University of Washington
Department of Civil and Environmental Engineering

TABLES OF PARAMETERS FOR THE THREE PARAMETER LOG NORMAL PROBABILITY DISTRIBUTION

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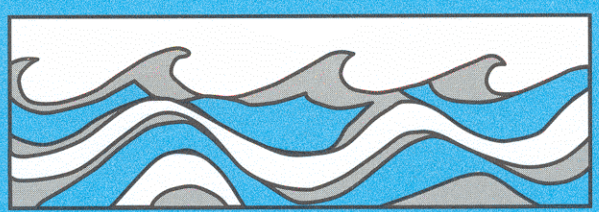

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Abstract

This report is intended to present a single package to aid the practitioner who desires to use the three parameter log normal probability distribution. Theoretical derivations are presented which aid in identifying parameter interactions. Two methods of solving for the third parameter, $\underline{a}$, of the distribution are presented. The first utilizes sample median, standard deviation, and mean (the median method) whereas the second requires use of sample skew, standard deviation, and mean (the skew method). Use of the median method yields two feasible solutions; one of the dual solutions has skew coefficient less than 5.87, the other has skew coefficient larger than 5.87. Limited Monte Carlo results are presented which indicate that in most practical applications the skew method yields estimates which are less variable and less biased than are those based on the median method. An earlier simplified solution based on the sample median (Sangal and Biswas, 1970) is shown to be invalid for most parameters of real interest, and solution of the full cubic equation for $\underline{a}$ is recommended. Tables are presented which give the solution based on the cubic equation for both the median and skew methods; the median estimates include both dual solutions; only one feasible solution results from use of the skew method.

Table of Contents

List of Figures

List of Tables

Chapter I

Introduction

The three parameter log normal probability distribution is an extremely versatile and convenient distribution in many engineering and scientific applications. Its versatility results from the fact that the three parameters allow three statistics of an observed data set to be matched, which is of help in curve fitting applications. The convenience of the three parameter log normal distribution derives from the property that three parameter log-normally distributed data are simply transformed to normally distributed data by use of the parameters of the distribution themselves.

It is reasonable to question why, with the numerous three parameter probability models available, the three parameter log normal distribution should be given special attention. All three parameter distributions can model three specified statistics of a data set, for instance, the mean, variance, and skew. This enables a more complete description of the data than is possible with a one or two parameter model. This capability does not come without a price, however, as in general the precision with which a parameter may be estimated decreases as the number of parameters being estimated increases. In cases where the use of a three parameter distribution can be justified, however, the three parameter log normal distribution should be considered, especially if the ability to work with normally distributed transforms is desirable. This does not imply that a three parameter log normal model should be chosen unthinkingly. There are, of course, situations where this distribution

is completely inappropriate. It is often the case, however, particularly when sample sizes are medium to small, that any one of several models appears to fit the data about equally well. In such cases, the use of the three parameter log normal distribution should be given special consideration.

In water resource planning activities the use of the three parameter log normal distribution is especially convenient, particularly in synthetic data generation schemes often used in storage design. While several different distributions have been used in single site generation schemes, multisite generation schemes usually require the use of a multivariate normal model. Here transformation via the three parameter log normal model is extremely advantageous.

The material presented in this report should be of interest to water resource systems planners, hydrologists, and data analysts in general. While use of the three parameter log normal distribution is not new, the properties of the distribution were not generally well known prior to this investigation. Two methods of parameter estimation are introduced and are accompanied by tabular values for use in parameter estimation. The use of the two methods was investigated via Monte Carlo analysis. Limited results are given here which should allow the user to determine which method is best for his particular application.

The report is structured for the convenience of persons having different degrees of familiarity with the three parameter log normal probability distribution. Chapters 2, 3, and 4 can be used independently. Chapter 2 gives general properties of the three parameter log normal distribution. Chapter 3 contains an extensive table (Table 3.2) of values of the non-dimensional third parameter, α, corresponding to

skew coefficient G_x and coefficient of variation γ. Chapter 4 gives values of α in terms of γ and the non-dimensional median β. The third parameter, the median, and the standard deviation ($\underline{a}$, $\tilde{x}$, and σ_x, respectively) are converted to the dimensionless quantities α, β, and γ by dividing by the arithmetic mean μ_x, hence

$$\alpha = \frac{a}{\mu_x}$$

$$\beta = \frac{\tilde{x}}{\mu_x}$$

$$\gamma = \frac{\sigma_x}{\mu_x}$$

The subscript x denotes the statistics of the raw, or untransformed data.

Tables 3.2 and 4.1 were prepared to facilitate computation of the third parameter, $\underline{a}$ from sample estimates (corrected for small sample bias) of either γ and G_x or γ and β and the estimated value $\hat{\mu}_x$ of μ_x. We suggest that readers who are not familiar with the properties of the three log normal probability distribution read Chapter 2 concerning distribution properties and parameter inter-relationships.

The tables of Chapter 3 and 4 provide, in addition to the tabulated parameter relationships, information which enables the user to determine the probability of observing a negative value of the three parameter log normally distributed variate, x. This is important in water resource studies when the three parameter distribution is being used for operational convenience. In such usage negative values usually need to be truncated to zero. It is important to know how much of the distribution has been

truncated in such applications. Specific instructions for using the information of Tables 3.2 and 4.1 are given in Chapters 3 and 4, respectively.

Appendix A includes a listing of two Fortran subroutines which may be used to determine the normalized third parameter numerically. The subroutines use a closed form solution to the cubic equation. Numerical computation is particularly useful in simulation studies when multiple values of the third parameter must be calculated.

Appendix B contains information extracted from Wallis, et al.,(1974) which is used to adjust estimates of the standard deviation and skew coefficients of the observed data for small sample bias.

Appendix C contains a list of all the symbols used throughout the report.

CHAPTER 2

PROPERTIES OF THE THREE PARAMETER LOG NORMAL PROBABILITY DISTRIBUTION

Background

The three parameter log normal probability distribution has several important advantages which should not be overlooked by hydrologists and water resource planners. Its principal advantages are that it provides a relatively simple method for preserving the first three moments of an observed data sequence and that its logarithmic transform is, by definition, normally distributed. The normal property of the logarithmic transform makes the use of the three parameter log normal appealing in multivariate synthetic flow generation schemes particularly when observed flows have skew coefficients which cannot be satisfactorily modeled by a two parameter distribution. The fact that three parameters can be determined using the mean, median, and variance of the untransformed random variate is appealing because most other distributions that model skew require use of the sample skew coefficient to determine the model parameters when using the method of moments.

The purpose of this chapter is to specifically examine the relationships between the third parameter, a, and the parameters that are used to determine it. Two methods for estimating the third parameter are explored. The first uses the sample mean median, and variance, the second uses the sample mean, variance and skew coefficient. Valid ranges of parameters for the three parameter log normal distribution are determined. Conditions where estimates of the third parameter are sensitive to changes in population parameters of the untranformed variate are discussed. Additionally,

the relationships between the observed population mean, median, variance, skew, and the third parameter, a, are examined. For most parameter combinations that cover the range of summary statistics usually encountered in hydrologic data, determination of the third parameter using sample mean, variance, and skew coefficient is shown to be preferable to the scheme employing the sample mean, median and variance.

While relationships between functional processes and certain probability distributions can be shown, e.g., log normal variates result from multiplicative processes, the three parameter log normal distribution need only be viewed as an operational tool which can be used to describe skewed flow volumes and in some instances flood peak information. Matalas (1967) indicated the general usefulness of this distribution in operational hydrology studies in that correctly transformed variates could be analyzed as multivariate normally distributed variates. Fiering and Jackson (1971) and Matalas(1967) interpreted the third parameter, a, to be a lower bound for the observed values of the random variate. They provided a method for determining the third parameter based upon the first three moments of the untransformed sequence. Their method implied that the third parameter would always be positive in hydrologic applications. However, this interpretation is not necessary; the third parameter can be positive or negative and in fact is usually negative. Negative values of a cause concern in an operational application only when they give rise to large probabilities of generation of negative values. This point is further explored later in this chapter.

Use of the three parameter log normal distribution is most helpful in extending the applicability of synthetic generation using residualization techniques developed by Young and Pisano (1968) in that a greater range

of skew can be accommodated than by using the transformations illustrated by Young and Pisano.

Mathematical Relationships

If a random variate, x, is three parameter log normally distributed then there exists a simple translation of the data by an unknown constant, a, such that the logarithm of the translated random variate is normally distributed:

$$\ln(x-a) \sim N(\mu_y, \sigma_y) \tag{1}$$

where μ_y and σ_y are the population mean and standard deviation of the transformed variate $y = \ln(x-a)$. Aitchison and Brown (1957) indicated difficulties involved in estimating the parameters of this distribution, particularly with respect to estimating a from a single sample. Sangal and Biswas (1970) addressed this problem by recommending the use of the mean, median, and variance of the random variate, x, to estimate a, μ_y, and σ_y. If the notation μ_x, σ_x, and x is used for the population mean, standard deviation, and median of the random variate, x, then (Sangal and Biswas, 1970)

$$\mu_x = a + \exp(\mu_y + 1/2\ \sigma_y^2), \tag{2}$$

$$\sigma_x^2 = (\exp(\sigma_y^2)-1)\exp(\sigma_y^2 + 2\mu_y), \tag{3}$$

$$\tilde{x} = a + \exp(\mu_y), \tag{4}$$

$$a<\tilde{x}<\mu_x$$

The population skew coefficient of the untransformed variate, G_x, is

$$G_x = \frac{\exp(3\sigma_y^2) - 3\exp(\sigma_y^2) + 2}{(\exp(\sigma_y^2)-1)^{3/2}} \tag{5}$$

Equations 2, 3, and 5 enable G_x to be uniquely expressed in terms of μ_x, σ_x and $\underline{a}$:

$$G_x = 3\Theta + \Theta^3 \tag{6a}$$

where

$$\Theta = \frac{\sigma_x}{\mu_x - a} \tag{6b}$$

Determination of μ_y, σ_y, and $\underline{a}$

The three parameters may be determined using equations 2, 3, and 4 or equations 2, 3, and 5. Elimination of μ_y and σ_y from equations 2, 3, and 4 yields a cubic equation in $\underline{a}$:

$$2a^3(\mu_x - \tilde{x}) + a^2(\sigma_x^2 + \tilde{x}^2 - 5\mu_x^2 + 4\mu_x\tilde{x}) + 2a(2\mu_x^3 - \tilde{x}\sigma_x^2 - \tilde{x}\mu_x^2 - \mu_x\tilde{x}^2)$$
$$+ \tilde{x}^2\sigma_x^2 - \mu_x^4 + \mu_x^2\tilde{x}^2 = 0. \tag{7}$$

Defining normalized parameters

$$\sigma = \frac{a}{\mu_x}, \quad \beta = \frac{\tilde{x}}{\mu_x}, \text{ and } \gamma = \frac{\sigma_x}{\mu_x}, \text{ equation 7 becomes}$$

$$2\alpha^3(1-\beta) + \alpha^2(\gamma^2 + \beta^2 - 5 + 4\beta) + 2\alpha(2 - \beta\gamma^2 - \beta - \beta^2) + \beta^2\gamma^2 - 1 + \beta^2 = 0 \tag{8}$$

Equation 6b when normalized becomes

$$\Theta = \frac{\gamma}{1-\alpha} \tag{6c}$$

Equations 6a and 6c reduce to the cubic form

$$G_x\alpha^3 + (3\gamma - 3G_x)\alpha^2 + (-6\gamma + 3G_x)\alpha + \gamma^3 + 3\gamma - G_x = 0 \tag{9}$$

The normalized third parameter, a, can be determined either from equation 8 (sample mean, median and variance) or from equation 9 (sample mean, variance and skew coefficient).

