0.2972	-0.3000	-0.3027
0.30	3.30	-0.3071	-0.3100	-0.3129	-0.3158	-0.3187
0.40	3.40	-0.3225	-0.3255	-0.3285	-0.3315	-0.3345
0.50	3.50	-0.3377	-0.3408	-0.3439	-0.3471	-0.3502
0.60	3.60	-0.3527	-0.3560	-0.3592	-0.3625	-0.3657
0.70	3.70	-0.3676	-0.3710	-0.3744	-0.3777	-0.3811
0.80	3.80	-0.3824	-0.3859	-0.3892	-0.3929	-0.3963
0.90	3.90	-0.3970	-0.4007	-0.4043	-0.4078	-0.4118
1.00	4.00	-0.4115	-0.4153	-0.4190	-0.4227	-0.4268
1.10	4.10	-0.4259	-0.4298	-0.4336	-0.4374	-0.4412
1.20	4.20	-0.4402	-0.4441	-0.4481	-0.4520	-0.4559
1.30	4.30	-0.4543	-0.4583	-0.4624	-0.4664	-0.4708
1.40	4.40	-0.4683	-0.4724	-0.4766	-0.4807	-0.4848
1.50	4.50	-0.4822	-0.4864	-0.4906	-0.4949	-0.4991
1.60	4.60	-0.4959	-0.5003	-0.5046	-0.5089	-0.5132
1.70	4.70	-0.5095	-0.5140	-0.5184	-0.5228	-0.5272
1.80	4.80	-0.5230	-0.5276	-0.5321	-0.5366	-0.5411
1.90	4.90	-0.5368	-0.5410	-0.5456	-0.5502	-0.5548
2.00	5.00	-0.5496	-0.5544	-0.5591	-0.5638	-0.5684
2.20	5.20	-0.5758	-0.5807	-0.5856	-0.5904	-0.5953
2.40	5.40	-0.6015	-0.6065	-0.6116	-0.6166	-0.6216
2.60	5.60	-0.6267	-0.6319	-0.6371	-0.6423	-0.6478
3.00	6.00	-0.6757	-0.6813	-0.6868	-0.6922	-0.6977

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 3.000 YEARS

*****INTEREST RATE IVS*****

TI	TP	0.100	0.101	0.102	0.103	0.104
-3.00	-3.00	1.0624	1.0747	1.0871	1.0996	1.1120
-2.60	-2.60	0.9477	0.9585	0.9694	0.9803	0.9912
-2.40	-2.40	0.8920	0.9021	0.9122	0.9223	0.9325
-2.20	-2.20	0.8373	0.8467	0.8561	0.8655	0.8750
-2.00	-2.00	0.7837	0.7924	0.8011	0.8098	0.8186
-1.90	-1.90	0.7573	0.7656	0.7740	0.7824	0.7908
-1.80	-1.80	0.7311	0.7391	0.7471	0.7552	0.7632
-1.70	-1.70	0.7051	0.7128	0.7206	0.7283	0.7360
-1.60	-1.60	0.6794	0.6868	0.6942	0.7017	0.7091
-1.50	-1.50	0.6540	0.6611	0.6682	0.6753	0.6824
-1.40	-1.40	0.6289	0.6356	0.6423	0.6491	0.6559
-1.30	-1.30	0.6038	0.6103	0.6168	0.6233	0.6298
-1.20	-1.20	0.5791	0.5853	0.5915	0.5976	0.6038
-1.10	-1.10	0.5546	0.5605	0.5664	0.5723	0.5782
-1.00	-1.00	0.5303	0.5359	0.5415	0.5471	0.5529
-0.90	-0.90	0.5062	0.5116	0.5169	0.5223	0.5276
-0.80	-0.80	0.4825	0.4875	0.4926	0.4976	0.5027
-0.70	-0.70	0.4589	0.4637	0.4685	0.4732	0.4780
-0.60	-0.60	0.4356	0.4401	0.4446	0.4491	0.4536
-0.50	-0.50	0.4124	0.4167	0.4209	0.4251	0.4294
-0.40	-0.40	0.3895	0.3935	0.3975	0.4015	0.4054
-0.30	-0.30	0.3668	0.3705	0.3742	0.3780	0.3817
-0.20	-0.20	0.3443	0.3478	0.3513	0.3548	0.3582
-0.10	-0.10	0.3221	0.3253	0.3285	0.3318	0.3350
-0.00	-0.00	0.3000	0.3030	0.3060	0.3090	0.3120
0.00	3.00	-0.2722	-0.2752	-0.2777	-0.2802	-0.2826
0.10	3.10	-0.2892	-0.2918	-0.2944	-0.2970	-0.2995
0.20	3.20	-0.3054	-0.3082	-0.3109	-0.3136	-0.3163
0.30	3.30	-0.3215	-0.3244	-0.3272	-0.3301	-0.3329
0.40	3.40	-0.3375	-0.3405	-0.3434	-0.3464	-0.3494
0.50	3.50	-0.3533	-0.3564	-0.3595	-0.3626	-0.3657
0.60	3.60	-0.3689	-0.3722	-0.3754	-0.3786	-0.3818
0.70	3.70	-0.3844	-0.3878	-0.3911	-0.3944	-0.3977
0.80	3.80	-0.3998	-0.4032	-0.4067	-0.4101	-0.4135
0.90	3.90	-0.4150	-0.4186	-0.4221	-0.4257	-0.4292
1.00	4.00	-0.4301	-0.4337	-0.4374	-0.4411	-0.4447
1.10	4.10	-0.4450	-0.4488	-0.4525	-0.4563	-0.4600
1.20	4.20	-0.4598	-0.4637	-0.4675	-0.4714	-0.4752
1.30	4.30	-0.4744	-0.4784	-0.4824	-0.4863	-0.4903
1.40	4.40	-0.4889	-0.4930	-0.4971	-0.5011	-0.5052
1.50	4.50	-0.5033	-0.5075	-0.5116	-0.5158	-0.5199
1.60	4.60	-0.5175	-0.5218	-0.5260	-0.5303	-0.5345
1.70	4.70	-0.5316	-0.5360	-0.5403	-0.5447	-0.5490
1.80	4.80	-0.5456	-0.5500	-0.5545	-0.5589	-0.5633
1.90	4.90	-0.5594	-0.5639	-0.5685	-0.5730	-0.5775
2.00	5.00	-0.5731	-0.5777	-0.5823	-0.5869	-0.5915
2.20	5.20	-0.6001	-0.6049	-0.6097	-0.6144	-0.6192
2.40	5.40	-0.6266	-0.6315	-0.6365	-0.6414	-0.6463
2.60	5.60	-0.6526	-0.6577	-0.6628	-0.6678	-0.6729
3.00	6.00	-0.7031	-0.7085	-0.7138	-0.7192	-0.7245

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 0.000 YEARS

*****INTEREST RATE VS*****

TI	TD	0.060	0.061	0.062	0.063	0.064
-3.00	-3.00	0.6715	0.6839	0.6964	0.7089	0.7215
-2.60	-2.60	0.6099	0.6210	0.6322	0.6435	0.6547
-2.40	-2.40	0.5796	0.5901	0.6007	0.6113	0.6219
-2.20	-2.20	0.5497	0.5596	0.5696	0.5796	0.5896
-2.00	-2.00	0.5201	0.5298	0.5388	0.5482	0.5576
-1.90	-1.90	0.5054	0.5145	0.5235	0.5327	0.5418
-1.80	-1.80	0.4908	0.4996	0.5088	0.5172	0.5260
-1.70	-1.70	0.4764	0.4848	0.4933	0.5019	0.5104
-1.60	-1.60	0.4619	0.4701	0.4788	0.4866	0.4948
-1.50	-1.50	0.4476	0.4555	0.4635	0.4714	0.4792
-1.40	-1.40	0.4334	0.4410	0.4487	0.4564	0.4640
-1.30	-1.30	0.4192	0.4266	0.4340	0.4414	0.4488
-1.20	-1.20	0.4052	0.4123	0.4194	0.4265	0.4336
-1.10	-1.10	0.3912	0.3980	0.4048	0.4117	0.4185
-1.00	-1.00	0.3772	0.3838	0.3904	0.3970	0.4036
-0.90	-0.90	0.3634	0.3697	0.3760	0.3824	0.3887
-0.80	-0.80	0.3497	0.3557	0.3618	0.3678	0.3739
-0.70	-0.70	0.3360	0.3418	0.3476	0.3534	0.3592
-0.60	-0.60	0.3224	0.3279	0.3335	0.3390	0.3446
-0.50	-0.50	0.3089	0.3142	0.3195	0.3248	0.3301
-0.40	-0.40	0.2955	0.3005	0.3055	0.3106	0.3156
-0.30	-0.30	0.2821	0.2869	0.2917	0.2965	0.3013
-0.20	-0.20	0.2688	0.2734	0.2779	0.2825	0.2870
-0.10	-0.10	0.2556	0.2599	0.2643	0.2686	0.2729
-0.00	-0.00	0.2425	0.2466	0.2507	0.2547	0.2588
0.00	4.00	-0.2244	-0.2279	-0.2313	-0.2348	-0.2383
0.10	4.10	-0.2347	-0.2384	-0.2420	-0.2456	-0.2492
0.20	4.20	-0.2450	-0.2488	-0.2525	-0.2563	-0.2600
0.30	4.30	-0.2552	-0.2591	-0.2630	-0.2669	-0.2708
0.40	4.40	-0.2654	-0.2694	-0.2735	-0.2775	-0.2815
0.50	4.50	-0.2755	-0.2797	-0.2838	-0.2880	-0.2922
0.60	4.60	-0.2855	-0.2898	-0.2942	-0.2985	-0.3028
0.70	4.70	-0.2955	-0.3000	-0.3044	-0.3088	-0.3133
0.80	4.80	-0.3054	-0.3100	-0.3146	-0.3192	-0.3237
0.90	4.90	-0.3153	-0.3200	-0.3247	-0.3294	-0.3341
1.00	5.00	-0.3251	-0.3299	-0.3348	-0.3396	-0.3444
1.10	5.10	-0.3348	-0.3398	-0.3448	-0.3497	-0.3547
1.20	5.20	-0.3445	-0.3496	-0.3547	-0.3598	-0.3649
1.30	5.30	-0.3542	-0.3594	-0.3646	-0.3698	-0.3750
1.40	5.40	-0.3637	-0.3691	-0.3744	-0.3798	-0.3851
1.50	5.50	-0.3733	-0.3788	-0.3842	-0.3897	-0.3951
1.60	5.60	-0.3827	-0.3883	-0.3939	-0.3995	-0.4050
1.70	5.70	-0.3921	-0.3979	-0.4036	-0.4093	-0.4149
1.80	5.80	-0.4015	-0.4074	-0.4132	-0.4190	-0.4247
1.90	5.90	-0.4108	-0.4168	-0.4227	-0.4286	-0.4345
2.00	6.00	-0.4201	-0.4261	-0.4322	-0.4382	-0.4442
2.20	6.20	-0.4384	-0.4447	-0.4510	-0.4572	-0.4634
2.40	6.40	-0.4565	-0.4631	-0.4695	-0.4760	-0.4824
2.60	6.60	-0.4745	-0.4812	-0.4879	-0.4945	-0.5012
3.00	7.00	-0.5097	-0.5168	-0.5239	-0.5310	-0.5380

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 8.000 YEARS

*****INTEREST RATE 1%*****						
WL	TP	0.065	0.066	0.067	0.068	0.069
-3.00	-3.00	0.7341	0.7468	0.7595	0.7722	0.7850
-2.60	-2.60	0.6660	0.6778	0.6897	0.7011	0.7116
-2.40	-2.40	0.6326	0.6433	0.6540	0.6648	0.6756
-2.20	-2.20	0.5996	0.6097	0.6198	0.6299	0.6401
-2.00	-2.00	0.5670	0.5765	0.5860	0.5955	0.6050
-1.90	-1.90	0.5509	0.5601	0.5693	0.5785	0.5877
-1.80	-1.80	0.5349	0.5437	0.5526	0.5615	0.5704
-1.70	-1.70	0.5189	0.5275	0.5361	0.5447	0.5533
-1.60	-1.60	0.5031	0.5114	0.5197	0.5280	0.5363
-1.50	-1.50	0.4874	0.4954	0.5034	0.5114	0.5195
-1.40	-1.40	0.4717	0.4795	0.4872	0.4949	0.5027
-1.30	-1.30	0.4562	0.4636	0.4711	0.4785	0.4860
-1.20	-1.20	0.4408	0.4479	0.4551	0.4623	0.4695
-1.10	-1.10	0.4254	0.4323	0.4392	0.4461	0.4530
-1.00	-1.00	0.4102	0.4168	0.4234	0.4300	0.4367
-0.90	-0.90	0.3950	0.4014	0.4077	0.4141	0.4205
-0.80	-0.80	0.3800	0.3861	0.3921	0.3982	0.4043
-0.70	-0.70	0.3650	0.3708	0.3767	0.3825	0.3883
-0.60	-0.60	0.3501	0.3557	0.3612	0.3668	0.3724
-0.50	-0.50	0.3354	0.3407	0.3460	0.3513	0.3566
-0.40	-0.40	0.3207	0.3257	0.3308	0.3359	0.3409
-0.30	-0.30	0.3061	0.3105	0.3157	0.3205	0.3251
-0.20	-0.20	0.2916	0.2962	0.3007	0.3053	0.3099
-0.10	-0.10	0.2772	0.2815	0.2858	0.2902	0.2945
-0.00	-0.00	0.2629	0.2670	0.2710	0.2751	0.2792
0.00	0.00	-0.2417	-0.2452	-0.2486	-0.2520	-0.2554
0.10	0.10	-0.2528	-0.2564	-0.2599	-0.2635	-0.2671
0.20	0.20	-0.2638	-0.2675	-0.2712	-0.2749	-0.2786
0.30	0.30	-0.2747	-0.2786	-0.2824	-0.2862	-0.2901
0.40	0.40	-0.2855	-0.2895	-0.2935	-0.2975	-0.3015
0.50	0.50	-0.2963	-0.3005	-0.3046	-0.3087	-0.3128
0.60	0.60	-0.3070	-0.3113	-0.3156	-0.3198	-0.3240
0.70	0.70	-0.3177	-0.3221	-0.3265	-0.3308	-0.3352
0.80	0.80	-0.3283	-0.3328	-0.3373	-0.3418	-0.3461
0.90	0.90	-0.3388	-0.3434	-0.3481	-0.3527	-0.3571
1.00	1.00	-0.3492	-0.3540	-0.3588	-0.3635	-0.3683
1.10	1.10	-0.3596	-0.3645	-0.3694	-0.3743	-0.3791
1.20	1.20	-0.3699	-0.3750	-0.3800	-0.3850	-0.3899
1.30	1.30	-0.3802	-0.3853	-0.3905	-0.3956	-0.4007
1.40	1.40	-0.3904	-0.3956	-0.4009	-0.4061	-0.4113
1.50	1.50	-0.4005	-0.4059	-0.4112	-0.4166	-0.4219
1.60	1.60	-0.4106	-0.4161	-0.4215	-0.4270	-0.4324
1.70	1.70	-0.4206	-0.4262	-0.4318	-0.4373	-0.4429
1.80	1.80	-0.4305	-0.4362	-0.4419	-0.4476	-0.4532
1.90	1.90	-0.4404	-0.4462	-0.4520	-0.4578	-0.4635
2.00	2.00	-0.4502	-0.4561	-0.4620	-0.4679	-0.4738
2.20	2.20	-0.4696	-0.4758	-0.4819	-0.4880	-0.4941
2.40	2.40	-0.4888	-0.4952	-0.5015	-0.5078	-0.5141
2.60	2.60	-0.5078	-0.5143	-0.5208	-0.5273	-0.5338
3.00	3.00	-0.5450	-0.5519	-0.5588	-0.5657	-0.5725

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 8.00C YEARS

*****INTEREST RATE IVS*****

TL	TR	0.070	0.071	0.072	0.073	0.074
-3.00	-3.00	0.7978	0.8107	0.8236	0.8366	0.8496
-2.60	-2.60	0.7230	0.7345	0.7461	0.7577	0.7693
-2.40	-2.40	0.6868	0.6972	0.7081	0.7190	0.7300
-2.20	-2.20	0.6503	0.6605	0.6707	0.6809	0.6912
-2.00	-2.00	0.6146	0.6242	0.6338	0.6434	0.6529
-1.90	-1.90	0.5969	0.6062	0.6155	0.6248	0.6341
-1.80	-1.80	0.5794	0.5886	0.5978	0.6068	0.6158
-1.70	-1.70	0.5620	0.5706	0.5793	0.5880	0.5967
-1.60	-1.60	0.5447	0.5531	0.5618	0.5698	0.5783
-1.50	-1.50	0.5277	0.5356	0.5437	0.5518	0.5599
-1.40	-1.40	0.5104	0.5182	0.5260	0.5338	0.5417
-1.30	-1.30	0.4935	0.5010	0.5085	0.5160	0.5236
-1.20	-1.20	0.4767	0.4839	0.4911	0.4983	0.5056
-1.10	-1.10	0.4599	0.4669	0.4738	0.4808	0.4877
-1.00	-1.00	0.4433	0.4500	0.4567	0.4633	0.4700
-0.90	-0.90	0.4268	0.4332	0.4396	0.4460	0.4524
-0.80	-0.80	0.4104	0.4165	0.4227	0.4288	0.4350
-0.70	-0.70	0.3942	0.4000	0.4059	0.4117	0.4176
-0.60	-0.60	0.3780	0.3836	0.3892	0.3948	0.4004
-0.50	-0.50	0.3620	0.3673	0.3726	0.3780	0.3833
-0.40	-0.40	0.3460	0.3511	0.3562	0.3612	0.3663
-0.30	-0.30	0.3302	0.3350	0.3398	0.3446	0.3495
-0.20	-0.20	0.3144	0.3190	0.3236	0.3282	0.3327
-0.10	-0.10	0.2988	0.3031	0.3075	0.3118	0.3161
-0.00	-0.00	0.2833	0.2874	0.2918	0.2955	0.2996
0.00	4.00	-0.2589	-0.2623	-0.2657	-0.2690	-0.2724
0.10	4.10	-0.2706	-0.2742	-0.2777	-0.2812	-0.2847
0.20	4.20	-0.2823	-0.2860	-0.2896	-0.2933	-0.2970
0.30	4.30	-0.2939	-0.2977	-0.3015	-0.3053	-0.3091
0.40	4.40	-0.3054	-0.3094	-0.3133	-0.3172	-0.3211
0.50	4.50	-0.3169	-0.3210	-0.3250	-0.3291	-0.3331
0.60	4.60	-0.3282	-0.3325	-0.3366	-0.3408	-0.3450
0.70	4.70	-0.3395	-0.3439	-0.3482	-0.3525	-0.3568
0.80	4.80	-0.3508	-0.3552	-0.3597	-0.3641	-0.3685
0.90	4.90	-0.3619	-0.3665	-0.3710	-0.3756	-0.3801
1.00	5.00	-0.3730	-0.3777	-0.3824	-0.3870	-0.3917
1.10	5.10	-0.3840	-0.3888	-0.3936	-0.3984	-0.4031
1.20	5.20	-0.3949	-0.3998	-0.4047	-0.4096	-0.4145
1.30	5.30	-0.4057	-0.4108	-0.4158	-0.4208	-0.4258
1.40	5.40	-0.4165	-0.4217	-0.4268	-0.4319	-0.4370
1.50	5.50	-0.4272	-0.4325	-0.4377	-0.4430	-0.4482
1.60	5.60	-0.4378	-0.4432	-0.4486	-0.4539	-0.4592
1.70	5.70	-0.4484	-0.4539	-0.4593	-0.4648	-0.4702
1.80	5.80	-0.4589	-0.4645	-0.4700	-0.4756	-0.4811
1.90	5.90	-0.4693	-0.4750	-0.4807	-0.4863	-0.4920
2.00	6.00	-0.4796	-0.4854	-0.4912	-0.4970	-0.5027
2.20	6.20	-0.5001	-0.5061	-0.5121	-0.5181	-0.5240
2.40	6.40	-0.5203	-0.5265	-0.5327	-0.5388	-0.5450
2.60	6.60	-0.5407	-0.5466	-0.5530	-0.5593	-0.5656
3.00	7.00	-0.5793	-0.5860	-0.5928	-0.5995	-0.6061

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 4.000 YEARS

*****INTEREST RATE IVS*****

TI	TP	0.075	0.076	0.077	0.078	0.079
-3.00	-3.00	0.9626	0.8757	0.8889	0.9021	0.9153
-2.60	-2.60	0.7809	0.7926	0.8043	0.8161	0.8279
-2.40	-2.40	0.7410	0.7519	0.7620	0.7740	0.7851
-2.20	-2.20	0.7015	0.7119	0.7222	0.7326	0.7431
-2.00	-2.00	0.6627	0.6724	0.6821	0.6918	0.7016
-1.90	-1.90	0.6435	0.6529	0.6623	0.6717	0.6811
-1.80	-1.80	0.6244	0.6335	0.6426	0.6517	0.6608
-1.70	-1.70	0.6055	0.6142	0.6230	0.6318	0.6406
-1.60	-1.60	0.5867	0.5951	0.6035	0.6121	0.6206
-1.50	-1.50	0.5680	0.5762	0.5843	0.5925	0.6007
-1.40	-1.40	0.5495	0.5573	0.5652	0.5731	0.5810
-1.30	-1.30	0.5311	0.5387	0.5462	0.5538	0.5614
-1.20	-1.20	0.5128	0.5201	0.5274	0.5347	0.5420
-1.10	-1.10	0.4947	0.5017	0.5087	0.5157	0.5227
-1.00	-1.00	0.4767	0.4834	0.4901	0.4968	0.5036
-0.90	-0.90	0.4588	0.4653	0.4717	0.4781	0.4846
-0.80	-0.80	0.4411	0.4472	0.4534	0.4596	0.4657
-0.70	-0.70	0.4235	0.4294	0.4353	0.4411	0.4470
-0.60	-0.60	0.4060	0.4116	0.4172	0.4229	0.4285
-0.50	-0.50	0.3886	0.3940	0.3993	0.4047	0.4101
-0.40	-0.40	0.3714	0.3765	0.3816	0.3867	0.3918
-0.30	-0.30	0.3542	0.3591	0.3640	0.3688	0.3736
-0.20	-0.20	0.3373	0.3419	0.3465	0.3511	0.3556
-0.10	-0.10	0.3204	0.3248	0.3291	0.3334	0.3378
-0.00	-0.00	0.3037	0.3078	0.3119	0.3160	0.3200
0.00	4.00	-0.2758	-0.2792	-0.2825	-0.2859	-0.2892
0.10	4.10	-0.2882	-0.2917	-0.2952	-0.2987	-0.3022
0.20	4.20	-0.3006	-0.3042	-0.3079	-0.3115	-0.3151
0.30	4.30	-0.3129	-0.3166	-0.3204	-0.3241	-0.3279
0.40	4.40	-0.3250	-0.3289	-0.3328	-0.3367	-0.3406
0.50	4.50	-0.3371	-0.3412	-0.3452	-0.3492	-0.3531
0.60	4.60	-0.3491	-0.3533	-0.3574	-0.3615	-0.3656
0.70	4.70	-0.3611	-0.3653	-0.3696	-0.3738	-0.3780
0.80	4.80	-0.3729	-0.3773	-0.3817	-0.3860	-0.3904
0.90	4.90	-0.3846	-0.3891	-0.3936	-0.3981	-0.4026
1.00	5.00	-0.3962	-0.4009	-0.4055	-0.4101	-0.4147
1.10	5.10	-0.4079	-0.4126	-0.4173	-0.4220	-0.4267
1.20	5.20	-0.4194	-0.4242	-0.4291	-0.4339	-0.4387
1.30	5.30	-0.4308	-0.4358	-0.4407	-0.4456	-0.4505
1.40	5.40	-0.4421	-0.4472	-0.4522	-0.4573	-0.4623
1.50	5.50	-0.4534	-0.4586	-0.4637	-0.4688	-0.4740
1.60	5.60	-0.4645	-0.4698	-0.4751	-0.4803	-0.4855
1.70	5.70	-0.4756	-0.4810	-0.4864	-0.4917	-0.4970
1.80	5.80	-0.4866	-0.4921	-0.4976	-0.5030	-0.5084
1.90	5.90	-0.4976	-0.5032	-0.5087	-0.5142	-0.5198
2.00	6.00	-0.5084	-0.5141	-0.5198	-0.5254	-0.5310
2.20	6.20	-0.5299	-0.5358	-0.5416	-0.5474	-0.5532
2.40	6.40	-0.5510	-0.5571	-0.5631	-0.5691	-0.5751
2.60	6.60	-0.5719	-0.5781	-0.5843	-0.5905	-0.5967
3.00	7.00	-0.6127	-0.6193	-0.6258	-0.6323	-0.6388

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 4.000 YEARS

*****INTEREST RATE IV*****

TL	TR	0.080	0.081	0.082	0.083	0.084
-3.00	-3.00	0.9286	0.9419	0.9552	0.9686	0.9821
-2.60	-2.60	0.8397	0.8515	0.8634	0.8754	0.8873
-2.40	-2.40	0.7963	0.8078	0.8196	0.8298	0.8411
-2.20	-2.20	0.7535	0.7640	0.7745	0.7850	0.7956
-2.00	-2.00	0.7114	0.7212	0.7310	0.7409	0.7508
-1.90	-1.90	0.6906	0.7001	0.7096	0.7191	0.7286
-1.80	-1.80	0.6699	0.6791	0.6883	0.6975	0.7067
-1.70	-1.70	0.6494	0.6583	0.6672	0.6760	0.6849
-1.60	-1.60	0.6291	0.6376	0.6462	0.6548	0.6633
-1.50	-1.50	0.6089	0.6171	0.6254	0.6336	0.6419
-1.40	-1.40	0.5889	0.5968	0.6048	0.6127	0.6207
-1.30	-1.30	0.5690	0.5766	0.5843	0.5919	0.5996
-1.20	-1.20	0.5493	0.5566	0.5640	0.5713	0.5787
-1.10	-1.10	0.5297	0.5368	0.5438	0.5509	0.5579
-1.00	-1.00	0.5103	0.5171	0.5238	0.5306	0.5374
-0.90	-0.90	0.4910	0.4975	0.5040	0.5105	0.5170
-0.80	-0.80	0.4719	0.4781	0.4843	0.4905	0.4967
-0.70	-0.70	0.4530	0.4589	0.4648	0.4707	0.4765
-0.60	-0.60	0.4341	0.4398	0.4454	0.4510	0.4567
-0.50	-0.50	0.4154	0.4208	0.4262	0.4316	0.4369
-0.40	-0.40	0.3969	0.4020	0.4071	0.4122	0.4173
-0.30	-0.30	0.3785	0.3833	0.3882	0.3930	0.3979
-0.20	-0.20	0.3602	0.3648	0.3694	0.3740	0.3786
-0.10	-0.10	0.3421	0.3464	0.3508	0.3551	0.3595
-0.00	-0.00	0.3241	0.3282	0.3323	0.3364	0.3405
0.00	4.00	-0.2925	-0.2959	-0.2992	-0.3025	-0.3058
0.10	4.10	-0.3057	-0.3091	-0.3126	-0.3160	-0.3194
0.20	4.20	-0.3187	-0.3223	-0.3258	-0.3294	-0.3329
0.30	4.30	-0.3316	-0.3353	-0.3390	-0.3427	-0.3464
0.40	4.40	-0.3444	-0.3482	-0.3521	-0.3559	-0.3597
0.50	4.50	-0.3571	-0.3611	-0.3650	-0.3690	-0.3729
0.60	4.60	-0.3697	-0.3738	-0.3779	-0.3819	-0.3860
0.70	4.70	-0.3823	-0.3865	-0.3906	-0.3948	-0.3990
0.80	4.80	-0.3947	-0.3990	-0.4033	-0.4076	-0.4119
0.90	4.90	-0.4070	-0.4114	-0.4159	-0.4203	-0.4247
1.00	5.00	-0.4193	-0.4238	-0.4283	-0.4328	-0.4373
1.10	5.10	-0.4314	-0.4361	-0.4407	-0.4453	-0.4499
1.20	5.20	-0.4435	-0.4482	-0.4530	-0.4577	-0.4624
1.30	5.30	-0.4554	-0.4603	-0.4651	-0.4700	-0.4748
1.40	5.40	-0.4673	-0.4722	-0.4772	-0.4821	-0.4870
1.50	5.50	-0.4791	-0.4841	-0.4892	-0.4942	-0.4992
1.60	5.60	-0.4907	-0.4959	-0.5011	-0.5062	-0.5113
1.70	5.70	-0.5023	-0.5076	-0.5129	-0.5181	-0.5233
1.80	5.80	-0.5138	-0.5192	-0.5246	-0.5299	-0.5352
1.90	5.90	-0.5253	-0.5307	-0.5362	-0.5416	-0.5470
2.00	6.00	-0.5366	-0.5421	-0.5477	-0.5532	-0.5587
2.20	6.20	-0.5590	-0.5647	-0.5704	-0.5761	-0.5818
2.40	6.40	-0.5810	-0.5870	-0.5928	-0.5987	-0.6045
2.60	6.60	-0.6028	-0.6088	-0.6149	-0.6209	-0.6269
3.00	7.00	-0.6452	-0.6516	-0.6580	-0.6643	-0.6706

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 5.000 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.085	0.086	0.087	0.088	0.089
-3.00	-3.00	0.9956	1.0091	1.0227	1.0368	1.0500
-2.60	-2.60	0.8993	0.9114	0.9234	0.9355	0.9477
-2.40	-2.40	0.8523	0.8637	0.8750	0.8868	0.8978
-2.20	-2.20	0.8061	0.8167	0.8274	0.8380	0.8487
-2.00	-2.00	0.7607	0.7706	0.7805	0.7905	0.8005
-1.90	-1.90	0.7382	0.7478	0.7574	0.7670	0.7767
-1.80	-1.80	0.7159	0.7252	0.7345	0.7438	0.7531
-1.70	-1.70	0.6938	0.7028	0.7117	0.7207	0.7297
-1.60	-1.60	0.6719	0.6806	0.6892	0.6978	0.7065
-1.50	-1.50	0.6502	0.6585	0.6668	0.6751	0.6835
-1.40	-1.40	0.6286	0.6366	0.6446	0.6527	0.6607
-1.30	-1.30	0.6073	0.6149	0.6226	0.6303	0.6381
-1.20	-1.20	0.5860	0.5934	0.6008	0.6082	0.6156
-1.10	-1.10	0.5650	0.5721	0.5792	0.5863	0.5934
-1.00	-1.00	0.5441	0.5509	0.5577	0.5646	0.5714
-0.90	-0.90	0.5234	0.5300	0.5365	0.5430	0.5495
-0.80	-0.80	0.5029	0.5091	0.5154	0.5216	0.5278
-0.70	-0.70	0.4826	0.4885	0.4944	0.5004	0.5064
-0.60	-0.60	0.4624	0.4680	0.4737	0.4794	0.4850
-0.50	-0.50	0.4423	0.4477	0.4531	0.4585	0.4639
-0.40	-0.40	0.4225	0.4276	0.4327	0.4378	0.4430
-0.30	-0.30	0.4029	0.4076	0.4125	0.4173	0.4222
-0.20	-0.20	0.3832	0.3878	0.3924	0.3970	0.4016
-0.10	-0.10	0.3638	0.3682	0.3725	0.3769	0.3812
-0.00	-0.00	0.3446	0.3487	0.3528	0.3569	0.3610
0.00	4.00	-0.3091	-0.3124	-0.3157	-0.3189	-0.3222
0.10	4.10	-0.3229	-0.3263	-0.3297	-0.3331	-0.3365
0.20	4.20	-0.3365	-0.3401	-0.3436	-0.3471	-0.3506
0.30	4.30	-0.3501	-0.3537	-0.3574	-0.3610	-0.3647
0.40	4.40	-0.3635	-0.3673	-0.3710	-0.3748	-0.3786
0.50	4.50	-0.3768	-0.3807	-0.3846	-0.3885	-0.3924
0.60	4.60	-0.3900	-0.3940	-0.3981	-0.4020	-0.4060
0.70	4.70	-0.4031	-0.4073	-0.4114	-0.4155	-0.4196
0.80	4.80	-0.4161	-0.4204	-0.4246	-0.4288	-0.4330
0.90	4.90	-0.4290	-0.4334	-0.4377	-0.4421	-0.4464
1.00	5.00	-0.4418	-0.4463	-0.4507	-0.4552	-0.4596
1.10	5.10	-0.4545	-0.4591	-0.4636	-0.4682	-0.4727
1.20	5.20	-0.4671	-0.4718	-0.4764	-0.4811	-0.4857
1.30	5.30	-0.4796	-0.4843	-0.4891	-0.4938	-0.4986
1.40	5.40	-0.4919	-0.4968	-0.5017	-0.5065	-0.5113
1.50	5.50	-0.5042	-0.5092	-0.5142	-0.5191	-0.5240
1.60	5.60	-0.5164	-0.5215	-0.5265	-0.5316	-0.5366
1.70	5.70	-0.5285	-0.5336	-0.5388	-0.5439	-0.5490
1.80	5.80	-0.5405	-0.5457	-0.5510	-0.5562	-0.5614
1.90	5.90	-0.5523	-0.5577	-0.5630	-0.5683	-0.5735
2.00	6.00	-0.5641	-0.5695	-0.5750	-0.5804	-0.5857
2.20	6.20	-0.5874	-0.5930	-0.5986	-0.6042	-0.6097
2.40	6.40	-0.6103	-0.6161	-0.6219	-0.6276	-0.6333
2.60	6.60	-0.6329	-0.6388	-0.6447	-0.6506	-0.6564
3.00	7.00	-0.6769	-0.6831	-0.6893	-0.6955	-0.7016