Solution of equation 8, subject to the constraint of equation 4, yields three roots which must be either all real or one real and two complex. When one real root and two complex roots satisfy equation 8, equation 4 is violated and the three parameter log normal distribution can be shown to be undefined.

Approximate solutions to equation 8, for example, Sangal and Biswas (1970), have been proposed. The experience of the present authors has shown their approximations to be valid for a very limited range of parameters. It is recommended that approximate solutions for the third parameter be avoided; equations 8 and 9 should be solved directly or tables of parameters such as those contained in Chapter 3 and 4 herein used.

General Properties of the Three Parameter Log Normal Distribution

For observed values of β and γ the corresponding values of α are obtained from equation 8 conditioned by the constraint imposed by equation 4. Equation 8 can be thought of as a three dimensional surface

(in α, β, γ space), $\phi(\alpha,\beta,\gamma) = 0$. $\phi(\alpha,\beta,\gamma)$ is continuous for all α, β, γ simultaneously satisfying equations 4 and 8. Contours of constant γ map onto the α,β plane as shown in Figure 2.1. Solution of equation 8 yields three real roots provided that $\beta_{min} < \beta < 1$. (β_{min} is the smallest real value that β can take and still satisfy equation 8 for γ constant.) Relationships between α, γ, and β_{min} are discussed below.

When three real roots satisfy equation 8, one of them violates the constraint imposed in equation 4, i.e., $\alpha \nless \beta$, and must be discarded. This can be readily shown by noting that along the constraint line $\alpha = \beta$ the value of $\phi(\alpha,\beta,\gamma)$ is always negative. Therefore, there must always be a real root for $\alpha > \beta$; the largest real root violates equation 4, and can be discarded. The remaining roots correspond to the two possible three-parameter distributions having identical β and γ but different observed skew coefficients. The dual distributions so found are schematically illustrated in Figure 2.2. The smaller value of α (α_2 in Figure 2) corresponds to distribution 2 in Figure 2.2 which has the smaller skew of the two possible distributions having the same β and γ. This relationship is clear from equations 6. When $\beta = \beta_{min}$, two coincident values of α result and distributions 1 and 2 (Figure 2.1) converge to a single distribution.

As β approaches unity one value of α approaches unity (for any γ) and the skew coefficient, G_x, approaches ∞. The second valid α from equation 8 approaches $-\infty$ while G_x approaches zero.

When $\beta < \beta_{min}$, one real root and two complex roots satisfy equation 8; the real root violates equation 4. Thus, three parameter log normal distributions cannot be defined in this range.

Relationships between the non-dimensional third parameter α, β, γ and

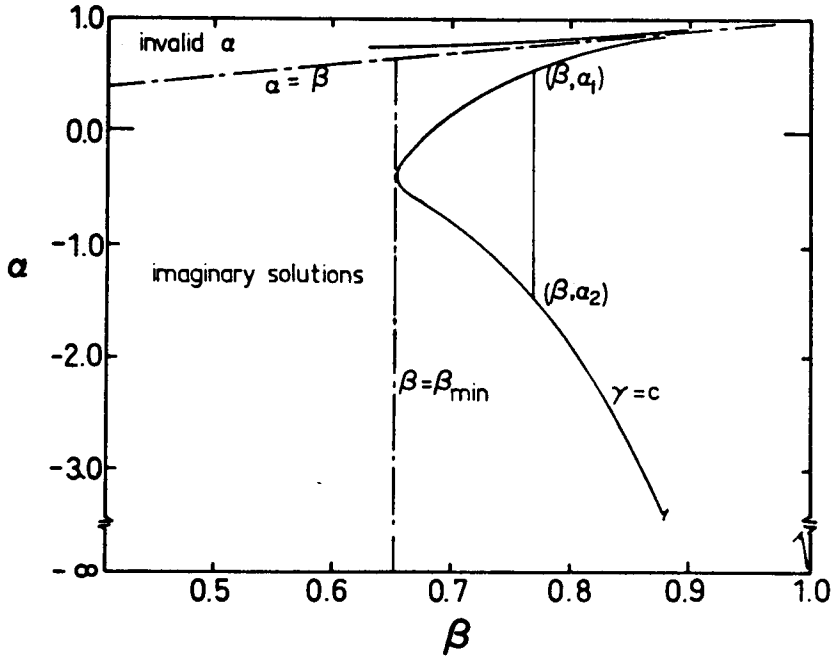

Fig. 2.1 Solutions to Equation 8 and Possible Values of α and β for $\gamma = c$

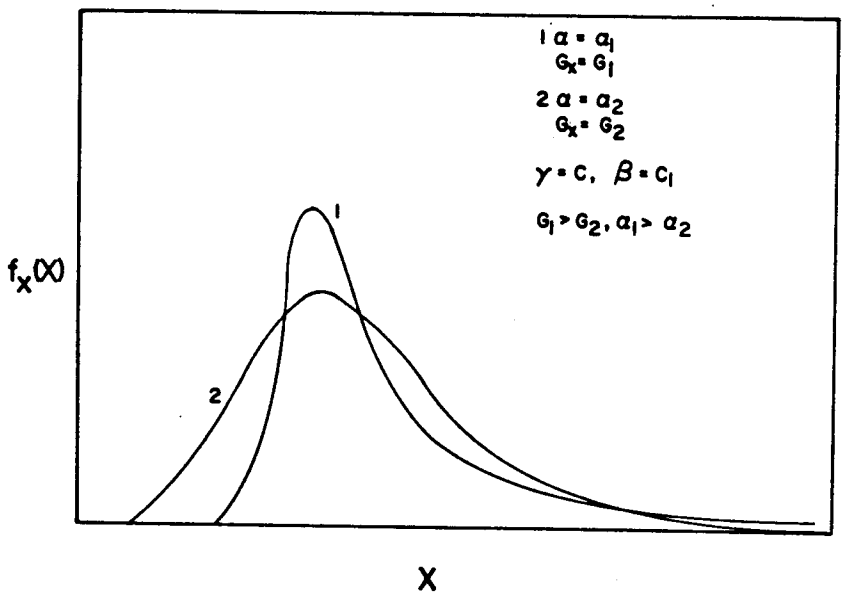

Fig. 2.2 Dual Three Parameter Log Normal Distributions having identical β and γ.

and G_x are shown in Figure 2.3 for β positive and coefficient of variation, γ, up to 2.0. Contours of constant skew are linear functions of α and β and converge to $\alpha = 1$, $\beta = 1$. A constant skew contour is seen to have a constant gradient along the surface $\phi(\alpha,\beta,\gamma) = 0$. The small skew coefficients have shallow gradients while the large skew coefficients have steep gradients. Use of the skew is made to determine the value of α and β_{min} for γ constant. The dashed constant skew line passing through all α, β_{min} has skew coefficient $G_x = 5.87423$. Finer resolution, covering more commonly encountered parameters, is given in Fig. 2.4. Figure 2.5 shows α and γ as a function of G_x. Parameter interactions observed from this perspective provide an informative contrast with the functional relationships of Figs. 2.3 and 2.4.

Relationships Between α, β_{min}, G_x, and γ

Since the surface defined by equation 8 (constrained by equation 4) is continuous and differentiable the projections of the contours corresponding to γ constant onto the α,β plane are continuous and differentiable. On any such contour $\frac{d\beta}{d\alpha}$ evaluated at $\beta = \beta_{min}$ must be zero. Additionally, equation 8 yields coincident values of α and $G_x = 5.87423$ when $\beta = \beta_{min}$.