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 4.000 YEARS

*****INTEREST RATE IVS*****

TI	TP	0.090	0.091	0.092	0.093	0.094
-3.00	-3.00	1.0638	1.0775	1.0913	1.1052	1.1191
-2.60	-2.60	0.9598	0.9721	0.9843	0.9966	1.0089
-2.40	-2.40	0.9092	0.9207	0.9322	0.9437	0.9553
-2.20	-2.20	0.8594	0.8702	0.8809	0.8918	0.9026
-2.00	-2.00	0.8105	0.8206	0.8306	0.8407	0.8508
-1.90	-1.90	0.7864	0.7961	0.8058	0.8155	0.8253
-1.80	-1.80	0.7624	0.7719	0.7812	0.7906	0.8000
-1.70	-1.70	0.7387	0.7477	0.7569	0.7659	0.7749
-1.60	-1.60	0.7152	0.7239	0.7326	0.7413	0.7501
-1.50	-1.50	0.6919	0.7002	0.7086	0.7170	0.7255
-1.40	-1.40	0.6687	0.6768	0.6849	0.6930	0.7011
-1.30	-1.30	0.6458	0.6536	0.6613	0.6691	0.6769
-1.20	-1.20	0.6231	0.6305	0.6380	0.6454	0.6529
-1.10	-1.10	0.6005	0.6077	0.6148	0.6220	0.6291
-1.00	-1.00	0.5782	0.5850	0.5919	0.5987	0.6056
-0.90	-0.90	0.5560	0.5626	0.5691	0.5757	0.5823
-0.80	-0.80	0.5341	0.5403	0.5466	0.5529	0.5591
-0.70	-0.70	0.5123	0.5183	0.5243	0.5302	0.5362
-0.60	-0.60	0.4907	0.4964	0.5021	0.5078	0.5135
-0.50	-0.50	0.4693	0.4747	0.4802	0.4856	0.4910
-0.40	-0.40	0.4481	0.4533	0.4588	0.4635	0.4687
-0.30	-0.30	0.4271	0.4320	0.4368	0.4417	0.4466
-0.20	-0.20	0.4062	0.4108	0.4154	0.4201	0.4247
-0.10	-0.10	0.3856	0.3899	0.3943	0.3986	0.4030
-0.00	-0.00	0.3651	0.3692	0.3733	0.3773	0.3818
0.00	0.00	-0.3255	-0.3287	-0.3320	-0.3352	-0.3388
0.10	0.10	-0.3399	-0.3432	-0.3466	-0.3500	-0.3533
0.20	0.20	-0.3541	-0.3576	-0.3611	-0.3646	-0.3681
0.30	0.30	-0.3683	-0.3719	-0.3755	-0.3791	-0.3827
0.40	0.40	-0.3823	-0.3860	-0.3898	-0.3935	-0.3972
0.50	0.50	-0.3962	-0.4001	-0.4039	-0.4077	-0.4116
0.60	0.60	-0.4100	-0.4140	-0.4179	-0.4219	-0.4258
0.70	0.70	-0.4237	-0.4278	-0.4318	-0.4359	-0.4399
0.80	0.80	-0.4372	-0.4414	-0.4456	-0.4497	-0.4539
0.90	0.90	-0.4507	-0.4550	-0.4592	-0.4635	-0.4677
1.00	1.00	-0.4640	-0.4684	-0.4728	-0.4771	-0.4815
1.10	1.10	-0.4772	-0.4817	-0.4862	-0.4906	-0.4951
1.20	1.20	-0.4903	-0.4949	-0.4995	-0.5040	-0.5086
1.30	1.30	-0.5033	-0.5080	-0.5126	-0.5173	-0.5219
1.40	1.40	-0.5161	-0.5209	-0.5257	-0.5304	-0.5352
1.50	1.50	-0.5289	-0.5338	-0.5386	-0.5435	-0.5483
1.60	1.60	-0.5416	-0.5465	-0.5515	-0.5564	-0.5613
1.70	1.70	-0.5541	-0.5592	-0.5642	-0.5692	-0.5742
1.80	1.80	-0.5665	-0.5717	-0.5768	-0.5819	-0.5870
1.90	1.90	-0.5789	-0.5841	-0.5893	-0.5945	-0.5997
2.00	2.00	-0.5911	-0.5964	-0.6017	-0.6070	-0.6122
2.20	2.20	-0.6152	-0.6207	-0.6261	-0.6316	-0.6370
2.40	2.40	-0.6389	-0.6446	-0.6502	-0.6558	-0.6613
2.60	2.60	-0.6622	-0.6680	-0.6738	-0.6795	-0.6852
3.00	3.00	-0.7077	-0.7137	-0.7198	-0.7258	-0.7317

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 4.000 YEARS

*****INTEREST RATE VS*****

TL	TR	0.095	0.096	0.097	0.098	0.099
-3.00	-3.00	1.1331	1.1471	1.1611	1.1752	1.1893
-2.60	-2.60	1.0212	1.0336	1.0461	1.0585	1.0710
-2.40	-2.40	0.9668	0.9785	0.9901	1.0018	1.0135
-2.20	-2.20	0.9134	0.9243	0.9352	0.9461	0.9571
-2.00	-2.00	0.8610	0.8711	0.8813	0.8915	0.9017
-1.90	-1.90	0.8351	0.8449	0.8547	0.8646	0.8744
-1.80	-1.80	0.8094	0.8189	0.8284	0.8379	0.8474
-1.70	-1.70	0.7840	0.7932	0.8023	0.8115	0.8206
-1.60	-1.60	0.7589	0.7676	0.7764	0.7853	0.7941
-1.50	-1.50	0.7339	0.7424	0.7509	0.7593	0.7678
-1.40	-1.40	0.7092	0.7173	0.7254	0.7336	0.7418
-1.30	-1.30	0.6847	0.6925	0.7003	0.7081	0.7159
-1.20	-1.20	0.6604	0.6679	0.6754	0.6829	0.6904
-1.10	-1.10	0.6363	0.6435	0.6507	0.6579	0.6651
-1.00	-1.00	0.6125	0.6194	0.6262	0.6332	0.6401
-0.90	-0.90	0.5888	0.5954	0.6020	0.6086	0.6152
-0.80	-0.80	0.5654	0.5717	0.5780	0.5843	0.5906
-0.70	-0.70	0.5422	0.5482	0.5542	0.5602	0.5662
-0.60	-0.60	0.5192	0.5249	0.5307	0.5364	0.5421
-0.50	-0.50	0.4964	0.5019	0.5073	0.5128	0.5182
-0.40	-0.40	0.4739	0.4790	0.4842	0.4893	0.4945
-0.30	-0.30	0.4515	0.4564	0.4613	0.4661	0.4710
-0.20	-0.20	0.4293	0.4339	0.4385	0.4432	0.4478
-0.10	-0.10	0.4073	0.4117	0.4160	0.4204	0.4248
-0.00	-0.00	0.3855	0.3896	0.3937	0.3978	0.4019
0.00	0.00	-0.3816	-0.3849	-0.3881	-0.3913	-0.3945
0.10	0.10	-0.3567	-0.3600	-0.3633	-0.3666	-0.3699
0.20	0.20	-0.3315	-0.3350	-0.3384	-0.3419	-0.3453
0.30	0.30	-0.3063	-0.3099	-0.3134	-0.3169	-0.3205
0.40	0.40	-0.2809	-0.2846	-0.2882	-0.2919	-0.2956
0.50	0.50	-0.2554	-0.2592	-0.2629	-0.2667	-0.2705
0.60	0.60	-0.2297	-0.2336	-0.2375	-0.2414	-0.2452
0.70	0.70	-0.2039	-0.2079	-0.2119	-0.2159	-0.2199
0.80	0.80	-0.1780	-0.1821	-0.1862	-0.1903	-0.1944
0.90	0.90	-0.1520	-0.1562	-0.1604	-0.1646	-0.1688
1.00	1.00	-0.1258	-0.1301	-0.1344	-0.1387	-0.1430
1.10	1.10	-0.0995	-0.1039	-0.1083	-0.1127	-0.1171
1.20	1.20	-0.0731	-0.0776	-0.0821	-0.0866	-0.0911
1.30	1.30	-0.0466	-0.0512	-0.0557	-0.0603	-0.0649
1.40	1.40	-0.0200	-0.0246	-0.0293	-0.0339	-0.0386
1.50	1.50	-0.0031	-0.0079	-0.0127	-0.0174	-0.0221
1.60	1.60	-0.0136	-0.0184	-0.0232	-0.0280	-0.0328
1.70	1.70	-0.0241	-0.0290	-0.0339	-0.0388	-0.0437
1.80	1.80	-0.0346	-0.0396	-0.0445	-0.0494	-0.0543
1.90	1.90	-0.0451	-0.0502	-0.0552	-0.0602	-0.0652
2.00	2.00	-0.0556	-0.0608	-0.0659	-0.0710	-0.0761
2.10	2.10	-0.0661	-0.0714	-0.0766	-0.0818	-0.0870
2.20	2.20	-0.0766	-0.0820	-0.0873	-0.0926	-0.0979
2.30	2.30	-0.0871	-0.0926	-0.0979	-0.1033	-0.1087
2.40	2.40	-0.0976	-0.1032	-0.1087	-0.1142	-0.1197
2.50	2.50	-0.1081	-0.1138	-0.1194	-0.1250	-0.1306
2.60	2.60	-0.1186	-0.1244	-0.1301	-0.1358	-0.1415
2.70	2.70	-0.1291	-0.1350	-0.1408	-0.1466	-0.1524
2.80	2.80	-0.1396	-0.1456	-0.1515	-0.1574	-0.1633
2.90	2.90	-0.1501	-0.1562	-0.1622	-0.1682	-0.1742
3.00	3.00	-0.1606	-0.1668	-0.1729	-0.1789	-0.1850

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 4.000 YEARS

*****INTEREST RATE 7%*****

TL	TP	0.100	0.101	0.102	0.103	0.104
-3.00	-3.00	1.2035	1.2177	1.2320	1.2463	1.2607
-2.60	-2.60	1.0836	1.0961	1.1087	1.1214	1.1341
-2.40	-2.40	1.0253	1.0371	1.0489	1.0607	1.0726
-2.20	-2.20	0.9681	0.9791	0.9902	1.0012	1.0123
-2.00	-2.00	0.9120	0.9223	0.9326	0.9429	0.9532
-1.90	-1.90	0.8883	0.8983	0.9082	0.9182	0.9281
-1.80	-1.80	0.8570	0.8665	0.8761	0.8857	0.8953
-1.70	-1.70	0.8298	0.8390	0.8483	0.8575	0.8668
-1.60	-1.60	0.8029	0.8118	0.8207	0.8296	0.8385
-1.50	-1.50	0.7763	0.7849	0.7938	0.8020	0.8105
-1.40	-1.40	0.7500	0.7582	0.7668	0.7746	0.7828
-1.30	-1.30	0.7238	0.7317	0.7396	0.7475	0.7558
-1.20	-1.20	0.6980	0.7055	0.7131	0.7207	0.7283
-1.10	-1.10	0.6728	0.6796	0.6868	0.6941	0.7014
-1.00	-1.00	0.6470	0.6539	0.6608	0.6678	0.6747
-0.90	-0.90	0.6218	0.6285	0.6351	0.6417	0.6484
-0.80	-0.80	0.5969	0.6033	0.6096	0.6159	0.6223
-0.70	-0.70	0.5723	0.5783	0.5843	0.5904	0.5964
-0.60	-0.60	0.5478	0.5536	0.5593	0.5651	0.5709
-0.50	-0.50	0.5236	0.5291	0.5346	0.5400	0.5455
-0.40	-0.40	0.4997	0.5049	0.5100	0.5152	0.5204
-0.30	-0.30	0.4759	0.4808	0.4857	0.4906	0.4955
-0.20	-0.20	0.4524	0.4571	0.4617	0.4663	0.4709
-0.10	-0.10	0.4291	0.4335	0.4379	0.4422	0.4466
-0.00	-0.00	0.4061	0.4102	0.4143	0.4184	0.4225
0.00	0.00	-0.3576	-0.3608	-0.3640	-0.3672	-0.3703
0.10	0.10	-0.3733	-0.3766	-0.3798	-0.3831	-0.3864
0.20	0.20	-0.3887	-0.3921	-0.3955	-0.3989	-0.4023
0.30	0.30	-0.4040	-0.4076	-0.4111	-0.4146	-0.4181
0.40	0.40	-0.4192	-0.4228	-0.4265	-0.4301	-0.4337
0.50	0.50	-0.4342	-0.4380	-0.4417	-0.4454	-0.4491
0.60	0.60	-0.4491	-0.4530	-0.4568	-0.4606	-0.4644
0.70	0.70	-0.4638	-0.4678	-0.4717	-0.4757	-0.4796
0.80	0.80	-0.4785	-0.4825	-0.4865	-0.4906	-0.4946
0.90	0.90	-0.4929	-0.4971	-0.5012	-0.5053	-0.5094
1.00	1.00	-0.5072	-0.5115	-0.5157	-0.5199	-0.5241
1.10	1.10	-0.5214	-0.5258	-0.5301	-0.5344	-0.5387
1.20	1.20	-0.5355	-0.5399	-0.5443	-0.5487	-0.5531
1.30	1.30	-0.5498	-0.5539	-0.5584	-0.5629	-0.5674
1.40	1.40	-0.5632	-0.5678	-0.5724	-0.5770	-0.5815
1.50	1.50	-0.5769	-0.5816	-0.5862	-0.5909	-0.5955
1.60	1.60	-0.5904	-0.5952	-0.5999	-0.6047	-0.6094
1.70	1.70	-0.6038	-0.6087	-0.6135	-0.6183	-0.6231
1.80	1.80	-0.6171	-0.6220	-0.6269	-0.6318	-0.6367
1.90	1.90	-0.6302	-0.6352	-0.6402	-0.6452	-0.6501
2.00	2.00	-0.6432	-0.6483	-0.6534	-0.6584	-0.6635
2.20	2.20	-0.6689	-0.6742	-0.6794	-0.6846	-0.6897
2.40	2.40	-0.6941	-0.6995	-0.7048	-0.7102	-0.7155
2.60	2.60	-0.7188	-0.7243	-0.7298	-0.7353	-0.7407
3.00	3.00	-0.7669	-0.7726	-0.7781	-0.7840	-0.7897

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 5.000 YEARS

*****INTEREST RATE 7%*****

TL	TR	0.060	0.061	0.062	0.063	0.064
-3.00	-3.00	0.7470	0.7610	0.7751	0.7891	0.8033
-2.60	-2.60	0.6837	0.6963	0.7090	0.7217	0.7345
-2.40	-2.40	0.6526	0.6645	0.6766	0.6886	0.7007
-2.20	-2.20	0.6218	0.6331	0.6445	0.6560	0.6678
-2.00	-2.00	0.5918	0.6021	0.6129	0.6237	0.6345
-1.90	-1.90	0.5763	0.5867	0.5972	0.6077	0.6182
-1.80	-1.80	0.5613	0.5718	0.5816	0.5918	0.6019
-1.70	-1.70	0.5468	0.5562	0.5661	0.5759	0.5858
-1.60	-1.60	0.5316	0.5411	0.5507	0.5602	0.5698
-1.50	-1.50	0.5169	0.5261	0.5358	0.5446	0.5539
-1.40	-1.40	0.5022	0.5112	0.5201	0.5291	0.5381
-1.30	-1.30	0.4877	0.4963	0.5050	0.5137	0.5228
-1.20	-1.20	0.4732	0.4816	0.4899	0.4988	0.5068
-1.10	-1.10	0.4588	0.4669	0.4750	0.4831	0.4912
-1.00	-1.00	0.4445	0.4523	0.4601	0.4680	0.4758
-0.90	-0.90	0.4303	0.4378	0.4458	0.4529	0.4605
-0.80	-0.80	0.4161	0.4238	0.4307	0.4380	0.4452
-0.70	-0.70	0.4021	0.4091	0.4161	0.4231	0.4301
-0.60	-0.60	0.3881	0.3948	0.4016	0.4083	0.4151
-0.50	-0.50	0.3742	0.3807	0.3872	0.3936	0.4001
-0.40	-0.40	0.3608	0.3666	0.3729	0.3790	0.3852
-0.30	-0.30	0.3467	0.3526	0.3586	0.3645	0.3705
-0.20	-0.20	0.3330	0.3387	0.3448	0.3501	0.3558
-0.10	-0.10	0.3195	0.3249	0.3303	0.3358	0.3412
-0.00	-0.00	0.3060	0.3111	0.3163	0.3215	0.3267
0.00	5.00	-0.2777	-0.2819	-0.2862	-0.2908	-0.2945
0.10	5.10	-0.2877	-0.2921	-0.2965	-0.3008	-0.3052
0.20	5.20	-0.2977	-0.3022	-0.3067	-0.3112	-0.3157
0.30	5.30	-0.3076	-0.3122	-0.3169	-0.3215	-0.3261
0.40	5.40	-0.3178	-0.3222	-0.3270	-0.3318	-0.3365
0.50	5.50	-0.3272	-0.3321	-0.3370	-0.3419	-0.3468
0.60	5.60	-0.3369	-0.3420	-0.3470	-0.3521	-0.3571
0.70	5.70	-0.3466	-0.3518	-0.3570	-0.3621	-0.3672
0.80	5.80	-0.3562	-0.3616	-0.3668	-0.3721	-0.3778
0.90	5.90	-0.3658	-0.3712	-0.3767	-0.3820	-0.3878
1.00	6.00	-0.3753	-0.3809	-0.3868	-0.3919	-0.3978
1.10	6.10	-0.3848	-0.3905	-0.3961	-0.4017	-0.4073
1.20	6.20	-0.3942	-0.4000	-0.4057	-0.4115	-0.4172
1.30	6.30	-0.4035	-0.4098	-0.4153	-0.4212	-0.4279
1.40	6.40	-0.4128	-0.4189	-0.4248	-0.4308	-0.4368
1.50	6.50	-0.4221	-0.4282	-0.4343	-0.4408	-0.4468
1.60	6.60	-0.4313	-0.4375	-0.4437	-0.4499	-0.4561
1.70	6.70	-0.4408	-0.4468	-0.4531	-0.4598	-0.4656
1.80	6.80	-0.4495	-0.4559	-0.4628	-0.4698	-0.4752
1.90	6.90	-0.4585	-0.4651	-0.4716	-0.4781	-0.4846
2.00	7.00	-0.4675	-0.4742	-0.4809	-0.4878	-0.4940
2.20	7.20	-0.4853	-0.4922	-0.4990	-0.5058	-0.5126
2.40	7.40	-0.5029	-0.5099	-0.5170	-0.5240	-0.5310
2.60	7.60	-0.5202	-0.5275	-0.5348	-0.5420	-0.5491
3.00	8.00	-0.5588	-0.5621	-0.5697	-0.5772	-0.5848

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 5.000 YEARS

*****INTEREST RATE 1%*****

TL	TP	0.065	0.066	0.067	0.068	0.069
-3.00	-3.00	0.8175	0.8317	0.8460	0.8604	0.8748
-2.60	-2.60	0.7873	0.7602	0.7731	0.7860	0.7990
-2.40	-2.40	0.7129	0.7251	0.7373	0.7496	0.7618
-2.20	-2.20	0.6789	0.6904	0.7020	0.7136	0.7252
-2.00	-2.00	0.6453	0.6562	0.6671	0.6781	0.6890
-1.90	-1.90	0.6247	0.6343	0.6449	0.6505	0.6711
-1.80	-1.80	0.6122	0.6224	0.6327	0.6430	0.6533
-1.70	-1.70	0.5958	0.6057	0.6157	0.6257	0.6357
-1.60	-1.60	0.5794	0.5891	0.5987	0.6084	0.6181
-1.50	-1.50	0.5632	0.5726	0.5819	0.5913	0.6007
-1.40	-1.40	0.5471	0.5562	0.5652	0.5743	0.5834
-1.30	-1.30	0.5311	0.5399	0.5486	0.5574	0.5662
-1.20	-1.20	0.5152	0.5237	0.5321	0.5406	0.5491
-1.10	-1.10	0.4994	0.5076	0.5157	0.5239	0.5321
-1.00	-1.00	0.4837	0.4916	0.4994	0.5073	0.5153
-0.90	-0.90	0.4681	0.4757	0.4833	0.4909	0.4985
-0.80	-0.80	0.4526	0.4599	0.4672	0.4745	0.4819
-0.70	-0.70	0.4371	0.4442	0.4512	0.4583	0.4653
-0.60	-0.60	0.4218	0.4286	0.4354	0.4421	0.4489
-0.50	-0.50	0.4066	0.4131	0.4196	0.4261	0.4326
-0.40	-0.40	0.3915	0.3977	0.4039	0.4102	0.4164
-0.30	-0.30	0.3764	0.3824	0.3884	0.3944	0.4003
-0.20	-0.20	0.3615	0.3672	0.3729	0.3785	0.3843
-0.10	-0.10	0.3467	0.3521	0.3576	0.3630	0.3685
-0.00	-0.00	0.3319	0.3371	0.3423	0.3475	0.3527
0.00	5.00	-0.2949	-0.3031	-0.3073	-0.3114	-0.3156
0.10	5.10	-0.3096	-0.3139	-0.3182	-0.3225	-0.3268
0.20	5.20	-0.3202	-0.3247	-0.3291	-0.3335	-0.3379
0.30	5.30	-0.3307	-0.3353	-0.3399	-0.3445	-0.3490
0.40	5.40	-0.3412	-0.3460	-0.3507	-0.3554	-0.3600
0.50	5.50	-0.3517	-0.3565	-0.3614	-0.3662	-0.3710
0.60	5.60	-0.3620	-0.3670	-0.3720	-0.3769	-0.3819
0.70	5.70	-0.3724	-0.3774	-0.3825	-0.3876	-0.3926
0.80	5.80	-0.3826	-0.3878	-0.3930	-0.3982	-0.4033
0.90	5.90	-0.3928	-0.3981	-0.4034	-0.4087	-0.4140
1.00	6.00	-0.4029	-0.4083	-0.4137	-0.4192	-0.4245
1.10	6.10	-0.4129	-0.4185	-0.4240	-0.4295	-0.4350
1.20	6.20	-0.4229	-0.4286	-0.4342	-0.4399	-0.4455
1.30	6.30	-0.4328	-0.4386	-0.4444	-0.4501	-0.4558
1.40	6.40	-0.4427	-0.4486	-0.4544	-0.4603	-0.4661
1.50	6.50	-0.4525	-0.4585	-0.4645	-0.4704	-0.4763
1.60	6.60	-0.4622	-0.4683	-0.4744	-0.4804	-0.4865
1.70	6.70	-0.4719	-0.4781	-0.4843	-0.4904	-0.4966
1.80	6.80	-0.4815	-0.4878	-0.4941	-0.5004	-0.5066
1.90	6.90	-0.4911	-0.4975	-0.5039	-0.5102	-0.5165
2.00	7.00	-0.5005	-0.5071	-0.5135	-0.5200	-0.5264
2.20	7.20	-0.5198	-0.5261	-0.5327	-0.5394	-0.5460
2.40	7.40	-0.5379	-0.5444	-0.5517	-0.5585	-0.5653
2.60	7.60	-0.5563	-0.5634	-0.5704	-0.5774	-0.5844
2.80	7.80	-0.5723	-0.5797	-0.5871	-0.5944	-0.6017

TABLE A-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 5.000 YEARS

*****INTEREST RATE 1%*****						
TL	EP	0.071	0.072	0.073	0.074	
-3.00	-3.00	0.8897	0.9183	0.9336	0.9476	
-2.60	-2.60	0.8120	0.8342	0.8518	0.8685	
-2.80	-2.80	0.7782	0.7990	0.8118	0.8239	
-2.20	-2.20	0.7369	0.7605	0.7720	0.7838	
-2.00	-2.00	0.7000	0.7110	0.7221	0.7332	
-1.90	-1.90	0.6818	0.6925	0.7032	0.7140	
-1.80	-1.80	0.6637	0.6741	0.6845	0.6949	
-1.70	-1.70	0.6457	0.6558	0.6659	0.6760	
-1.60	-1.60	0.6278	0.6376	0.6478	0.6572	
-1.50	-1.50	0.6101	0.6195	0.6290	0.6385	
-1.40	-1.40	0.5925	0.6016	0.6108	0.6194	
-1.30	-1.30	0.5750	0.5838	0.5926	0.6014	
-1.20	-1.20	0.5576	0.5661	0.5747	0.5832	
-1.10	-1.10	0.5403	0.5486	0.5569	0.5651	
-1.00	-1.00	0.5232	0.5311	0.5391	0.5470	
-0.90	-0.90	0.5061	0.5138	0.5215	0.5291	
-0.80	-0.80	0.4892	0.4965	0.5040	0.5113	
-0.70	-0.70	0.4728	0.4795	0.4866	0.4937	
-0.60	-0.60	0.4557	0.4625	0.4693	0.4762	
-0.50	-0.50	0.4391	0.4457	0.4522	0.4589	
-0.40	-0.40	0.4227	0.4289	0.4352	0.4415	
-0.30	-0.30	0.4063	0.4123	0.4183	0.4243	
-0.20	-0.20	0.3901	0.3959	0.4015	0.4072	
-0.10	-0.10	0.3739	0.3798	0.3859	0.3919	
-0.00	-0.00	0.3579	0.3631	0.3682	0.3735	
0.00	5.00	-0.3418	-0.3239	-0.3222	-0.3163	
0.10	5.10	-0.3311	-0.3158	-0.3197	-0.3183	
0.20	5.20	-0.3208	-0.3068	-0.3112	-0.3155	
0.30	5.30	-0.3106	-0.2981	-0.3026	-0.3116	
0.40	5.40	-0.3007	-0.2898	-0.2947	-0.3032	
0.50	5.50	-0.2909	-0.2805	-0.2853	-0.2937	
0.60	5.60	-0.2812	-0.2716	-0.2765	-0.2848	
0.70	5.70	-0.2716	-0.2626	-0.2676	-0.2758	
0.80	5.80	-0.2621	-0.2535	-0.2584	-0.2666	
0.90	5.90	-0.2527	-0.2445	-0.2491	-0.2572	
1.00	6.00	-0.2434	-0.2355	-0.2400	-0.2480	
1.10	6.10	-0.2342	-0.2266	-0.2310	-0.2389	
1.20	6.20	-0.2251	-0.2178	-0.2221	-0.2300	
1.30	6.30	-0.2161	-0.2090	-0.2132	-0.2210	
1.40	6.40	-0.2071	-0.2002	-0.2043	-0.2120	
1.50	6.50	-0.1982	-0.1915	-0.1955	-0.2031	
1.60	6.60	-0.1894	-0.1829	-0.1868	-0.1943	
1.70	6.70	-0.1807	-0.1744	-0.1782	-0.1856	
1.80	6.80	-0.1721	-0.1660	-0.1697	-0.1770	
1.90	6.90	-0.1636	-0.1577	-0.1613	-0.1685	
2.00	7.00	-0.1552	-0.1495	-0.1530	-0.1601	
2.20	7.20	-0.1470	-0.1415	-0.1449	-0.1519	
2.40	7.40	-0.1389	-0.1336	-0.1369	-0.1438	
2.60	7.60	-0.1309	-0.1258	-0.1290	-0.1358	
2.80	7.80	-0.1230	-0.1180	-0.1211	-0.1278	
3.00	8.00	-0.1152	-0.1104	-0.1134	-0.1200	

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 5.000 YEARS

*****INTEREST RATE IV*****

TI	TD	0.075	0.076	0.077	0.078	0.079
-3.00	-3.00	0.9628	0.9771	0.9920	1.0069	1.0218
-2.60	-2.60	0.8778	0.8911	0.9068	0.9178	0.9312
-2.40	-2.40	0.8368	0.8490	0.8616	0.8742	0.8869
-2.20	-2.20	0.7957	0.8075	0.8198	0.8313	0.8433
-2.00	-2.00	0.7555	0.7666	0.7778	0.7891	0.8007
-1.90	-1.90	0.7356	0.7468	0.7573	0.7682	0.7791
-1.80	-1.80	0.7158	0.7268	0.7369	0.7478	0.7580
-1.70	-1.70	0.6963	0.7068	0.7166	0.7269	0.7371
-1.60	-1.60	0.6768	0.6867	0.6965	0.7068	0.7168
-1.50	-1.50	0.6575	0.6670	0.6766	0.6862	0.6958
-1.40	-1.40	0.6383	0.6475	0.6568	0.6660	0.6753
-1.30	-1.30	0.6193	0.6282	0.6371	0.6461	0.6550
-1.20	-1.20	0.6004	0.6090	0.6176	0.6262	0.6349
-1.10	-1.10	0.5816	0.5899	0.5982	0.6066	0.6149
-1.00	-1.00	0.5630	0.5710	0.5790	0.5870	0.5951
-0.90	-0.90	0.5445	0.5522	0.5599	0.5677	0.5758
-0.80	-0.80	0.5261	0.5336	0.5410	0.5488	0.5559
-0.70	-0.70	0.5079	0.5150	0.5222	0.5293	0.5365
-0.60	-0.60	0.4898	0.4967	0.5035	0.5104	0.5173
-0.50	-0.50	0.4719	0.4788	0.4850	0.4916	0.4982
-0.40	-0.40	0.4540	0.4603	0.4666	0.4729	0.4792
-0.30	-0.30	0.4363	0.4423	0.4488	0.4548	0.4608
-0.20	-0.20	0.4187	0.4245	0.4302	0.4360	0.4417
-0.10	-0.10	0.4013	0.4068	0.4123	0.4177	0.4232
-0.00	-0.00	0.3840	0.3892	0.3948	0.3996	0.4048
0.00	5.00	-0.3808	-0.3845	-0.3886	-0.3926	-0.3967
0.10	5.10	-0.3528	-0.3566	-0.3608	-0.3650	-0.3692
0.20	5.20	-0.3643	-0.3686	-0.3729	-0.3773	-0.3816
0.30	5.30	-0.3761	-0.3805	-0.3850	-0.3898	-0.3938
0.40	5.40	-0.3878	-0.3928	-0.3970	-0.4015	-0.4060
0.50	5.50	-0.3995	-0.4041	-0.4088	-0.4135	-0.4181
0.60	5.60	-0.4110	-0.4158	-0.4206	-0.4258	-0.4301
0.70	5.70	-0.4225	-0.4278	-0.4322	-0.4372	-0.4421
0.80	5.80	-0.4339	-0.4389	-0.4439	-0.4489	-0.4539
0.90	5.90	-0.4452	-0.4503	-0.4558	-0.4605	-0.4656
1.00	6.00	-0.4568	-0.4617	-0.4669	-0.4721	-0.4773
1.10	6.10	-0.4676	-0.4729	-0.4782	-0.4835	-0.4888
1.20	6.20	-0.4786	-0.4841	-0.4895	-0.4949	-0.5003
1.30	6.30	-0.4896	-0.4952	-0.5007	-0.5062	-0.5117
1.40	6.40	-0.5005	-0.5062	-0.5118	-0.5173	-0.5230
1.50	6.50	-0.5113	-0.5171	-0.5228	-0.5285	-0.5342
1.60	6.60	-0.5221	-0.5279	-0.5338	-0.5395	-0.5453
1.70	6.70	-0.5328	-0.5387	-0.5446	-0.5505	-0.5568
1.80	6.80	-0.5438	-0.5498	-0.5558	-0.5618	-0.5673
1.90	6.90	-0.5539	-0.5600	-0.5661	-0.5722	-0.5782
2.00	7.00	-0.5643	-0.5705	-0.5767	-0.5829	-0.5890
2.20	7.20	-0.5850	-0.5918	-0.5977	-0.6040	-0.6103
2.40	7.40	-0.6058	-0.6119	-0.6188	-0.6249	-0.6313
2.60	7.60	-0.6258	-0.6321	-0.6388	-0.6458	-0.6521
3.00	8.00	-0.6647	-0.6717	-0.6787	-0.6856	-0.6925

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 5,000 YEARS

*****INTEREST RATE VS*****						
IL	IR	0.080	0.081	0.082	0.083	0.084
-3.00	-3.00	1.0364	1.0519	1.0670	1.0822	1.0974
-2.60	-2.60	0.9447	0.9582	0.9717	0.9853	0.9990
-2.40	-2.40	0.8996	0.9124	0.9252	0.9380	0.9509
-2.20	-2.20	0.8553	0.8673	0.8794	0.8915	0.9036
-2.00	-2.00	0.8116	0.8239	0.8363	0.8487	0.8611
-1.90	-1.90	0.7901	0.8010	0.8121	0.8231	0.8342
-1.80	-1.80	0.7687	0.7793	0.7900	0.8006	0.8114
-1.70	-1.70	0.7474	0.7577	0.7680	0.7784	0.7888
-1.60	-1.60	0.7263	0.7363	0.7463	0.7563	0.7663
-1.50	-1.50	0.7054	0.7150	0.7247	0.7344	0.7441
-1.40	-1.40	0.6846	0.6939	0.7033	0.7126	0.7220
-1.30	-1.30	0.6640	0.6730	0.6820	0.6911	0.7001
-1.20	-1.20	0.6436	0.6522	0.6610	0.6697	0.6784
-1.10	-1.10	0.6233	0.6316	0.6400	0.6484	0.6569
-1.00	-1.00	0.6031	0.6112	0.6193	0.6274	0.6355
-0.90	-0.90	0.5832	0.5909	0.5987	0.6065	0.6143
-0.80	-0.80	0.5633	0.5708	0.5783	0.5858	0.5933
-0.70	-0.70	0.5437	0.5508	0.5580	0.5652	0.5724
-0.60	-0.60	0.5241	0.5310	0.5379	0.5448	0.5517
-0.50	-0.50	0.5044	0.5113	0.5180	0.5246	0.5312
-0.40	-0.40	0.4855	0.4918	0.4982	0.5045	0.5108
-0.30	-0.30	0.4664	0.4725	0.4785	0.4846	0.4906
-0.20	-0.20	0.4475	0.4533	0.4590	0.4648	0.4706
-0.10	-0.10	0.4287	0.4342	0.4397	0.4452	0.4507
-0.00	-0.00	0.4101	0.4153	0.4205	0.4254	0.4310
0.00	5.00	-0.3604	-0.3644	-0.3684	-0.3724	-0.3764
0.10	5.10	-0.3734	-0.3775	-0.3817	-0.3858	-0.3899
0.20	5.20	-0.3859	-0.3901	-0.3944	-0.3986	-0.4029
0.30	5.30	-0.3982	-0.4026	-0.4070	-0.4114	-0.4157
0.40	5.40	-0.4106	-0.4151	-0.4196	-0.4240	-0.4285
0.50	5.50	-0.4228	-0.4274	-0.4320	-0.4366	-0.4411
0.60	5.60	-0.4349	-0.4396	-0.4443	-0.4490	-0.4537
0.70	5.70	-0.4469	-0.4517	-0.4566	-0.4614	-0.4661
0.80	5.80	-0.4588	-0.4638	-0.4687	-0.4736	-0.4785
0.90	5.90	-0.4707	-0.4757	-0.4807	-0.4857	-0.4907
1.00	6.00	-0.4824	-0.4876	-0.4927	-0.4976	-0.5024
1.10	6.10	-0.4941	-0.4993	-0.5046	-0.5098	-0.5149
1.20	6.20	-0.5057	-0.5110	-0.5163	-0.5216	-0.5269
1.30	6.30	-0.5171	-0.5226	-0.5280	-0.5334	-0.5388
1.40	6.40	-0.5285	-0.5341	-0.5396	-0.5451	-0.5505
1.50	6.50	-0.5398	-0.5455	-0.5511	-0.5566	-0.5622
1.60	6.60	-0.5511	-0.5568	-0.5625	-0.5681	-0.5734
1.70	6.70	-0.5622	-0.5680	-0.5734	-0.5795	-0.5852
1.80	6.80	-0.5732	-0.5791	-0.5850	-0.5904	-0.5966
1.90	6.90	-0.5842	-0.5902	-0.5961	-0.6020	-0.6074
2.00	7.00	-0.5951	-0.6011	-0.6072	-0.6132	-0.6191
2.20	7.20	-0.6166	-0.6228	-0.6290	-0.6352	-0.6413
2.40	7.40	-0.6378	-0.6441	-0.6505	-0.6568	-0.6631
2.60	7.60	-0.6586	-0.6651	-0.6716	-0.6781	-0.6845
3.00	8.00	-0.6994	-0.7062	-0.7130	-0.7197	-0.7264

TABLE 2-8.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 5.000 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.085	0.095	0.087	0.098	0.089
-3.00	-3.00	1.1127	1.1280	1.1838	1.1589	1.1788
-2.60	-2.60	1.0126	1.0268	1.0801	1.0580	1.0678
-2.40	-2.40	0.9638	0.9769	0.9998	1.0028	1.0159
-2.20	-2.20	0.9158	0.9280	0.9403	0.9525	0.9689
-2.00	-2.00	0.8686	0.8801	0.8916	0.9031	0.9187
-1.90	-1.90	0.8452	0.8568	0.8675	0.8787	0.8899
-1.80	-1.80	0.8221	0.8329	0.8437	0.8545	0.8653
-1.70	-1.70	0.7991	0.8096	0.8200	0.8305	0.8410
-1.60	-1.60	0.7764	0.7865	0.7966	0.8067	0.8168
-1.50	-1.50	0.7538	0.7635	0.7732	0.7831	0.7929
-1.40	-1.40	0.7318	0.7408	0.7502	0.7597	0.7692
-1.30	-1.30	0.7092	0.7183	0.7278	0.7365	0.7456
-1.20	-1.20	0.6871	0.6959	0.7047	0.7135	0.7223
-1.10	-1.10	0.6653	0.6737	0.6822	0.6907	0.6991
-1.00	-1.00	0.6436	0.6517	0.6599	0.6680	0.6762
-0.90	-0.90	0.6221	0.6299	0.6378	0.6456	0.6535
-0.80	-0.80	0.6008	0.6083	0.6158	0.6233	0.6309
-0.70	-0.70	0.5796	0.5868	0.5941	0.6013	0.6085
-0.60	-0.60	0.5586	0.5655	0.5725	0.5798	0.5868
-0.50	-0.50	0.5378	0.5444	0.5511	0.5577	0.5648
-0.40	-0.40	0.5172	0.5235	0.5299	0.5362	0.5426
-0.30	-0.30	0.4967	0.5028	0.5089	0.5149	0.5210
-0.20	-0.20	0.4768	0.4822	0.4880	0.4937	0.4995
-0.10	-0.10	0.4562	0.4617	0.4673	0.4729	0.4783
-0.00	-0.00	0.4362	0.4415	0.4467	0.4520	0.4572
0.00	5.00	-0.3809	-0.3848	-0.3988	-0.3928	-0.3967
0.10	5.10	-0.3980	-0.3981	-0.4022	-0.4063	-0.4108
0.20	5.20	-0.4071	-0.4113	-0.4155	-0.4197	-0.4239
0.30	5.30	-0.4201	-0.4248	-0.4287	-0.4330	-0.4373
0.40	5.40	-0.4329	-0.4378	-0.4418	-0.4462	-0.4506
0.50	5.50	-0.4457	-0.4502	-0.4548	-0.4593	-0.4638
0.60	5.60	-0.4583	-0.4630	-0.4676	-0.4722	-0.4768
0.70	5.70	-0.4709	-0.4757	-0.4808	-0.4851	-0.4898
0.80	5.80	-0.4838	-0.4882	-0.4930	-0.4979	-0.5027
0.90	5.90	-0.4957	-0.5007	-0.5056	-0.5105	-0.5158
1.00	6.00	-0.5079	-0.5130	-0.5180	-0.5230	-0.5280
1.10	6.10	-0.5201	-0.5252	-0.5308	-0.5355	-0.5405
1.20	6.20	-0.5321	-0.5378	-0.5426	-0.5478	-0.5530
1.30	6.30	-0.5441	-0.5498	-0.5547	-0.5600	-0.5653
1.40	6.40	-0.5560	-0.5618	-0.5668	-0.5721	-0.5775
1.50	6.50	-0.5677	-0.5732	-0.5787	-0.5842	-0.5896
1.60	6.60	-0.5798	-0.5850	-0.5905	-0.5961	-0.6016
1.70	6.70	-0.5909	-0.5966	-0.6023	-0.6079	-0.6135
1.80	6.80	-0.6028	-0.6082	-0.6139	-0.6196	-0.6253
1.90	6.90	-0.6138	-0.6196	-0.6255	-0.6312	-0.6370
2.00	7.00	-0.6251	-0.6310	-0.6369	-0.6429	-0.6486
2.20	7.20	-0.6478	-0.6535	-0.6595	-0.6655	-0.6715
2.40	7.40	-0.6693	-0.6755	-0.6817	-0.6879	-0.6940
2.60	7.60	-0.6909	-0.6973	-0.7036	-0.7099	-0.7161
3.00	8.00	-0.7330	-0.7397	-0.7463	-0.7528	-0.7593

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 5.000 YEARS

*****INTEREST RATE I VS*****

TL	TR	0.090	0.091	0.092	0.093	0.094
-3.00	-3.00	1.1899	1.2055	1.2212	1.2369	1.2527
-2.60	-2.60	1.0817	1.0957	1.1097	1.1237	1.1378
-2.40	-2.40	1.0290	1.0422	1.0553	1.0686	1.0819
-2.20	-2.20	0.9772	0.9896	1.0020	1.0144	1.0269
-2.00	-2.00	0.9263	0.9379	0.9495	0.9612	0.9730
-1.90	-1.90	0.9011	0.9124	0.9237	0.9350	0.9463
-1.80	-1.80	0.8762	0.8871	0.8980	0.9090	0.9200
-1.70	-1.70	0.8515	0.8620	0.8726	0.8832	0.8938
-1.60	-1.60	0.8270	0.8372	0.8474	0.8576	0.8679
-1.50	-1.50	0.8027	0.8126	0.8224	0.8323	0.8422
-1.40	-1.40	0.7786	0.7881	0.7977	0.8072	0.8168
-1.30	-1.30	0.7548	0.7639	0.7731	0.7823	0.7916
-1.20	-1.20	0.7311	0.7399	0.7488	0.7577	0.7666
-1.10	-1.10	0.7076	0.7162	0.7247	0.7332	0.7418
-1.00	-1.00	0.6844	0.6926	0.7008	0.7090	0.7172
-0.90	-0.90	0.6613	0.6692	0.6771	0.6850	0.6929
-0.80	-0.80	0.6385	0.6460	0.6536	0.6612	0.6688
-0.70	-0.70	0.6158	0.6231	0.6303	0.6376	0.6449
-0.60	-0.60	0.5933	0.6003	0.6072	0.6142	0.6212
-0.50	-0.50	0.5710	0.5777	0.5844	0.5911	0.5977
-0.40	-0.40	0.5489	0.5553	0.5617	0.5681	0.5745
-0.30	-0.30	0.5270	0.5331	0.5392	0.5453	0.5514
-0.20	-0.20	0.5053	0.5111	0.5169	0.5228	0.5286
-0.10	-0.10	0.4838	0.4893	0.4949	0.5004	0.5059
-0.00	-0.00	0.4625	0.4677	0.4730	0.4782	0.4835
0.00	5.00	-0.4007	-0.4046	-0.4085	-0.4124	-0.4164
0.10	5.10	-0.4144	-0.4185	-0.4225	-0.4265	-0.4305
0.20	5.20	-0.4281	-0.4322	-0.4364	-0.4405	-0.4446
0.30	5.30	-0.4416	-0.4458	-0.4501	-0.4543	-0.4585
0.40	5.40	-0.4550	-0.4593	-0.4637	-0.4680	-0.4724
0.50	5.50	-0.4683	-0.4727	-0.4772	-0.4816	-0.4861
0.60	5.60	-0.4814	-0.4860	-0.4906	-0.4951	-0.5006
0.70	5.70	-0.4945	-0.4992	-0.5038	-0.5084	-0.5131
0.80	5.80	-0.5074	-0.5122	-0.5169	-0.5217	-0.5264
0.90	5.90	-0.5203	-0.5251	-0.5300	-0.5348	-0.5396
1.00	6.00	-0.5330	-0.5379	-0.5429	-0.5478	-0.5527
1.10	6.10	-0.5456	-0.5507	-0.5557	-0.5607	-0.5657
1.20	6.20	-0.5581	-0.5633	-0.5684	-0.5735	-0.5785
1.30	6.30	-0.5705	-0.5757	-0.5809	-0.5861	-0.5913
1.40	6.40	-0.5828	-0.5881	-0.5934	-0.5987	-0.6039
1.50	6.50	-0.5950	-0.6004	-0.6057	-0.6111	-0.6164
1.60	6.60	-0.6071	-0.6126	-0.6180	-0.6234	-0.6288
1.70	6.70	-0.6191	-0.6246	-0.6301	-0.6356	-0.6411
1.80	6.80	-0.6309	-0.6366	-0.6422	-0.6477	-0.6533
1.90	6.90	-0.6427	-0.6484	-0.6541	-0.6597	-0.6654
2.00	7.00	-0.6544	-0.6602	-0.6659	-0.6716	-0.6773
2.20	7.20	-0.6774	-0.6834	-0.6892	-0.6951	-0.7009
2.40	7.40	-0.7001	-0.7061	-0.7122	-0.7182	-0.7241
2.60	7.60	-0.7224	-0.7285	-0.7347	-0.7408	-0.7469
3.00	8.00	-0.7658	-0.7722	-0.7786	-0.7849	-0.7913

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 5.000 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.095	0.096	0.097	0.098	0.099
-3.00	-3.00	1.2686	1.2845	1.3004	1.3164	1.3325
-2.60	-2.60	1.1519	1.1661	1.1803	1.1946	1.2089
-2.40	-2.40	1.0952	1.1085	1.1219	1.1353	1.1488
-2.20	-2.20	1.0394	1.0520	1.0646	1.0772	1.0899
-2.00	-2.00	0.9847	0.9965	1.0083	1.0201	1.0320
-1.90	-1.90	0.9577	0.9691	0.9805	0.9920	1.0035
-1.80	-1.80	0.9310	0.9420	0.9530	0.9641	0.9752
-1.70	-1.70	0.9045	0.9151	0.9258	0.9365	0.9473
-1.60	-1.60	0.8782	0.8885	0.8988	0.9092	0.9195
-1.50	-1.50	0.8522	0.8621	0.8721	0.8821	0.8921
-1.40	-1.40	0.8264	0.8360	0.8456	0.8552	0.8649
-1.30	-1.30	0.8008	0.8101	0.8193	0.8286	0.8379
-1.20	-1.20	0.7755	0.7844	0.7933	0.8023	0.8112
-1.10	-1.10	0.7504	0.7590	0.7675	0.7762	0.7848
-1.00	-1.00	0.7255	0.7337	0.7420	0.7503	0.7586
-0.90	-0.90	0.7008	0.7088	0.7167	0.7247	0.7326
-0.80	-0.80	0.6764	0.6840	0.6917	0.6993	0.7069
-0.70	-0.70	0.6522	0.6595	0.6668	0.6741	0.6815
-0.60	-0.60	0.6282	0.6352	0.6422	0.6492	0.6563
-0.50	-0.50	0.6044	0.6111	0.6178	0.6246	0.6313
-0.40	-0.40	0.5809	0.5873	0.5937	0.6001	0.6065
-0.30	-0.30	0.5575	0.5636	0.5698	0.5759	0.5820
-0.20	-0.20	0.5344	0.5402	0.5460	0.5519	0.5577
-0.10	-0.10	0.5115	0.5170	0.5226	0.5281	0.5336
-0.00	-0.00	0.4888	0.4940	0.4993	0.5045	0.5098
0.00	5.00	-0.4202	-0.4241	-0.4280	-0.4319	-0.4357
0.10	5.10	-0.4345	-0.4385	-0.4425	-0.4465	-0.4504
0.20	5.20	-0.4487	-0.4528	-0.4569	-0.4610	-0.4650
0.30	5.30	-0.4628	-0.4670	-0.4711	-0.4753	-0.4795
0.40	5.40	-0.4767	-0.4810	-0.4853	-0.4895	-0.4938
0.50	5.50	-0.4905	-0.4949	-0.4992	-0.5036	-0.5080
0.60	5.60	-0.5041	-0.5086	-0.5131	-0.5176	-0.5220
0.70	5.70	-0.5177	-0.5223	-0.5268	-0.5314	-0.5359
0.80	5.80	-0.5311	-0.5358	-0.5404	-0.5451	-0.5497
0.90	5.90	-0.5444	-0.5492	-0.5539	-0.5587	-0.5634
1.00	6.00	-0.5576	-0.5624	-0.5673	-0.5721	-0.5769
1.10	6.10	-0.5706	-0.5756	-0.5805	-0.5854	-0.5903
1.20	6.20	-0.5835	-0.5886	-0.5936	-0.5986	-0.6036
1.30	6.30	-0.5964	-0.6015	-0.6066	-0.6117	-0.6167
1.40	6.40	-0.6091	-0.6143	-0.6195	-0.6246	-0.6298
1.50	6.50	-0.6217	-0.6270	-0.6322	-0.6375	-0.6427
1.60	6.60	-0.6342	-0.6395	-0.6449	-0.6502	-0.6554
1.70	6.70	-0.6466	-0.6520	-0.6574	-0.6628	-0.6681
1.80	6.80	-0.6588	-0.6643	-0.6698	-0.6752	-0.6807
1.90	6.90	-0.6710	-0.6765	-0.6821	-0.6876	-0.6931
2.00	7.00	-0.6830	-0.6886	-0.6942	-0.6998	-0.7054
2.20	7.20	-0.7067	-0.7125	-0.7183	-0.7240	-0.7297
2.40	7.40	-0.7301	-0.7360	-0.7418	-0.7477	-0.7535
2.60	7.60	-0.7530	-0.7590	-0.7650	-0.7709	-0.7769
3.00	8.00	-0.7975	-0.8038	-0.8100	-0.8162	-0.8223

TABLE A-4.
RATIO OF INDIRECT TO DIRECT COST FOR EXPOSURE TIME 5.000 YEARS

*****INTEREST RATE IVS*****

TL	TR	0.100	0.101	0.102	0.103	0.104
-3.00	-3.00	1.3486	1.3648	1.3811	1.3974	1.4137
-2.60	-2.60	1.2232	1.2377	1.2521	1.2666	1.2811
-2.40	-2.40	1.1623	1.1759	1.1895	1.2031	1.2168
-2.20	-2.20	1.1026	1.1153	1.1280	1.1409	1.1537
-2.00	-2.00	1.0439	1.0559	1.0679	1.0799	1.0919
-1.90	-1.90	1.0150	1.0266	1.0381	1.0497	1.0614
-1.80	-1.80	0.9864	0.9975	1.0087	1.0199	1.0312
-1.70	-1.70	0.9580	0.9688	0.9796	0.9905	1.0013
-1.60	-1.60	0.9299	0.9404	0.9508	0.9613	0.9717
-1.50	-1.50	0.9021	0.9122	0.9222	0.9323	0.9424
-1.40	-1.40	0.8746	0.8843	0.8940	0.9037	0.9134
-1.30	-1.30	0.8473	0.8566	0.8660	0.8753	0.8847
-1.20	-1.20	0.8202	0.8292	0.8382	0.8473	0.8563
-1.10	-1.10	0.7934	0.8021	0.8108	0.8194	0.8281
-1.00	-1.00	0.7669	0.7752	0.7836	0.7919	0.8003
-0.90	-0.90	0.7406	0.7486	0.7566	0.7646	0.7727
-0.80	-0.80	0.7146	0.7223	0.7300	0.7376	0.7453
-0.70	-0.70	0.6888	0.6962	0.7035	0.7109	0.7183
-0.60	-0.60	0.6633	0.6703	0.6774	0.6844	0.6915
-0.50	-0.50	0.6380	0.6447	0.6515	0.6582	0.6650
-0.40	-0.40	0.6129	0.6194	0.6258	0.6322	0.6387
-0.30	-0.30	0.5881	0.5943	0.5004	0.6065	0.6127
-0.20	-0.20	0.5635	0.5694	0.5752	0.5811	0.5869
-0.10	-0.10	0.5392	0.5448	0.5503	0.5559	0.5614
-0.00	-0.00	0.5151	0.5204	0.5256	0.5309	0.5362
0.00	5.00	-0.4395	-0.4434	-0.4472	-0.4510	-0.4548
0.10	5.10	-0.4544	-0.4583	-0.4622	-0.4661	-0.4700
0.20	5.20	-0.4691	-0.4731	-0.4771	-0.4811	-0.4851
0.30	5.30	-0.4836	-0.4878	-0.4919	-0.4960	-0.5001
0.40	5.40	-0.4980	-0.5023	-0.5065	-0.5107	-0.5149
0.50	5.50	-0.5123	-0.5166	-0.5210	-0.5253	-0.5295
0.60	5.60	-0.5265	-0.5309	-0.5353	-0.5397	-0.5440
0.70	5.70	-0.5405	-0.5450	-0.5495	-0.5539	-0.5584
0.80	5.80	-0.5543	-0.5589	-0.5635	-0.5681	-0.5726
0.90	5.90	-0.5681	-0.5728	-0.5774	-0.5821	-0.5867
1.00	6.00	-0.5817	-0.5865	-0.5912	-0.5960	-0.6007
1.10	6.10	-0.5952	-0.6000	-0.6049	-0.6097	-0.6145
1.20	6.20	-0.6085	-0.6135	-0.6184	-0.6233	-0.6281
1.30	6.30	-0.6218	-0.6268	-0.6318	-0.6367	-0.6417
1.40	6.40	-0.6349	-0.6400	-0.6450	-0.6501	-0.6551
1.50	6.50	-0.6478	-0.6530	-0.6581	-0.6633	-0.6684
1.60	6.60	-0.6607	-0.6659	-0.6711	-0.6763	-0.6815
1.70	6.70	-0.6734	-0.6787	-0.6840	-0.6893	-0.6945
1.80	6.80	-0.6861	-0.6914	-0.6968	-0.7021	-0.7074
1.90	6.90	-0.6985	-0.7040	-0.7094	-0.7148	-0.7202
2.00	7.00	-0.7109	-0.7164	-0.7219	-0.7274	-0.7328
2.20	7.20	-0.7353	-0.7410	-0.7466	-0.7521	-0.7577
2.40	7.40	-0.7593	-0.7650	-0.7707	-0.7764	-0.7821
2.60	7.60	-0.7827	-0.7886	-0.7944	-0.8002	-0.8060
3.00	8.00	-0.8284	-0.8345	-0.8405	-0.8465	-0.8525

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PHI

*****INTEREST RATE IVS*****

TR	0.060	0.061	0.062	0.063	0.064
-5.00	0.6775	0.6902	0.7025	0.7157	0.7285
-4.90	0.6620	0.6743	0.6867	0.6991	0.7116
-4.80	0.6465	0.6585	0.6706	0.6827	0.6948
-4.70	0.6311	0.6428	0.6545	0.6663	0.6781
-4.60	0.6158	0.6272	0.6386	0.6500	0.6615
-4.50	0.6006	0.6116	0.6227	0.6339	0.6451
-4.40	0.5854	0.5962	0.6070	0.6178	0.6287
-4.30	0.5704	0.5808	0.5913	0.6019	0.6124
-4.20	0.5554	0.5656	0.5758	0.5860	0.5962
-4.10	0.5406	0.5504	0.5603	0.5702	0.5802
-4.00	0.5258	0.5354	0.5449	0.5545	0.5642
-3.90	0.5111	0.5204	0.5296	0.5390	0.5483
-3.80	0.4965	0.5055	0.5145	0.5235	0.5325
-3.70	0.4820	0.4907	0.4994	0.5081	0.5168
-3.60	0.4675	0.4759	0.4843	0.4928	0.5013
-3.50	0.4532	0.4613	0.4694	0.4776	0.4858
-3.40	0.4389	0.4467	0.4546	0.4625	0.4704
-3.30	0.4247	0.4323	0.4395	0.4475	0.4551
-3.20	0.4106	0.4179	0.4252	0.4325	0.4399
-3.10	0.3966	0.4036	0.4106	0.4177	0.4248
-3.00	0.3826	0.3894	0.3962	0.4030	0.4097
-2.90	0.3688	0.3753	0.3818	0.3883	0.3948
-2.80	0.3550	0.3612	0.3675	0.3737	0.3800
-2.70	0.3413	0.3473	0.3533	0.3593	0.3653
-2.60	0.3277	0.3334	0.3391	0.3449	0.3506
-2.50	0.3141	0.3196	0.3251	0.3306	0.3361
-2.40	0.3007	0.3059	0.3111	0.3163	0.3216
-2.30	0.2873	0.2923	0.2972	0.3022	0.3072
-2.20	0.2740	0.2787	0.2834	0.2882	0.2929
-2.10	0.2607	0.2652	0.2697	0.2742	0.2787
-2.00	0.2476	0.2518	0.2561	0.2604	0.2646
-1.90	0.2345	0.2385	0.2425	0.2466	0.2506
-1.80	0.2215	0.2253	0.2291	0.2329	0.2366
-1.70	0.2086	0.2121	0.2157	0.2192	0.2228
-1.60	0.1957	0.1991	0.2024	0.2057	0.2090
-1.50	0.1830	0.1861	0.1892	0.1923	0.1953
-1.40	0.1703	0.1731	0.1760	0.1789	0.1818
-1.30	0.1576	0.1603	0.1629	0.1656	0.1682
-1.20	0.1451	0.1475	0.1499	0.1524	0.1548
-1.10	0.1326	0.1348	0.1370	0.1392	0.1415
-1.00	0.1202	0.1222	0.1242	0.1262	0.1282
-0.90	0.1079	0.1096	0.1114	0.1132	0.1150
-0.80	0.0956	0.0972	0.0988	0.1003	0.1019
-0.70	0.0834	0.0848	0.0861	0.0875	0.0889
-0.60	0.0713	0.0724	0.0736	0.0748	0.0760
-0.50	0.0592	0.0602	0.0612	0.0621	0.0631
-0.40	0.0472	0.0480	0.0488	0.0496	0.0503
-0.30	0.0353	0.0359	0.0365	0.0371	0.0376
-0.20	0.0235	0.0239	0.0242	0.0246	0.0250
-0.10	0.0117	0.0119	0.0121	0.0123	0.0125

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PHI

*****INTEREST RATE IVS*****					
TR	0.060	0.061	0.062	0.063	0.064
-0.00	0.0	0.0	0.0	0.0	0.0
1.00	-0.1134	-0.1152	-0.1165	-0.1187	-0.1205
1.10	-0.1244	-0.1263	-0.1283	-0.1302	-0.1321
1.20	-0.1353	-0.1374	-0.1395	-0.1416	-0.1437
1.30	-0.1461	-0.1484	-0.1507	-0.1529	-0.1552
1.40	-0.1569	-0.1594	-0.1618	-0.1642	-0.1666
1.50	-0.1677	-0.1702	-0.1728	-0.1754	-0.1780
1.60	-0.1783	-0.1811	-0.1838	-0.1865	-0.1893
1.70	-0.1889	-0.1918	-0.1947	-0.1976	-0.2005
1.80	-0.1995	-0.2025	-0.2056	-0.2086	-0.2116
1.90	-0.2099	-0.2131	-0.2163	-0.2195	-0.2227
2.00	-0.2204	-0.2237	-0.2271	-0.2304	-0.2337
2.10	-0.2347	-0.2382	-0.2417	-0.2452	-0.2487
2.20	-0.2510	-0.2547	-0.2583	-0.2619	-0.2656
2.30	-0.2513	-0.2550	-0.2588	-0.2626	-0.2664
2.40	-0.2614	-0.2654	-0.2693	-0.2732	-0.2771
2.50	-0.2715	-0.2756	-0.2797	-0.2837	-0.2878
2.60	-0.2816	-0.2858	-0.2900	-0.2942	-0.2984
2.70	-0.2916	-0.2960	-0.3003	-0.3046	-0.3089
2.80	-0.3016	-0.3060	-0.3105	-0.3150	-0.3194
2.90	-0.3114	-0.3161	-0.3207	-0.3253	-0.3298
3.00	-0.3213	-0.3260	-0.3308	-0.3355	-0.3402
3.10	-0.3310	-0.3359	-0.3408	-0.3456	-0.3505
3.20	-0.3408	-0.3458	-0.3508	-0.3557	-0.3607
3.30	-0.3504	-0.3556	-0.3607	-0.3658	-0.3708
3.40	-0.3600	-0.3653	-0.3705	-0.3757	-0.3809
3.50	-0.3696	-0.3750	-0.3803	-0.3856	-0.3910
3.60	-0.3791	-0.3846	-0.3900	-0.3955	-0.4009
3.70	-0.3885	-0.3941	-0.3997	-0.4053	-0.4108
3.80	-0.3979	-0.4036	-0.4093	-0.4150	-0.4207
3.90	-0.4072	-0.4131	-0.4189	-0.4247	-0.4305
4.00	-0.4165	-0.4225	-0.4284	-0.4343	-0.4402
4.10	-0.4257	-0.4318	-0.4378	-0.4439	-0.4499
4.20	-0.4349	-0.4411	-0.4472	-0.4534	-0.4595
4.30	-0.4440	-0.4503	-0.4566	-0.4628	-0.4690
4.40	-0.4530	-0.4594	-0.4658	-0.4722	-0.4785
4.50	-0.4620	-0.4686	-0.4751	-0.4815	-0.4879
4.60	-0.4710	-0.4776	-0.4842	-0.4908	-0.4973
4.70	-0.4799	-0.4866	-0.4932	-0.5000	-0.5066
4.80	-0.4887	-0.4956	-0.5024	-0.5091	-0.5159
4.90	-0.4975	-0.5045	-0.5114	-0.5182	-0.5251
5.00	-0.5063	-0.5133	-0.5203	-0.5273	-0.5342
5.10	-0.5150	-0.5221	-0.5292	-0.5363	-0.5433
5.20	-0.5236	-0.5309	-0.5381	-0.5452	-0.5523
5.30	-0.5322	-0.5396	-0.5468	-0.5541	-0.5613
5.40	-0.5408	-0.5482	-0.5556	-0.5629	-0.5702
5.50	-0.5493	-0.5568	-0.5643	-0.5717	-0.5791
5.60	-0.5577	-0.5653	-0.5729	-0.5804	-0.5879
5.70	-0.5661	-0.5738	-0.5815	-0.5891	-0.5966
5.80	-0.5745	-0.5823	-0.5900	-0.5977	-0.6053

TABLE A-5. RATIO U/L/UD USING TIME MEASURED FROM T SUE PHI

***** INTEREST RATE IVS*****					
TR	0.065	0.066	0.067	0.068	0.069
-5.00	0.7414	0.7543	0.7672	0.7802	0.7933
-4.90	0.7241	0.7367	0.7493	0.7620	0.7747
-4.80	0.7070	0.7192	0.7315	0.7438	0.7562
-4.70	0.6900	0.7019	0.7136	0.7258	0.7379
-4.60	0.6731	0.6847	0.6963	0.7075	0.7196
-4.50	0.6563	0.6675	0.6788	0.6902	0.7015
-4.40	0.6396	0.6505	0.6615	0.6725	0.6835
-4.30	0.6230	0.6336	0.6443	0.6550	0.6657
-4.20	0.6065	0.6168	0.6272	0.6375	0.6479
-4.10	0.5901	0.6001	0.6102	0.6202	0.6303
-4.00	0.5738	0.5835	0.5933	0.6030	0.6128
-3.90	0.5577	0.5671	0.5765	0.5855	0.5954
-3.80	0.5416	0.5507	0.5596	0.5685	0.5781
-3.70	0.5256	0.5344	0.5432	0.5521	0.5609
-3.60	0.5097	0.5182	0.5268	0.5353	0.5435
-3.50	0.4940	0.5022	0.5104	0.5187	0.5269
-3.40	0.4783	0.4862	0.4942	0.5021	0.5101
-3.30	0.4627	0.4704	0.4780	0.4857	0.4934
-3.20	0.4472	0.4546	0.4620	0.4694	0.4768
-3.10	0.4318	0.4389	0.4461	0.4532	0.4603
-3.00	0.4166	0.4234	0.4302	0.4371	0.4439
-2.90	0.4014	0.4079	0.4145	0.4211	0.4277
-2.80	0.3863	0.3926	0.3985	0.4052	0.4115
-2.70	0.3713	0.3773	0.3833	0.3894	0.3954
-2.60	0.3564	0.3621	0.3675	0.3737	0.3795
-2.50	0.3416	0.3471	0.3526	0.3581	0.3636
-2.40	0.3268	0.3321	0.3374	0.3426	0.3479
-2.30	0.3122	0.3172	0.3222	0.3272	0.3323
-2.20	0.2977	0.3024	0.3072	0.3120	0.3167
-2.10	0.2832	0.2877	0.2922	0.2968	0.3013
-2.00	0.2689	0.2731	0.2774	0.2817	0.2860
-1.90	0.2546	0.2586	0.2627	0.2667	0.2708
-1.80	0.2404	0.2442	0.2480	0.2518	0.2556
-1.70	0.2264	0.2299	0.2335	0.2370	0.2406
-1.60	0.2124	0.2157	0.2190	0.2224	0.2257
-1.50	0.1984	0.2016	0.2047	0.2078	0.2109
-1.40	0.1846	0.1875	0.1904	0.1933	0.1961
-1.30	0.1709	0.1735	0.1762	0.1785	0.1815
-1.20	0.1572	0.1597	0.1621	0.1646	0.1670
-1.10	0.1437	0.1459	0.1481	0.1503	0.1526
-1.00	0.1302	0.1322	0.1342	0.1362	0.1382
-0.90	0.1168	0.1186	0.1204	0.1222	0.1240
-0.80	0.1035	0.1051	0.1067	0.1083	0.1098
-0.70	0.0903	0.0917	0.0930	0.0944	0.0958
-0.60	0.0771	0.0783	0.0795	0.0807	0.0818
-0.50	0.0641	0.0650	0.0660	0.0670	0.0680
-0.40	0.0511	0.0519	0.0526	0.0534	0.0542
-0.30	0.0382	0.0388	0.0394	0.0399	0.0405
-0.20	0.0254	0.0258	0.0261	0.0265	0.0269
-0.10	0.0127	0.0128	0.0130	0.0132	0.0134

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PHI

*****INTEREST RATE IVS*****

TR	0.065	0.066	0.067	0.068	0.069
-0.00	0.0	0.0	0.0	0.0	0.0
1.00	-0.1223	-0.1240	-0.1258	-0.1275	-0.1293
1.10	-0.1341	-0.1360	-0.1379	-0.1398	-0.1418
1.20	-0.1458	-0.1479	-0.1500	-0.1521	-0.1541
1.30	-0.1575	-0.1597	-0.1620	-0.1642	-0.1664
1.40	-0.1690	-0.1715	-0.1739	-0.1763	-0.1786
1.50	-0.1806	-0.1831	-0.1857	-0.1882	-0.1908
1.60	-0.1920	-0.1947	-0.1974	-0.2001	-0.2028
1.70	-0.2034	-0.2062	-0.2091	-0.2120	-0.2148
1.80	-0.2147	-0.2177	-0.2207	-0.2237	-0.2267
1.90	-0.2259	-0.2291	-0.2322	-0.2354	-0.2385
2.00	-0.2371	-0.2404	-0.2437	-0.2470	-0.2503
2.10	-0.2481	-0.2516	-0.2550	-0.2585	-0.2619
2.20	-0.2592	-0.2628	-0.2663	-0.2699	-0.2735
2.30	-0.2701	-0.2739	-0.2776	-0.2813	-0.2850
2.40	-0.2810	-0.2849	-0.2887	-0.2926	-0.2964
2.50	-0.2918	-0.2958	-0.2998	-0.3038	-0.3078
2.60	-0.3025	-0.3067	-0.3108	-0.3149	-0.3190
2.70	-0.3132	-0.3175	-0.3218	-0.3260	-0.3302
2.80	-0.3238	-0.3282	-0.3326	-0.3370	-0.3414
2.90	-0.3344	-0.3389	-0.3434	-0.3479	-0.3524
3.00	-0.3449	-0.3495	-0.3542	-0.3588	-0.3634
3.10	-0.3553	-0.3601	-0.3648	-0.3696	-0.3743
3.20	-0.3656	-0.3705	-0.3754	-0.3803	-0.3851
3.30	-0.3759	-0.3809	-0.3859	-0.3909	-0.3959
3.40	-0.3861	-0.3913	-0.3964	-0.4015	-0.4066
3.50	-0.3963	-0.4015	-0.4068	-0.4120	-0.4172
3.60	-0.4063	-0.4117	-0.4171	-0.4224	-0.4277
3.70	-0.4164	-0.4219	-0.4273	-0.4328	-0.4382
3.80	-0.4263	-0.4319	-0.4375	-0.4431	-0.4486
3.90	-0.4362	-0.4420	-0.4476	-0.4533	-0.4590
4.00	-0.4461	-0.4519	-0.4577	-0.4635	-0.4692
4.10	-0.4558	-0.4618	-0.4677	-0.4736	-0.4794
4.20	-0.4656	-0.4716	-0.4776	-0.4836	-0.4896
4.30	-0.4752	-0.4814	-0.4875	-0.4936	-0.4996
4.40	-0.4848	-0.4911	-0.4973	-0.5035	-0.5096
4.50	-0.4943	-0.5007	-0.5070	-0.5133	-0.5196
4.60	-0.5038	-0.5103	-0.5167	-0.5231	-0.5294
4.70	-0.5132	-0.5198	-0.5263	-0.5328	-0.5392
4.80	-0.5226	-0.5292	-0.5358	-0.5424	-0.5490
4.90	-0.5319	-0.5386	-0.5453	-0.5520	-0.5586
5.00	-0.5411	-0.5479	-0.5547	-0.5615	-0.5682
5.10	-0.5503	-0.5572	-0.5641	-0.5710	-0.5778
5.20	-0.5594	-0.5664	-0.5734	-0.5804	-0.5873
5.30	-0.5685	-0.5756	-0.5827	-0.5897	-0.5967
5.40	-0.5775	-0.5847	-0.5918	-0.5990	-0.6060
5.50	-0.5864	-0.5937	-0.6010	-0.6082	-0.6153
5.60	-0.5953	-0.6027	-0.6100	-0.6173	-0.6246
5.70	-0.6042	-0.6116	-0.6190	-0.6264	-0.6337
5.80	-0.6129	-0.6205	-0.6280	-0.6354	-0.6428