For γ constant, differentiation of equation 8 yields

$$\frac{d\beta}{d\alpha} = - \frac{3\alpha^2(1-\beta) + \alpha(\gamma^2 + \beta^2 - 5 + 4\beta) + 2 - \beta(\gamma^2 + 1 + \beta)}{\alpha^2(\beta - \alpha + 2) - \alpha(1 + \gamma^2 + 2\beta) + \beta(1 + \gamma^2)} \qquad (10)$$

$\frac{d\beta}{d\alpha}\Big|\beta = \beta_{min} = 0$, so the numerator of equation 10 must be zero, i.e.,

$$3\alpha^2 (1 - \beta_{min}) + \alpha(\gamma^2 + \beta_{min}^2 - 5 + 4\beta_{min}) + 2 - \beta_{min}(1 + \gamma^2 + \beta_{min}) = 0 \qquad (11)$$

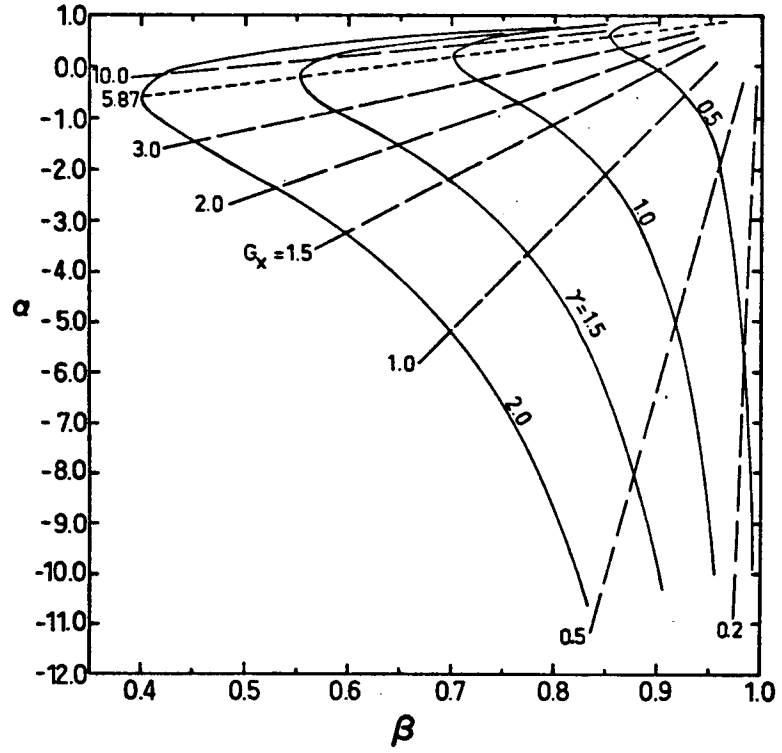

Fig. 2.3 General Relationships between α, β, γ and G_x

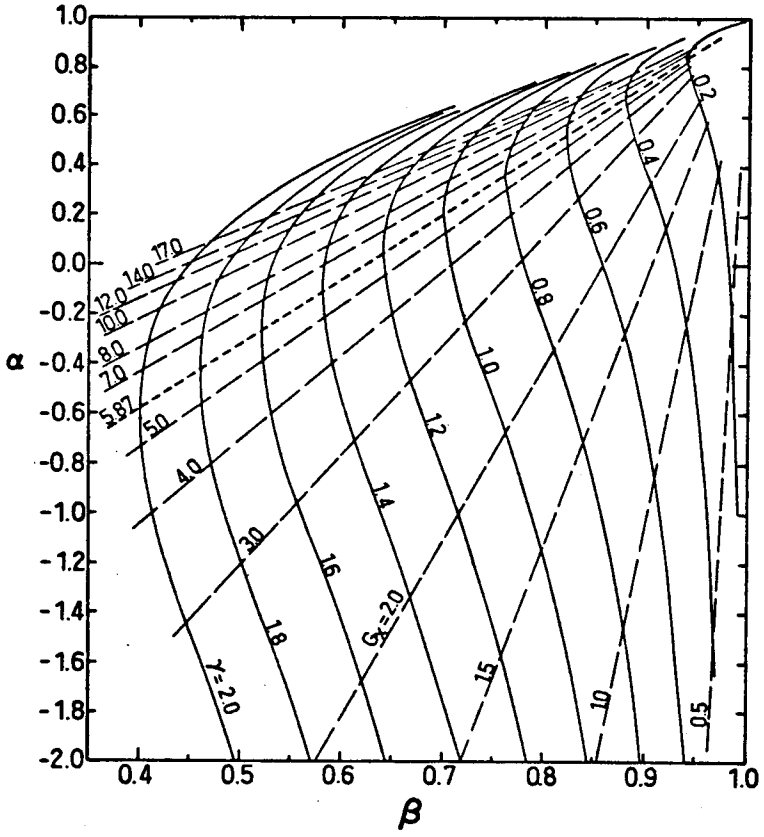

Fig. 2.4 Relationships between α, β, γ and G_x, $-2<\alpha<1$; $0.4<\beta<1$; $0<\gamma\leq 2$; $0<G_x\leq 17$

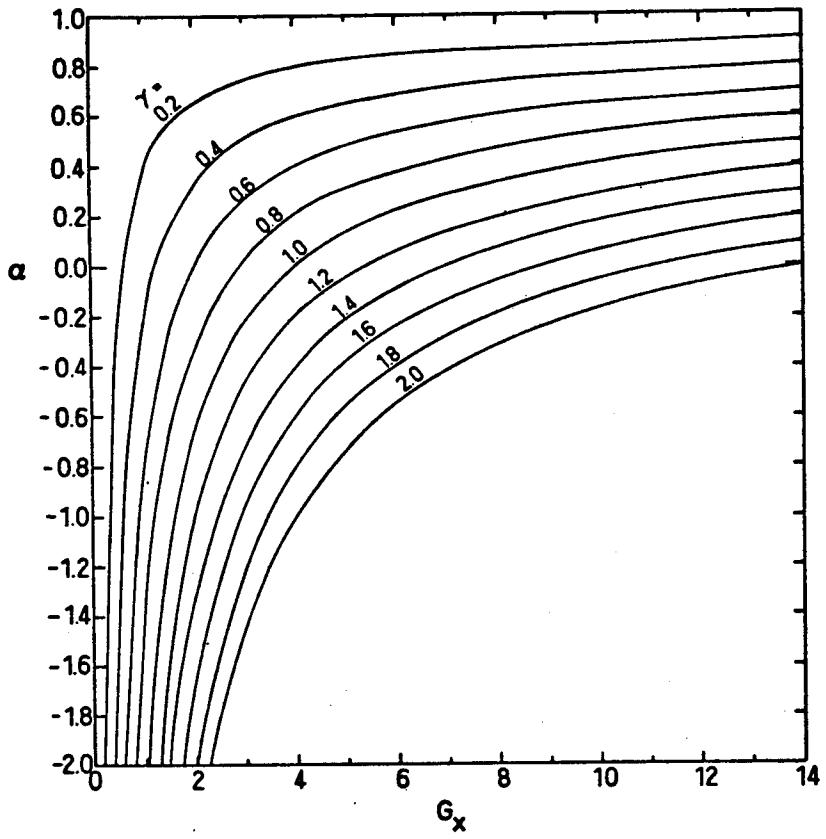

Fig. 2.5 γ as a Function of α and G_x.

Table 2.1 α and β_{min} for Constant Values of γ

γ	α	β_{min}	γ	α	β_{min}
0.1	0.92138	0.96997	1.7	- .33646	0.48952
0.2	0.84277	0.93994	1.8	- .41507	0.45949
0.3	0.76415	0.90991	1.9	- .49369	0.42946
0.4	0.68554	0.87989	2.0	- .57230	0.39943
0.5	0.60692	0.84986	2.1	- .65092	0.36941
0.6	0.52831	0.81983	2.2	- .72953	0.33938
0.7	0.44969	0.78980	2.3	- .80815	0.30735
0.8	0.37108	0.75977	2.4	- .88676	0.27932
0.9	0.29246	0.72974	2.5	- .96538	0.24929
1.0	0.21385	0.69972	2.6	-1.04399	0.21926
1.1	0.13523	0.66969	2.7	-1.12261	0.18924
1.2	0.05662	0.63966	2.8	-1.20122	0.15921
1.3	- .02199	0.60963	2.9	-1.27984	0.12918
1.4	- .10061	0.57960	3.0	-1.35845	0.09917
1.5	- .17923	0.54957			
1.6	- .25784	0.51955	3.3302	-1.61803	0.0

Simultaneous solution of equations 8 and 11 yields α and β_{min} for a particular γ. Alternatively α and β_{min} can be obtained from the roots of equation 11 by using equations 6. The relevant real root obtained from equation 11 is

$$\alpha = -\{(\gamma^2 + \beta_{min}^2 - 5 + 4\beta_{min}) - [(\gamma^2 + \beta_{min}^2 - 5 + 4\beta_{min})^2 - 12(1 - \beta_{min})(2 - \beta_{min}(1 + \gamma^2 + \beta_{min}))]^{1/2}\} \frac{1}{6(1 - \beta_{min})} \quad (12)$$

Simultaneous solution of equations 11 and 8 for $\alpha = 0$ yields $\beta_{min} = 0.618034$, $\gamma = 1.272019$. For this case equation 6c becomes $\theta = 1.270219$. Thus, for any γ along the constant skew contour passing through α, β_{min} pairs, equation 6c yields

$$\alpha = 1 - \frac{\gamma}{1.272019} \quad (13)$$

β_{min} is readily found by substituting a value of γ into equations 12 and 13 and equating the right hand sides of each equation. Values of α, β_{min}, and γ are given in Table 2.1. These values augment the information contained in Figure 2.4 and are included as aids to enable initial estimates of the feasibility of fitting a three parameter log normal distribution to observed data. The fit may be suitable if $\beta > \beta_{min}$ for the sample estimate of γ.

Parameter Estimation

The estimation of the third parameter a is based on sample estimates of either the mean, median, and standard deviation or the mean, standard

deviation, and skew. Sangal and Biswas (1970) suggest the use of the median rather than the skew because of high variability of sample estimates of the skew from short length samples. It will be shown here that the skew estimator in fact gives, in most cases of hydrologic interest, less variable and less biased estimates of the population value of the third parameter $\underline{a}$ than does the median estimator.

The complex interrelationships between the parameters of the three parameter log normal distribution make an analytic parameter sensitivity analysis intractable. Most previous work on parameter sensitivity resorts to assumptions of normality for estimates of the marginal distributions of the individual parameters (Matalas and Benson, 1968); this approach is of limited usefulness here for two reasons. First, the sample distributions of the parameters are highly skewed making an assumption of normality invalid, and second, an estimate of the joint distribution of the parameters is required to analyze the total sensitivity, hence an estimate of the correlations of the parameters as well as their marginal distributions is required. The complexity of the problem suggests a numerical approach of the type presented below.

To investigate the general behavior of the third parameter, $\underline{a}$, a limited Monte Carlo simulation program was utilized. Population values of the mean, median, and coefficient of variation were assumed. Equations 2 and 3 can be solved for the two parameters of the transformed distribution, which is, by definition, normal; $N(\mu_y, \sigma_y^2)$:

$$\sigma_y^2 = \ln\left(1 + \frac{\gamma^2}{(1-\alpha)^2}\right) \tag{14}$$

$$\mu_y = \ln\left[\frac{\mu_x(1-\alpha)}{\left[1 + \frac{\gamma^2}{(1-\alpha)^2}\right]^{1/2}}\right] \tag{15}$$

where α is the population value determined from either equation 8 or 9 depending on which method is used.