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PH1

***** INTEREST RATE IVS*****					
TR	0.070	0.071	0.072	0.073	0.074
-5.00	0.8064	0.8195	0.8327	0.8466	0.8593
-4.90	0.7874	0.8002	0.8131	0.8266	0.8385
-4.80	0.7686	0.7811	0.7936	0.8061	0.8187
-4.70	0.7499	0.7620	0.7742	0.7864	0.7980
-4.60	0.7314	0.7431	0.7556	0.7668	0.7787
-4.50	0.7129	0.7244	0.7355	0.7474	0.7585
-4.40	0.6946	0.7057	0.7165	0.7281	0.7393
-4.30	0.6764	0.6872	0.6980	0.7089	0.7198
-4.20	0.6584	0.6688	0.6793	0.6898	0.7004
-4.10	0.6404	0.6505	0.6607	0.6705	0.6812
-4.00	0.6226	0.6324	0.6423	0.6522	0.6621
-3.90	0.6049	0.6144	0.6235	0.6325	0.6431
-3.80	0.5873	0.5965	0.6057	0.6156	0.6243
-3.70	0.5698	0.5787	0.5877	0.5966	0.6050
-3.60	0.5525	0.5611	0.5697	0.5784	0.5870
-3.50	0.5352	0.5436	0.5515	0.5602	0.5686
-3.40	0.5181	0.5261	0.5342	0.5422	0.5503
-3.30	0.5011	0.5088	0.5166	0.5244	0.5321
-3.20	0.4842	0.4917	0.4991	0.5066	0.5141
-3.10	0.4675	0.4746	0.4818	0.4890	0.4962
-3.00	0.4508	0.4577	0.4646	0.4715	0.4784
-2.90	0.4343	0.4409	0.4475	0.4541	0.4608
-2.80	0.4178	0.4242	0.4305	0.4365	0.4432
-2.70	0.4015	0.4076	0.4137	0.4197	0.4258
-2.60	0.3853	0.3911	0.3965	0.4027	0.4086
-2.50	0.3692	0.3747	0.3803	0.3858	0.3914
-2.40	0.3532	0.3585	0.3638	0.3691	0.3744
-2.30	0.3373	0.3423	0.3474	0.3524	0.3575
-2.20	0.3215	0.3263	0.3311	0.3355	0.3407
-2.10	0.3058	0.3104	0.3145	0.3189	0.3240
-2.00	0.2903	0.2945	0.2986	0.3031	0.3074
-1.90	0.2748	0.2788	0.2825	0.2865	0.2910
-1.80	0.2594	0.2632	0.2671	0.2705	0.2747
-1.70	0.2442	0.2477	0.2513	0.2545	0.2585
-1.60	0.2290	0.2324	0.2357	0.2390	0.2424
-1.50	0.2140	0.2171	0.2202	0.2233	0.2264
-1.40	0.1990	0.2019	0.2046	0.2077	0.2108
-1.30	0.1842	0.1868	0.1895	0.1921	0.1948
-1.20	0.1694	0.1719	0.1743	0.1767	0.1792
-1.10	0.1546	0.1570	0.1592	0.1614	0.1636
-1.00	0.1402	0.1422	0.1442	0.1462	0.1482
-0.90	0.1256	0.1276	0.1293	0.1311	0.1329
-0.80	0.1114	0.1130	0.1146	0.1162	0.1177
-0.70	0.0972	0.0985	0.0995	0.1013	0.1026
-0.60	0.0830	0.0842	0.0853	0.0865	0.0877
-0.50	0.0689	0.0699	0.0705	0.0718	0.0728
-0.40	0.0550	0.0557	0.0565	0.0573	0.0580
-0.30	0.0411	0.0416	0.0422	0.0428	0.0434
-0.20	0.0273	0.0277	0.0280	0.0284	0.0288
-0.10	0.0136	0.0138	0.0140	0.0142	0.0143

TABLE A-5. KATIO UC/UD USING TIME PEASURED FROM T SUB PHI

***** INTEREST RATE IVS*****						
TR	0.070	0.071	0.072	0.073	0.074	
-0.00	0.0	0.0	0.0	0.0	0.0	0.0
1.00	-0.1311	-0.1328	-0.1345	-0.1363	-0.1380	-0.1380
1.10	-0.1437	-0.1456	-0.1475	-0.1494	-0.1513	-0.1513
1.20	-0.1562	-0.1583	-0.1603	-0.1624	-0.1645	-0.1645
1.30	-0.1687	-0.1709	-0.1731	-0.1753	-0.1775	-0.1775
1.40	-0.1810	-0.1834	-0.1856	-0.1882	-0.1905	-0.1905
1.50	-0.1933	-0.1959	-0.1984	-0.2005	-0.2034	-0.2034
1.60	-0.2055	-0.2082	-0.2105	-0.2136	-0.2162	-0.2162
1.70	-0.2176	-0.2205	-0.2233	-0.2261	-0.2289	-0.2289
1.80	-0.2297	-0.2327	-0.2356	-0.2386	-0.2416	-0.2416
1.90	-0.2416	-0.2448	-0.2475	-0.2516	-0.2541	-0.2541
2.00	-0.2535	-0.2568	-0.2600	-0.2633	-0.2665	-0.2665
2.10	-0.2653	-0.2687	-0.2721	-0.2755	-0.2789	-0.2789
2.20	-0.2770	-0.2806	-0.2841	-0.2876	-0.2912	-0.2912
2.30	-0.2887	-0.2924	-0.2960	-0.2997	-0.3033	-0.3033
2.40	-0.3002	-0.3041	-0.3075	-0.3116	-0.3154	-0.3154
2.50	-0.3117	-0.3157	-0.3196	-0.3235	-0.3274	-0.3274
2.60	-0.3231	-0.3272	-0.3313	-0.3353	-0.3394	-0.3394
2.70	-0.3345	-0.3387	-0.3425	-0.3476	-0.3512	-0.3512
2.80	-0.3457	-0.3500	-0.3544	-0.3587	-0.3629	-0.3629
2.90	-0.3569	-0.3613	-0.3656	-0.3702	-0.3746	-0.3746
3.00	-0.3680	-0.3726	-0.3771	-0.3817	-0.3862	-0.3862
3.10	-0.3790	-0.3837	-0.3884	-0.3931	-0.3977	-0.3977
3.20	-0.3900	-0.3948	-0.3996	-0.4044	-0.4091	-0.4091
3.30	-0.4008	-0.4058	-0.4107	-0.4156	-0.4205	-0.4205
3.40	-0.4117	-0.4167	-0.4217	-0.4267	-0.4317	-0.4317
3.50	-0.4224	-0.4275	-0.4327	-0.4378	-0.4429	-0.4429
3.60	-0.4330	-0.4383	-0.4436	-0.4488	-0.4540	-0.4540
3.70	-0.4436	-0.4490	-0.4544	-0.4597	-0.4650	-0.4650
3.80	-0.4541	-0.4596	-0.4651	-0.4705	-0.4760	-0.4760
3.90	-0.4646	-0.4702	-0.4758	-0.4813	-0.4868	-0.4868
4.00	-0.4750	-0.4807	-0.4863	-0.4920	-0.4976	-0.4976
4.10	-0.4853	-0.4911	-0.4966	-0.5026	-0.5083	-0.5083
4.20	-0.4955	-0.5014	-0.5073	-0.5131	-0.5189	-0.5189
4.30	-0.5057	-0.5117	-0.5176	-0.5236	-0.5295	-0.5295
4.40	-0.5158	-0.5219	-0.5275	-0.5340	-0.5400	-0.5400
4.50	-0.5258	-0.5320	-0.5382	-0.5443	-0.5504	-0.5504
4.60	-0.5358	-0.5421	-0.5483	-0.5545	-0.5607	-0.5607
4.70	-0.5457	-0.5520	-0.5584	-0.5647	-0.5710	-0.5710
4.80	-0.5555	-0.5620	-0.5684	-0.5748	-0.5812	-0.5812
4.90	-0.5652	-0.5718	-0.5783	-0.5848	-0.5913	-0.5913
5.00	-0.5749	-0.5816	-0.5882	-0.5948	-0.6013	-0.6013
5.10	-0.5846	-0.5913	-0.5980	-0.6047	-0.6113	-0.6113
5.20	-0.5941	-0.6010	-0.6078	-0.6145	-0.6212	-0.6212
5.30	-0.6036	-0.6105	-0.6174	-0.6243	-0.6310	-0.6310
5.40	-0.6131	-0.6201	-0.6270	-0.6339	-0.6406	-0.6406
5.50	-0.6225	-0.6295	-0.6366	-0.6436	-0.6505	-0.6505
5.60	-0.6318	-0.6388	-0.6460	-0.6531	-0.6601	-0.6601
5.70	-0.6410	-0.6482	-0.6554	-0.6626	-0.6697	-0.6697
5.80	-0.6502	-0.6575	-0.6648	-0.6720	-0.6792	-0.6792

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PHI

***** INTEREST RATE IVS*****					
TR	0.075	0.076	0.077	0.078	0.075
-5.00	0.8727	0.8860	0.8995	0.913C	0.9266
-4.90	0.8519	0.8650	0.8781	0.8912	0.9044
-4.80	0.8314	0.8440	0.8566	0.8695	0.8823
-4.70	0.8109	0.8232	0.8356	0.848C	0.8605
-4.60	0.7906	0.8026	0.8146	0.8267	0.8384
-4.50	0.7705	0.7821	0.7936	0.8055	0.8173
-4.40	0.7505	0.7618	0.7731	0.7845	0.7959
-4.30	0.7307	0.7416	0.7526	0.7636	0.7747
-4.20	0.7110	0.7216	0.7323	0.7425	0.7537
-4.10	0.6914	0.7017	0.712C	0.7224	0.7328
-4.00	0.6720	0.6820	0.692C	0.702C	0.7120
-3.90	0.6527	0.6624	0.6721	0.6817	0.6915
-3.80	0.6336	0.6429	0.6523	0.6617	0.6711
-3.70	0.6146	0.6236	0.6327	0.6417	0.6508
-3.60	0.5957	0.6044	0.6132	0.6219	0.6307
-3.50	0.5770	0.5854	0.5936	0.6023	0.6108
-3.40	0.5584	0.5665	0.5746	0.5828	0.5910
-3.30	0.5399	0.5478	0.5556	0.5634	0.5713
-3.20	0.5216	0.5291	0.5367	0.5442	0.5518
-3.10	0.5034	0.5107	0.5175	0.5252	0.5325
-3.00	0.4854	0.4923	0.4993	0.5063	0.5132
-2.90	0.4674	0.4741	0.4808	0.4875	0.4942
-2.80	0.4496	0.4560	0.4624	0.4688	0.4753
-2.70	0.4320	0.4381	0.4442	0.4503	0.4565
-2.60	0.4144	0.4203	0.4261	0.432C	0.4379
-2.50	0.3970	0.4026	0.4082	0.4138	0.4194
-2.40	0.3797	0.3850	0.3903	0.3957	0.4010
-2.30	0.3625	0.3676	0.3727	0.3777	0.3828
-2.20	0.3455	0.3503	0.3551	0.3595	0.3647
-2.10	0.3285	0.3331	0.3377	0.3422	0.3468
-2.00	0.3117	0.3161	0.3204	0.3247	0.3290
-1.90	0.2951	0.2991	0.3032	0.3073	0.3113
-1.80	0.2785	0.2823	0.2862	0.2900	0.2938
-1.70	0.2621	0.2656	0.2692	0.2728	0.2764
-1.60	0.2457	0.2491	0.2524	0.2558	0.2591
-1.50	0.2295	0.2326	0.2358	0.2385	0.2420
-1.40	0.2134	0.2163	0.2192	0.2221	0.225C
-1.30	0.1975	0.2001	0.2028	0.2055	0.2081
-1.20	0.1816	0.1841	0.1865	0.1885	0.1914
-1.10	0.1659	0.1681	0.1703	0.1725	0.1747
-1.00	0.1502	0.1522	0.1542	0.1562	0.1583
-0.90	0.1347	0.1365	0.1383	0.1401	0.1419
-0.80	0.1193	0.1209	0.1225	0.1241	0.1256
-0.70	0.1040	0.1054	0.1068	0.1081	0.1095
-0.60	0.0888	0.0900	0.0912	0.0923	0.0935
-0.50	0.0738	0.0747	0.0757	0.0767	0.0776
-0.40	0.0588	0.0596	0.0603	0.0611	0.0619
-0.30	0.0439	0.0445	0.0451	0.0456	0.0462
-0.20	0.0292	0.0296	0.0295	0.0303	0.0307
-0.10	0.0145	0.0147	0.0145	0.0151	0.0153

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PH1

***** INTEREST RATE IVS*****					
TR	0.075	0.076	0.077	0.078	0.079
-0.00	0.0	0.0	0.0	0.0	0.0
1.00	-0.1398	-0.1415	-0.1432	-0.1449	-0.1467
1.10	-0.1532	-0.1551	-0.1570	-0.1588	-0.1607
1.20	-0.1665	-0.1686	-0.1706	-0.1726	-0.1747
1.30	-0.1798	-0.1820	-0.1842	-0.1863	-0.1885
1.40	-0.1929	-0.1952	-0.1974	-0.1995	-0.2023
1.50	-0.2059	-0.2084	-0.2105	-0.2134	-0.2159
1.60	-0.2189	-0.2215	-0.2242	-0.2268	-0.2295
1.70	-0.2317	-0.2345	-0.2372	-0.2401	-0.2425
1.80	-0.2445	-0.2474	-0.2504	-0.2533	-0.2562
1.90	-0.2572	-0.2603	-0.2632	-0.2664	-0.2695
2.00	-0.2698	-0.2730	-0.2762	-0.2794	-0.2826
2.10	-0.2823	-0.2856	-0.2890	-0.2923	-0.2956
2.20	-0.2947	-0.2981	-0.3016	-0.3051	-0.3086
2.30	-0.3070	-0.3106	-0.3142	-0.3178	-0.3214
2.40	-0.3192	-0.3229	-0.3267	-0.3304	-0.3341
2.50	-0.3313	-0.3352	-0.3391	-0.3425	-0.3468
2.60	-0.3434	-0.3474	-0.3514	-0.3554	-0.3593
2.70	-0.3553	-0.3595	-0.3636	-0.3677	-0.3718
2.80	-0.3672	-0.3715	-0.3757	-0.3799	-0.3841
2.90	-0.3790	-0.3834	-0.3877	-0.3921	-0.3964
3.00	-0.3907	-0.3952	-0.3997	-0.4041	-0.4086
3.10	-0.4023	-0.4069	-0.4115	-0.4161	-0.4206
3.20	-0.4139	-0.4186	-0.4233	-0.4280	-0.4326
3.30	-0.4253	-0.4301	-0.4350	-0.4398	-0.4445
3.40	-0.4367	-0.4416	-0.4465	-0.4514	-0.4563
3.50	-0.4480	-0.4530	-0.4581	-0.4631	-0.4681
3.60	-0.4592	-0.4643	-0.4695	-0.4746	-0.4797
3.70	-0.4703	-0.4756	-0.4808	-0.4860	-0.4912
3.80	-0.4813	-0.4867	-0.4921	-0.4974	-0.5027
3.90	-0.4923	-0.4978	-0.5032	-0.5086	-0.5140
4.00	-0.5032	-0.5088	-0.5143	-0.5198	-0.5253
4.10	-0.5140	-0.5197	-0.5253	-0.5305	-0.5365
4.20	-0.5247	-0.5305	-0.5362	-0.5415	-0.5470
4.30	-0.5354	-0.5412	-0.5471	-0.5525	-0.5586
4.40	-0.5460	-0.5519	-0.5578	-0.5637	-0.5696
4.50	-0.5565	-0.5625	-0.5685	-0.5745	-0.5804
4.60	-0.5669	-0.5730	-0.5791	-0.5852	-0.5912
4.70	-0.5772	-0.5835	-0.5896	-0.5956	-0.6019
4.80	-0.5875	-0.5938	-0.6001	-0.6063	-0.6125
4.90	-0.5977	-0.6041	-0.6105	-0.6168	-0.6231
5.00	-0.6079	-0.6143	-0.6208	-0.6272	-0.6335
5.10	-0.6179	-0.6245	-0.6310	-0.6375	-0.6439
5.20	-0.6279	-0.6345	-0.6411	-0.6477	-0.6542
5.30	-0.6378	-0.6445	-0.6512	-0.6578	-0.6644
5.40	-0.6476	-0.6544	-0.6612	-0.6675	-0.6746
5.50	-0.6574	-0.6643	-0.6711	-0.6779	-0.6846
5.60	-0.6671	-0.6740	-0.6805	-0.6878	-0.6946
5.70	-0.6767	-0.6837	-0.6907	-0.6976	-0.7045
5.80	-0.6863	-0.6934	-0.7004	-0.7074	-0.7144

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PH1

*****INTEREST RATE IVS*****					
TR	0.080	0.081	0.082	0.083	0.084
-5.00	0.9402	0.9538	0.9675	0.9813	0.9951
-4.90	0.9176	0.9309	0.9442	0.9576	0.9710
-4.80	0.8952	0.9081	0.9211	0.9340	0.9471
-4.70	0.8730	0.8855	0.8981	0.9107	0.9234
-4.60	0.8509	0.8631	0.8753	0.8876	0.8999
-4.50	0.8290	0.8409	0.8527	0.8646	0.8766
-4.40	0.8073	0.8189	0.8303	0.8418	0.8534
-4.30	0.7858	0.7969	0.8081	0.8192	0.8305
-4.20	0.7644	0.7752	0.7860	0.7968	0.8077
-4.10	0.7432	0.7536	0.7641	0.7746	0.7851
-4.00	0.7221	0.7322	0.7424	0.7525	0.7627
-3.90	0.7012	0.7110	0.7208	0.7306	0.7405
-3.80	0.6805	0.6900	0.6994	0.7089	0.7185
-3.70	0.6599	0.6691	0.6782	0.6874	0.6966
-3.60	0.6395	0.6483	0.6572	0.6660	0.6749
-3.50	0.6193	0.6278	0.6363	0.6448	0.6534
-3.40	0.5991	0.6073	0.6156	0.6238	0.6321
-3.30	0.5792	0.5871	0.5950	0.6029	0.6109
-3.20	0.5594	0.5670	0.5746	0.5822	0.5899
-3.10	0.5398	0.5471	0.5544	0.5617	0.5691
-3.00	0.5203	0.5273	0.5343	0.5413	0.5484
-2.90	0.5009	0.5076	0.5144	0.5211	0.5279
-2.80	0.4817	0.4882	0.4946	0.5011	0.5076
-2.70	0.4627	0.4688	0.4750	0.4812	0.4874
-2.60	0.4438	0.4496	0.4556	0.4615	0.4674
-2.50	0.4250	0.4306	0.4363	0.4419	0.4475
-2.40	0.4064	0.4117	0.4171	0.4225	0.4279
-2.30	0.3879	0.3930	0.3981	0.4032	0.4083
-2.20	0.3696	0.3744	0.3792	0.3841	0.3889
-2.10	0.3514	0.3560	0.3605	0.3651	0.3697
-2.00	0.3333	0.3377	0.3420	0.3463	0.3507
-1.90	0.3154	0.3195	0.3236	0.3277	0.3318
-1.80	0.2976	0.3015	0.3053	0.3092	0.3130
-1.70	0.2800	0.2836	0.2872	0.2908	0.2944
-1.60	0.2625	0.2659	0.2692	0.2726	0.2759
-1.50	0.2451	0.2482	0.2514	0.2545	0.2576
-1.40	0.2279	0.2308	0.2337	0.2366	0.2395
-1.30	0.2108	0.2134	0.2161	0.2188	0.2215
-1.20	0.1938	0.1963	0.1987	0.2011	0.2036
-1.10	0.1770	0.1792	0.1814	0.1836	0.1859
-1.00	0.1603	0.1623	0.1643	0.1663	0.1683
-0.90	0.1437	0.1455	0.1472	0.1490	0.1508
-0.80	0.1272	0.1288	0.1304	0.1319	0.1335
-0.70	0.1109	0.1122	0.1136	0.1150	0.1164
-0.60	0.0947	0.0958	0.0970	0.0982	0.0993
-0.50	0.0786	0.0795	0.0805	0.0815	0.0824
-0.40	0.0626	0.0634	0.0642	0.0649	0.0657
-0.30	0.0468	0.0474	0.0479	0.0485	0.0491
-0.20	0.0311	0.0314	0.0318	0.0322	0.0326
-0.10	0.0155	0.0157	0.0158	0.0160	0.0162

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PHI

*****INTEREST RATE IVS*****					
TR	0.080	0.081	0.082	0.083	0.084
-0.00	0.0	0.0	0.0	0.0	0.0
1.00	-0.1484	-0.1501	-0.1518	-0.1535	-0.1552
1.10	-0.1626	-0.1645	-0.1663	-0.1682	-0.1701
1.20	-0.1767	-0.1787	-0.1808	-0.1828	-0.1848
1.30	-0.1907	-0.1929	-0.1951	-0.1972	-0.1994
1.40	-0.2046	-0.2069	-0.2093	-0.2116	-0.2139
1.50	-0.2184	-0.2209	-0.2233	-0.2258	-0.2283
1.60	-0.2321	-0.2347	-0.2373	-0.2399	-0.2425
1.70	-0.2457	-0.2484	-0.2512	-0.2539	-0.2567
1.80	-0.2591	-0.2620	-0.2649	-0.2678	-0.2707
1.90	-0.2725	-0.2755	-0.2786	-0.2816	-0.2846
2.00	-0.2858	-0.2890	-0.2921	-0.2953	-0.2984
2.10	-0.2989	-0.3023	-0.3056	-0.3088	-0.3121
2.20	-0.3120	-0.3154	-0.3189	-0.3223	-0.3257
2.30	-0.3250	-0.3285	-0.3321	-0.3356	-0.3392
2.40	-0.3378	-0.3415	-0.3452	-0.3489	-0.3526
2.50	-0.3506	-0.3544	-0.3582	-0.3620	-0.3658
2.60	-0.3633	-0.3672	-0.3711	-0.3751	-0.3790
2.70	-0.3759	-0.3799	-0.3840	-0.3880	-0.3920
2.80	-0.3883	-0.3925	-0.3967	-0.4008	-0.4050
2.90	-0.4007	-0.4050	-0.4093	-0.4135	-0.4178
3.00	-0.4130	-0.4174	-0.4218	-0.4262	-0.4305
3.10	-0.4252	-0.4297	-0.4342	-0.4387	-0.4432
3.20	-0.4373	-0.4419	-0.4465	-0.4511	-0.4557
3.30	-0.4493	-0.4540	-0.4587	-0.4634	-0.4681
3.40	-0.4612	-0.4660	-0.4709	-0.4757	-0.4805
3.50	-0.4730	-0.4780	-0.4829	-0.4878	-0.4927
3.60	-0.4848	-0.4898	-0.4948	-0.4998	-0.5048
3.70	-0.4964	-0.5015	-0.5067	-0.5118	-0.5169
3.80	-0.5079	-0.5132	-0.5184	-0.5236	-0.5288
3.90	-0.5194	-0.5248	-0.5301	-0.5354	-0.5406
4.00	-0.5308	-0.5362	-0.5416	-0.5470	-0.5524
4.10	-0.5421	-0.5476	-0.5531	-0.5586	-0.5641
4.20	-0.5533	-0.5589	-0.5645	-0.5701	-0.5756
4.30	-0.5644	-0.5701	-0.5758	-0.5814	-0.5871
4.40	-0.5754	-0.5812	-0.5870	-0.5927	-0.5985
4.50	-0.5864	-0.5923	-0.5981	-0.6039	-0.6097
4.60	-0.5972	-0.6032	-0.6091	-0.6151	-0.6209
4.70	-0.6080	-0.6141	-0.6201	-0.6261	-0.6320
4.80	-0.6187	-0.6248	-0.6309	-0.6370	-0.6431
4.90	-0.6293	-0.6355	-0.6417	-0.6479	-0.6540
5.00	-0.6399	-0.6461	-0.6524	-0.6586	-0.6648
5.10	-0.6503	-0.6567	-0.6630	-0.6693	-0.6756
5.20	-0.6607	-0.6671	-0.6735	-0.6799	-0.6862
5.30	-0.6710	-0.6775	-0.6840	-0.6904	-0.6968
5.40	-0.6812	-0.6878	-0.6943	-0.7008	-0.7073
5.50	-0.6913	-0.6980	-0.7046	-0.7112	-0.7177
5.60	-0.7014	-0.7081	-0.7148	-0.7214	-0.7280
5.70	-0.7114	-0.7182	-0.7249	-0.7316	-0.7383
5.80	-0.7213	-0.7281	-0.7349	-0.7417	-0.7485

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PH1

*****INTEREST RATE IVS*****

TR	0.085	0.086	0.087	0.088	0.089
-5.00	1.0089	1.0228	1.0368	1.0508	1.0649
-4.90	0.9844	0.9980	1.0115	1.0251	1.0388
-4.80	0.9602	0.9733	0.9865	0.9997	1.0130
-4.70	0.9361	0.9489	0.9617	0.9745	0.9874
-4.60	0.9122	0.9246	0.9370	0.9495	0.9620
-4.50	0.8885	0.9005	0.9126	0.9247	0.9368
-4.40	0.8650	0.8767	0.8884	0.9001	0.9119
-4.30	0.8417	0.8530	0.8644	0.8757	0.8871
-4.20	0.8186	0.8296	0.8405	0.8515	0.8626
-4.10	0.7957	0.8063	0.8169	0.8276	0.8382
-4.00	0.7729	0.7832	0.7935	0.8038	0.8141
-3.90	0.7504	0.7603	0.7702	0.7802	0.7902
-3.80	0.7280	0.7376	0.7472	0.7568	0.7665
-3.70	0.7058	0.7151	0.7244	0.7336	0.7430
-3.60	0.6838	0.6927	0.7017	0.7107	0.7197
-3.50	0.6620	0.6706	0.6792	0.6879	0.6965
-3.40	0.6403	0.6486	0.6569	0.6653	0.6736
-3.30	0.6189	0.6268	0.6348	0.6429	0.6509
-3.20	0.5975	0.6052	0.6129	0.6206	0.6284
-3.10	0.5764	0.5838	0.5912	0.5986	0.6060
-3.00	0.5555	0.5625	0.5696	0.5767	0.5839
-2.90	0.5347	0.5415	0.5483	0.5551	0.5619
-2.80	0.5140	0.5206	0.5271	0.5336	0.5401
-2.70	0.4936	0.4998	0.5060	0.5123	0.5185
-2.60	0.4733	0.4793	0.4852	0.4912	0.4971
-2.50	0.4532	0.4589	0.4645	0.4702	0.4759
-2.40	0.4332	0.4386	0.4440	0.4494	0.4549
-2.30	0.4134	0.4186	0.4237	0.4288	0.4340
-2.20	0.3938	0.3987	0.4035	0.4084	0.4133
-2.10	0.3743	0.3789	0.3835	0.3882	0.3928
-2.00	0.3550	0.3594	0.3637	0.3681	0.3724
-1.90	0.3359	0.3400	0.3441	0.3482	0.3523
-1.80	0.3168	0.3207	0.3246	0.3284	0.3323
-1.70	0.2980	0.3016	0.3052	0.3088	0.3124
-1.60	0.2793	0.2827	0.2860	0.2894	0.2928
-1.50	0.2608	0.2639	0.2670	0.2702	0.2733
-1.40	0.2424	0.2453	0.2482	0.2511	0.2540
-1.30	0.2241	0.2268	0.2295	0.2321	0.2348
-1.20	0.2060	0.2085	0.2109	0.2134	0.2158
-1.10	0.1881	0.1903	0.1925	0.1947	0.1970
-1.00	0.1703	0.1723	0.1743	0.1763	0.1783
-0.90	0.1526	0.1544	0.1562	0.1580	0.1598
-0.80	0.1351	0.1367	0.1382	0.1398	0.1414
-0.70	0.1177	0.1191	0.1205	0.1218	0.1232
-0.60	0.1005	0.1017	0.1028	0.1040	0.1051
-0.50	0.0834	0.0844	0.0853	0.0863	0.0872
-0.40	0.0664	0.0672	0.0680	0.0687	0.0695
-0.30	0.0496	0.0502	0.0508	0.0513	0.0519
-0.20	0.0329	0.0333	0.0337	0.0341	0.0344
-0.10	0.0164	0.0166	0.0168	0.0170	0.0171

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PHI

*****INTEREST RATE IVS*****

TR	0.085	0.086	0.087	0.088	0.089
-0.00	0.0	0.0	0.0	0.0	0.0
1.00	-0.1569	-0.1586	-0.1603	-0.1620	-0.1637
1.10	-0.1719	-0.1738	-0.1756	-0.1775	-0.1793
1.20	-0.1868	-0.1888	-0.1906	-0.1928	-0.1948
1.30	-0.2016	-0.2037	-0.2055	-0.2080	-0.2102
1.40	-0.2162	-0.2185	-0.2208	-0.2231	-0.2254
1.50	-0.2307	-0.2332	-0.2356	-0.2381	-0.2405
1.60	-0.2451	-0.2477	-0.2503	-0.2525	-0.2554
1.70	-0.2594	-0.2621	-0.2645	-0.2676	-0.2703
1.80	-0.2736	-0.2764	-0.2793	-0.2822	-0.2850
1.90	-0.2876	-0.2906	-0.2936	-0.2966	-0.2996
2.00	-0.3016	-0.3047	-0.3078	-0.3105	-0.3140
2.10	-0.3154	-0.3187	-0.3215	-0.3252	-0.3284
2.20	-0.3291	-0.3325	-0.3355	-0.3392	-0.3426
2.30	-0.3427	-0.3462	-0.3497	-0.3532	-0.3567
2.40	-0.3562	-0.3598	-0.3635	-0.3671	-0.3707
2.50	-0.3696	-0.3733	-0.3771	-0.3808	-0.3845
2.60	-0.3829	-0.3867	-0.3906	-0.3944	-0.3983
2.70	-0.3960	-0.4000	-0.4040	-0.4080	-0.4119
2.80	-0.4091	-0.4132	-0.4173	-0.4214	-0.4254
2.90	-0.4220	-0.4262	-0.4305	-0.4346	-0.4388
3.00	-0.4349	-0.4392	-0.4435	-0.4478	-0.4521
3.10	-0.4476	-0.4521	-0.4565	-0.4605	-0.4653
3.20	-0.4603	-0.4648	-0.4693	-0.4738	-0.4783
3.30	-0.4728	-0.4774	-0.4821	-0.4867	-0.4913
3.40	-0.4852	-0.4900	-0.4947	-0.4994	-0.5041
3.50	-0.4976	-0.5024	-0.5072	-0.5120	-0.5168
3.60	-0.5098	-0.5147	-0.5197	-0.5246	-0.5294
3.70	-0.5219	-0.5270	-0.5320	-0.5370	-0.5420
3.80	-0.5340	-0.5391	-0.5442	-0.5493	-0.5544
3.90	-0.5459	-0.5511	-0.5563	-0.5615	-0.5667
4.00	-0.5577	-0.5631	-0.5684	-0.5736	-0.5789
4.10	-0.5695	-0.5749	-0.5803	-0.5856	-0.5910
4.20	-0.5811	-0.5866	-0.5921	-0.5975	-0.6029
4.30	-0.5927	-0.5983	-0.6038	-0.6093	-0.6148
4.40	-0.6041	-0.6098	-0.6154	-0.6210	-0.6266
4.50	-0.6155	-0.6213	-0.6270	-0.6326	-0.6383
4.60	-0.6268	-0.6326	-0.6384	-0.6442	-0.6499
4.70	-0.6380	-0.6439	-0.6497	-0.6556	-0.6614
4.80	-0.6491	-0.6550	-0.6610	-0.6665	-0.6728
4.90	-0.6601	-0.6661	-0.6721	-0.6781	-0.6841
5.00	-0.6710	-0.6771	-0.6832	-0.6892	-0.6953
5.10	-0.6818	-0.6880	-0.6942	-0.7003	-0.7064
5.20	-0.6925	-0.6988	-0.7050	-0.7112	-0.7174
5.30	-0.7032	-0.7095	-0.7158	-0.7221	-0.7283
5.40	-0.7137	-0.7201	-0.7265	-0.7328	-0.7391
5.50	-0.7242	-0.7307	-0.7371	-0.7435	-0.7499
5.60	-0.7346	-0.7411	-0.7476	-0.7541	-0.7605
5.70	-0.7449	-0.7515	-0.7581	-0.7646	-0.7710
5.80	-0.7551	-0.7618	-0.7684	-0.7750	-0.7815