Using the population values to determine the parameters of the normal generating distribution via equations 15 and 16, 1000 sequences of length 50 having sample parameters s_y and μ_y were generated. The simulations were performed on a CDC 6400 computer. Uniform random numbers were generated using the RANF random number generator; these numbers were transformed to a normal distribution using an inversion method after Hastings (Zelen and Severo, 1968). The sequences were then inverse transformed using equation 1 to give sequences of three parameter log normally generated numbers. The inverse transform was carried out using the population values of α and μ_x. From these sequences sample estimates $\hat{\mu}_x$, $\hat{\tilde{x}}$, $\hat{S}_x$, and $\hat{G}_x$ were made of the population mean, median, standard deviation, and skew coefficient, respectively, using moment estimators. The sample estimates of standard deviation and skew were corrected for small sample bias using the results of Wallis, et al. (1974). The population values of skew and coefficient of variation were used to determine the bias correction factors, hence the analysis was not complicated by bias factor estimation problems. (In a real application an iterative procedure would be required to estimate the bias correction factors.) From the estimated parameters, corresponding values of α were calculated using both the median method (eq. 8) and the skew method (eq. 9). The results are presented in Tables 2.2 and 2.3.

It should be noted that eq. 16 requires the value of the mean as well as the normalized statistics, i.e., the parameter sensitivity is

a function of level as well as the dimensionless parameters. Several values of the mean were used and appeared to have much less impact on the results than did the dimensionless parameters. All the simulations reported here were carried out using a mean of $\mu_x = 5000$.

The parameter sensitivity estimates are complicated when the β estimator is used by the fact that the sample sequences sometimes result in estimates $\hat{\alpha}$ of α which are imaginary. In these cases the generating sequence is rejected and a new sequence generated. Depending on the population parameters, disturbingly large numbers of generated sequences may fall in infeasible regions as shown in columns 7-9 of Table 2.3. A similar problem results when sample estimates of β which exceed unity are generated; the same approach is taken.

Although at first glance this procedure would appear to bias the parameter estimates, the Monte Carlo results indicate that the $\hat{\beta}$ so calculated in fact provides an unbiased estimate of the population value whereas the estimator which includes infeasible sequences is itself biased. A comparable problem results if the skew method is used when a negative skew is generated. In the simulations, the non-negativity constraint on G_x was violated much less frequently than were the feasibility constraints on β. As shown in Table 2.3 an extreme value of nearly 40% of the generated sequences were rejected due to violation of the two constraints on β whereas a maximum of about 10% were rejected due to the non-negativity constraint on G_x.

Table 2.2 Population Parameters Employed in Monte Carlo Experiments

Distribution Number	μ_x	G_x	γ	β	α	Bias Correction Factor For* $\hat{\gamma}$	$\hat{G}_x$
1	5000	0.500	0.500	0.960	-2.027	1.016	1.156
2	5000	1.000	0.500	0.925	-0.552	1.019	1.201
3	5000	1.000	1.000	0.850	-2.104	1.019	1.201
4	5000	1.500	0.500	0.900	-0.072	1.024	1.270
5	5000	1.500	1.000	0.800	-1.145	1.024	1.270
6	5000	2.000	0.500	0.882	0.161	1.031	1.358
7	5000	2.000	1.000	0.763	-0.678	1.031	1.358
8	5000	2.000	2.000	0.527	-2.355	1.031	1.358
9	5000	4.000	0.500	0.853	0.500	1.065	1.813
10	5000	4.000	1.000	0.707	0.000	1.065	1.813
11	5000	4.000	1.500	0.561	-0.500	1.065	1.813
12	5000	4.000	2.000	0.414	-1.000	1.065	1.813

* From Tables 3 and 4 Wallis et al. 1974

Assessment of Methods of Parameter Estimation

Estimation of parameters from sample sequences of short length involves two difficulties. The first of these is variability of the estimates and is commonly measured by the standard error, a method which is strictly correct only for parameters which have normal marginal distributions but which is approximately correct so long as the skew is fairly small. The second difficulty is that even though the sample estimate may have small variability, it may be biased if the sample length is short. Problems of parameter bias are discussed by Wallis, et al. (1974) for the case of sample skew and standard deviation. It will be shown that biasing is estremely significant in estimates of the transform parameter for a three parameter log normal distribution.

Parameter Variability

Parameter variability was estimated in the simulations by computing

the average of the parameter estimates as well as their standard deviations and skews. The results presented in Tables 2.3 show that for almost all cases investigated, the parameter variability is smaller when the skew method is used. As skew increases the variability and bias of both methods decreases, however, the skew estimator remains superior. For skews larger than 4 additional experimentation might prove useful in extending the results presented here. The sample skews of the parameter α tend to have large negative values indicating that the mean value is being strongly affected by outliers. The effect of outliers also may be visualized by examining the behavior of α as β approaches 1, or alternatively as G approaches 0, in Figure 2.4.

Biasing

The apparent bias in the parameter α can be investigated by comparing the sample averages and the population values. In all cases the sample value of α is less than the population value and indicates a positive additive biasing constant. Two such biasing constants, K_{b_m} and K_{b_s}; $\alpha \simeq <\alpha_s> + K_{b_s}(\alpha, G_x, \gamma)$ and $\alpha \simeq <\alpha_m> + K_{b_m}(\alpha, \beta, \gamma)$ where $<\alpha_s>$ is the mean value of the sample estimate of α obtained from sample estimates of the mean variance and skew coefficient, are given in Table 3. Because of the large skews of the sample parameters, extremely long sample sequences would be required to obtain good estimates of the K_b. The apparent values obtained by taking the difference of the sample average and the population values can only be considered approximate estimates of the true values.

Table 2.3 Results of Monte Carlo Experiments Employing The Distribution Parameters of Table 2.2

Distribution Number (a) (1)	Parameter (b) (2)	Sample Mean (3)	Sample Standard Deviation (4)	Sample Skew (5)	K_b (c) (6)	N_1 (c) (7)	N_2 (c) (8)	N_3 (c) (9)
1	$\hat{\alpha}_m$	-6.029 (d)	59.97	-29.5	4.002			
	$\hat{\alpha}_s$	-5.406	15.25	-8.79	3.379			
	$\hat{\beta}_1$	0.942	0.036	-0.60		272	19	98
	$\hat{\beta}_2$	0.954	0.049					
	$\hat{G}_x$	0.564	0.351	0.82				
	$\hat{\gamma}$	0.510	0.055					
2	$\hat{\alpha}_m$	-2.479	12.46	-14.0	1.927			
	$\hat{\alpha}_s$	-1.294	4.51	-19.9	0.742			
	$\hat{\beta}_1$	0.922	0.042	-0.21		89	44	8
	$\hat{\beta}_2$	0.926	0.052					
	$\hat{G}_x$	1.039	0.548	0.88				
	$\hat{\gamma}$	0.506	0.056					
3	$\hat{\alpha}_m$	-6.607	33.23	-15.7	4.503			
	$\hat{\alpha}_s$	-8.049	101.8	-26.0	5.945			
	$\hat{\beta}_1$	0.842	0.085	-0.31		72	48	5
	$\hat{\beta}_2$	0.849	0.106					
	$\hat{G}_x$	1.020	0.541	0.87				
	$\hat{\gamma}$	1.018	0.140					
4	$\hat{\alpha}_m$	-0.871	4.60	-16.2	0.799			
	$\hat{\alpha}_s$	-0.397	1.83	-14.9	0.325			
	$\hat{\beta}_1$	0.908	0.039	0.10		33	133	2
	$\hat{\beta}_2$	0.900	0.052					
	$\hat{G}_x$	1.480	0.682	1.13				
	$\hat{\gamma}$	0.502	0.064					
5	$\hat{\alpha}_m$	-13.336	268.5	-29.3	12.191			
	$\hat{\alpha}_s$	-1.812	2.92	-11.8	0.667			
	$\hat{\beta}_1$	0.819	0.080	0.03		36	108	2
	$\hat{\beta}_2$	0.809	0.102					
	$\hat{G}_x$	1.494	0.731	1.05				
	$\hat{\gamma}$	1.008	0.134					
6	$\hat{\alpha}_m$	-0.512	3.76	-17.0	0.673			
	$\hat{\alpha}_s$	0.011	0.379	-4.26	0.150			
	$\hat{\beta}_1$	0.899	0.040	0.08		9	230	0
	$\hat{\beta}_2$	0.887	0.049					
	$\hat{G}_x$	1.923	0.883	1.39				
	$\hat{\gamma}$	0.495	0.074					
7	$\hat{\alpha}_m$	-1.719	4.10	-13.7	1.041			
	$\hat{\alpha}_s$	-0.962	0.710	-2.62	0.284			
	$\hat{\beta}_1$	0.797	0.076	-0.14		9	221	0
	$\hat{\beta}_2$	0.772	0.094					
	$\hat{G}_x$	1.975	0.873	1.14				
	$\hat{\gamma}$	1.006	0.132					
8	$\hat{\alpha}_m$	-6.817	68.2	-31.0	4.462			
	$\hat{\alpha}_s$	-3.194	1.96	-3.13	0.839			
	$\hat{\beta}_1$	0.573	0.186	-0.78		9	198	0
	$\hat{\beta}_2$	0.531	0.220					
	$\hat{G}_x$	1.941	0.879	1.37				
	$\hat{\gamma}$	2.095	0.519					

Table 2.3 (continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
9	$\hat{\alpha}_m$	0.200	0.345	-1.67	0.300			
	$\hat{\alpha}_s$	0.479	0.101	-0.93	0.021			
	$\hat{\beta}_1$	0.882	0.041	-0.67		2	693	0
	$\hat{\beta}_2$	0.862	0.046					
	$\hat{G}_x$	3.992	1.69	1.17				
	$\hat{\gamma}$	0.486	0.115					
10	$\hat{\alpha}_m$	-0.612	0.704	-2.80	0.612			
	$\hat{\alpha}_s$	-0.050	0.177	-1.31	0.050			
	$\hat{\beta}_1$	0.764	0.074	-0.28		2	722	0
	$\hat{\beta}_2$	0.718	0.087					
	$\hat{G}_x$	4.027	1.67	1.13				
	$\hat{\gamma}$	0.986	0.194					
11	$\hat{\alpha}_m$	-1.564	1.268	-3.41	1.064			
	$\hat{\alpha}_s$	-0.631	0.357	-3.45	0.131			
	$\hat{\beta}_1$	0.640	0.107	-0.09		2	669	0
	$\hat{\beta}_2$	0.575	0.124					
	$\hat{G}_x$	3.956	1.73	1.19				
	$\hat{\gamma}$	1.489	0.273					
12	$\hat{\alpha}_m$	-2.486	2.25	-6.61	1.486			
	$\hat{\alpha}_s$	-1.222	0.556	-1.86	0.222			
	$\hat{\beta}_1$	0.498	0.149	-0.17		0	696	0
	$\hat{\beta}_2$	0.419	0.169					
	$\hat{G}_x$	4.032	1.74	1.16				
	$\hat{\gamma}$	2.048	0.397					

Footnotes to Table 2.3

a Distribution numbers correspond to index of Table 2.2

b $\hat{\alpha}_m$ Value of α estimated using the median method (eq. 8)

$\hat{\alpha}_s$ Value of α estimated using the skew method (eq. 9)

$\hat{\beta}_1$ Value of β estimated from all generated traces

$\hat{\beta}_2$ Value of β estimated using only traces which were feasible

$\hat{G}_x$ Sample skew coefficient computed from all generated traces

$\hat{\gamma}$ Sample coefficient of variation computed from all generated traces

c K_b Additive bias constant for α

N_1 Number of traces rejected because sample median to mean ratio exceeded unity

N_2 Number of traces rejected because sample median to mean ratio was in the infeasible range

N_3 Number of traces rejected because of negative sample skew

d Statistics computed for 1000 sequences of length 50

A maximum of $1000 + N_1 + N_2 + N_3$ traces of length 50 were generated to yield 1000 acceptable traces

Conclusion

Over the range investigated, use of the sample skew, corrected for small samples bias, appears to be superior to use of the median to mean ratio. The only exception to this appears to be for small values of skew, i.e., less than about 0.5,where the median method appears to be slightly better. In this range, however, the distribution is nearly symmetric and the use of a three parameter log normal would probably not be appropriate. For parameter values in the range for which a three parameter log normal distribution might be applicable to hydrologic data, the variability of the third parameter estimate appears to be less using the skew method and the bias appears to be smaller as well. Since the skews of the estimated parameters tend to be large, the results presented can provide only approximate estimates of the true bias, although they are, in general, more reliable for the skew estimator than the median. A further advantage of the skew estimator is that many fewer traces are generated which are found to be infeasible; many traces were generated for which the use of the median method yields infeasible results while the corresponding skew estimator provides perfectly reasonable sample parameters.

A final comment concerning the sign of α is needed. When $\alpha < 0$ the three parameter distribution will have finite probabilities of some of its values falling in the range α to 0. The probability of a negative value should be computed to determine if its magnitude is of concern in hydrologic studies. Provided that this probability is small any negative hydrologic quantity may be truncated to zero without appreciably biasing the analysis at hand.

Chapter 3

RELATIONSHIPS BETWEEN α, γ and G_x: $\alpha = \alpha(\gamma, G_x)$

3.1 Use of Table 3.2

Functional relationships between α and β (dependent variables) and γ and G_x (independent variables) for three parameter log normally related variates are given in Table 3.1. The table headings are:

GAMMA = γ = coefficient of variation

SKEW = G_x = skew coefficient

ALPHA = $\alpha = \frac{a}{\mu_x}$ = third parameter divided by the mean

BETA = $\beta = \frac{x}{\mu_x}$ = median to mean ratio

NSY is the number of standard deviations corresponding to the location of $x = 0$ relative to μ_y.

Table 3.1 covers the range $0.05 \leq \gamma \leq 2.0$ in increments of 0.05 and the range $2.0 \leq \gamma \leq 4.0$ in increments of 0.1. Values of G_x $0.1 \leq G_x \leq 5.0$ are in increments of 0.10 and $5.20 \leq G_x \leq 15.0$ are in increments of 0.2. The corresponding values of α and β are given.

Typically, information contained in the tables enables rapid determination of α given γ and G_x. For example, on page (50)

GAMMA = 1.0

SKEW = 1.50

ALPHA = 1.145

BETA = 0.799

NSY = -1.19

The value of ALPHA can be immediately used in equations 2 and 3, Chapter 2, to completely define the transformation parameters μ_y and

σ_y. NSY = -1.19 means that $x = 0.0$ corresponds to $\mu_y \cong -1.19\ \sigma_y$ or 11.7% of the distribution falls in the negative x region (making use of any standard tables of the normal distribution, for example Hald (1952, p. 34)).

Thus, the values of NSY immediately indicate the probability of a negative value being modeled by the three parameter distribution. This is most important if truncation of negative values to zero (to satisfactorily represent physical reality) will distort the sample distribution.

Thus, the cumulative probability associated with negative values of x satisfying the three parameter distribution will be that probability corresponding to $-\infty < z \leq -NSY$ where z is a zero mean, unit variance normally distributed variate. When $NSY < -2.0$, only about 1% of the distribution falls in the negative region; truncation to zero in such cases is usually not a problem in water resource design activity. Examination of equation 1, Chapter 2, reveals that for $\alpha > 0$, negative values cannot be generated. In these cases the entry for NSY is left blank and the probability of negative values is zero.

Example 3.1

To illustrate the use of information contained in Table 3.2 for construction of theoretical three parameter log normal distribution cumulative density functions, a representative example follows. Purely for illustration purposes a three parameter log normal distribution is constructed for a set of peak annual flood flows. Our intention is not to show that this is the "best" theoretical description of the data. Rather we wish to illustrate the steps involved in general "curve fitting"

applications.

Table 3.1 lists the annual instantaneous flood peaks on the South Fork of the Skykomish River near Index, Washington for the period 1904-1970 except 1906-11. A three parameter log normal probability distribution is to be fitted to the data using the skew method.

First the mean, standard deviation, and skew of the data are computed. The resulting values are:

$$\hat{\mu}_x = 24853 \text{ cfs}$$

$$\hat{\sigma}_x = 12699 \text{ cfs}$$

$$\hat{G}_x = .962$$

The skew and standard deviation are corrected for small sample bias using the results of Wallis, et al. (1974). (The relevant parts of Tables 3 and 4 have been extracted and reproduced in Appendix B of this report.) An iterative procedure is followed. Initial bias factors based on the initial skew estimate ($\hat{G}_x = .96$; n = 60) are:

skew bias	1.168 (Table B.2)
standard deviation bias	1.016 (Table B.1)

Hence, first estimate corrected parameters are:

skew = .962 x 1.168 = 1.123

standard dev. = 12699 x 1.016 = 12902

New estimates of bias factors are:

skew bias	1.188
standard dev. bias	1.017

The second iteration estimates are:

skew = 1.143

standard dev. = 12915

A third estimate is not necessary as the bias factors based on the new skew estimate are (to within 4 significant figures) the same as the second iteration estimates.

The corrected coefficient of variation is estimated as $\gamma = 12915/24853 = .520$. Entering Table 3.2, the following estimates of ALPHA are obtained:

G_x	γ	ALPHA
1.10	0.5	-0.420
1.20	0.5	-0.311
1.10	0.55	-0.562
1.20	0.55	-0.442

Double interpolation results in the estimate $\hat{\alpha} = -0.427$, $\hat{\underline{a}} = -0.427 \times 24853 = -10636$. We also note that NSY = -3.2, hence less than 0.07% of the modeled values will be negative. It might be desirable to use the results given in Table 2.3 to correct for bias in the estimate of α. However, the estimates of the bias constants themselves are heavily weighted by values of α which are very large in absolute value. Since our estimate is relatively small in absolute value, it is probably advisable not to attempt to correct for bias.

The theoretical distribution may be very simply plotted using log normal cumulative probability paper. We note that the transformed theoretical curve $x' = x - \underline{a}$ will, by definition, plot as a straight line on log normal paper. We first require the transform mean and standard deviation $\hat{\mu}_y$ and $\hat{\sigma}_y$ from equations 14 and 15. These are calculated as:

$$\hat{\mu}_y = 10.413$$

$$\hat{\sigma}_y = 0.352$$

We now form the one standard deviation values as $\hat{\mu}_y + \hat{\sigma}_y = 10.089$

$$\hat{\mu}_y - \hat{\sigma}_y = 10.766$$

These are transformed from logarithmic space to real space as shown.

$$\mu'_x - \sigma'_x = \exp\ (10.089) = 24074$$

$$\mu'_x = \exp\ (10.413) = 33289$$

$$\mu'_x + \sigma'_x = \exp\ (10.766) = 47382$$

These numbers are plotted at probability levels of .159, .500, and .841, respectively, corresponding to the one standard deviation deviates of a unit normal distribution. These points define a straight line on lognormal probability paper as shown in Figure 3.1.

By adding $\hat{\underline{a}}$ to each point on the line, the (curved) line corresponding to the theoretical curve of the three parameter distribution may be plotted. The observed and theoretical cumulative distribution functions are plotted in Figure 3.1. At this point it might be desired to verify the modeling of the data using the three parameter distribution using one of several goodness-of-fit tests (see, for example, Benjamin and Cornell (1970)).