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PH1

*****INTEREST RATE IVS*****

TR	0.090	0.091	0.092	0.093	0.094
-5.00	1.0790	1.0931	1.1073	1.1216	1.1355
-4.90	1.0525	1.0663	1.0801	1.0940	1.1079
-4.80	1.0263	1.0397	1.0531	1.0665	1.0800
-4.70	1.0003	1.0133	1.0263	1.0394	1.0525
-4.60	0.9745	0.9871	0.9997	1.0124	1.0251
-4.50	0.9490	0.9612	0.9734	0.9857	0.9981
-4.40	0.9236	0.9355	0.9472	0.9593	0.9712
-4.30	0.8985	0.9100	0.9215	0.9330	0.9446
-4.20	0.8736	0.8847	0.8955	0.9070	0.9182
-4.10	0.8489	0.8597	0.8705	0.8813	0.8921
-4.00	0.8245	0.8349	0.8453	0.8557	0.8662
-3.90	0.8002	0.8103	0.8203	0.8304	0.8406
-3.80	0.7762	0.7859	0.7956	0.8053	0.8151
-3.70	0.7523	0.7617	0.7711	0.7805	0.7899
-3.60	0.7287	0.7377	0.7467	0.7558	0.7649
-3.50	0.7052	0.7139	0.7227	0.7314	0.7402
-3.40	0.6820	0.6904	0.6988	0.7072	0.7156
-3.30	0.6589	0.6670	0.6751	0.6832	0.6913
-3.20	0.6361	0.6439	0.6516	0.6594	0.6672
-3.10	0.6134	0.6209	0.6284	0.6358	0.6433
-3.00	0.5910	0.5981	0.6052	0.6125	0.6197
-2.90	0.5687	0.5756	0.5824	0.5893	0.5962
-2.80	0.5467	0.5532	0.5598	0.5664	0.5730
-2.70	0.5248	0.5311	0.5372	0.5436	0.5499
-2.60	0.5031	0.5091	0.5151	0.5211	0.5271
-2.50	0.4816	0.4873	0.4930	0.4987	0.5045
-2.40	0.4603	0.4657	0.4711	0.4766	0.4820
-2.30	0.4391	0.4443	0.4494	0.4546	0.4598
-2.20	0.4182	0.4231	0.4280	0.4325	0.4378
-2.10	0.3974	0.4020	0.4067	0.4113	0.4159
-2.00	0.3768	0.3812	0.3855	0.3895	0.3943
-1.90	0.3564	0.3605	0.3646	0.3687	0.3729
-1.80	0.3361	0.3400	0.3435	0.3477	0.3516
-1.70	0.3161	0.3197	0.3233	0.3265	0.3305
-1.60	0.2962	0.2995	0.3025	0.3063	0.3097
-1.50	0.2764	0.2796	0.2827	0.2858	0.2890
-1.40	0.2569	0.2598	0.2627	0.2656	0.2685
-1.30	0.2375	0.2401	0.2428	0.2455	0.2482
-1.20	0.2182	0.2207	0.2231	0.2256	0.2280
-1.10	0.1992	0.2014	0.2036	0.2055	0.2081
-1.00	0.1803	0.1823	0.1843	0.1863	0.1883
-0.90	0.1615	0.1633	0.1651	0.1665	0.1687
-0.80	0.1430	0.1445	0.1461	0.1477	0.1493
-0.70	0.1246	0.1259	0.1272	0.1287	0.1300
-0.60	0.1063	0.1075	0.1086	0.1098	0.1109
-0.50	0.0882	0.0892	0.0901	0.0911	0.0920
-0.40	0.0703	0.0710	0.0716	0.0725	0.0733
-0.30	0.0525	0.0530	0.0536	0.0542	0.0547
-0.20	0.0348	0.0352	0.0356	0.0359	0.0363
-0.10	0.0173	0.0175	0.0177	0.0179	0.0181

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PHI

***** INTEREST RATE IVS*****					
TR	0.090	0.091	0.092	0.093	0.094
-0.00	0.0	0.0	0.0	0.0	0.0
1.00	-0.1654	-0.1671	-0.1688	-0.1704	-0.1721
1.10	-0.1812	-0.1830	-0.1848	-0.1867	-0.1885
1.20	-0.1968	-0.1988	-0.2006	-0.2026	-0.2047
1.30	-0.2123	-0.2144	-0.2166	-0.2187	-0.2208
1.40	-0.2277	-0.2300	-0.2322	-0.2345	-0.2368
1.50	-0.2429	-0.2453	-0.2477	-0.2501	-0.2526
1.60	-0.2580	-0.2606	-0.2631	-0.2657	-0.2682
1.70	-0.2730	-0.2757	-0.2784	-0.2811	-0.2837
1.80	-0.2878	-0.2907	-0.2935	-0.2963	-0.2991
1.90	-0.3026	-0.3055	-0.3085	-0.3114	-0.3143
2.00	-0.3171	-0.3202	-0.3233	-0.3264	-0.3295
2.10	-0.3316	-0.3348	-0.3380	-0.3412	-0.3444
2.20	-0.3460	-0.3493	-0.3526	-0.3559	-0.3593
2.30	-0.3602	-0.3636	-0.3671	-0.3705	-0.3740
2.40	-0.3743	-0.3779	-0.3814	-0.3850	-0.3885
2.50	-0.3883	-0.3919	-0.3956	-0.3993	-0.4030
2.60	-0.4021	-0.4059	-0.4097	-0.4135	-0.4173
2.70	-0.4158	-0.4196	-0.4237	-0.4274	-0.4315
2.80	-0.4295	-0.4335	-0.4375	-0.4415	-0.4455
2.90	-0.4430	-0.4471	-0.4512	-0.4554	-0.4595
3.00	-0.4564	-0.4606	-0.4648	-0.4691	-0.4733
3.10	-0.4696	-0.4740	-0.4783	-0.4826	-0.4869
3.20	-0.4828	-0.4872	-0.4917	-0.4961	-0.5005
3.30	-0.4958	-0.5004	-0.5049	-0.5094	-0.5140
3.40	-0.5088	-0.5134	-0.5181	-0.5227	-0.5273
3.50	-0.5216	-0.5263	-0.5311	-0.5358	-0.5405
3.60	-0.5343	-0.5391	-0.5440	-0.5488	-0.5536
3.70	-0.5469	-0.5518	-0.5566	-0.5616	-0.5665
3.80	-0.5594	-0.5644	-0.5694	-0.5744	-0.5794
3.90	-0.5718	-0.5769	-0.5820	-0.5871	-0.5921
4.00	-0.5841	-0.5893	-0.5944	-0.5996	-0.6047
4.10	-0.5963	-0.6015	-0.6068	-0.6120	-0.6172
4.20	-0.6083	-0.6137	-0.6190	-0.6243	-0.6296
4.30	-0.6203	-0.6257	-0.6312	-0.6365	-0.6419
4.40	-0.6322	-0.6377	-0.6432	-0.6486	-0.6541
4.50	-0.6439	-0.6495	-0.6551	-0.6606	-0.6662
4.60	-0.6556	-0.6613	-0.6669	-0.6725	-0.6781
4.70	-0.6672	-0.6729	-0.6786	-0.6843	-0.6900
4.80	-0.6786	-0.6844	-0.6902	-0.6960	-0.7017
4.90	-0.6900	-0.6959	-0.7017	-0.7076	-0.7133
5.00	-0.7013	-0.7072	-0.7131	-0.7190	-0.7249
5.10	-0.7124	-0.7184	-0.7244	-0.7304	-0.7363
5.20	-0.7235	-0.7296	-0.7356	-0.7417	-0.7476
5.30	-0.7345	-0.7406	-0.7467	-0.7528	-0.7589
5.40	-0.7454	-0.7516	-0.7578	-0.7639	-0.7700
5.50	-0.7562	-0.7624	-0.7687	-0.7749	-0.7810
5.60	-0.7669	-0.7732	-0.7795	-0.7857	-0.7920
5.70	-0.7775	-0.7839	-0.7902	-0.7965	-0.8028
5.80	-0.7880	-0.7944	-0.8008	-0.8072	-0.8135

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PHA

*****INTEREST RATE IVS*****

TR	0.095	0.096	0.097	0.098	0.099
-5.00	1.1503	1.1647	1.1792	1.1937	1.2083
-4.90	1.1218	1.1358	1.1499	1.1640	1.1781
-4.80	1.0936	1.1072	1.1208	1.1345	1.1483
-4.70	1.0656	1.0788	1.0920	1.1053	1.1186
-4.60	1.0379	1.0507	1.0635	1.0764	1.0893
-4.50	1.0104	1.0228	1.0353	1.0477	1.0603
-4.40	0.9832	0.9952	1.0072	1.0194	1.0315
-4.30	0.9562	0.9678	0.9795	0.9912	1.0030
-4.20	0.9295	0.9407	0.9520	0.9634	0.9747
-4.10	0.9030	0.9139	0.9248	0.9358	0.9467
-4.00	0.8767	0.8873	0.8978	0.9084	0.9190
-3.90	0.8507	0.8609	0.8711	0.8813	0.8916
-3.80	0.8249	0.8347	0.8446	0.8545	0.8644
-3.70	0.7994	0.8089	0.8183	0.8279	0.8374
-3.60	0.7740	0.7832	0.7923	0.8015	0.8107
-3.50	0.7490	0.7578	0.7666	0.7754	0.7843
-3.40	0.7241	0.7326	0.7411	0.7496	0.7581
-3.30	0.6995	0.7076	0.7158	0.7240	0.7322
-3.20	0.6750	0.6829	0.6907	0.6986	0.7065
-3.10	0.6508	0.6584	0.6659	0.6734	0.6810
-3.00	0.6269	0.6341	0.6413	0.6485	0.6558
-2.90	0.6031	0.6100	0.6169	0.6239	0.6308
-2.80	0.5796	0.5862	0.5928	0.5994	0.6061
-2.70	0.5562	0.5625	0.5689	0.5752	0.5815
-2.60	0.5331	0.5391	0.5452	0.5512	0.5573
-2.50	0.5102	0.5159	0.5217	0.5274	0.5332
-2.40	0.4875	0.4929	0.4984	0.5039	0.5094
-2.30	0.4650	0.4702	0.4754	0.4806	0.4858
-2.20	0.4427	0.4476	0.4525	0.4574	0.4624
-2.10	0.4206	0.4252	0.4299	0.4345	0.4392
-2.00	0.3987	0.4031	0.4075	0.4119	0.4163
-1.90	0.3770	0.3811	0.3852	0.3894	0.3935
-1.80	0.3555	0.3594	0.3632	0.3671	0.3710
-1.70	0.3342	0.3378	0.3414	0.3451	0.3487
-1.60	0.3131	0.3164	0.3198	0.3232	0.3266
-1.50	0.2921	0.2953	0.2984	0.3016	0.3047
-1.40	0.2714	0.2743	0.2772	0.2801	0.2830
-1.30	0.2508	0.2535	0.2562	0.2589	0.2615
-1.20	0.2305	0.2329	0.2354	0.2378	0.2403
-1.10	0.2103	0.2125	0.2147	0.2170	0.2192
-1.00	0.1903	0.1923	0.1943	0.1963	0.1983
-0.90	0.1705	0.1723	0.1741	0.1758	0.1776
-0.80	0.1508	0.1524	0.1540	0.1556	0.1571
-0.70	0.1314	0.1328	0.1341	0.1355	0.1368
-0.60	0.1121	0.1133	0.1144	0.1156	0.1167
-0.50	0.0930	0.0939	0.0949	0.0959	0.0968
-0.40	0.0741	0.0748	0.0756	0.0763	0.0771
-0.30	0.0553	0.0559	0.0564	0.0570	0.0575
-0.20	0.0367	0.0371	0.0374	0.0378	0.0382
-0.10	0.0183	0.0184	0.0186	0.0188	0.0190

TABLE A-5. RATIO UC/UD USING TIME PEASURU FACT 1 SUB PM

*****INTEREST RATE IVS*****					
TR	0.095	0.096	0.097	0.098	0.099
-0.00	0.0	0.0	0.0	0.0	0.0
1.00	-0.1738	-0.1755	-0.1771	-0.1766	-0.1805
1.10	-0.1903	-0.1921	-0.1940	-0.1956	-0.1975
1.20	-0.2067	-0.2087	-0.2106	-0.2126	-0.2145
1.30	-0.2229	-0.2250	-0.2271	-0.2292	-0.2313
1.40	-0.2390	-0.2413	-0.2435	-0.2456	-0.2460
1.50	-0.2550	-0.2573	-0.2597	-0.2621	-0.2645
1.60	-0.2707	-0.2733	-0.2756	-0.2783	-0.2808
1.70	-0.2864	-0.2891	-0.2917	-0.2944	-0.2970
1.80	-0.3019	-0.3047	-0.3075	-0.3103	-0.3130
1.90	-0.3173	-0.3202	-0.3231	-0.3260	-0.3285
2.00	-0.3325	-0.3356	-0.3386	-0.3416	-0.3446
2.10	-0.3476	-0.3508	-0.3535	-0.3571	-0.3602
2.20	-0.3626	-0.3659	-0.3691	-0.3724	-0.3757
2.30	-0.3774	-0.3808	-0.3842	-0.3876	-0.3910
2.40	-0.3921	-0.3956	-0.3991	-0.4026	-0.4061
2.50	-0.4066	-0.4103	-0.4135	-0.4175	-0.4211
2.60	-0.4210	-0.4246	-0.4285	-0.4323	-0.4360
2.70	-0.4353	-0.4392	-0.4430	-0.4465	-0.4507
2.80	-0.4495	-0.4535	-0.4574	-0.4614	-0.4653
2.90	-0.4635	-0.4676	-0.4717	-0.4757	-0.4797
3.00	-0.4775	-0.4816	-0.4856	-0.4895	-0.4940
3.10	-0.4912	-0.4955	-0.4998	-0.5040	-0.5082
3.20	-0.5049	-0.5093	-0.5136	-0.5180	-0.5223
3.30	-0.5184	-0.5229	-0.5273	-0.5318	-0.5362
3.40	-0.5318	-0.5364	-0.5405	-0.5450	-0.5500
3.50	-0.5451	-0.5498	-0.5544	-0.5590	-0.5636
3.60	-0.5583	-0.5631	-0.5676	-0.5725	-0.5772
3.70	-0.5714	-0.5762	-0.5810	-0.5858	-0.5906
3.80	-0.5843	-0.5892	-0.5941	-0.5990	-0.6038
3.90	-0.5971	-0.6021	-0.6071	-0.6120	-0.6170
4.00	-0.6098	-0.6149	-0.6200	-0.6250	-0.6300
4.10	-0.6224	-0.6276	-0.6327	-0.6378	-0.6425
4.20	-0.6349	-0.6401	-0.6453	-0.6505	-0.6557
4.30	-0.6472	-0.6526	-0.6578	-0.6631	-0.6683
4.40	-0.6595	-0.6649	-0.6702	-0.6756	-0.6809
4.50	-0.6716	-0.6771	-0.6825	-0.6875	-0.6933
4.60	-0.6837	-0.6892	-0.6947	-0.7002	-0.7056
4.70	-0.6956	-0.7012	-0.7068	-0.7123	-0.7178
4.80	-0.7074	-0.7131	-0.7187	-0.7243	-0.7299
4.90	-0.7191	-0.7248	-0.7305	-0.7362	-0.7418
5.00	-0.7307	-0.7365	-0.7423	-0.7480	-0.7537
5.10	-0.7422	-0.7481	-0.7535	-0.7597	-0.7654
5.20	-0.7536	-0.7595	-0.7654	-0.7712	-0.7771
5.30	-0.7649	-0.7709	-0.7768	-0.7827	-0.7886
5.40	-0.7761	-0.7821	-0.7881	-0.7941	-0.8000
5.50	-0.7872	-0.7933	-0.7993	-0.8053	-0.8113
5.60	-0.7981	-0.8043	-0.8104	-0.8165	-0.8225
5.70	-0.8090	-0.8152	-0.8214	-0.8275	-0.8336
5.80	-0.8198	-0.8261	-0.8323	-0.8385	-0.8446

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PH1

*****INTEREST RATE IVS*****

TR	0.100	0.101	0.102	0.103	0.104
-5.00	1.2230	1.2377	1.2524	1.2672	1.2820
-4.90	1.1924	1.2066	1.2209	1.2353	1.2497
-4.80	1.1621	1.1759	1.1898	1.2037	1.2177
-4.70	1.1320	1.1455	1.1595	1.1724	1.1860
-4.60	1.1023	1.1153	1.1283	1.1414	1.1546
-4.50	1.0728	1.0854	1.0981	1.1108	1.1235
-4.40	1.0437	1.0559	1.0681	1.0804	1.0927
-4.30	1.0148	1.0266	1.0384	1.0503	1.0622
-4.20	0.9861	0.9976	1.0090	1.0205	1.0320
-4.10	0.9578	0.9688	0.9799	0.9910	1.0022
-4.00	0.9297	0.9404	0.9511	0.9618	0.9726
-3.90	0.9019	0.9122	0.9225	0.9329	0.9433
-3.80	0.8743	0.8843	0.8942	0.9042	0.9143
-3.70	0.8470	0.8566	0.8662	0.8759	0.8855
-3.60	0.8200	0.8292	0.8385	0.8478	0.8571
-3.50	0.7932	0.8021	0.8110	0.8200	0.8289
-3.40	0.7667	0.7752	0.7838	0.7924	0.8011
-3.30	0.7404	0.7486	0.7569	0.7652	0.7735
-3.20	0.7144	0.7223	0.7302	0.7382	0.7461
-3.10	0.6886	0.6962	0.7038	0.7114	0.7190
-3.00	0.6631	0.6703	0.6776	0.6849	0.6922
-2.90	0.6378	0.6447	0.6517	0.6587	0.6657
-2.80	0.6127	0.6194	0.6260	0.6327	0.6394
-2.70	0.5879	0.5943	0.6006	0.6070	0.6134
-2.60	0.5633	0.5694	0.5755	0.5816	0.5877
-2.50	0.5390	0.5448	0.5505	0.5563	0.5621
-2.40	0.5149	0.5204	0.5259	0.5314	0.5369
-2.30	0.4910	0.4962	0.5014	0.5066	0.5119
-2.20	0.4673	0.4723	0.4772	0.4822	0.4871
-2.10	0.4439	0.4486	0.4532	0.4579	0.4626
-2.00	0.4207	0.4251	0.4295	0.4339	0.4383
-1.90	0.3977	0.4018	0.4060	0.4101	0.4143
-1.80	0.3749	0.3788	0.3827	0.3866	0.3905
-1.70	0.3523	0.3560	0.3596	0.3633	0.3669
-1.60	0.3300	0.3334	0.3368	0.3402	0.3436
-1.50	0.3079	0.3110	0.3142	0.3173	0.3205
-1.40	0.2859	0.2889	0.2918	0.2947	0.2976
-1.30	0.2642	0.2669	0.2696	0.2723	0.2750
-1.20	0.2427	0.2452	0.2476	0.2501	0.2525
-1.10	0.2214	0.2236	0.2259	0.2281	0.2303
-1.00	0.2003	0.2023	0.2043	0.2063	0.2083
-0.90	0.1794	0.1812	0.1830	0.1848	0.1866
-0.80	0.1587	0.1603	0.1619	0.1634	0.1650
-0.70	0.1382	0.1396	0.1409	0.1423	0.1437
-0.60	0.1179	0.1190	0.1202	0.1214	0.1225
-0.50	0.0978	0.0987	0.0997	0.1006	0.1016
-0.40	0.0778	0.0786	0.0794	0.0801	0.0809
-0.30	0.0581	0.0587	0.0592	0.0598	0.0603
-0.20	0.0385	0.0389	0.0393	0.0397	0.0400
-0.10	0.0192	0.0194	0.0195	0.0197	0.0199

TABLE A-5. RATIO UC/UD USING TIME MEASURED FROM T SUB PHI

***** INTEREST RATE IVS*****					
TR	0.100	0.101	0.102	0.103	0.104
-0.00	0.0	0.0	0.0	0.0	0.0
1.00	-0.1821	-0.1838	-0.1854	-0.1871	-0.1887
1.10	-0.1994	-0.2012	-0.2030	-0.2048	-0.2066
1.20	-0.2165	-0.2184	-0.2204	-0.2223	-0.2243
1.30	-0.2334	-0.2355	-0.2376	-0.2397	-0.2418
1.40	-0.2502	-0.2525	-0.2547	-0.2569	-0.2591
1.50	-0.2669	-0.2692	-0.2716	-0.2739	-0.2763
1.60	-0.2833	-0.2858	-0.2883	-0.2908	-0.2933
1.70	-0.2996	-0.3023	-0.3049	-0.3075	-0.3101
1.80	-0.3158	-0.3186	-0.3213	-0.3241	-0.3268
1.90	-0.3318	-0.3347	-0.3376	-0.3404	-0.3433
2.00	-0.3477	-0.3507	-0.3537	-0.3567	-0.3596
2.10	-0.3634	-0.3665	-0.3696	-0.3727	-0.3758
2.20	-0.3789	-0.3822	-0.3854	-0.3886	-0.3918
2.30	-0.3943	-0.3977	-0.4010	-0.4044	-0.4077
2.40	-0.4096	-0.4131	-0.4165	-0.4200	-0.4234
2.50	-0.4247	-0.4283	-0.4319	-0.4354	-0.4390
2.60	-0.4397	-0.4434	-0.4470	-0.4507	-0.4544
2.70	-0.4545	-0.4583	-0.4621	-0.4659	-0.4696
2.80	-0.4692	-0.4731	-0.4770	-0.4809	-0.4847
2.90	-0.4838	-0.4878	-0.4917	-0.4957	-0.4997
3.00	-0.4982	-0.5023	-0.5063	-0.5104	-0.5145
3.10	-0.5124	-0.5166	-0.5208	-0.5250	-0.5291
3.20	-0.5266	-0.5309	-0.5351	-0.5394	-0.5436
3.30	-0.5406	-0.5450	-0.5493	-0.5537	-0.5580
3.40	-0.5545	-0.5589	-0.5634	-0.5678	-0.5722
3.50	-0.5682	-0.5728	-0.5773	-0.5818	-0.5863
3.60	-0.5818	-0.5865	-0.5911	-0.5957	-0.6003
3.70	-0.5953	-0.6000	-0.6047	-0.6094	-0.6141
3.80	-0.6087	-0.6135	-0.6182	-0.6230	-0.6278
3.90	-0.6219	-0.6268	-0.6316	-0.6365	-0.6413
4.00	-0.6350	-0.6399	-0.6448	-0.6498	-0.6547
4.10	-0.6480	-0.6530	-0.6580	-0.6630	-0.6680
4.20	-0.6606	-0.6659	-0.6710	-0.6761	-0.6811
4.30	-0.6736	-0.6787	-0.6839	-0.6890	-0.6941
4.40	-0.6862	-0.6914	-0.6966	-0.7019	-0.7070
4.50	-0.6987	-0.7040	-0.7093	-0.7145	-0.7198
4.60	-0.7110	-0.7164	-0.7216	-0.7271	-0.7324
4.70	-0.7233	-0.7287	-0.7342	-0.7396	-0.7449
4.80	-0.7354	-0.7409	-0.7464	-0.7519	-0.7573
4.90	-0.7475	-0.7530	-0.7586	-0.7641	-0.7696
5.00	-0.7594	-0.7650	-0.7706	-0.7762	-0.7817
5.10	-0.7712	-0.7769	-0.7825	-0.7882	-0.7938
5.20	-0.7829	-0.7886	-0.7943	-0.8000	-0.8057
5.30	-0.7944	-0.8002	-0.8060	-0.8118	-0.8175
5.40	-0.8059	-0.8118	-0.8176	-0.8234	-0.8291
5.50	-0.8173	-0.8232	-0.8290	-0.8349	-0.8407
5.60	-0.8285	-0.8345	-0.8404	-0.8463	-0.8521
5.70	-0.8396	-0.8457	-0.8516	-0.8576	-0.8635
5.80	-0.8507	-0.8567	-0.8628	-0.8687	-0.8747

TABLE A-6. RATIO T SUB PHI/T SUB EXP

*****INTEREST RATE IVS*****

TEXP	0.060	0.061	0.062	0.063	0.064
1.00	0.4976	0.4975	0.4975	0.4975	0.4974
1.10	0.4973	0.4973	0.4972	0.4972	0.4972
1.20	0.4971	0.4970	0.4970	0.4969	0.4969
1.30	0.4968	0.4968	0.4967	0.4967	0.4966
1.40	0.4966	0.4966	0.4965	0.4964	0.4964
1.50	0.4964	0.4963	0.4962	0.4962	0.4961
1.60	0.4961	0.4961	0.4960	0.4959	0.4959
1.70	0.4959	0.4958	0.4957	0.4957	0.4956
1.80	0.4956	0.4956	0.4955	0.4954	0.4953
1.90	0.4954	0.4953	0.4952	0.4952	0.4951
2.00	0.4951	0.4951	0.4950	0.4949	0.4948
2.10	0.4949	0.4948	0.4947	0.4947	0.4946
2.20	0.4947	0.4946	0.4945	0.4944	0.4943
2.30	0.4944	0.4943	0.4942	0.4941	0.4941
2.40	0.4942	0.4941	0.4940	0.4939	0.4938
2.50	0.4939	0.4938	0.4937	0.4936	0.4935
2.60	0.4937	0.4936	0.4935	0.4934	0.4933
2.70	0.4934	0.4933	0.4932	0.4931	0.4930
2.80	0.4932	0.4931	0.4930	0.4929	0.4928
2.90	0.4930	0.4928	0.4927	0.4926	0.4925
3.00	0.4927	0.4926	0.4925	0.4924	0.4922
3.10	0.4925	0.4924	0.4922	0.4921	0.4920
3.20	0.4922	0.4921	0.4920	0.4919	0.4917
3.30	0.4920	0.4919	0.4917	0.4916	0.4915
3.40	0.4917	0.4916	0.4915	0.4913	0.4912
3.50	0.4915	0.4914	0.4912	0.4911	0.4910
3.60	0.4913	0.4911	0.4910	0.4908	0.4907
3.70	0.4910	0.4909	0.4907	0.4906	0.4904
3.80	0.4908	0.4906	0.4905	0.4903	0.4902
3.90	0.4905	0.4904	0.4902	0.4901	0.4899
4.00	0.4903	0.4901	0.4900	0.4898	0.4897
4.10	0.4901	0.4899	0.4897	0.4896	0.4894
4.20	0.4898	0.4896	0.4895	0.4893	0.4892
4.30	0.4896	0.4894	0.4892	0.4891	0.4889
4.40	0.4893	0.4892	0.4890	0.4888	0.4886
4.50	0.4891	0.4889	0.4887	0.4886	0.4884
4.60	0.4888	0.4887	0.4885	0.4883	0.4881
4.70	0.4886	0.4884	0.4882	0.4880	0.4879
4.80	0.4884	0.4882	0.4880	0.4878	0.4876
4.90	0.4881	0.4879	0.4877	0.4875	0.4873
5.00	0.4879	0.4877	0.4875	0.4873	0.4871
5.10	0.4876	0.4874	0.4872	0.4870	0.4868
5.20	0.4874	0.4872	0.4870	0.4868	0.4866
5.30	0.4871	0.4869	0.4867	0.4865	0.4863
5.40	0.4869	0.4867	0.4865	0.4863	0.4861
5.50	0.4867	0.4864	0.4862	0.4860	0.4858
5.60	0.4864	0.4862	0.4860	0.4858	0.4855
5.70	0.4862	0.4860	0.4857	0.4855	0.4853
5.80	0.4859	0.4857	0.4855	0.4853	0.4850
5.90	0.4857	0.4855	0.4852	0.4850	0.4848
6.00	0.4854	0.4852	0.4850	0.4847	0.4845

TABLE A-6. RATIO T SUB PHI/T SUB EXP

*****INTEREST RATE IVS*****

TEXP	0.065	0.066	0.067	0.068	0.069
1.00	0.4974	0.4973	0.4973	0.4973	0.4972
1.10	0.4971	0.4971	0.4971	0.4971	0.4969
1.20	0.4969	0.4968	0.4968	0.4967	0.4967
1.30	0.4966	0.4965	0.4965	0.4964	0.4964
1.40	0.4963	0.4963	0.4962	0.4962	0.4961
1.50	0.4961	0.4960	0.4959	0.4959	0.4958
1.60	0.4958	0.4957	0.4957	0.4956	0.4956
1.70	0.4955	0.4955	0.4954	0.4953	0.4953
1.80	0.4953	0.4952	0.4951	0.4951	0.4950
1.90	0.4950	0.4949	0.4949	0.4948	0.4947
2.00	0.4948	0.4947	0.4946	0.4945	0.4944
2.10	0.4945	0.4944	0.4943	0.4942	0.4942
2.20	0.4942	0.4941	0.4941	0.4940	0.4939
2.30	0.4940	0.4939	0.4938	0.4937	0.4936
2.40	0.4937	0.4936	0.4935	0.4934	0.4933
2.50	0.4934	0.4933	0.4932	0.4931	0.4931
2.60	0.4932	0.4931	0.4930	0.4929	0.4928
2.70	0.4929	0.4928	0.4927	0.4926	0.4925
2.80	0.4927	0.4925	0.4924	0.4923	0.4922
2.90	0.4924	0.4923	0.4922	0.4921	0.4919
3.00	0.4921	0.4920	0.4919	0.4918	0.4917
3.10	0.4919	0.4917	0.4916	0.4915	0.4914
3.20	0.4916	0.4915	0.4914	0.4912	0.4911
3.30	0.4913	0.4912	0.4911	0.4910	0.4908
3.40	0.4911	0.4909	0.4908	0.4907	0.4906
3.50	0.4908	0.4907	0.4905	0.4904	0.4903
3.60	0.4906	0.4904	0.4903	0.4901	0.4900
3.70	0.4903	0.4902	0.4900	0.4899	0.4897
3.80	0.4900	0.4899	0.4897	0.4896	0.4894
3.90	0.4898	0.4896	0.4895	0.4893	0.4892
4.00	0.4895	0.4894	0.4892	0.4890	0.4889
4.10	0.4892	0.4891	0.4889	0.4888	0.4886
4.20	0.4890	0.4888	0.4887	0.4885	0.4883
4.30	0.4887	0.4886	0.4884	0.4882	0.4881
4.40	0.4885	0.4883	0.4881	0.4879	0.4878
4.50	0.4882	0.4880	0.4878	0.4877	0.4875
4.60	0.4879	0.4878	0.4876	0.4874	0.4872
4.70	0.4877	0.4875	0.4873	0.4871	0.4869
4.80	0.4874	0.4872	0.4870	0.4869	0.4867
4.90	0.4872	0.4870	0.4868	0.4866	0.4864
5.00	0.4869	0.4867	0.4865	0.4863	0.4861
5.10	0.4866	0.4864	0.4862	0.4860	0.4858
5.20	0.4864	0.4862	0.4860	0.4858	0.4856
5.30	0.4861	0.4859	0.4857	0.4855	0.4853
5.40	0.4858	0.4856	0.4854	0.4852	0.4850
5.50	0.4856	0.4854	0.4852	0.4849	0.4847
5.60	0.4853	0.4851	0.4849	0.4847	0.4844
5.70	0.4851	0.4848	0.4846	0.4844	0.4842
5.80	0.4848	0.4846	0.4843	0.4841	0.4839
5.90	0.4845	0.4843	0.4841	0.4838	0.4836
6.00	0.4843	0.4840	0.4838	0.4836	0.4833

TABLE A-6. RATIO T SUB PHI/T SUB EXP

*****INTEREST RATE IVS*****

TEXP	0.070	0.071	0.072	0.073	0.074
1.00	0.4972	0.4971	0.4971	0.4971	0.4970
1.10	0.4969	0.4969	0.4968	0.4968	0.4967
1.20	0.4966	0.4966	0.4965	0.4965	0.4964
1.30	0.4963	0.4963	0.4962	0.4962	0.4961
1.40	0.4961	0.4960	0.4959	0.4959	0.4958
1.50	0.4958	0.4957	0.4957	0.4956	0.4955
1.60	0.4955	0.4954	0.4954	0.4953	0.4952
1.70	0.4952	0.4951	0.4951	0.4950	0.4949
1.80	0.4949	0.4949	0.4948	0.4947	0.4946
1.90	0.4946	0.4946	0.4945	0.4944	0.4943
2.00	0.4944	0.4943	0.4942	0.4941	0.4941
2.10	0.4941	0.4940	0.4939	0.4938	0.4938
2.20	0.4938	0.4937	0.4936	0.4935	0.4935
2.30	0.4935	0.4934	0.4933	0.4932	0.4932
2.40	0.4932	0.4931	0.4930	0.4930	0.4929
2.50	0.4930	0.4929	0.4928	0.4927	0.4926
2.60	0.4927	0.4926	0.4925	0.4924	0.4923
2.70	0.4924	0.4923	0.4922	0.4921	0.4920
2.80	0.4921	0.4920	0.4919	0.4918	0.4917
2.90	0.4918	0.4917	0.4916	0.4915	0.4914
3.00	0.4915	0.4914	0.4913	0.4912	0.4911
3.10	0.4913	0.4911	0.4910	0.4909	0.4908
3.20	0.4910	0.4909	0.4907	0.4906	0.4905
3.30	0.4907	0.4906	0.4904	0.4903	0.4902
3.40	0.4904	0.4903	0.4902	0.4900	0.4899
3.50	0.4901	0.4900	0.4899	0.4897	0.4896
3.60	0.4899	0.4897	0.4896	0.4894	0.4893
3.70	0.4896	0.4894	0.4893	0.4891	0.4890
3.80	0.4893	0.4891	0.4890	0.4888	0.4887
3.90	0.4890	0.4889	0.4887	0.4886	0.4884
4.00	0.4887	0.4886	0.4884	0.4883	0.4881
4.10	0.4884	0.4883	0.4881	0.4880	0.4878
4.20	0.4882	0.4880	0.4878	0.4877	0.4875
4.30	0.4879	0.4877	0.4876	0.4874	0.4872
4.40	0.4876	0.4874	0.4873	0.4871	0.4869
4.50	0.4873	0.4871	0.4870	0.4868	0.4866
4.60	0.4870	0.4869	0.4867	0.4865	0.4863
4.70	0.4868	0.4866	0.4864	0.4862	0.4860
4.80	0.4865	0.4863	0.4861	0.4859	0.4857
4.90	0.4862	0.4860	0.4858	0.4856	0.4854
5.00	0.4859	0.4857	0.4855	0.4853	0.4851
5.10	0.4856	0.4854	0.4852	0.4850	0.4848
5.20	0.4854	0.4852	0.4850	0.4848	0.4846
5.30	0.4851	0.4849	0.4847	0.4845	0.4843
5.40	0.4848	0.4846	0.4844	0.4842	0.4840
5.50	0.4845	0.4843	0.4841	0.4839	0.4837
5.60	0.4842	0.4840	0.4838	0.4836	0.4834
5.70	0.4840	0.4837	0.4835	0.4833	0.4831
5.80	0.4837	0.4834	0.4832	0.4830	0.4828
5.90	0.4834	0.4832	0.4829	0.4827	0.4825
6.00	0.4831	0.4829	0.4826	0.4824	0.4822