Table 3.1: Annual Instantaneous Peak Flow,
South Fork Skykomish River
near Index, Washington USGS #12133000

Remarks: 355 square mile drainage area
No diversion, regulation, or reservoirs
60 years of record, Water years 1904-70
Years missing, 1906-11, 13
Records: Excellent

Year	Discharge (cfs)	Date	Year	Discharge (cfs)	Date
1904	12,400	11-30	1941	13,000	11-29
5	10,200	11-22	2	12,600	12-2
1912	26,000	11-19	3	21,200	11-23
14	24,800	1-6	4	41,900	12-3
15	15,800	11-3	5	28,200	1-7
16	14,200	10-31	6	18,400	10-25
17	14,300	11-9	7	24,700	12-11
18	54,100	12-18	8	26,900	10-19
19	26,500	12-14	9	13,800	5-13
1920	33,900	11-15	1950	33,700	11-27
1	22,100	2-11	1	33,300	2-9
2	55,000	12-12	2	7,600	10-3
3	25,400	1-6	3	25,100	1-31
4	50,500	2-12	4	17,800	12-9
5	22,400	2-2	5	18,900	2-8
6	22,400	12-23	6	27,900	11-4
7	21,500	10-16	7	31,900	12-10
8	34,300	1-12	8	8,500	5-25
9	10,500	10-9	9	24,400	11-12
1930	10,900	2-5	1960	51,800	12-15
1	19,400	12-27	1	24,200	1-15
2	50,000	2-6	2	17,800	1-3
3	46,900	11-13	3	42,400	11-20
4	53,200	12-21	4	13,800	1-1
5	35,400	10-25	5	17,900	1-30
6	11,800	5-16	6	12,200	5-6
7	14,400	12-18	7	16,800	12-13
8	27,700	4-18	8	30,100	1-20
9	17,200	1-1	9	24,000	1-5
1940	15,400	12-15	1970	11,800	10-30

Summary Statistics: mean = 24,850 cfs
standard deviation = 12,700 cfs
skew coefficient = .96

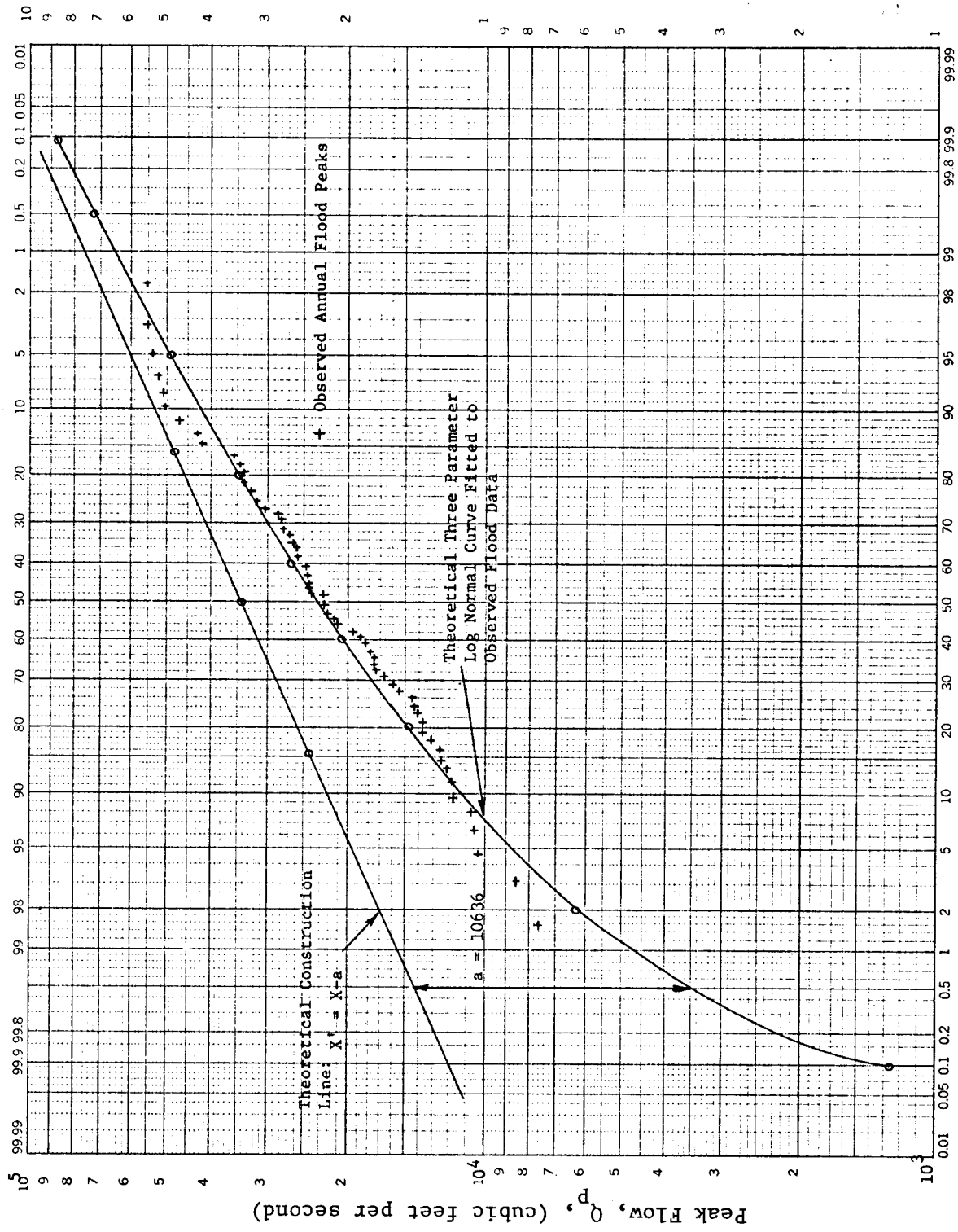

Fig. 3.1 Fit of Three Parameter Distribution to Skykomish River Flood Data Using Skew Method.

Table 3.2 α and β as Functions of G_x

GAMMA = .05

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-.501	.999	-32.94	5.20	.958	.985	
.20	.249	.998		5.40	.959	.985	
.30	.498	.998		5.60	.960	.985	
.40	.623	.997		5.80	.960	.985	
.50	.697	.996		6.00	.961	.985	
.60	.747	.995		6.20	.962	.985	
.70	.782	.994		6.40	.963	.985	
.80	.808	.994		6.60	.963	.985	
.90	.829	.993		6.80	.964	.985	
1.00	.845	.993		7.00	.964	.985	
1.10	.858	.992		7.20	.965	.985	
1.20	.869	.991		7.40	.966	.985	
1.30	.878	.991		7.60	.966	.985	
1.40	.886	.990		7.80	.966	.985	
1.50	.893	.990		8.00	.967	.985	
1.60	.899	.990		8.20	.967	.985	
1.70	.904	.989		8.40	.968	.985	
1.80	.908	.989		8.60	.968	.985	
1.90	.912	.988		8.80	.969	.985	
2.00	.916	.988		9.00	.969	.985	
2.10	.919	.988		9.20	.969	.985	
2.20	.922	.988		9.40	.970	.985	
2.30	.925	.987		9.60	.970	.985	
2.40	.928	.987		9.80	.970	.985	
2.50	.930	.987		10.00	.971	.985	
2.60	.932	.987		10.20	.971	.986	
2.70	.934	.987		10.40	.971	.986	
2.80	.936	.986		10.60	.971	.986	
2.90	.937	.986		10.80	.972	.986	
3.00	.939	.986		11.00	.972	.986	
3.10	.940	.986		11.20	.972	.986	
3.20	.942	.986		11.40	.972	.986	
3.30	.943	.986		11.60	.973	.986	
3.40	.944	.986		11.80	.973	.986	
3.50	.945	.986		12.00	.973	.986	
3.60	.946	.986		12.20	.973	.986	
3.70	.947	.986		12.40	.974	.986	
3.80	.948	.985		12.60	.974	.986	
3.90	.949	.985		12.80	.974	.986	
4.00	.950	.985		13.00	.974	.986	
4.10	.951	.985		13.20	.974	.986	
4.20	.952	.985		13.40	.974	.986	
4.30	.952	.985		13.60	.975	.986	
4.40	.953	.985		13.80	.975	.986	
4.50	.954	.985		14.00	.975	.986	
4.60	.954	.985		14.20	.975	.986	
4.70	.955	.985		14.40	.975	.986	
4.80	.956	.985		14.60	.975	.986	
4.90	.956	.985		14.80	.976	.986	
5.00	.957	.985		15.00	.976	.986	

TABLE 3.2(CONTINUED)

GAMMA = .10

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-2.001	.998	-12.15	5.20	.915	.970	
.20	-.502	.997	-16.44	5.40	.917	.970	
.30	-.003	.995	-57.42	5.60	.919	.970	
.40	.246	.993		5.80	.921	.970	
.50	.395	.992		6.00	.922	.970	
.60	.494	.990		6.20	.924	.970	
.70	.564	.989		6.40	.925	.970	
.80	.617	.988		6.60	.926	.970	
.90	.657	.986		6.80	.928	.970	
1.00	.690	.985		7.00	.929	.970	
1.10	.716	.984		7.20	.930	.970	
1.20	.738	.983		7.40	.931	.970	
1.30	.756	.982		7.60	.932	.970	
1.40	.772	.981		7.80	.933	.970	
1.50	.786	.980		8.00	.934	.970	
1.60	.797	.979		8.20	.935	.970	
1.70	.808	.978		8.40	.936	.970	
1.80	.817	.978		8.60	.936	.971	
1.90	.825	.977		8.80	.937	.971	
2.00	.832	.976		9.00	.938	.971	
2.10	.839	.976		9.20	.939	.971	
2.20	.845	.975		9.40	.939	.971	
2.30	.850	.975		9.60	.940	.971	
2.40	.855	.974		9.80	.941	.971	
2.50	.860	.974		10.00	.941	.971	
2.60	.864	.974		10.20	.942	.971	
2.70	.868	.973		10.40	.942	.971	
2.80	.871	.973		10.60	.943	.971	
2.90	.875	.973		10.80	.943	.971	
3.00	.878	.972		11.00	.944	.971	
3.10	.881	.972		11.20	.944	.971	
3.20	.883	.972		11.40	.945	.971	
3.30	.886	.972		11.60	.945	.972	
3.40	.888	.972		11.80	.946	.972	
3.50	.890	.971		12.00	.946	.972	
3.60	.893	.971		12.20	.947	.972	
3.70	.895	.971		12.40	.947	.972	
3.80	.896	.971		12.60	.947	.972	
3.90	.898	.971		12.80	.948	.972	
4.00	.900	.971		13.00	.948	.972	
4.10	.902	.971		13.20	.949	.972	
4.20	.903	.971		13.40	.949	.972	
4.30	.905	.970		13.60	.949	.972	
4.40	.906	.970		13.80	.950	.972	
4.50	.907	.970		14.00	.950	.972	
4.60	.909	.970		14.20	.950	.972	
4.70	.910	.970		14.40	.951	.972	
4.80	.911	.970		14.60	.951	.973	
4.90	.912	.970		14.80	.951	.973	
5.00	.913	.970		15.00	.952	.973	