TABLE A-6. RATIO T SUB PH / T SUB EXP

***** INTEREST RATE 1% *****					
TEP	0.075	0.076	0.077	0.078	0.075
1.00	0.4970	0.4969	0.4965	0.4565	0.4968
1.10	0.4967	0.4966	0.4966	0.4566	0.4965
1.20	0.4964	0.4963	0.4963	0.4562	0.4962
1.30	0.4961	0.4960	0.4960	0.4555	0.4959
1.40	0.4958	0.4957	0.4957	0.4556	0.4956
1.50	0.4955	0.4954	0.4954	0.4553	0.4952
1.60	0.4952	0.4951	0.4951	0.4550	0.4949
1.70	0.4949	0.4948	0.4947	0.4547	0.4946
1.80	0.4946	0.4945	0.4944	0.4544	0.4943
1.90	0.4943	0.4942	0.4941	0.4541	0.4940
2.00	0.4940	0.4939	0.4938	0.4537	0.4937
2.10	0.4937	0.4936	0.4935	0.4534	0.4933
2.20	0.4934	0.4933	0.4932	0.4531	0.4930
2.30	0.4931	0.4930	0.4929	0.4528	0.4927
2.40	0.4928	0.4927	0.4926	0.4525	0.4924
2.50	0.4925	0.4924	0.4923	0.4522	0.4921
2.60	0.4922	0.4921	0.4920	0.4519	0.4918
2.70	0.4919	0.4918	0.4917	0.4516	0.4914
2.80	0.4916	0.4915	0.4913	0.4512	0.4911
2.90	0.4913	0.4912	0.4910	0.4508	0.4908
3.00	0.4910	0.4908	0.4907	0.4506	0.4905
3.10	0.4907	0.4905	0.4904	0.4503	0.4902
3.20	0.4904	0.4902	0.4901	0.4500	0.4895
3.30	0.4901	0.4899	0.4898	0.4497	0.4896
3.40	0.4898	0.4896	0.4895	0.4494	0.4892
3.50	0.4895	0.4893	0.4892	0.4491	0.4889
3.60	0.4892	0.4890	0.4889	0.4487	0.4886
3.70	0.4889	0.4887	0.4886	0.4484	0.4883
3.80	0.4886	0.4884	0.4883	0.4481	0.4880
3.90	0.4883	0.4881	0.4880	0.4478	0.4877
4.00	0.4880	0.4878	0.4876	0.4475	0.4873
4.10	0.4877	0.4875	0.4873	0.4472	0.4870
4.20	0.4874	0.4872	0.4870	0.4469	0.4867
4.30	0.4871	0.4869	0.4867	0.4466	0.4864
4.40	0.4868	0.4866	0.4864	0.4462	0.4861
4.50	0.4865	0.4863	0.4861	0.4455	0.4858
4.60	0.4862	0.4860	0.4858	0.4450	0.4855
4.70	0.4859	0.4857	0.4855	0.4453	0.4851
4.80	0.4856	0.4854	0.4852	0.4450	0.4848
4.90	0.4853	0.4851	0.4849	0.4447	0.4845
5.00	0.4849	0.4848	0.4846	0.4444	0.4842
5.10	0.4846	0.4845	0.4843	0.4441	0.4839
5.20	0.4843	0.4841	0.4839	0.4437	0.4835
5.30	0.4840	0.4838	0.4836	0.4434	0.4832
5.40	0.4837	0.4835	0.4833	0.4431	0.4829
5.50	0.4834	0.4832	0.4830	0.4428	0.4826
5.60	0.4831	0.4829	0.4827	0.4425	0.4823
5.70	0.4828	0.4826	0.4824	0.4422	0.4820
5.80	0.4825	0.4823	0.4821	0.4419	0.4817
5.90	0.4822	0.4820	0.4818	0.4416	0.4813
6.00	0.4819	0.4817	0.4815	0.4413	0.4810

TABLE A-6. KATIO T SUB PHA/T SUB EXP

*****INTEREST RATE IVS*****

TEMP	0.080	0.081	0.082	0.083	0.084
1.00	0.4968	0.4968	0.4967	0.4967	0.4966
1.10	0.4965	0.4964	0.4964	0.4963	0.4963
1.20	0.4962	0.4961	0.4961	0.4960	0.4960
1.30	0.4958	0.4958	0.4957	0.4957	0.4956
1.40	0.4955	0.4955	0.4954	0.4954	0.4953
1.50	0.4952	0.4951	0.4951	0.4950	0.4950
1.60	0.4949	0.4948	0.4947	0.4947	0.4946
1.70	0.4946	0.4945	0.4944	0.4944	0.4943
1.80	0.4942	0.4942	0.4941	0.4940	0.4940
1.90	0.4939	0.4938	0.4938	0.4937	0.4936
2.00	0.4936	0.4935	0.4934	0.4934	0.4933
2.10	0.4933	0.4932	0.4931	0.4930	0.4929
2.20	0.4929	0.4929	0.4928	0.4927	0.4926
2.30	0.4926	0.4925	0.4924	0.4924	0.4923
2.40	0.4923	0.4922	0.4921	0.4920	0.4919
2.50	0.4920	0.4919	0.4918	0.4917	0.4916
2.60	0.4917	0.4916	0.4915	0.4914	0.4913
2.70	0.4913	0.4912	0.4911	0.4910	0.4909
2.80	0.4910	0.4909	0.4908	0.4907	0.4906
2.90	0.4907	0.4906	0.4905	0.4904	0.4903
3.00	0.4904	0.4903	0.4902	0.4900	0.4899
3.10	0.4901	0.4899	0.4898	0.4897	0.4896
3.20	0.4897	0.4896	0.4895	0.4894	0.4893
3.30	0.4894	0.4893	0.4892	0.4890	0.4889
3.40	0.4891	0.4890	0.4888	0.4887	0.4886
3.50	0.4888	0.4886	0.4885	0.4884	0.4883
3.60	0.4885	0.4883	0.4882	0.4880	0.4879
3.70	0.4881	0.4880	0.4878	0.4877	0.4876
3.80	0.4878	0.4877	0.4875	0.4874	0.4872
3.90	0.4875	0.4874	0.4872	0.4871	0.4869
4.00	0.4872	0.4870	0.4869	0.4867	0.4866
4.10	0.4869	0.4867	0.4865	0.4864	0.4862
4.20	0.4865	0.4864	0.4862	0.4861	0.4859
4.30	0.4862	0.4861	0.4859	0.4857	0.4856
4.40	0.4859	0.4857	0.4856	0.4854	0.4852
4.50	0.4856	0.4854	0.4852	0.4851	0.4849
4.60	0.4853	0.4851	0.4849	0.4847	0.4846
4.70	0.4849	0.4848	0.4846	0.4844	0.4842
4.80	0.4846	0.4844	0.4843	0.4841	0.4839
4.90	0.4843	0.4841	0.4839	0.4837	0.4836
5.00	0.4840	0.4838	0.4836	0.4834	0.4832
5.10	0.4837	0.4835	0.4833	0.4831	0.4829
5.20	0.4833	0.4831	0.4829	0.4827	0.4825
5.30	0.4830	0.4828	0.4826	0.4824	0.4822
5.40	0.4827	0.4825	0.4823	0.4821	0.4819
5.50	0.4824	0.4822	0.4820	0.4818	0.4815
5.60	0.4821	0.4819	0.4816	0.4814	0.4812
5.70	0.4818	0.4815	0.4813	0.4811	0.4809
5.80	0.4814	0.4812	0.4810	0.4808	0.4805
5.90	0.4811	0.4809	0.4807	0.4804	0.4802
6.00	0.4808	0.4806	0.4803	0.4801	0.4799

TABLE A-6. RATIO γ SUB PHI/T SUB EXP

***** INTEREST RATE IVS*****

TEXP	0.085	0.086	0.087	0.088	0.089
1.00	0.4966	0.4966	0.4965	0.4965	0.4965
1.10	0.4963	0.4962	0.4962	0.4961	0.4961
1.20	0.4959	0.4959	0.4958	0.4958	0.4957
1.30	0.4956	0.4955	0.4955	0.4954	0.4954
1.40	0.4952	0.4952	0.4951	0.4951	0.4950
1.50	0.4949	0.4948	0.4946	0.4947	0.4947
1.60	0.4946	0.4945	0.4944	0.4944	0.4943
1.70	0.4942	0.4942	0.4941	0.4940	0.4940
1.80	0.4939	0.4938	0.4937	0.4937	0.4936
1.90	0.4935	0.4935	0.4934	0.4933	0.4933
2.00	0.4932	0.4931	0.4931	0.4930	0.4929
2.10	0.4929	0.4928	0.4927	0.4926	0.4925
2.20	0.4925	0.4924	0.4924	0.4923	0.4922
2.30	0.4922	0.4921	0.4920	0.4919	0.4918
2.40	0.4918	0.4918	0.4917	0.4916	0.4915
2.50	0.4915	0.4914	0.4913	0.4912	0.4911
2.60	0.4912	0.4911	0.4910	0.4909	0.4908
2.70	0.4908	0.4907	0.4906	0.4905	0.4904
2.80	0.4905	0.4904	0.4903	0.4902	0.4901
2.90	0.4901	0.4900	0.4899	0.4898	0.4897
3.00	0.4898	0.4897	0.4896	0.4895	0.4893
3.10	0.4895	0.4894	0.4892	0.4891	0.4890
3.20	0.4891	0.4890	0.4889	0.4888	0.4886
3.30	0.4888	0.4887	0.4885	0.4884	0.4883
3.40	0.4885	0.4883	0.4882	0.4881	0.4879
3.50	0.4881	0.4880	0.4878	0.4877	0.4876
3.60	0.4878	0.4876	0.4875	0.4874	0.4872
3.70	0.4874	0.4873	0.4871	0.4870	0.4869
3.80	0.4871	0.4869	0.4868	0.4867	0.4865
3.90	0.4868	0.4866	0.4865	0.4863	0.4862
4.00	0.4864	0.4863	0.4861	0.4860	0.4858
4.10	0.4861	0.4859	0.4858	0.4856	0.4854
4.20	0.4857	0.4856	0.4854	0.4853	0.4851
4.30	0.4854	0.4852	0.4851	0.4849	0.4847
4.40	0.4851	0.4849	0.4847	0.4846	0.4844
4.50	0.4847	0.4845	0.4844	0.4842	0.4840
4.60	0.4844	0.4842	0.4840	0.4839	0.4837
4.70	0.4840	0.4839	0.4837	0.4835	0.4833
4.80	0.4837	0.4835	0.4833	0.4832	0.4830
4.90	0.4834	0.4832	0.4830	0.4828	0.4826
5.00	0.4830	0.4828	0.4826	0.4825	0.4823
5.10	0.4827	0.4825	0.4823	0.4821	0.4819
5.20	0.4824	0.4822	0.4820	0.4818	0.4816
5.30	0.4820	0.4818	0.4816	0.4814	0.4812
5.40	0.4817	0.4815	0.4813	0.4811	0.4809
5.50	0.4813	0.4811	0.4809	0.4807	0.4805
5.60	0.4810	0.4808	0.4806	0.4804	0.4801
5.70	0.4807	0.4804	0.4802	0.4800	0.4798
5.80	0.4803	0.4801	0.4799	0.4797	0.4794
5.90	0.4800	0.4798	0.4795	0.4793	0.4791
6.00	0.4796	0.4794	0.4792	0.4790	0.4787

TABLE A-6. RATIO T SUB PHI/T SUB EXP

*****INTEREST RATE IVS*****

TEXP	0.090	0.091	0.092	0.093	0.094
1.00	0.4964	0.4964	0.4963	0.4963	0.4963
1.10	0.4961	0.4960	0.4960	0.4959	0.4959
1.20	0.4957	0.4956	0.4956	0.4956	0.4955
1.30	0.4953	0.4953	0.4952	0.4952	0.4951
1.40	0.4950	0.4949	0.4949	0.4948	0.4948
1.50	0.4946	0.4946	0.4945	0.4944	0.4944
1.60	0.4943	0.4942	0.4941	0.4941	0.4940
1.70	0.4939	0.4938	0.4938	0.4937	0.4936
1.80	0.4935	0.4935	0.4934	0.4933	0.4933
1.90	0.4932	0.4931	0.4930	0.4930	0.4929
2.00	0.4928	0.4927	0.4927	0.4926	0.4925
2.10	0.4925	0.4924	0.4923	0.4922	0.4921
2.20	0.4921	0.4920	0.4919	0.4919	0.4918
2.30	0.4917	0.4917	0.4916	0.4915	0.4914
2.40	0.4914	0.4913	0.4912	0.4911	0.4910
2.50	0.4910	0.4909	0.4908	0.4907	0.4906
2.60	0.4907	0.4906	0.4905	0.4904	0.4903
2.70	0.4903	0.4902	0.4901	0.4900	0.4899
2.80	0.4900	0.4898	0.4897	0.4896	0.4895
2.90	0.4896	0.4895	0.4894	0.4893	0.4892
3.00	0.4892	0.4891	0.4890	0.4889	0.4888
3.10	0.4889	0.4888	0.4887	0.4886	0.4885
3.20	0.4885	0.4884	0.4883	0.4882	0.4880
3.30	0.4882	0.4880	0.4879	0.4878	0.4877
3.40	0.4878	0.4877	0.4875	0.4874	0.4873
3.50	0.4874	0.4873	0.4872	0.4870	0.4869
3.60	0.4871	0.4869	0.4868	0.4867	0.4865
3.70	0.4867	0.4866	0.4864	0.4863	0.4862
3.80	0.4864	0.4862	0.4861	0.4859	0.4858
3.90	0.4860	0.4859	0.4857	0.4856	0.4854
4.00	0.4857	0.4855	0.4853	0.4852	0.4850
4.10	0.4853	0.4851	0.4850	0.4848	0.4847
4.20	0.4849	0.4848	0.4846	0.4845	0.4843
4.30	0.4846	0.4844	0.4843	0.4841	0.4839
4.40	0.4842	0.4841	0.4839	0.4837	0.4836
4.50	0.4839	0.4837	0.4835	0.4833	0.4832
4.60	0.4835	0.4833	0.4832	0.4830	0.4828
4.70	0.4831	0.4830	0.4828	0.4826	0.4824
4.80	0.4828	0.4826	0.4824	0.4822	0.4821
4.90	0.4824	0.4822	0.4821	0.4819	0.4817
5.00	0.4821	0.4819	0.4817	0.4815	0.4813
5.10	0.4817	0.4815	0.4813	0.4811	0.4809
5.20	0.4814	0.4812	0.4810	0.4808	0.4806
5.30	0.4810	0.4808	0.4806	0.4804	0.4802
5.40	0.4806	0.4804	0.4802	0.4800	0.4798
5.50	0.4803	0.4801	0.4799	0.4797	0.4795
5.60	0.4799	0.4797	0.4795	0.4793	0.4791
5.70	0.4796	0.4794	0.4791	0.4789	0.4787
5.80	0.4792	0.4790	0.4788	0.4786	0.4783
5.90	0.4789	0.4786	0.4784	0.4782	0.4780
6.00	0.4785	0.4783	0.4780	0.4778	0.4776

TABLE A-6. RATIO T SUB PHI/T SUB EXP

***** INTEREST RATE IVS*****

TEXP	0.095	0.096	0.097	0.098	0.099
1.00	0.4962	0.4962	0.4961	0.4961	0.4961
1.10	0.4958	0.4958	0.4958	0.4957	0.4957
1.20	0.4955	0.4954	0.4954	0.4953	0.4953
1.30	0.4951	0.4950	0.4950	0.4949	0.4949
1.40	0.4947	0.4947	0.4946	0.4945	0.4945
1.50	0.4943	0.4943	0.4942	0.4942	0.4941
1.60	0.4940	0.4939	0.4938	0.4938	0.4937
1.70	0.4936	0.4935	0.4934	0.4934	0.4933
1.80	0.4932	0.4931	0.4931	0.4930	0.4929
1.90	0.4928	0.4927	0.4927	0.4926	0.4925
2.00	0.4924	0.4924	0.4923	0.4922	0.4921
2.10	0.4921	0.4920	0.4919	0.4918	0.4917
2.20	0.4917	0.4916	0.4915	0.4914	0.4913
2.30	0.4913	0.4912	0.4911	0.4910	0.4910
2.40	0.4909	0.4908	0.4907	0.4907	0.4906
2.50	0.4906	0.4905	0.4904	0.4903	0.4902
2.60	0.4902	0.4901	0.4900	0.4899	0.4898
2.70	0.4898	0.4897	0.4896	0.4895	0.4894
2.80	0.4894	0.4893	0.4892	0.4891	0.4890
2.90	0.4890	0.4889	0.4888	0.4887	0.4886
3.00	0.4887	0.4885	0.4884	0.4883	0.4882
3.10	0.4883	0.4882	0.4881	0.4879	0.4878
3.20	0.4879	0.4878	0.4877	0.4875	0.4874
3.30	0.4875	0.4874	0.4873	0.4872	0.4870
3.40	0.4872	0.4870	0.4869	0.4868	0.4866
3.50	0.4868	0.4866	0.4865	0.4864	0.4862
3.60	0.4864	0.4863	0.4861	0.4860	0.4859
3.70	0.4860	0.4859	0.4857	0.4856	0.4855
3.80	0.4856	0.4855	0.4854	0.4852	0.4851
3.90	0.4853	0.4851	0.4850	0.4848	0.4847
4.00	0.4849	0.4847	0.4846	0.4844	0.4843
4.10	0.4845	0.4844	0.4842	0.4840	0.4839
4.20	0.4841	0.4840	0.4838	0.4837	0.4835
4.30	0.4838	0.4836	0.4834	0.4833	0.4831
4.40	0.4834	0.4832	0.4831	0.4829	0.4827
4.50	0.4830	0.4828	0.4827	0.4825	0.4823
4.60	0.4826	0.4825	0.4823	0.4821	0.4819
4.70	0.4823	0.4821	0.4819	0.4817	0.4815
4.80	0.4819	0.4817	0.4815	0.4813	0.4812
4.90	0.4815	0.4813	0.4811	0.4809	0.4808
5.00	0.4811	0.4809	0.4807	0.4806	0.4804
5.10	0.4807	0.4806	0.4804	0.4802	0.4800
5.20	0.4804	0.4802	0.4800	0.4798	0.4796
5.30	0.4800	0.4798	0.4796	0.4794	0.4792
5.40	0.4796	0.4794	0.4792	0.4790	0.4788
5.50	0.4792	0.4790	0.4788	0.4786	0.4784
5.60	0.4789	0.4787	0.4784	0.4782	0.4780
5.70	0.4785	0.4783	0.4781	0.4778	0.4776
5.80	0.4781	0.4779	0.4777	0.4775	0.4772
5.90	0.4777	0.4775	0.4773	0.4771	0.4769
6.00	0.4774	0.4771	0.4769	0.4767	0.4765

TABLE A-6. RATIO T SUB PHI/T SUB EXP

***** INTEREST RATE IVS*****

TEXP	0.100	0.101	0.102	0.103	0.104
1.00	0.4960	0.4960	0.4960	0.4959	0.4959
1.10	0.4956	0.4956	0.4956	0.4955	0.4955
1.20	0.4952	0.4952	0.4951	0.4951	0.4951
1.30	0.4948	0.4948	0.4947	0.4947	0.4946
1.40	0.4944	0.4944	0.4943	0.4943	0.4942
1.50	0.4940	0.4940	0.4939	0.4939	0.4938
1.60	0.4936	0.4936	0.4935	0.4935	0.4934
1.70	0.4933	0.4932	0.4931	0.4931	0.4930
1.80	0.4929	0.4928	0.4927	0.4926	0.4926
1.90	0.4925	0.4924	0.4923	0.4922	0.4922
2.00	0.4921	0.4920	0.4919	0.4918	0.4918
2.10	0.4917	0.4916	0.4915	0.4914	0.4913
2.20	0.4913	0.4912	0.4911	0.4910	0.4909
2.30	0.4909	0.4908	0.4907	0.4906	0.4905
2.40	0.4905	0.4904	0.4903	0.4902	0.4901
2.50	0.4901	0.4900	0.4899	0.4898	0.4897
2.60	0.4897	0.4896	0.4895	0.4894	0.4893
2.70	0.4893	0.4892	0.4891	0.4890	0.4889
2.80	0.4889	0.4888	0.4887	0.4886	0.4885
2.90	0.4885	0.4884	0.4883	0.4882	0.4881
3.00	0.4881	0.4880	0.4879	0.4878	0.4877
3.10	0.4877	0.4876	0.4875	0.4874	0.4873
3.20	0.4873	0.4872	0.4871	0.4870	0.4869
3.30	0.4869	0.4868	0.4867	0.4866	0.4865
3.40	0.4865	0.4864	0.4863	0.4862	0.4861
3.50	0.4861	0.4860	0.4859	0.4858	0.4857
3.60	0.4857	0.4856	0.4855	0.4854	0.4853
3.70	0.4853	0.4852	0.4851	0.4850	0.4849
3.80	0.4849	0.4848	0.4847	0.4846	0.4845
3.90	0.4845	0.4844	0.4843	0.4842	0.4841
4.00	0.4841	0.4840	0.4839	0.4838	0.4837
4.10	0.4837	0.4836	0.4835	0.4834	0.4833
4.20	0.4833	0.4832	0.4831	0.4830	0.4829
4.30	0.4829	0.4828	0.4827	0.4826	0.4825
4.40	0.4826	0.4824	0.4823	0.4822	0.4821
4.50	0.4822	0.4820	0.4819	0.4818	0.4817
4.60	0.4818	0.4816	0.4815	0.4814	0.4813
4.70	0.4814	0.4812	0.4811	0.4810	0.4809
4.80	0.4810	0.4808	0.4807	0.4806	0.4805
4.90	0.4806	0.4804	0.4803	0.4802	0.4801
5.00	0.4802	0.4800	0.4799	0.4798	0.4797
5.10	0.4798	0.4796	0.4795	0.4794	0.4793
5.20	0.4794	0.4792	0.4791	0.4790	0.4789
5.30	0.4790	0.4788	0.4787	0.4786	0.4785
5.40	0.4786	0.4784	0.4783	0.4782	0.4781
5.50	0.4782	0.4780	0.4779	0.4778	0.4777
5.60	0.4778	0.4776	0.4775	0.4774	0.4773
5.70	0.4774	0.4772	0.4771	0.4770	0.4769
5.80	0.4770	0.4768	0.4767	0.4766	0.4765
5.90	0.4766	0.4764	0.4763	0.4762	0.4761
6.00	0.4762	0.4760	0.4759	0.4758	0.4757

LEVEL 21.6 (DEC 72)

CS/360 FORTRAN II

COMPILER OPTIONS - NAME= MAIN,OPT=02,LINECNT=00,SIZE=JUNK,
SOURCE,EOC0IC,NGLIST,MODECK,LUAD,MAP,MUEUIT,NULU,NUMBER

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C
C*****REFCO-d*****JULY 1974 *****
C*****A NUCLEAR FUEL CYCLE COST CODE USING THE DISCOUNTED CASH FLOW
C METHOD WITH CONTINUOUS DISCOUNTING.
C**** THIS VERSION HAS BATCHWISE COST BREAKDOWNS ****
C**** URANIUM CREDIT IS GIVEN AS FEE AND SEPARATIVE WORK ****
C**** PRICE ESCALATION ROUTINE IS REVISED TO PROVIDE SEPARATE ESCALATION
C**** FOR EACH COST COMPONENT.
C**** FOR COST BREAKDOWNS USE LL(1)=5.
C
ISN 0002 COMMON LCA
ISN 0003 COMMON LL(10),DES(13),D(35),TLEAD(70,10),PRICE(120,10)
ISN 0004 COMMON G,XF,XT,PWEXPS,TXRE,TXRN,PWEXPA,CUMK
ISN 0005 COMMON NBMAX,NTPAX,NPPAX,NYPAX,NPRICE,NPLCST,YKSTRT
ISN 0006 COMMON PFW(500),LWRA(500),CFAB(500),CREP(500),CPLU(500),KMAX
ISN 0007 COMMON NCOK(120),CHPU(120),CHFP(120),NTYPE(120),BLVCST(120),
1 BLV2(120),EXPDIR(120,8),NTA(120),NTB(120),CHW(120),CH235(120),
2 DSU(120),DS235(120),DSPU(120),USFP(120),TINC(120),PWF(120),
3 NPA(120),NPB(120),DEDUC(120),TGTKWH(120),DCUST(120),NAA(120),
4 NBB(120),BKWH(120,40),BTCKWH(120),BBUY(120),PMBEAP(120),DDUC(120)
ISN 0008 COMMON DIRECT(120,8)
ISN 0009 DIMENSION BPWPTX(120),PWCYC(120),PWCPTV(120),CYCOST(120),
1 CYCCUM(120)
ISN 0010 DIMENSION DGCOST(120,8),ECCOST(120,8),CANHY(120,8)
C
C
C***** DEFINITIONS *****
C
C BCST(NB) = TOTAL COSTS ACCUMULATED FOR BATCH NB
C DDUC(NP) = DEDUCTIBLES FOR BATCH NB IN PERIOD NP
C BKWH(NB,NP) = KWH DELIVERED BY BATCH NB DURING PERIOD NP
C BLVCST(NB) = LEVELIZED FUEL CYCLE COST FOR BATCH NB
C BLV2(NB) = CUMULATIVE LEVELIZED FUEL CYCLE COST THROUGH BATCH NB
C BTCKWH(NB) = TOTAL KWH DELIVERED BY BATCH NB
C CARDIR(NB) = CARRYING CHARGE FOR BATCH NB, MILLS/KWH
C CFAB(K) = EXPENDITURE FOR FABRICATION IN PERIOD K
C CHW(NB) = TOTAL U CHARGED FOR BATCH NB
C CH235(NB) = U235 CHARGED FOR BATCH NB
C CPLU(K) = CREDIT FOR U235 AND PU IN PERIOD K
C CREP(K) = EXPENDITURE FOR REPROCESSING IN PERIOD K
C CUMCAR(NB) = CARRYING CHARGE, CUMULATIVE THRU BATCH NB
C CUMDIR(NB,K) = CUMUL DIRECT EXPENSE BATCH NB PROCESS K, >
C CUMKWH(NB) = CUMULATIVE ENERGY THROUGH BATCH NB
C CURA(K) = EXPENDITURE FOR UF6 AND SEP DUTY IN PERIOD K
C D(1-35) = INPLT CONSTANTS
C DEDUC(NP) = DEDUCTIBLE FUEL EXPENSE FOR PERIOD NP
C DES(1-13) = PROBLEM NAME
C DIRCST(NB,K) = DIRECT COST BATCH NB, PROCESS K, MILLS/KWH
C DIRCUM(NB,K) = CUMUL DIRECT ENERGY COST THRU BATCH NB, PROC K
C DSFP(NB) = FISSILE PU DISCHARGED FOR BATCH NB
C DSPU(NB) = PU DISCHARGED FOR BATCH NB
C DSU(NB) = TOTAL U DISCHARGED FOR BATCH NB
C DS235(NB) = U235 DISCHARGED FOR BATCH NB
C EXPDIR(NB,K) = DIRECT EXPENSE FOR BATCH NB AND PROCESS K, >
C LL(1-10) = INPLT SIGNALS FOR CONTRL PURPOSES
C NAA(NP) = EARLIEST BATCH DELIVERING HEAT DURING PERIOD NP

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C	NDB(NP)	= LATEST BATCH DELIVERING HEAT DURING PERIOD NP
C	NPA(NB)	= EARLIEST PERIOD IN WHICH BATCH NB DELIVERS HEAT
C	NPB(NB)	= LAST PERIOD IN WHICH BATCH NB DELIVERS HEAT
C	NTA(NB)	= TIME POINT AT WHICH BATCH NB ENTERS REACTOR
C	NTB(NB)	= TIME POINT AT WHICH BATCH NB LEAVES REACTOR
C	NTHA(NP)	= TIME POINT AT BEGINNING OF PERIOD NP
C	NTNB(NP)	= TIME POINT AT END OF PERIOD NP
C	PFW(K)	= CAPACITY FACTOR IN PERIOD K
C	PRICE(M)	= PRICE, \$/KG, FOR FUEL CYCLE ITEM M
C	PWF(NP)	= PRESENT WORTH FACTOR FOR PERIOD NP
C	TIME(N)	= TIME OF A REACTOR EVENT, YEARS FROM REACTOR STARTUP
C	TIME2(NT)	= TIME POINTS SUPPLIED AS INPUT DATA
C	TLEAD(M)	= LEAD TIME, YEARS, FOR FUEL CYCLE ITEM M
C	TOTKWH(NP)	= TOTAL KWH DELIVERED DURING PERIOD NP
C	ALLKWH	= TOTAL ENERGY GENERATED OVER LIFE OF REACTOR
C	BOBT	= DENOMINATOR FOR BATCH LEVEL ENERGY COST
C	BOBT2	= CUMULATIVE VALUE OF BOBT
C	BOBY	= TAXABLE VALUE FOR BATCH NB
C	BF238	= RATIO OF FUEL TO PRODUCT IN ENRICHMENT PLANT
C	BLVCST	= BATCH LEVELIZED ENERGY COST
C	BLV2	= CUMULATIVE LEVELIZED FUEL CYCLE COST
C	BND	= FRACTION OF INVESTMENT IN BONDS
C	BOI	= DENOMINATOR OF FUEL CYCLE COST EXPRESSION
C	BPRPTA	= PROPERTY TAXES AND INSURANCE FOR BATCH NB
C	BPWPTY	= PW OF PROPERTY TAXES AND INSURANCE FOR BATCH NB
C	BTOP	= NUMERATOR FOR BATCH LEVEL ENERGY COST
C	BTUP2	= CUMULATIVE VALUE OF BTOP
C	CAFAC	= CAPACITY FACTOR, USED AS PARAMETER.
C	ELAPS	= ELAPSED TIME FOR PERIOD, CALCULATED FROM CAFAC.
C	EXPEND	= CASH EXPENDITURE, MILLIONS OF \$
C	G	= NATURAL LOG OF 1 + RAY
C	GTA	= PRODUCT OF G AND INITIAL TIME POINT
C	GTAX	= $\exp(-GTA)$
C	GTB	= PRODUCT OF G AND FINAL TIME POINT
C	NB	= BATCH NUMBER
C	NBCA	= SAME AS NAA(NP)
C	NBCB	= SAME AS NBB(NP)
C	NOMAX	= TOTAL NUMBER OF BATCHES
C	NP	= PERIOD NUMBER
C	NPAND	= SAME AS NPA(NB)
C	NPBND	= SAME AS NPB(NB)
C	NPMAX	= TOTAL NUMBER OF PERIODS
C	NPRICE	= NUMBER OF YEARS FOR WHICH PRICES ARE ENTERED
C	NTMAX	= TOTAL NUMBER OF TIME POINTS
C	NYLOST	= YEAR IN WHICH PRICE DATA BEGIN
C	NYMAX	= NUMBER OF YEARS FOR WHICH LEAD TIMES ARE SPECIFIED
C	PCOST	= FUEL CYCLE COST, MILLS/KWH OR CENTS/MILLION BTU
C	PRPTA	= ANNUAL PROPERTY TAXES AND INSURANCE ON CORE
C	PWDDUC	= PW DEDUCTIBLES FOR BATCH NB
C	PWBELE	= PW ENERGY DELIVERED BY BATCH NB
C	PWBTCH	= DISCOUNTED BATCH COST, \$10000
C	PWDDUC	= TOTAL PRESENT WORTH OF DEDUCTIBLE FUEL EXPENSE
C	PWELEC	= TOTAL PRESENT-WORTHED ELECTRICITY PRODUCED
C	PWEXPA	= SUM OF PWEXPS THROUGH PREVIOUS BATCH
C	PWEXPS	= TOTAL PRESENT WORTH OF CASH FUEL EXPENSES
C	PWPTY	= TOTAL PRESENT WORTH OF PROPERTY TAXES AND INSURANCE
C	QT38	= QUANTITY OF UF6 PURCHASED PER BATCH, KG
C	RRB	= BOND INTEREST RATE PER YEAR

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C   RRE          * ANNUAL EARNING RATE ON EQUITY AFTER TAXES
C   RRV          * MODIFIED INTEREST RATE
C   SALE         * CASH SALE OF PL, MILLIONS OF $
C   SEDY         * SEPARATIVE DUTY, KG PER KG L
C   TBCOST       * TOTAL DIRECT EXPENDITURES FOR BATCH NO
C   TCF          * NUMERATOR OF FUEL CYCLE COST EXPRESSION
C   TCR          * FEDERAL INCOME TAX RATE
C   TXRE        * TAX CONSTANT K SUB E
C   TXRM        * TAX CONSTANT K SUB M
C   VALUE        * VALUE OF RETURNED URANIUM, $/KG
C   XF           * U235 ASSAY OF NATURAL U308 = 0.00711
C   XP           * U235 ASSAY OF FRESH FUEL
C   XT           * U235 ASSAY OF DIFFUSION PLANT TAILS
C   YRSTAT       * YEAR IN WHICH REACTOR STARTS UP (E.G. 1974.25)
C
C
C *** NAA(NP) IS THE EARLIEST BATCH IN THE REACTOR DURING PERIOD NP
C *** NOB(NP) IS THE LATEST BATCH IN THE REACTOR DURING PERIOD NP
C
C ***** OPTIONS *****
C
C *****IF LL(1)=0, PRICES ARE SUPPLIED AS A FUNCTION OF THE YEAR OF
C   PROCUREMENT. THE CODE PERFORMS A LINEAR INTERPOLATION FOR
C   FRACTIONS OF A YEAR. IF LL(1)=1, THE INTERPOLATION IS
C   OMITTED. IF LL(1)=2, PRICES ARE SUPPLIED FOR EACH BATCH.
C *****IF LL(2)=1, DEDUCTIBLE FUEL EXPENSE IS PRORATED BY kWh AS IN
C   POWERCO. IF LL(2)=0, DEDUCTIBLE EXPENSE IS COLLECTED BY BATCHES
C   AND PRORATED TO EACH PERIOD ON THE BASIS OF THE ELECTRICITY
C   PRODUCED BY THAT BATCH IN THAT PERIOD.
C *****IF LL(3)=0, COSTS ARE CALCULATED IN MILLS/KWH. IF LL(3)=1,
C   COSTS ARE CALCULATED IN CENTS/MILLION BTU.
C   LL(4)=0, NORMAL INPUT DATA SET
C   LL(4)=1, PROBLEM DATA CONSISTS OF ONE CARD ONLY.
C   IF LL(4)=2, INPUT CONSISTS OF FIRST CARD AND FIVE (N) CARDS.
C   LL(5)=1, SUBROUTINE PUMINP IS CALLED TO PREPARE INPUT DATA
C   CARDS FOR PROGRAM PGM70 WHICH CAN BE RUN SUBSEQUENTLY.
C   LL(5)=0, PUMINP IS NOT CALLED.
C   IF LL(6)=0, SUBROUTINE GLT2 IS CALLED AND BATCHWISE COST
C   BREAKDOWNS ARE PRINTED.
C   IF LL(7) IS GREATER THAN 0 PRICES ARE ESCALATED AT THE RATE
C   OF LL(7) PERCENT PER YEAR.
C   IF LL(8)=0, READ ENERGY PER BATCH PER CYCLE (ENCYC) CARDS.
C   IF LL(8)=1, THE ENCYC CARDS ARE OMITTED AND THE ENERGY PER
C   BATCH IS DIVIDED EQUALLY AMONG THE CYCLES.
C   LL(9) IS NORMALLY ZERO WHEN CHU(INB) IS TOTAL URANIUM CHARGED.
C   IF LL(9)=1, QUANTITY OF UF6 PURCHASED IS ADJUSTED AS FOLLOWS.
C   QT30=0.132*(CHU(INB)-CHFPUI(NB))/0.721
C *****IF LL(10)=0, ENERGIES ON CARDS 8 ARE IN TERMS OF BURNUP AND
C   METRIC TONS OF HEAVY METAL PER BATCH.
C *****IF LL(10)=1 OR 2, ENERGIES PER BATCH ON CARDS 8 ARE INPUTTED
C   IN TERMS OF 10**9 KWHR OR 10**14 BTU RESPECTIVELY.
C   LEAD AND LAG TIMES (CARD 4) ARE IN THE FOLLOWING ORDER.
C   BUY UF6, ENRICHMENT, FABRICATION, REPROCESSING, PU CREDIT,
C   U235 CREDIT, PURCHASE TAILS, PURCHASE PU.
C   PRICES (CARDS 5) ARE IN THE FOLLOWING ORDER. NATURAL UF6,
C   SEPARATIVE DUTY, FABRICATION (BLKT), REPROCESSING (BLKT),
C   FISSILE PU, DEPLETED U (TAILS), FABRICATION (CURE),
C   REPROCESSING (CONE).

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C*** THE SIGNAL LL(6).EQ.5 CALLS FOR COST BREAKDOWNS.
C*** IF LL(6)=0 OR 4, SUBROUTINE UGTC IS CALLED.
C
C
C*** THE UNIFORM PRESENT MONTH FUNCTION IS AS FOLLOWS.
PMECA(CTA,GTB)=(EXP(-CTA)-EXP(-GTB))/(10T0-CTA)
C
C
ISN 0011
C
ISN 0012      1 CALL INPUT
ISN 0013      LCA=-1
ISN 0014      3 KMAX=1
ISN 0015      LCA=LCA+1
ISN 0016      PMUUC=0.
ISN 0017      PNELEC=0.
ISN 0018      PMEXPS=0.
ISN 0019      CORE=0.
ISN 0020      TBCOST=0.
ISN 0021      ALLKMH=0.
ISN 0022      DO 2 K=1,500
ISN 0023      PF(K)=0.
ISN 0024      CURA(K)=0.
ISN 0025      CFAD(K)=0.
ISN 0026      CREP(K)=0.
ISN 0027      2 CPLEK(K)=0.
C
C*** COLLECT COSTS FOR EACH BATCH IN TURN. TOTAL PRESENT MONTH OF
C EXPENSES, PMEXPS, IS ACCUMULATED DURING THIS PROCESS.
C
ISN 0028      DO 45 NB=1,NBMAX
ISN 0029      BCOST(NB)=0.
ISN 0030      CALL COSTS(NB)
ISN 0031      45 CALL SALES(NB)
C
ISN 0032      DO 46 NB=1,NBMAX
ISN 0033      46 TBCOST=TBCOST+BCOST(NB)
C
C*** DO FOR EACH PERIOD NP. COLLECT TOTKMH(NP), THE TOTAL KMH
C DELIVERED DURING PERIOD NP. ALSO COLLECT JEDUC(NP), THE TAX-
C DEDUCTIBLE FUEL EXPENSE FOR PERIOD NP.
C
ISN 0034      IFILL(2).EQ.1)GO TO 82
ISN 0035      DO 80 NP=1,NPMAX
ISN 0036      DEDUC(NP)=0.
ISN 0037      TOTKMH(NP)=0.
ISN 0038      DO 64 NB=1,NBMAX
ISN 0039      63 TOTKMH(NP)=TOTKMH(NP)+bKMH(NB,NP)
ISN 0040      64 DEDUC(NP)=DEDUC(NP)+bCCST(NB)*bKMH(NB,NP)/BTUKMH(NB)
ISN 0041      PMUUC=PMUUC+DEDUC(NP)*PF(NP)
ISN 0042      PNELEC=PNELEC+TOTKMH(NP)*PWF(NP)
ISN 0043      ALLKMH=ALLKMH+TOTKMH(NP)
ISN 0044      80 CONTINUE
ISN 0045      GO TO 91
C
ISN 0047      82 DO 86 NP=1,NPMAX
ISN 0048      DEDUC(NP)=0.
ISN 0049      TOTKMH(NP)=0.
ISN 0050      DO 83 NB=1,NBMAX
ISN 0051      83 TOTKMH(NP)=TOTKMH(NP)+bKMH(NB,NP)

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ISN 0052      ALLKWH=ALLKWH+TOTKWH(NP)
ISN 0053      86 PHELEC=PHELEC+TOTKWH(NP)*PWF(NP)
ISN 0054      DO 87 NP=1,NPMAX
ISN 0055      DEDUC(NP)=TOTKWH(NP)*TCCST/ALLKWH
ISN 0056      87 PWDUC=PWDUC+DEDUC(NP)*PWF(NP)

C
C** PRPTA IS THE ANNUAL AMOUNT SPENT FOR PROPERTY TAXES AND INSURANCE.
C PRESENT MONTH IS PMPTY.
C
ISN 0057      91 PMPTY=0.
ISN 0058      D92=(L(17)*D(22)+C(19))
ISN 0059      DO 92 NB=1,NBMAX
ISN 0060      GTA=G+TIME(NTA(NB))
ISN 0061      GTB=G+TIME(NTB(NB))
ISN 0062      PM92=D92*BBUY(NB)*(TIME(NTB(NB))-TIME(NTA(NB)))*PWF(NB)
ISN 0063      92 PMPTY=PMPTY+PM92

C
C** CALCULATE FUEL CYCLE COST, FCOST.
C
ISN 0064      TOP=(1.-TXRN)*PMPTY -TXRN*FWDUC +PNCXPS
ISN 0065      BOT=(1.-TXRE)*PHELEC
ISN 0066      PCOST=TOP/BOT

C
C** PRINT OUTPUT.
ISN 0067      PRINT 500,(DES(I),I=1,13)
ISN 0068      IF(ILL(3).EQ.0)PRINT 507,PCOST
ISN 0070      IF(ILL(3).EQ.1)PRINT 508,PCOST
ISN 0072      PRINT 505
ISN 0073      PRINT 520
ISN 0074      PRINT 504
ISN 0075      PRINT 503,TOP,BOT,PCOST,PHELEC,PMPTY,PWDUC,PNCXPS,TXRE,TXRN,G
ISN 0076      PRINT 505
ISN 0077      IF(ILL(3).EQ.0)PRINT 506
ISN 0079      IF(ILL(3).EQ.1)PRINT 516
ISN 0081      DO 93 NP=1,NPMAX
ISN 0082      93 PRINT 502,NP,TOTKWH(NP),CEDUC(NP),PWF(NP)

C
C
C** CALCULATION OF BATCH LEVELIZED ENERGY COSTS.
ISN 0083      PRINT 517,(DES(I),I=1,13)
ISN 0084      PRINT 518
ISN 0085      BTOP2=0.
ISN 0086      BBOT2=0.
ISN 0087      DO 98 NB=1,NBMAX
ISN 0088      PWDLE=0.
ISN 0089      PWDUC=0.

C** DO FOR THE PERIODS DURING WHICH THIS BATCH IS IN THE REACTOR.
ISN 0090      NPANB=NPA(NB)
ISN 0091      NPBNB=NPB(NB)
ISN 0092      DO 96 NP=NPANB,NPBNB
ISN 0093      PWDLE=PWDLE+BKWH(NB,NP)*PWF(NP)
ISN 0094      BDUK(NP)=BKWH(NB,NP)*BCLST(NB)/BTOKWH(NB)
ISN 0095      96 PWDUC=PWDUC+BDUC(NP)*PWF(NP)
ISN 0096      GTA=G+TIME(NTA(NB))
ISN 0097      GTB=G+TIME(NTB(NB))
ISN 0098      BPRPTA=D92*BBUY(NB)
ISN 0099      BPMPTY=NPBPTA*(TIME(NTB(NB))-TIME(NTA(NB)))*PWF(NB)
ISN 0100      BPMPTX(NB)=BPMPTY

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ISM 0101      BTJP=(1.-TXRM)*PMPY-TXNP*PNUDUC*PNEEXP(NB)
ISM 0102      DBCT=(1.-TXRE)*PNECLE
ISM 0103      BLVCST(NB)=BTGP/BEUT
ISM 0104      BTGP2=BTGP2+BTGP
ISM 0105      DBCT2=DBCT2+DBCT
ISM 0106      BLVZ(NB)=BTGP2/DBCT2
ISM 0107      IF(LCA.EQ.0)GO TO 98
ISM 0109      BGCST(NB,LCA)=BLVCST(NB)
ISM 0110      DGCST(NB,LCA)=DIRECT(NB,LCA)/BTGMH(NB)
ISM 0111      CARRY(NB,LCA)=BGCST(NB,LCA)-DGCST(NB,LCA)
ISM 0112      98 PRINT 519,NB,BTGMH(NB),FNUELE,BLVCST(NB),DBVZ(NB)

C
C
C*** CALCULATE LEVELIZED COST AND CUMULATIVE LEVELIZED COST FOR
C      EACH CYCLE.
C
ISM 0113      PRINT 521,(DES(1),I=1,13)
ISM 0114      PRINT 522
ISM 0115      CYTOP2=0.
ISM 0116      CYBOT2=0.
ISM 0117      DO 120 NP=1,NPMAX
ISM 0118      PNCYX(NP)=0.
C*** DO FOR ALL BATCHES IN CYCLE NP.
ISM 0119      DO 101 NB=1,NBMAX
ISM 0120      101 PNCYX(NP)=PNCYX(NP)+BLVCST(NB)+DBKMH(NB,NP)
ISM 0121      CYCOST(NP)=PNCYX(NP)/TCTKMH(NP)
ISM 0122      CYTOP2=CYTOP2+PNCYX(NP)*FNF(NP)
ISM 0123      CYBOT2=CYBOT2+TOTKMH(NP)*PNF(NP)
ISM 0124      CYCCUM(NP)=CYTOP2/CYBOT2
ISM 0125      120 PRINT 519,NP,TOTKMH(NP),PNCYX(NP),CYCOST(NP),CYCCUM(NP)

C
C
C
ISM 0126      500 FORMAT('1',5X,'RESULTS',5X,13A4, '/')
ISM 0127      502 FORMAT(' ',15,6X,F14.5,3X,5F14.5)
ISM 0128      503 FORMAT(' ',10F12.5)
ISM 0129      504 FORMAT('          TCP          OCT          PCOST          PNELEC',
1 '          PMPY          PNUDUC          PNEEXP          TXRE',
2 '          TXRM          G',/)
ISM 0130      505 FORMAT(' ',/)
ISM 0131      506 FORMAT(' PERIOD          IC**% KWH          DEDUC $10000',
1 '          PH FACTOR',/)
ISM 0132      507 FORMAT(' LEVELIZED FUEL CYCLE CGST, MILLS/KWH',F14.5, '/')
ISM 0133      508 FORMAT(' LEVELIZED FUEL CYCLE CGST, CENTS/MILLION BTU',F14.5, '/')
ISM 0134      514 FORMAT(' PERIOD          IC**14 BTU          DEDUC $10000',
1 '          PH FACTOR',/)
ISM 0135      517 FORMAT('1 LEVELIZED ENERGY CGST FOR EACH BATCH',5X,13A4, '/')
ISM 0136      518 FORMAT(' BATCH          ENERGY          PH ENERGY          LEVEL COST',
1 '          CUM LVL COST',/)
ISM 0137      519 FORMAT(' ',18,6X,F14.5)
ISM 0138      520 FORMAT(' OTHER CALCULATED QUANTITIES',/)
ISM 0139      521 FORMAT('1 LEVELIZED ENERGY CGST FOR EACH CYCLE',5X,13A4, '/')
ISM 0140      522 FORMAT(' CYCLE          ENERGY          PH EXPENSE',
1 '          LEVEL COST          CUM LVL COST',/)
ISM 0141      523 FORMAT('1 BATCHWISE CGST BREAKDOWNS',5X,13A4, '/')
ISM 0142      524 FORMAT(' BATCH NUMBER ',15,7X,' DIRECT ',10X,' CARRY CHG',
1 '          9X,' TOTAL ',/)
ISM 0143      525 FORMAT(' PU PURCHASE ',3(1CX,F10.4))

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ISN 0144 526 FORMAT(' UF6 PURCHASE ',3(1GX,F10.4))
ISN 0145 527 FORMAT(' SEP. DUTY ',3(1GX,F10.4))
ISN 0146 528 FORMAT(' FABRICAT ION ',3(1GX,F10.4))
ISN 0147 529 FORMAT(' REPROCESSING ',3(1GX,F10.4))
ISN 0148 530 FORMAT(' PU CREDIT ',3(1GX,F10.4))
ISN 0149 531 FORMAT(' U CRED (FEE) ',3(1GX,F10.4))
ISN 0150 532 FORMAT(' TOTAL ',3(1GX,F10.4),'/')
ISN 0151 533 FORMAT(' U CRED (SEV) ',3(1GX,F10.4))

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C

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ISN 0152 IFILL(5).EQ.1.AND.JCA.EG.0)CALL PCINP
ISN 0154 IFILL(6).EQ.0)CALL OUT2
ISN 0156 IFILL(6).EQ.0)CALL OUT2
ISN 0158 IFILL(6).GE.5.AND.JCA.LT.8)GC TO 3
ISN 0160 IFILCA.NE.8)GC TO 200
ISN 0162 DO 160 NB=1,NOMAX
ISN 0163 IF(NOD(NB,4).EQ.1)PRINT 523,(DES(I),I=1,13)
ISN 0165 T11=0.
ISN 0166 T12=0.
ISN 0167 T13=0.
ISN 0168 PRINT 524,NB
ISN 0169 PRINT 525,DCOCST(NB,1),CARRY(NB,1),BCCST(NB,1)
ISN 0170 PRINT 526,DCOCST(NB,2),CARRY(NB,2),BCCST(NB,2)
ISN 0171 PRINT 527,DCOCST(NB,3),CARRY(NB,3),BCCST(NB,3)
ISN 0172 PRINT 528,DCOCST(NB,4),CARRY(NB,4),BCCST(NB,4)
ISN 0173 PRINT 529,DCOCST(NB,5),CARRY(NB,5),BCCST(NB,5)
ISN 0174 PRINT 530,DCOCST(NB,6),CARRY(NB,6),BCCST(NB,6)
ISN 0175 PRINT 531,DCOCST(NB,7),CARRY(NB,7),BCCST(NB,7)
ISN 0176 PRINT 533,DCOCST(NB,8),CARRY(NB,8),BCCST(NB,8)
ISN 0177 DO 152 N=1,8
ISN 0178 T11=T11+DCOCST(NB,N)
ISN 0179 T12=T12+CARRY(NB,N)
ISN 0180 152 T13=T13+BCCST(NB,N)
ISN 0181 PRINT 532,T11,T12,T13
ISN 0182 160 CONTINUE
ISN 0183 200 CONTINUE
ISN 0184 GO TO 1
ISN 0185 END

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LEVEL 21.6 (DEC 72)

CS/360 FORTRAN M

COMPILER OPTIONS - NAME= MAIN,OPT=02,LINECT=6C,SIZE=000K,
SOURCE,EOCIC,MLIST,MODECK,LLAD,MAP,MJEDIT,MULD,MJMET

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ISM 0002      SUBROUTINE INPUT
C
ISM 0003      COMMON LLA
ISM 0004      COMMON LL(10),DES(13),U(35),TLEAD(70,10),PRICE(120,10)
ISM 0005      COMMON G,XF,XT,PWEXPS,TXRE,TXRN,PWEXPA,CURE
ISM 0006      COMMON NDMAX,NTMAX,NPPAX,NYMAX,NPRICE,NVCCST,YRSTAT
ISM 0007      COMMON PFH(500),LMA(500),CFAB(500),CREP(500),CPLU(500),KMAX
ISM 0008      COMMON NCONE(120),CHPU(120),CHFP(120),PTYPE(120),MVCST(120),
1 BLVZ(120),EXPDIR(120,8),ATA(120),NTB(120),CHN(120),CHZ(120),
2 DSU(120),DSZSM(120),DSPL(120),DSFP(120),TIME(120),PWF(120),
3 MPA(120),NPB(120),DEWAC(120),TOTRHH(120),BCUST(120),MAA(120),
4 MB(120),BKMH(120,40),BTCMP(120),BBUY(120),PMDEAP(120),DCUC(120)
C
ISM 0009      COMMON DIRECT(120,8)
ISM 0010      DIMENSION NTMA(70),NTMB(70)
ISM 0011      DIMENSION ENCYC(70)
ISM 0012      DIMENSION NPTGT(120),DBUMA(120),DBUMET(120)
C
C000 THE UNIFORM PRESENT WORTH FACTOR IS AS FOLLOWS.
ISM 0013      PWFCH(GTA,GTB)=(EXP(-GTA)-EXP(-GTB))/(GTB-GTA)
C
C
C000 ALL INPUT DATA FOR THE ENTIRE PROGRAM IS READ IN THIS SUBROUTINE.
C
C000 DATA CONTROL SIGNALS ARE AS FOLLOWS.
C000 IF LL(4)=0, FULL SET OF INPUT DATA CARDS.
C000 IF LL(4)=1, CARD 1 ONLY.
C000 IF LL(4)=2, CARDS 1 AND 2 ONLY.
C000 IF LL(4)=3, CARDS 1,2,3,4,5 ONLY.
C000 IF LL(4)=4, CARDS 1,4 ONLY.
C000 IF LL(4)=5, CARDS 1,5 ONLY.
C
C000 CARD 1. CONTROL SIGNALS AND PROBLEM IDENTIFICATION.
ISM 0014      1 READ 400,(LL(K),K=1,10),(DES(I),I=1,13)
ISM 0015      IF(LL(4).EQ.1)GO TO 119
ISM 0017      IF(LL(4).EQ.4)GO TO 108
ISM 0019      IF(LL(4).EQ.5)GO TO 109
C000 CARD 2. ECONOMIC PARAMETERS, ETC.
ISM 0021      20 READ 401,(D(N),N=1,35)
ISM 0022      IF(LL(4).EQ.2)GO TO 119
C000 CARD 3. NUMBER OF BATCHES AND OTHER CONSTANTS.
ISM 0024      READ 409,NDMAX,NTMAX,NPPAX,NYMAX,NPRICE,NVCCST,YRSTAT
C000 CARDS 4. LEAD AND LAG TIMES.
ISM 0025      100 DO 3 NY=1,NYMAX
ISM 0026      3 READ 403,(TLEAD(NY,M),M=1,8)
ISM 0027      DO 4 NY=NYMAX,70
ISM 0028      DO 4 M=1,8
ISM 0029      4 TLEAD(NY,M)=TLEAD(NYMAX,M)
ISM 0030      IF(LL(4).EQ.4)GO TO 119
C000 CARDS 5. PRICES.
ISM 0032      109 DO 5 NY=1,NPRICE
ISM 0033      5 READ 403,(PRICE(NY,M),M=1,8)
ISM 0034      DO 6 NY=NPRICE,120
ISM 0035      DO 6 M=1,8
ISM 0036      6 PRICE(NY,M)=PRICE(NPRICE,M)
ISM 0037      IF(LL(4).GE.3)GO TO 119
C000 ZERO THE ENERGY FOR EACH BATCH IN EACH PERIOD.

```

```

ISN 0039      DO 2 NB=1,120
ISN 0040      DO 2 M=1,40
ISN 0041      2 BXMH(NB,M)=0.
C**** CARDS 6. TIME POINTS FOR ALL CYCLES.
ISN 0042      DO 7 NP=1,NPMAX
ISN 0043      NTHA(NP)=2*NP-1
ISN 0044      7 NTHB(NP)=NTHA(NP)+1
ISN 0045      READ 403,(TIME(NT),NT=1,NTPAX)
C**** CARDS 7. MASS BALANCE HISTOGRAM.
ISN 0046      DO 8 NB=1,NBMAX
ISN 0047      8 READ 403,CHU(NB),CS235(NB),CHPU(NB),CHFP(NB),
1          DSU(NB),CS235(NB),DSPU(NB),DSFPU(NB)
ISN 0048      IF(ILL(10).GT.0)GO TO 11C
ISN 0050      CONST2=(1-LL(3))*C(30)*24.*1.0E-06 + LL(3)*24.*1.0E-11
C**** CARDS 8. BATCH TIMING AND ENERGY.
ISN 0051      10 DO 11 N=1,NBMAX
ISN 0052      READ 404,NB,NTYPE(NB),NPA(NB),NPTCT(NB),NCORE(NB),NBURN(NB),
1          BMYNET(NB)
ISN 0053      11 BTOKM(NB)=NBURN(NB)*BMYNET(NB)*CCAST2
ISN 0054      6C 10 125
ISN 0055      110 CONST4=(3412.*1.0E-05/D(3C))**((1+LL(3)-LL(10))
ISN 0056      DO 111 N=1,NBMAX
ISN 0057      READ 404,NB,NTYPE(NB),NPA(NB),NPTCT(NB),NCORE(NB),BTOKM(NB)
ISN 0058      111 BTOKM(NB)=BTOKM(NB)*CONST4
ISN 0059      125 DO 18 NB=1,NBMAX
ISN 0060      NPB(NB)=NPA(NB)+NPTOT(NB)-1
ISN 0061      NPANB=NPA(NB)
ISN 0062      NPNB=NPB(NB)
ISN 0063      NTA(NB)=NTHA(NPANB)
ISN 0064      NTB(NB)=NTHB(NPNB)
ISN 0065      IF(ILL(10).EQ.1)GO TO 16
C**** CARDS 9. ENERGY DISTRIBUTION PER BATCH PER CYCLE.
ISN 0067      READ 403,(ENVC(N),N=NPANB,NPNB)
ISN 0068      DIV2=0.
ISN 0069      DO 13 N=NPANB,NPNB
ISN 0070      13 DIV2=DIV2+ENVC(N)
ISN 0071      DO 15 N=NPANB,NPNB
ISN 0072      15 BXMH(NB,M)=BTOKM(NB)*ENVC(N)/DIV2
ISN 0073      GO TO 18
ISN 0074      16 DO 17 N=NPANB,NPNB
ISN 0075      17 BXMH(NB,M)=BTOKM(NB)/NPTCT(NB)
ISN 0076      18 CONTINUE
ISN 0077      GO TO 19
C
C**** THIS COMPLETES THE READING OF INPUT DATA.
C
C**** THIS SECTION IS FOR ABBREVIATED INPUT DATA SETS.
C
ISN 0078      119 IF(ILL(3).EQ.LLL)GO TO 142
ISN 0080      CONST3=(3412.*1.0E-05/D(3C))**((LL(3)-LLL))
ISN 0081      DO 29 NB=1,NBMAX
ISN 0082      BTOKM(NB)=BTOKM(NB)*CCAST3
ISN 0083      NPANB=NPA(NB)
ISN 0084      NPNB=NPB(NB)
ISN 0085      DO 29 NP=NPANB,NPNB
ISN 0086      29 BXMH(NB,NP)=BXMH(NB,NP)*CCAST3
C****THE ENERGIES HAVE NOW BEEN PUT IN THE PROPER UNITS****
ISN 0087      142 CONTINUE

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```

ISM 0088      19 IFILL(7).EQ.0160 TO 21
C
C*** PRICE ESCALATION OPTION *****
C
ISM 0090      DO 20 NY=2,126
ISM 0091      PRICE(NY,1)=PRICE(NY,1)*(1.+D(26))**(NY-1)
ISM 0092      PRICE(NY,2)=PRICE(NY,2)*(1.+D(21))**(NY-1)
ISM 0093      PRICE(NY,3)=PRICE(NY,3)*(1.+D(26))**(NY-1)
ISM 0094      PRICE(NY,4)=PRICE(NY,4)*(1.+D(27))**(NY-1)
ISM 0095      PRICE(NY,5)=PRICE(NY,5)*(1.+D(26))**(NY-1)
ISM 0096      PRICE(NY,6)=PRICE(NY,6)*(1.+D(29))**(NY-1)
ISM 0097      PRICE(NY,7)=PRICE(NY,7)*(1.+D(26))**(NY-1)
ISM 0098      PRICE(NY,8)=PRICE(NY,8)*(1.+D(27))**(NY-1)
ISM 0099      20 CONTINUE

C
ISM 0100      21 BND=D(4)
ISM 0101      RRB=D(5)
ISM 0102      RRE=D(6)
ISM 0103      TXR=D(7)
ISM 0104      XF=D(24)
ISM 0105      XT=D(25)
ISM 0106      TXRM=TXR*D(15)-TXR*D(15)
ISM 0107      TXRE=(1.-TXR)*(D(15)+D(16)-G(15)+G(16))+TXR
ISM 0108      RPA=BND*RRB+(1.-BND)*RRE
ISM 0109      RRV=BND*RRB+(1.-TXRM)*(1.-BND)*RRE
ISM 0110      G=ALOG(1.+RRV)
C*** FIXED CHARGE RATE ON FUEL = FCRF
ISM 0111      FCRF=G/(1.-TXRE)

C
ISM 0112      DO 35 NP=1,NPMAX
ISM 0113      GTA=G*TIME(NTMA(NP))
ISM 0114      GTB=G*TIME(NTMB(NP))
ISM 0115      35 PMF(NP)=PMFCN(GTA,GTB)

C
ISM 0116      PRINT 500,(DES(1),I=1,12)
ISM 0117      PRINT 509
ISM 0118      PRINT 510,(LL(K),K=1,10)
ISM 0119      PRINT 502
ISM 0120      PRINT 528,NBMAX,NTMAX,NPMAX,NYMAX,NPRICE,NYLCOST,YRS,NT
ISM 0121      PRINT 502
ISM 0122      PRINT 507
ISM 0123      PRINT 503,(D(N),N=1,35)
ISM 0124      PRINT 502
ISM 0125      PRINT 533,RAA,RRV
ISM 0126      PRINT 532,FCRF
ISM 0127      PRINT 508
ISM 0128      PRINT 503,(PMF(N),N=1,NPMAX)
ISM 0129      PRINT 502
ISM 0130      PRINT 511
ISM 0131      PRINT 512
ISM 0132      DO 38 NY=1,NYMAX
ISM 0133      38 PRINT 513,NY,(TLEAD(NY,N),N=1,8)
ISM 0134      PRINT 521
ISM 0135      PRINT 525,(DES(1),I=1,13)
ISM 0136      PRINT 520
ISM 0137      PRINT 505
ISM 0138      DO 42 NB=1,NBMAX
ISM 0139      42 PRINT 501,NB,NTA(NB),NTB(NB),CHU(NB),CH235(NB),CHPU(NB),

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```

      1  CHFP(NA),CS(NA),OS(35(NA),OSP(NA),USFP(NA)
ISM 0140      PRINT 500,(DESI(1),I=1,13)
ISM 0141      IF(11(1).EQ.2)GO TO 50
ISM 0143      PRINT 519
ISM 0144      PRINT 517
ISM 0145      NPRICE=NPRICE
ISM 0146      IF(11(7).GT.0.AND.NPRICE.LT.4C)NPRICE=4C
ISM 0146      DO 55 NY=1,NPRICE
ISM 0149      NYSS=NYCOST*NY-1
ISM 0150      55 PRINT 518-NYSS,(PRICE(NY,P),P=1,8)
ISM 0151      PRINT 521
ISM 0152      IF(11(7).GT.0)PRINT 531
ISM 0154      GO TO 58
ISM 0155      56 PRINT 523
ISM 0156      PRINT 529
ISM 0157      DO 57 NR=1,NPRICE
ISM 0158      57 PRINT 518-NR,(PRICE(NR,R),R=1,8)
ISM 0159      PRINT 530
ISM 0160      58 PRINT 502
ISM 0161      PRINT 526
ISM 0162      PRINT 527,(TIME(NT),NT=1,ATPA)
ISM 0163      PRINT 500,(DESI(1),I=1,13)
ISM 0164      PRINT 506
ISM 0165      DO 59 NR=1,NRMAX
ISM 0166      59 PRINT 504,NR,NPA(NR),NPR(NR),TIME(NTA(NR)),TIME(NTB(NR)),
      1  BTOR(NR)
ISM 0167      PRINT 500,(DESI(1),I=1,13)
ISM 0168      PRINT 522
ISM 0169      DO 60 NR=1,NRMAX
ISM 0170      NPAND=NPA(NR)
ISM 0171      NPNB=NPD(NR)
ISM 0172      60 PRINT 524,NR,(BNH(NR,N),N=NPAND,NPNB)

C
ISM 0173      400 FORMAT(10I2,13A4)
ISM 0174      401 FORMAT(7E10.0)
ISM 0175      402 FORMAT(10I4)
ISM 0176      403 FORMAT(10E10.0)
ISM 0177      404 FORMAT(5I4,5E10.0)
ISM 0178      406 FORMAT(3I5,1X,6E10.0)
ISM 0179      407 FORMAT(13,7A,6E10.0)
ISM 0180      409 FORMAT(6I5,F(5.0)
ISM 0181      500 FORMAT('1',5X,'INPUT DATA',5X,13A4,///)
ISM 0182      501 FORMAT(' ',15,2I1C,8F13.1)
ISM 0183      502 FORMAT(' ',///)
ISM 0184      503 FORMAT(' ',10F12.5)
ISM 0185      504 FORMAT(' ',16,2I1C,5X,7F13.5)
ISM 0186      505 FORMAT('  BATCH      NTA IA  NTB OUT  CHARGE U  ',
      1  'CHARGE U235  CHARGE PU  CHARGE FIPU  DISCH U',
      2  '  DISCH U235  DISCH PU  DISCH FIPU',/)
ISM 0187      506 FORMAT('  BATCH      NPD IA  NPD OUT  TIME IN',
      1  '  TIME OUT  TOTAL ENERGY',/)
ISM 0188      507 FORMAT(' INPUT CONSTANTS C(1),N=1,35 ',/)
ISM 0189      508 FORMAT(' PRESENT NORTH FACTORS FOR EACH PERIOD',/)
ISM 0190      509 FORMAT(' INPUT SIGNALS, 11(K),K=1,1C',/)
ISM 0191      510 FORMAT(' ',10I6)
ISM 0192      511 FORMAT(' LEAD AND LAG TIMES FOR PAYMENTS, YEARS',/)
ISM 0193      512 FORMAT(' YEAR  BUY UP  ENRICHMENT  FABRICATION',
      1  '  REPROCESS',

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```

      2 * PU CREDIT JESS CREDIT BUY TAILS BUY PU'//
ISN 0194 513 FORMAT('F13.0F12.2)
ISN 0195 516 FORMAT(' BATCH NPC IA NPC CUE TIME IN'
      1 * TIME UNIT ENERGY DELIVERED PER PERIOD, 10000 BTU'//
ISN 0196 517 FORMAT('F' YEAR'0X'00'0X'0X'SEP UNIT'0X' FADR 1'0X'
      1 * REPR 1'0X'PU CREDIT'0X'TAILS'0X' FADR 2'0X'
      2 * REPR 2'0X'//
ISN 0197 518 FORMAT('F10.0F12.2)
ISN 0198 519 FORMAT(' PRICE DATA ENTERED BY YEARS'//)
ISN 0199 520 FORMAT(' TIME PLANTS '1
ISN 0200 521 FORMAT('0 SUBSEQUENT YEARS ARE IDENTICAL TO LAST YEAR PRINTED')
ISN 0201 522 FORMAT(' ENERGY DELIVERED PER BATCH BY CYCLES'//)
ISN 0202 523 FORMAT(' PRICE DATA ENTERED BY BATCH'//)
ISN 0203 524 FORMAT('F14.0X,15F0.4)
ISN 0204 525 FORMAT('1'0X'BATCH CHARGE-DISCHARGE DATA, MASSES IN KG'
      1 0X,13A6'//)
ISN 0205 526 FORMAT(' TIME IN YEARS AT START AND END OF EACH CYCLE'//)
ISN 0206 527 FORMAT('F10F12.5)
ISN 0207 528 FORMAT(' NMAX ATMAX AFMAX NYMAX NPRICE NYLUSE YASTIR'
      1 0X,F12.4)
ISN 0208 529 FORMAT('F' BATCH'0X'00'0X'0X'SEP UNIT'0X' FADR 1'0X'0X'
      1 * REPR 1'0X'PU CREDIT'0X'TAILS'0X' FADR 2'0X'0X'
      2 * REPR 2'0X'//
ISN 0209 530 FORMAT('0SUBSEQUENT BATCHES ARE IDENTICAL TO LAST BATCH PRINTED')
ISN 0210 531 FORMAT(' EXCEPT FOR RE-STARTS')
ISN 0211 532 FORMAT(' ANNUAL FUEL CHARGE RATE IN FUEL'F15.0'//)
ISN 0212 533 FORMAT(' COST OF PURCH AND RVV 'F15.0'//)
C
ISN 0213 LLL$LL(3)
ISN 0214 RETURN
ISN 0215 END

```

LEVEL 21.6 (DEC 72)

CS/360 FORTRAN H

COMPILER OPTIONS - NAME= MAIN,OPT=G2,LINECNT=60,SIZE=0000K,
SOURCE,EBCDIC,NGLIST,MODECK,LGAD,MAP,NOEDIT,NJID,MXXREF