TABLE 3.2(CONTINUED)

GAMMA = .15

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-3.502	.998	-7.52	5.20	.873	.955	
.20	-1.253	.995	-8.79	5.40	.876	.955	
.30	-.505	.993	-10.93	5.60	.879	.955	
.40	-.132	.990	-16.24	5.80	.881	.955	
.50	.092	.988		6.00	.884	.955	
.60	.240	.986		6.20	.886	.955	
.70	.346	.983		6.40	.888	.955	
.80	.425	.981		6.60	.890	.955	
.90	.486	.979		6.80	.892	.955	
1.00	.534	.978		7.00	.893	.955	
1.10	.574	.976		7.20	.895	.955	
1.20	.607	.974		7.40	.897	.955	
1.30	.634	.973		7.60	.898	.955	
1.40	.658	.971		7.80	.899	.955	
1.50	.678	.970		8.00	.901	.956	
1.60	.696	.969		8.20	.902	.956	
1.70	.711	.967		8.40	.903	.956	
1.80	.725	.966		8.60	.905	.956	
1.90	.737	.965		8.80	.906	.956	
2.00	.748	.965		9.00	.907	.956	
2.10	.758	.964		9.20	.908	.956	
2.20	.767	.963		9.40	.909	.956	
2.30	.775	.962		9.60	.910	.956	
2.40	.783	.962		9.80	.911	.956	
2.50	.790	.961		10.00	.912	.956	
2.60	.796	.960		10.20	.913	.957	
2.70	.802	.960		10.40	.913	.957	
2.80	.807	.959		10.60	.914	.957	
2.90	.812	.959		10.80	.915	.957	
3.00	.817	.959		11.00	.916	.957	
3.10	.821	.958		11.20	.917	.957	
3.20	.825	.958		11.40	.917	.957	
3.30	.829	.958		11.60	.918	.957	
3.40	.832	.957		11.80	.919	.957	
3.50	.836	.957		12.00	.919	.958	
3.60	.839	.957		12.20	.920	.958	
3.70	.842	.957		12.40	.921	.958	
3.80	.845	.956		12.60	.921	.958	
3.90	.847	.956		12.80	.922	.958	
4.00	.850	.956		13.00	.922	.958	
4.10	.852	.956		13.20	.923	.958	
4.20	.855	.956		13.40	.923	.958	
4.30	.857	.956		13.60	.924	.958	
4.40	.859	.956		13.80	.924	.958	
4.50	.861	.955		14.00	.925	.959	
4.60	.863	.955		14.20	.925	.959	
4.70	.865	.955		14.40	.926	.959	
4.80	.867	.955		14.60	.926	.959	
4.90	.868	.955		14.80	.927	.959	
5.00	.870	.955		15.00	.927	.959	

TABLE 3.2(CONTINUED)

GAMMA = .20

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-5.002	.997	-5.45	5.20	.831	.940	
.20	-2.004	.993	-6.05	5.40	.835	.940	
.30	-1.007	.990	-6.89	5.60	.838	.940	
.40	-.509	.987	-8.17	5.80	.842	.940	
.50	-.211	.984	-10.57	6.00	.845	.940	
.60	-.013	.981	-22.18	6.20	.848	.940	
.70	.128	.978		6.40	.850	.940	
.80	.233	.975		6.60	.853	.940	
.90	.314	.973		6.80	.855	.940	
1.00	.379	.970		7.00	.858	.940	
1.10	.432	.968		7.20	.860	.940	
1.20	.476	.966		7.40	.862	.940	
1.30	.513	.964		7.60	.864	.940	
1.40	.544	.962		7.80	.866	.941	
1.50	.571	.960		8.00	.868	.941	
1.60	.595	.958		8.20	.870	.941	
1.70	.615	.957		8.40	.871	.941	
1.80	.634	.955		8.60	.873	.941	
1.90	.650	.954		8.80	.874	.941	
2.00	.664	.953		9.00	.876	.941	
2.10	.678	.952		9.20	.877	.941	
2.20	.690	.951		9.40	.879	.942	
2.30	.700	.950		9.60	.880	.942	
2.40	.710	.949		9.80	.881	.942	
2.50	.719	.948		10.00	.882	.942	
2.60	.728	.947		10.20	.883	.942	
2.70	.735	.946		10.40	.885	.942	
2.80	.743	.946		10.60	.886	.942	
2.90	.749	.945		10.80	.887	.943	
3.00	.755	.945		11.00	.888	.943	
3.10	.761	.944		11.20	.889	.943	
3.20	.767	.944		11.40	.890	.943	
3.30	.772	.943		11.60	.891	.943	
3.40	.776	.943		11.80	.892	.943	
3.50	.781	.943		12.00	.892	.943	
3.60	.785	.942		12.20	.893	.944	
3.70	.789	.942		12.40	.894	.944	
3.80	.793	.942		12.60	.895	.944	
3.90	.797	.942		12.80	.896	.944	
4.00	.800	.941		13.00	.896	.944	
4.10	.803	.941		13.20	.897	.944	
4.20	.806	.941		13.40	.898	.944	
4.30	.809	.941		13.60	.899	.944	
4.40	.812	.941		13.80	.899	.945	
4.50	.815	.941		14.00	.900	.945	
4.60	.817	.941		14.20	.901	.945	
4.70	.820	.940		14.40	.901	.945	
4.80	.822	.940		14.60	.902	.945	
4.90	.825	.940		14.80	.903	.945	
5.00	.827	.940		15.00	.903	.945	

TABLE 3.2(CONTINUED)

GAMMA = .25

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-6.503	.996	-4.28	5.20	.789	.925	
.20	-2.756	.992	-4.62	5.40	.793	.925	
.30	-1.508	.988	-5.07	5.60	.798	.925	
.40	-.886	.984	-5.66	5.80	.802	.925	
.50	-.514	.980	-6.51	6.00	.806	.925	
.60	-.266	.976	-7.88	6.20	.810	.925	
.70	-.090	.972	-10.89	6.40	.813	.925	
.80	.041	.969		6.60	.816	.925	
.90	.143	.966		6.80	.819	.925	
1.00	.224	.963		7.00	.822	.925	
1.10	.290	.960		7.20	.825	.925	
1.20	.345	.957		7.40	.828	.925	
1.30	.391	.954		7.60	.830	.926	
1.40	.430	.952		7.80	.832	.926	
1.50	.464	.950		8.00	.835	.926	
1.60	.493	.948		8.20	.837	.926	
1.70	.519	.946		8.40	.839	.926	
1.80	.542	.944		8.60	.841	.926	
1.90	.562	.942		8.80	.843	.926	
2.00	.581	.941		9.00	.845	.927	
2.10	.597	.939		9.20	.846	.927	
2.20	.612	.938		9.40	.848	.927	
2.30	.625	.937		9.60	.850	.927	
2.40	.638	.936		9.80	.851	.927	
2.50	.649	.935		10.00	.853	.927	
2.60	.660	.934		10.20	.854	.928	
2.70	.669	.933		10.40	.856	.928	
2.80	.678	.932		10.60	.857	.928	
2.90	.687	.932		10.80	.858	.928	
3.00	.694	.931		11.00	.860	.928	
3.10	.701	.930		11.20	.861	.929	
3.20	.708	.930		11.40	.862	.929	
3.30	.715	.929		11.60	.863	.929	
3.40	.721	.929		11.80	.864	.929	
3.50	.726	.928		12.00	.866	.929	
3.60	.731	.928		12.20	.867	.929	
3.70	.736	.928		12.40	.868	.930	
3.80	.741	.927		12.60	.869	.930	
3.90	.746	.927		12.80	.870	.930	
4.00	.750	.927		13.00	.871	.930	
4.10	.754	.927		13.20	.871	.930	
4.20	.758	.926		13.40	.872	.930	
4.30	.762	.926		13.60	.873	.931	
4.40	.765	.926		13.80	.874	.931	
4.50	.769	.926		14.00	.875	.931	
4.60	.772	.926		14.20	.876	.931	
4.70	.775	.926		14.40	.877	.931	
4.80	.778	.925		14.60	.877	.931	
4.90	.781	.925		14.80	.878	.932	
5.00	.783	.925		15.00	.879	.932	

TABLE 3.2(CONTINUED)

GAMMA = .30

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-8.003	.995	-3.52	5.20	.746	.910	
.20	-3.507	.990	-3.74	5.40	.752	.910	
.30	-2.010	.985	-4.01	5.60	.757	.910	
.40	-1.263	.980	-4.35	5.80	.762	.910	
.50	-.816	.976	-4.79	6.00	.767	.910	
.60	-.519	.971	-5.39	6.20	.771	.910	
.70	-.308	.967	-6.27	6.40	.776	.910	
.80	-.150	.963	-7.80	6.60	.779	.910	
.90	-.028	.959	-12.42	6.80	.783	.910	
1.00	.069	.955		7.00	.787	.910	
1.10	.148	.952		7.20	.790	.910	
1.20	.214	.948		7.40	.793	.911	
1.30	.269	.945		7.60	.796	.911	
1.40	.316	.942		7.80	.799	.911	
1.50	.357	.940		8.00	.802	.911	
1.60	.392	.937		8.20	.804	.911	
1.70	.423	.935		8.40	.807	.911	
1.80	.450	.933		8.60	.809	.912	
1.90	.475	.931		8.80	.811	.912	
2.00	.497	.929		9.00	.814	.912	
2.10	.516	.927		9.20	.816	.912	
2.20	.534	.926		9.40	.818	.912	
2.30	.551	.924		9.60	.820	.913	
2.40	.565	.923		9.80	.822	.913	
2.50	.579	.922		10.00	.823	.913	
2.60	.592	.921		10.20	.825	.913	
2.70	.603	.920		10.40	.827	.913	
2.80	.614	.919		10.60	.828	.914	
2.90	.624	.918		10.80	.830	.914	
3.00	.633	.917		11.00	.832	.914	
3.10	.642	.916		11.20	.833	.914	
3.20	.650	.916		11.40	.835	.914	
3.30	.658	.915		11.60	.836	.915	
3.40	.665	.915		11.80	.837	.915	
3.50	.671	.914		12.00	.839	.915	
3.60	.678	.914		12.20	.840	.915	
3.70	.684	.913		12.40	.841	.915	
3.80	.689	.913		12.60	.842	.916	
3.90	.695	.912		12.80	.844	.916	
4.00	.700	.912		13.00	.845	.916	
4.10	.705	.912		13.20	.846	.916	
4.20	.710	.912		13.40	.847	.916	
4.30	.714	.911		13.60	.848	.917	
4.40	.718	.911		13.80	.849	.917	
4.50	.722	.911		14.00	.850	.917	
4.60	.726	.911		14.20	.851	.917	
4.70	.730	.911		14.40	.852	.917	
4.80	.733	.910		14.60	.853	.918	
4.90	.737	.910		14.80	.854	.918	
5.00	.740	.910		15.00	.855	.918	