```

ISN 0002      SUBROUTINE COSTS(NB)
C
ISN 0003      COMMON LCA
ISN 0004      COMMON LL(10),DES(13),D(135),TLEAD(70,10),PRICE(120,10)
ISN 0005      COMMON G,XF,XT,PWEXPS,TXRE,TXRM,PWEXPA,CORE
ISN 0006      COMMON NBMAX,NTMAX,NPRAX,NYPAX,APRICE,NYCOST,YRSTRT
ISN 0007      COMMON PFM(500),CURA(500),CFAB(500),CREP(500),CPLU(500),RMAX
ISN 0008      COMMON NCORE(120),CHPU(120),CHFP(120),NTYPE(120),BLVST(120),
1 BLV2(120),EXDIR(120,8),NTA(120),NTB(120),CHU(120),CH255(120),
2 DSU(120),DS235(120),DSPL(120),DSFPU(120),TIME(120),PWF(120),
3 NPA(120),NPB(120),DEUC(120),TOTKWH(120),BLUST(120),NAA(120),
4 NBB(120),BKWH(120,40),BTUKWH(120),OBLV(120),PWBCAP(120),OLOC(120)
ISN 0009      COMMON DIRECT(120,8)
C
C*** NPA(NB) IS THE PERIOD IN WHICH BATCH NB IS CHARGED.
C*** NPB(NB) IS THE PERIOD IN WHICH BATCH NB IS DISCHARGED.
C*** NTA(NB) IS THE TIME POINT AT WHICH BATCH NB IS CHARGED.
C*** NTB(NB) IS THE TIME POINT AT WHICH BATCH NB IS DISCHARGED.
C
C
C*** THE SIGNAL LL(6)=5 CALLS FOR COST BREAKDOWNS.
C
C****V(X) IS THE VALUE FUNCTION FOR SEPARATIVE DUTY.
V(X)=(1.-2.*X)*ALCG(1./X-1.)
C
ISN 0010      C
ISN 0011      EXPEND=0.
ISN 0012      IF(MOD(NB,4).EQ.1)PRINT 506,(DES(I),I=1,13)
ISN 0014      TIMEIN=TIME(NTA(NB))+YRSTRT
ISN 0015      TMCUT =TIME(NTB(NB))+YRSTRT
ISN 0016      PRINT 500,NB,NTYPE(NB),TIMEIN,TMCUT
ISN 0017      PRINT 501
ISN 0018      BBUY(NB)=0.
ISN 0019      PWEXPA=PWEXPS
ISN 0020      DO 2 M=1,8
ISN 0021      2 EXDIR(NB,M)=0.
ISN 0022      NYL=1+TIME(NTA(NB))
C
C*** PU PURCHASE
IF(LCA.NE.0.AND.LCA.NE.1)GO TO 4
QT38=D(31)*CHFP(NB)
TM38=TIME(NTA(NB))-TLEAD(NYL,8)
TNY=YRSTRT-NYCOST+TM38+1.
IF(TNY.LT.1.0)TNY=1.0
NY=TNY
PRICE=PRICE(NY,5)+(TNY-NY)*(PRICE(NY+1,5)-PRICE(NY,5))
IF(LL(1).EQ.1)PRICE=PRICE(NY,5)
IF(LL(1).EQ.2)PRICE=PRICE(NB,5)
EXPEND=1.0E-06*QT38*2PRICE
BBUY(NB)=BBUY(NB)+EXPEND
EXDIR(NB,1)=EXPEND
BCOST(NB)=BCOST(NB)+EXPEND
IF(NCORE(NB).EQ.1)CORE=CGRE+EXPEND
GTA=G*TM38
GTAX=EXP(-GTA)
EX38=EXPEND*GTAX
PWEXPS=PWEXPS+EX38

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ISN 0046      K=1001-IFIX(1000.-12.*(TM38+TLEAD(1,1)))
ISN 0047      CURA(K)=CURA(K)+EXPEND
ISN 0048      IF(K.GT.KMAX)KMAX=K
ISN 0050      TNY7=TNY+NYCOST-1.
ISN 0051      PRINT 507,TM38,TNY7,QT38,ZPRICE      ,EXPEND,GTA,EX38,PWEXPS

```

C

C*** UFG COST

```

ISN 0052      4 IF(LCA.NE.0.AND.LCA.NE.2)GO TO 20
ISN 0054      5 IF(CHU(NB).EQ.0.)GO TO 20
ISN 0056      XP=CH235(NB)/CHU(NB)
ISN 0057      IF(XP.GT.XT)GO TO 10
ISN 0059      QT38=CHU(NB)*D(32)
ISN 0060      IF(LL(9).EQ.1)QT38=D(32)*(CHU(NB)-CHFPU(NB)/.72)
ISN 0062      TM38=TIME(NTA(NB))-TLEAD(NYL,7)
ISN 0063      TNY=YRSTRT-NYCOST+TM38+1.
ISN 0064      IF(TNY.LT.1.0)TNY=1.0
ISN 0066      NY=TNY
ISN 0067      ZPRICE=PRICE(NY,6)+(TNY-NY)*(PRICE(NY+1,6)-PRICE(NY,6))
ISN 0068      IF(LL(1).EQ.1)ZPRICE=PRICE(NY,6)
ISN 0070      IF(LL(1).EQ.2)ZPRICE=PRICE(NB,6)
ISN 0072      EXPEND=1.0E-06*QT38*ZPRICE
ISN 0073      K=1001-IFIX(1000.-12.*(TM38+TLEAD(1,1)))
ISN 0074      GO TO 15
ISN 0075      10 BF238=(XP-XT)/(XF-XT)
ISN 0076      QT38=CHU(NB)*BF238*D(32)
ISN 0077      TM38=TIME(NTA(NB))-TLEAD(NYL,1)
ISN 0078      TNY=YRSTRT-NYCOST+TM38+1.
ISN 0079      IF(TNY.LT.1.0)TNY=1.0
ISN 0081      NY=TNY
ISN 0082      ZPRICE=PRICE(NY,1)+(TNY-NY)*(PRICE(NY+1,1)-PRICE(NY,1))
ISN 0083      IF(LL(1).EQ.1)ZPRICE=PRICE(NY,1)
ISN 0085      IF(LL(1).EQ.2)ZPRICE=PRICE(NB,1)
ISN 0087      K=1001-IFIX(1000.-12.*(TM38+TLEAD(1,1)))
ISN 0088      EXPEND=1.0E-06*QT38*ZPRICE
ISN 0089      15 BBUY(NB)=BBUY(NB)+EXPEND
ISN 0090      EXPDIR(NB,2)=EXPEND
ISN 0091      BCOST(NB)=BCOST(NB)+EXPEND
ISN 0092      IF(MCORE(NB).EQ.1)CORE=CCRE+EXPEND
ISN 0094      GTA=G*TM38
ISN 0095      GTAX=EXP(-GTA)
ISN 0096      EX38=EXPEND*GTAX
ISN 0097      PWEXPS=PWEXPS+EX38
ISN 0098      CURA(K)=CURA(K)+EXPEND
ISN 0099      IF(K.GT.KMAX)KMAX=K
ISN 0101      PR38=EXPEND*1.0E06/QT38
ISN 0102      TNY7=TNY+NYCOST-1.
ISN 0103      PRINT 502,TM38,TNY7,QT38,PR38      ,EXPEND,GTA,EX38,PWEXPS

```

C

C*** SEPARATIVE DUTY COST IS NEXT

```

ISN 0104      20 IF(LCA.NE.0.AND.LCA.NE.3)GO TO 28
ISN 0106      IF(CHU(NB).EQ.0.)GO TO 28
ISN 0108      XP=CH235(NB)/CHU(NB)
ISN 0109      BF238=(XP-XT)/(XF-XT)
ISN 0110      IF(XP.LE.XT)GO TO 28
ISN 0112      SEDY=V(XP)-BF238*V(XF)+(BF238-1.)*V(XT)
ISN 0113      QT38=SEDY*CHU(NB)*D(33)
ISN 0114      TM38=TIME(NTA(NB))-TLEAD(NYL,2)
ISN 0115      TNY=YRSTRT-NYCOST+TM38+1.

```



```

ISN 0116      IF(TNY.LT.1.0)TNY=1.0
ISN 0118      NY=TNY
ISN 0119      ZPRICE=PRICE(NY,2)+(TNY-NY)*(PRICE(NY+1,2)-PRICE(NY,2))
ISN 0120      IF(LL(1).EQ.1)ZPRICE=PRICE(NY,2)
ISN 0122      IF(LL(1).EQ.2)ZPRICE=PRICE(NB,2)
ISN 0124      EXPEND=1.0E-06*QT38*ZPRICE
ISN 0125      BBUY(NB)=BBUY(NB)+EXPEND
ISN 0126      EXPDIR(NB,3)=EXPEND
ISN 0127      BCOST(NB)=BCOST(NB)+EXPEND
ISN 0128      IF(NCORE(NB).EQ.1)CURE=CLRE+EXPEND
ISN 0130      GTA=G*TM38
ISN 0131      GTAX=EXP(-GTA)
ISN 0132      EX38=EXPEND*GTAX
ISN 0133      PWEXPS=PWEXPS+EX38
ISN 0134      K=1001-IF(IX(1000,-12.)*(TM38+TLEAD(1,1)))
ISN 0135      CURA(K)=CURA(K)+EXPEND
ISN 0136      IF(K.GT.KMAX)KMAX=K
ISN 0138      TNY7=TNY+NYCOST-1.
ISN 0139      PRINT 503,TM38,TNY7,QT38,ZPRICE      ,EXPEND,GTAX,EX38,PWEXPS

```

C

C*** FABRICATION COST IS NEXT.

```

ISN 0140      28 IF(LCA.NE.0.AND.LCA.NE.4)GO TO 40
ISN 0142      30 QT38=D(33)*(CHU(NB)+CHPL(NB))
ISN 0143      IF(LL(9).EQ.1)QT38=D(33)*CHL(NB)
ISN 0145      TM38=TIME(NTA(NB))-TLEAD(NY,3)
ISN 0146      TNY=YRSTRT-NYCOST+TM38+1.
ISN 0147      IF(TNY.LT.1.0)TNY=1.0
ISN 0149      NY=TNY
ISN 0150      IF(NIYPE(NB).EQ.2)GO TO 34
ISN 0152      ZPRICE=PRICE(NY,3)+(TNY-NY)*(PRICE(NY+1,3)-PRICE(NY,3))
ISN 0153      IF(LL(1).EQ.1)ZPRICE=PRICE(NY,3)
ISN 0155      IF(LL(1).EQ.2)ZPRICE=PRICE(NB,3)
ISN 0157      GO TO 36
ISN 0158      34 ZPRICE=PRICE(NY,7)+(TNY-NY)*(PRICE(NY+1,7)-PRICE(NY,7))
ISN 0159      IF(LL(1).EQ.1)ZPRICE=PRICE(NY,7)
ISN 0161      IF(LL(1).EQ.2)ZPRICE=PRICE(NB,7)
ISN 0163      36 EXPEND=1.0E-06*QT38*ZPRICE
ISN 0164      BBUY(NB)=BBUY(NB)+EXPEND
ISN 0165      EXPDIR(NB,4)=EXPEND
ISN 0166      BCOST(NB)=BCOST(NB)+EXPEND
ISN 0167      IF(NCORE(NB).EQ.1)CURE=CCRE+EXPEND
ISN 0169      GTA=G*TM38
ISN 0170      GTAX=EXP(-GTA)
ISN 0171      EX38=EXPEND*GTAX
ISN 0172      PWEXPS=PWEXPS+EX38
ISN 0173      K=1001-IF(IX(1000,-12.)*(TM38+TLEAD(1,1)))
ISN 0174      CFAB(K)=CFAB(K)+EXPEND
ISN 0175      IF(K.GT.KMAX)KMAX=K
ISN 0177      PR38=EXPEND*1.0E06/QT38
ISN 0178      TNY7=TNY+NYCOST-1.
ISN 0179      PRINT 504,TM38,TNY7,QT38,PR38      ,EXPEND,GTAX,EX38,PWEXPS

```

C

C*** REPROCESSING COST IS NEXT.

```

ISN 0180      40 IF(LCA.NE.0.AND.LCA.NE.5)GO TO 95
ISN 0182      QT38=DSU(NB)+DSPU(NB)
ISN 0183      IF(LL(9).EQ.1)QT38=DSU(NB)
ISN 0185      NYZ=1+TIME(NTB(NB))
ISN 0186      TM38=TIME(NTB(NB))-TLEAD(NY,4)

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```

ISN 0187      TNY=YKSTRT-NYCOST+TM38*1.
ISN 0188      IF(TNY.LT.1.0)TNY=1.0
ISN 0190      NY=TNY
ISN 0191      IF(NTYPE(NB1.EQ.2)GO TO 44
ISN 0193      ZPRICE=PRICE(NY,4)+(TNY-NY)*(PRICE(NY+1,4)-PRICE(NY,4))
ISN 0194      IF(LL(1).EQ.1)ZPRICE=PRICE(NY,4)
ISN 0196      IF(LL(1).EQ.2)ZPRICE=PRICE(NB,4)
ISN 0198      GO TO 46
ISN 0199      44 ZPRICE=PRICE(NY,6)+(TNY-NY)*(PRICE(NY+1,6)-PRICE(NY,6))
ISN 0200      IF(LL(1).EQ.1)ZPRICE=PRICE(NY,8)
ISN 0202      IF(LL(1).EQ.2)ZPRICE=PRICE(NB,8)
ISN 0204      46 EXPEND=1.0E-06*QT38*ZPRICE
ISN 0205      BCGST(NB)=BCGST(NB)+EXPENC
ISN 0206      EXPDIR(NB,5)=EXPEND
ISN 0207      GTA=G*TM38
ISN 0208      GTAX=EXP(-GTA)
ISN 0209      EX38=EXPEND*GTAX
ISN 0210      PWEXPS=PWEXPS+EX38
ISN 0211      K=1001-IFIX(1000.-12.*(TM38+TLEAD(1,1)))
ISN 0212      CREPI(K)=CREPI(K)+EXPEND
ISN 0213      IF(K.GT.KMAX)KMAX=K
ISN 0215      PR38=EXPEND*1.0E06/QT38
ISN 0216      TNY7=TNY+NYCOST-1.
ISN 0217      PRINT 505, TM38, TNY7, QT38, PR38, EXPEND, GTAX, EX38, PWEXPS
C
ISN 0218      500 FORMAT('0 CGSTS FOR BATCH NUMBER',I4,4X,'TYPE=',I2,5X,
ISN 0219      1 'CHARGED AT TIME =',F12.4,4X,'DISCHARGED AT TIME =',F12.4)
ISN 0219      501 FORMAT('0',20X,'TIME',7X,'YEAR',6X,'QUANTITY',6X,'PRICE',7X,
ISN 0220      1 '$ MILLION',5X,'PW FACTOR',4X,'PW EXPENSE',3X,'CUMUL PW EXP',/)
ISN 0220      502 FORMAT(' UF6 COST ',F15.5,2F12.2, F14.2,4F14.5)
ISN 0221      503 FORMAT(' SEP DUTY ',F15.5,2F12.2, F14.2,4F14.5)
ISN 0222      504 FORMAT(' FAB COST ',F15.5,2F12.2, F14.2,4F14.5)
ISN 0223      505 FORMAT(' REPROCESS ',F15.5,2F12.2, F14.2,4F14.5)
ISN 0224      506 FORMAT('1 CALCULATED BATCH CGSTS, MILLIONS OF $',5X,I3A4,/)
ISN 0225      507 FORMAT(' PU COST ',F15.5,2F12.2, F14.2,4F14.5)
ISN 0226      95 CONTINUE
ISN 0227      97 RETURN
ISN 0228      END

```

LEVEL 21.6 (DEC 72)

CS/360 FORTRAN M

COMPILER OPTIONS - NAME= MAIN,OPT=02,LINECNT=60,SIZE=JUNK,
SOURCE,EBCDIC,NCLIST,NODECA,LCAD,MAP,NODEIT,NULD,NMAXEF

```

ISN 0002      SUBROUTINE SALES(NB)
C
ISN 0003      COMMON LCA
ISN 0004      COMMON LL(10),DES(15),D(35),TLEAD(70,10),PRICE(120,10)
ISN 0005      COMMON G,XF,XT,PWEXPS,TARE,TARM,PWEXPA,CUNE
ISN 0006      COMMON NBMAX,NTMAX,NPPAX,NTMAX,NPRICE,NYCOST,YRSTRT
ISN 0007      COMMON PFW(500),CLRA(500),CFAB(500),CREP(500),CPLU(500),KMAX
ISN 0008      COMMON NCOK(120),CHPU(120),CHFPU(120),NTYPE(120),BLVLS(120),
1      BLV2(120),EXPDIR(120,8),NTA(120),NTB(120),CMU(120),CH235(120),
2      DSU(120),DS235(120),DSPL(120),DSFPU(120),TIME(120),PWF(120),
3      NPA(120),NPB(120),DEDUC(120),TOTKWH(120),BCOST(120),NAA(120),
4      NBB(120),BKWH(120,40),BTCKWH(120),BBUY(120),PWEXP(120),DDUC(120)
ISN 0009      COMMON DIRECT(120,8)
C
C*****V(X) IS THE VALUE FUNCTION FOR SEPARATIVE DUTY.
ISN 0010      V(X)=(1.-2.*X)*ALCG(1./X-1.)
C
C
ISN 0011      SALE=0.
C*** SALE OF FISSILE PL IS NEXT.
ISN 0012      IF(LCA.NE.0.AND.LCA.NE.6)GO TO 10
ISN 0014      NYZ=1+TIME(NTB(NB))
ISN 0015      QT38=DSFPU(NB)*D(34)
ISN 0016      TM38=TIME(NTB(NB))-TLEAD(NYZ,5)
ISN 0017      TNY=YRSTRT-NYCOST+TM38+1.
ISN 0018      IF(TNY.LT.1.0)TNY=1.0
ISN 0020      NY=TNY
ISN 0021      ZPRICE=PRICE(NY,5)+(TNY-NY)*(PRICE(NY+1,5)-PRICE(NY,5))
ISN 0022      IF(LL(1).EQ.1)ZPRICE=PRICE(NY,5)
ISN 0024      IF(LL(1).EQ.2)ZPRICE=PRICE(NB,5)
ISN 0026      SALE = 1.0E-06*QT38*ZPRICE
ISN 0027      BCOST(NB)=BCOST(NB)-SALE
ISN 0028      EXPDIR(NB,6)=SALE
ISN 0029      GTA=G+TM38
ISN 0030      GTAX=EXP(-GTA)
ISN 0031      EX39=SALE*GTAX
ISN 0032      PWEXPS=PWEXPS-EX39
ISN 0033      K=1001-IFIX(1000.-12.*(TM38+TLEAD(1,1)))
ISN 0034      CPLU(K)=CPLU(K)+SALE
ISN 0035      IF(K.GT.KMAX)KMAX=K
ISN 0037      TNY7=TNY+NYCOST-1.
ISN 0038      PRINT 506,TM38,TNY7,QT38,ZPRICE,      SALE ,GTAX,EX39,PWEXPS
C
C*** SALE OF U235 IS NEXT (U FEEL CREDIT) ****
ISN 0039      10 IF(LCA.NE.0.AND.LCA.NE.7)GO TO 20
ISN 0041      IF(DSU(NB).EQ.0.) GO TO 15
ISN 0043      XP=DS235(NB)/DSU(NB)
ISN 0044      IF(XP.LT.XT)GO TO 15
ISN 0046      BF238=(XP-XT)/(XF-XE)
ISN 0047      GO TO 10
ISN 0048      15 BF238=0.
ISN 0049      16 TM38=TIME(NTB(NB))-TLEAD(NYZ,6)
ISN 0050      TNY=YRSTRT-NYCOST+TM38+1.
ISN 0051      IF(TNY.LT.1.0)TNY=1.0
ISN 0053      NY=TNY
ISN 0054      P238FD=PRICE(NY,1)+(TNY-NY)*(PRICE(NY+1,1)-PRICE(NY,1))

```

```

ISN 0055      IF (LL(1).EQ.1)P23ESD=PRICE(NY,1)
ISN 0057      IF (LL(1).EQ.2)P23ESD=PRICE(NB,1)
ISN 0059      VALUE=BF236*P238FC
ISN 0060      SALE=1.0E-06*DSU(NB)*D(35)*VALUE
ISN 0061      BCGST(NB)=BCOST(NB)-SALE
ISN 0062      EXPDIR(NB,7)=SALE
ISN 0063      GTA=G*TM38
ISN 0064      GTAX=EXP(-GTA)
ISN 0065      EX39=SALE*GTAX
ISN 0066      PMEXPS=PMEXPS-EX39
ISN 0067      K=1001-IFIX(1000.-12.*(TM38+TLEAD(1,1)))
ISN 0068      CPLU(K)=CPLU(K)+SALE
ISN 0069      IF(K.GT.KMAX)KMAX=K
ISN 0071      TNY7=TNY+NYCOST-1.
ISN 0072      PRINT 507, TM38, TNY7, DSU(NB), VALUE, SALE, GTA, EX39, PMEXPS
ISN 0073      20 CONTINUE

```

C

C

C*** SALE OF U235 IS NEXT (SEPARATIVE DUTY CREDIT) ***

```

ISN 0074      22 IF (LCA.NE.0.AND.LCA.NE.8)GO TO 30
ISN 0076      IF (DSU(NB).EQ.0.) GO TO 25
ISN 0078      XP=DS235(NB)/DSU(NB)
ISN 0079      IF (XP.LT.XT)GO TO 25
ISN 0081      BF238=(XP-XT)/(XF-XT)
ISN 0082      SEDY=V(XP)-BF238*V(XF)+(BF238-1.)*V(XT)
ISN 0083      GO TO 26
ISN 0084      25 SEDY=0.
ISN 0085      26 TM28=TIME (NTB(NB))-TLEAD(NY2,6)
ISN 0086      TNY=YRSTRT-NYCOST+TM28+1.
ISN 0087      IF (TNY.LT.1.0)TNY=1.0
ISN 0089      NY=TNY
ISN 0090      P238SD=PRICE(NY,2)+(TNY-NY)*(PRICE(NY+1,2)-PRICE(NY,2))
ISN 0091      IF (LL(1).EQ.1)P23ESD=PRICE(NY,2)
ISN 0093      IF (LL(1).EQ.2)P23ESD=PRICE(NB,2)
ISN 0095      VALUE=SEDY*P238SD
ISN 0096      SALE=1.0E-06*DSU(NB)*D(35)*VALUE
ISN 0097      BCGST(NB)=BCOST(NB)-SALE
ISN 0098      EXPDIR(NB,8)=SALE
ISN 0099      GTA=G*TM38
ISN 0100      GTAX=EXP(-GTA)
ISN 0101      EX39=SALE*GTAX
ISN 0102      PMEXPS=PMEXPS-EX39
ISN 0103      K=1001-IFIX(1000.-12.*(TM38+TLEAD(1,1)))
ISN 0104      CPLU(K)=CPLU(K)+SALE
ISN 0105      IF(K.GT.KMAX)KMAX=K
ISN 0107      TNY7=TNY+NYCOST-1.
ISN 0108      PRINT 509, TM38, TNY7, DSU(NB), VALUE, SALE, GTA, EX39, PMEXPS
ISN 0109      30 CONTINUE

```

C

```

ISN 0110      IF (LCA.GT.0)DIRECT(NB,LCA)=BCGST(NB)
ISN 0112      PMBTCH=PMEXPS-PMEXPA
ISN 0113      PMBEXP(NB)=PMBTCH
ISN 0114      PRINT 508, BCGST(NB), PMBTCH, PMEXPS

```

C

C

```

ISN 0115      506 FORMAT(' SALE FIPL ',F15.5,2F12.2, F14.2,4F14.5)
ISN 0116      507 FORMAT(' U CRED FC ',F15.5,2F12.2, F14.2,4F14.5)
ISN 0117      508 FORMAT(' TOTAL COST',53X,F14.5,14X,2F14.5,/)

```

```

ISN 0118      509 FORMAT(' U CRED SC ',F15.5,2F12.2, F14.2,4F14.5)
ISN 0119      RETURN
ISN 0120      END

```

LEVEL 21.6 (DEC 72)

05/360 FORTRAN H

COMPILER OPTIONS - NAME= MAIN,OPT=02,LINECNT=60,SIZE=0000K,
SOURCE,EBCDIC,NULIST,MODECK,LGAW,MAP,NODEIT,NULU,NOXREF

```

ISN 0002      SUBROUTINE PCHIMP
C
ISN 0003      COMMON LCA
ISN 0004      COMMON LL(10),UES(13),D(35),TLEAD(70,10),PRICE(120,10)
ISN 0005      COMMON G,XF,XT,PWEXPS,TXRE,TXRM,PWEXPA,CURE
ISN 0006      COMMON NBMAX,NTPAX,NPMAX,NYMAX,NPRICE,NYCEST,YRSTRT
ISN 0007      COMMON PFW(500),CURA(500),CFAB(500),CREP(500),CPLU(500),KMAX
ISN 0008      COMMON NCORE(120),CHPU(120),CHFPU(120),NTYPE(120),BLVCST(120),
1 BLV2(120),EXPDIR(120,8),NTA(120),NTB(120),CHW(120),CH255(120),
2 DSU(120),DS235(120),DSPL(120),DSFPU(120),TIME(120),PMF(120),
3 NPA(120),NPB(120),DEDUC(120),TOTKWH(120),BCGST(120),MAA(120),
4 MBG(120),BKWH(120,40),BTCKWH(120),BBUY(120),PMBEXP(120),BOUC(120)
ISN 0009      COMMON DIRECT(120,8)
C
ISN 0010      PRINT 400,(DES(I),I=1,13)
ISN 0011      DM6=D(8)*1000.*365.*24.*1.E-09/12.0
ISN 0012      DO 40 NP=1,NPMAX
ISN 0013      TYRA=TIME(2*NP-1) + TLEAD(1,1)
ISN 0014      TYRB=TIME(2*NP) + TLEAD(1,1)
ISN 0015      TMONA=12.*TYRA
ISN 0016      TMONB=12.*TYRB
ISN 0017      KMA=TMONA
ISN 0018      KMB=TMONB
ISN 0019      FRACA=TMONA-KMA
ISN 0020      FRACB=TMONB-KMB
ISN 0021      PFWNP=TOTKWH(NP)/(TMONB-TMONA)/DM6
ISN 0022      IF((KMB-KMA).EQ.1. GO TO 32
ISN 0024      KA2=KMA+3
ISN 0025      KB2=KMB+1
ISN 0026      DO 30 K=KA2,KB2
ISN 0027      30 PFW(K)=PFWNP
ISN 0028      32 PFW(KMA+2)=(1.-FRACA)*PFWNP
ISN 0029      PFW(KMB+2)=FRACB*PFWNP
ISN 0030      35 TOTNP=(KMB-KMA-1)*PFWNP*DM6+DM6*(PFW(KMA+2)+PFW(KMB+2))
ISN 0031      PRINT 403,NP,TOTKWH(NP),TOTNP
ISN 0032      40 CONTINUE
ISN 0033      DO 65 K=1,KMAX
ISN 0034      PUNCH 401,K,PFW(K),CURA(K),CFAB(K),CREP(K),CPLU(K)
ISN 0035      65 PRINT 402,K,PFW(K),CURA(K),CFAB(K),CREP(K),CPLU(K)
C
ISN 0036      400 FORMAT('1 RESULTS OF SUBROUTINE PCHIMP',5X,13A4,///)
ISN 0037      401 FORMAT(15,5X,7F10.0)
ISN 0038      402 FORMAT(' ',16,5F15.0)
ISN 0039      403 FORMAT(' ',14,4F20.0)
C
ISN 0040      RETURN
ISN 0041      END

```

LEVEL 21.6 (DEC 72)

CS/360 FCATRAM H

COMPILER OPTIONS - NAME= MAIN,OPT=02,LINECNT=6C,SIZE=0000K,
SOURCE,EBCDIC,MULIST,MUDECK,LLAD,MAP,MJEDIT,MUID,NOXREF

```

ISN 0002      SUBROUTINE OUT2
C
ISN 0003      COMMON LLA
ISN 0004      COMMON LL(10),DES(13),D(35),TLEAD(70,10),PRICE(120,10)
ISN 0005      COMMON G,XF,XT,PWEXPS,FXRE,TXRM,PWEXPA,CURE
ISN 0006      COMMON NBMAX,NTMAX,NPPAX,NYMAX,NPRICE,NTCLST,YRSTRT
ISN 0007      COMMON PFH(500),CLRA(500),CFAB(500),CREP(500),CPLU(500),KMAX
ISN 0008      COMMON NCORE(120),CHPU(120),CHFPU(120),NTYPE(120),BLVCST(120),
1 BLVZ(120),EXPDIR(120,8),NTA(120),NTB(120),CHU(120),CH235(120),
2 DSU(120),DS235(120),DSFL(120),DSFPU(120),TIME(120),PWF(120),
3 NPA(120),NPB(120),UEDUC(120),TOTKWH(120),BCUST(120),NAA(120),
4 NBB(120),BKWH(120,40),BTCKWH(120),BBLY(120),PWBEXP(120),BCUC(120)
ISN 0009      COMMON DIRECT(120,8)
C
ISN 0010      DIMENSION CUMKWH(120),CARDIR(120),CUMLAR(120),CUMDIR(120,8),
1 DIRCST(120,8),CIRCUM(120,4)
C
ISN 0011      SS22=0.
ISN 0012      SS31=0.
ISN 0013      SS32=0.
ISN 0014      SS33=0.
ISN 0015      SS34=0.
ISN 0016      SS35=0.
ISN 0017      SS36=0.
ISN 0018      SS37=0.
ISN 0019      SS38=0.
C
ISN 0020      DO 20 NB=1,NBMAX
ISN 0021      CUMKWH(NB)=0.
ISN 0022      DO 18 K=1,8
ISN 0023      16 CUMDIR(NB,K)=0.
ISN 0024      20 CONTINUE
C
ISN 0025      DO 32 NB=1,NBMAX
ISN 0026      SS22=SS22+BTCKWH(NB)
ISN 0027      SS31=SS31+XPCIR(NB,1)
ISN 0028      SS32=SS32+XPCIR(NB,2)
ISN 0029      SS33=SS33+XPCIR(NB,3)
ISN 0030      SS34=SS34+XPCIR(NB,4)
ISN 0031      SS35=SS35+XPCIR(NB,5)
ISN 0032      SS36=SS36+XPCIR(NB,6)
ISN 0033      SS37=SS37+XPCIR(NB,7)
ISN 0034      SS38=SS38+XPCIR(NB,8)
ISN 0035      CUMKWH(NB)=SS22
ISN 0036      CUMDIR(NB,1)=SS31
ISN 0037      CUMDIR(NB,2)=SS32
ISN 0038      CUMDIR(NB,3)=SS33
ISN 0039      CUMDIR(NB,4)=SS34
ISN 0040      CUMDIR(NB,5)=SS35
ISN 0041      CUMDIR(NB,6)=SS36
ISN 0042      CUMDIR(NB,7)=SS37
ISN 0043      CUMDIR(NB,8)=SS38
ISN 0044      DO 31 K=1,8
ISN 0045      DIRCST(NB,K)=EXPDIR(NB,K)/BTCKWH(NB)
ISN 0046      31 CIRCUM(NB,K)=CUMDIR(NB,K)/CUMKWH(NB)
ISN 0047      CARDIR(NB)=BLVCST(NB)-CIRCST(NB,1)-CIRCST(NB,2)-CIRCST(NB,3)

```

```

1  -DIRCST(NB,4)-DIRCST(NB,5)+DIRCST(NB,6)+DIRCST(NB,7)+
2  DIRCST(NB,8)
ISN 0048  CUMCAR(NB)=BLV2(NB)-DIRCUM(NB,1)-DIRCUM(NB,2)-DIRCUM(NB,3)
1  -DIRCUM(NB,4)-DIRCUM(NB,5)+DIRCUM(NB,6)+DIRCUM(NB,7)+
2  DIRCUM(NB,8)
ISN 0049  32 CONTINUE
C
ISN 0050  PRINT 501,(DES(I),I=1,13)
ISN 0051  PRINT 502
ISN 0052  DO 103 NB=1,NBMAX
ISN 0053  103 PRINT 503,NB,(DIRCST(NB,K),K=1,8),CARC(NB),BLV2(NB)
ISN 0054  PRINT 504,(DES(I),I=1,13)
ISN 0055  PRINT 502
ISN 0056  DO 106 NB=1,NBMAX
ISN 0057  106 PRINT 503,NB,(DIRCUM(NB,K),K=1,8),CUMCAR(NB),BLV2(NB)
C
ISN 0058  501 FORMAT('1 COST BREAKDOWN BY BATCHES ',5X,13A4,///)
ISN 0059  502 FORMAT(' BATCH',8X,'PU',11X,'UF6',4X,'SEP DUTY',6X,'FABR',6X,
1  'REPROC',4X,'PU CRED',4X,'U CR FD',4X,'U CR SU',5X,'CARRY LMG',
2  4X,'TOTAL',/)
ISN 0060  503 FORMAT(' ',14,4X,10F11.5)
ISN 0061  504 FORMAT('1 CUMULATIVE BATCHWISE COST BREAKDOWN',5X,13A4,///)
C
ISN 0062  RETURN
ISN 0063  END

```

3. NOTATION

A_1 = Cash payment for property taxes and insurance.

A_p = Annual amount paid for property taxes and insurance, \$.

b = Fraction of investment in bonds (debt).

f_c = Fraction of core value for tax assessment.

F_n = tax-deductible fuel expense in period n , \$.

$\bar{g}$ = Equivalent annual continuous interest rate.

i_a = Average cost of money = $bi_b + (1 - b)i_e$.

i_b = Annual interest rate on debt.

i_e = Annual after-tax earning rate on equity.

I_p = Total present worth of incomes from t_1 to t_2 , \$.

i_v = Modified interest rate = $(1 - k_t)bi_b + (1 - b)i_e$.

i_{vs} = Modified interest rate = $(1 - k_m)bi_b + (1 - b)i_e$.

J_n = Cash expenditure in period n , \$.

J'_n = Cash expenditures in period n , including preoperational periods.

J'_r = Cash expenditure at time t_r .

k_b = Property insurance rate.

$k_c = (1 - k_s)(k_v f_c + k_b)$.

$k_e = 1 - (1 - k_t)(1 - k_w)$

$k_f = 1 - (1 - k_t)k_c \sum P_{n,vs}$.

$k_m = 1 - (1 - k_t)(1 - k_s)$.

k_r = Gross revenues tax rate.

k_s = State income tax rate.

k_t = Federal income tax rate.

k_v = Property tax rate.

$k_w = 1 - (1 - k_r)(1 - k_s)$.

- i_f = Annual fixed charge rate on fuel.
 i_n = Annual fixed charge rate on nondepreciable capital.
 ϕ_i = Uniform continuous discount factor for period i .
 ϕ_n = Continuous discount factor for N cycles.
 $P_{n,vs}$ = Discrete discount factor for period n at interest rate i_{vs} .
 P_r = Discount factor at time t_r ($P_r = e^{-st_r}$)
 P_t = Continuous discount factor at time t .
 q = Rate of income from t_1 to t_2 , \$/year.
 t = Time, years after reactor startup.
 t_1 = Initial point of continuous time interval.
 t_2 = Final point of continuous time interval.
 t_{exp} = Exposure time for a given batch of fuel, years.
 t_m = Effective inventory time, years.
 t_r = Time at which cash expenditure occurs, measured from start of exposure.
 t'_r = Time at which cash expenditure occurs, measured from t_ϕ .
 t_ϕ = Effective average time point during cycle.
 U_A = Component of fuel cycle cost due to property taxes and insurance.
 U_C = Indirect fuel cycle cost (also referred to as inventory charges or carrying charges).
 U_D = Direct fuel cycle cost.
 U_F = Levelized fuel cycle cost, mills/kWhr.
 V_0 = Price paid for initial core, \$.
 Z_i = Electricity produced in cycle i , kWhr.
 Z_n = Electricity produced in period n , kWhr.

9. REFERENCES

1. R. Salmon, Two Computer Codes (REFCO and POW76) for Calculating the Fuel Cycle Cost of a Nuclear Power Reactor, ORNL-4695 (August 1971).
2. R. Salmon, User's Manual for REFCC, a Discounted Cash Flow Code for Calculating Nuclear Fuel Cycle Costs, ORNL-TM-3709 (April 1972).