TABLE 3.2(CONTINUED)

GAMMA = .35

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-9.504	.994	-2.99	5.20	.704	.895	
.20	-4.258	.988	-3.14	5.40	.711	.895	
.30	-2.512	.983	-3.32	5.60	.717	.895	
.40	-1.640	.977	-3.54	5.80	.723	.895	
.50	-1.119	.972	-3.81	6.00	.728	.895	
.60	-.773	.966	-4.15	6.20	.733	.895	
.70	-.526	.961	-4.59	6.40	.738	.895	
.80	-.342	.957	-5.20	6.60	.743	.895	
.90	-.200	.952	-6.13	6.80	.747	.895	
1.00	-.086	.948	-7.90	7.00	.751	.895	
1.10	.006	.944		7.20	.755	.895	
1.20	.083	.940		7.40	.759	.896	
1.30	.147	.936		7.60	.762	.896	
1.40	.202	.933		7.80	.765	.896	
1.50	.249	.930		8.00	.769	.896	
1.60	.291	.927		8.20	.772	.896	
1.70	.327	.924		8.40	.775	.897	
1.80	.359	.922		8.60	.777	.897	
1.90	.387	.919		8.80	.780	.897	
2.00	.413	.917		9.00	.783	.897	
2.10	.436	.915		9.20	.785	.898	
2.20	.457	.913		9.40	.787	.898	
2.30	.476	.912		9.60	.790	.898	
2.40	.493	.910		9.80	.792	.898	
2.50	.509	.909		10.00	.794	.898	
2.60	.524	.908		10.20	.796	.899	
2.70	.537	.906		10.40	.798	.899	
2.80	.550	.905		10.60	.800	.899	
2.90	.561	.904		10.80	.802	.899	
3.00	.572	.903		11.00	.804	.900	
3.10	.582	.902		11.20	.805	.900	
3.20	.592	.902		11.40	.807	.900	
3.30	.600	.901		11.60	.809	.900	
3.40	.609	.900		11.80	.810	.901	
3.50	.617	.900		12.00	.812	.901	
3.60	.624	.899		12.20	.813	.901	
3.70	.631	.899		12.40	.815	.901	
3.80	.638	.898		12.60	.816	.902	
3.90	.644	.898		12.80	.817	.902	
4.00	.650	.897		13.00	.819	.902	
4.10	.656	.897		13.20	.820	.902	
4.20	.661	.897		13.40	.821	.903	
4.30	.666	.897		13.60	.823	.903	
4.40	.671	.896		13.80	.824	.903	
4.50	.676	.896		14.00	.825	.903	
4.60	.680	.896		14.20	.826	.903	
4.70	.685	.896		14.40	.827	.904	
4.80	.689	.896		14.60	.828	.904	
4.90	.693	.895		14.80	.829	.904	
5.00	.697	.895		15.00	.831	.904	

TABLE 3.2(CONTINUED)

GAMMA = .40

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-11.004	.993	-2.59	5.20	.662	.880	
.20	-5.009	.987	-2.70	5.40	.669	.880	
.30	-3.013	.980	-2.83	5.60	.677	.880	
.40	-2.018	.974	-2.98	5.80	.683	.880	
.50	-1.422	.968	-3.16	6.00	.689	.880	
.60	-1.026	.962	-3.38	6.20	.695	.880	
.70	-.744	.956	-3.65	6.40	.701	.880	
.80	-.534	.950	-3.99	6.60	.706	.880	
.90	-.371	.945	-4.43	6.80	.711	.880	
1.00	-.242	.940	-5.05	7.00	.716	.880	
1.10	-.136	.936	-6.04	7.20	.720	.881	
1.20	-.049	.931	-8.15	7.40	.724	.881	
1.30	.025	.927		7.60	.728	.881	
1.40	.088	.923		7.80	.732	.881	
1.50	.142	.920		8.00	.736	.881	
1.60	.189	.916		8.20	.739	.882	
1.70	.231	.913		8.40	.742	.882	
1.80	.267	.910		8.60	.746	.882	
1.90	.300	.908		8.80	.749	.882	
2.00	.329	.905		9.00	.752	.883	
2.10	.355	.903		9.20	.754	.883	
2.20	.379	.901		9.40	.757	.883	
2.30	.401	.899		9.60	.760	.883	
2.40	.421	.897		9.80	.762	.884	
2.50	.439	.896		10.00	.765	.884	
2.60	.455	.894		10.20	.767	.884	
2.70	.471	.893		10.40	.769	.885	
2.80	.485	.892		10.60	.771	.885	
2.90	.498	.891		10.80	.773	.885	
3.00	.511	.890		11.00	.775	.885	
3.10	.522	.889		11.20	.777	.886	
3.20	.533	.888		11.40	.779	.886	
3.30	.543	.887		11.60	.781	.886	
3.40	.553	.886		11.80	.783	.886	
3.50	.562	.885		12.00	.785	.887	
3.60	.570	.885		12.20	.787	.887	
3.70	.578	.884		12.40	.788	.887	
3.80	.586	.884		12.60	.790	.888	
3.90	.593	.883		12.80	.791	.888	
4.00	.600	.883		13.00	.793	.888	
4.10	.607	.882		13.20	.794	.888	
4.20	.613	.882		13.40	.796	.889	
4.30	.619	.882		13.60	.797	.889	
4.40	.624	.882		13.80	.799	.889	
4.50	.630	.881		14.00	.800	.889	
4.60	.635	.881		14.20	.801	.890	
4.70	.640	.881		14.40	.803	.890	
4.80	.644	.881		14.60	.804	.890	
4.90	.649	.881		14.80	.805	.890	
5.00	.653	.880		15.00	.806	.891	

TABLE 3.2(CONTINUED)

GAMMA = .45

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-12.505	.993	-2.29	5.20	.619	.865	
.20	-5.760	.985	-2.37	5.40	.628	.865	
.30	-3.515	.978	-2.47	5.60	.636	.865	
.40	-2.395	.971	-2.58	5.80	.644	.865	
.50	-1.725	.964	-2.71	6.00	.651	.865	
.60	-1.279	.957	-2.86	6.20	.657	.865	
.70	-.962	.950	-3.03	6.40	.663	.865	
.80	-.726	.944	-3.25	6.60	.669	.865	
.90	-.543	.938	-3.51	6.80	.675	.865	
1.00	-.397	.933	-3.85	7.00	.680	.865	
1.10	-.278	.927	-4.29	7.20	.685	.866	
1.20	-.180	.923	-4.92	7.40	.690	.866	
1.30	-.097	.918	-5.96	7.60	.694	.866	
1.40	-.026	.914	-8.54	7.80	.698	.866	
1.50	.035	.910		8.00	.703	.867	
1.60	.088	.906		8.20	.706	.867	
1.70	.134	.902		8.40	.710	.867	
1.80	.176	.899		8.60	.714	.867	
1.90	.212	.896		8.80	.717	.868	
2.00	.245	.894		9.00	.720	.868	
2.10	.275	.891		9.20	.724	.868	
2.20	.301	.889		9.40	.727	.869	
2.30	.326	.887		9.60	.730	.869	
2.40	.348	.885		9.80	.732	.869	
2.50	.369	.883		10.00	.735	.869	
2.60	.387	.881		10.20	.738	.870	
2.70	.405	.880		10.40	.740	.870	
2.80	.421	.878		10.60	.743	.870	
2.90	.436	.877		10.80	.745	.871	
3.00	.450	.876		11.00	.747	.871	
3.10	.463	.875		11.20	.750	.871	
3.20	.475	.874		11.40	.752	.872	
3.30	.486	.873		11.60	.754	.872	
3.40	.497	.872		11.80	.756	.872	
3.50	.507	.871		12.00	.758	.873	
3.60	.517	.870		12.20	.760	.873	
3.70	.526	.870		12.40	.762	.873	
3.80	.534	.869		12.60	.764	.874	
3.90	.542	.869		12.80	.765	.874	
4.00	.550	.868		13.00	.767	.874	
4.10	.557	.868		13.20	.769	.874	
4.20	.564	.867		13.40	.770	.875	
4.30	.571	.867		13.60	.772	.875	
4.40	.577	.867		13.80	.773	.875	
4.50	.583	.866		14.00	.775	.876	
4.60	.589	.866		14.20	.776	.876	
4.70	.595	.866		14.40	.778	.876	
4.80	.600	.866		14.60	.779	.876	
4.90	.605	.866		14.80	.781	.877	
5.00	.610	.865		15.00	.782	.877	

TABLE 3.2(CONTINUED)

GAMMA = .50

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-14.006	.992	-2.05	5.20	.577	.850	
.20	-6.511	.983	-2.12	5.40	.587	.850	
.30	-4.017	.975	-2.19	5.60	.596	.850	
.40	-2.772	.967	-2.27	5.80	.604	.850	
.50	-2.027	.960	-2.36	6.00	.612	.850	
.60	-1.532	.952	-2.47	6.20	.619	.850	
.70	-1.180	.945	-2.60	6.40	.626	.850	
.80	-.917	.938	-2.75	6.60	.632	.850	
.90	-.714	.931	-2.92	6.80	.639	.850	
1.00	-.552	.925	-3.13	7.00	.644	.850	
1.10	-.420	.919	-3.39	7.20	.650	.851	
1.20	-.311	.914	-3.72	7.40	.655	.851	
1.30	-.219	.909	-4.16	7.60	.660	.851	
1.40	-.140	.904	-4.79	7.80	.665	.851	
1.50	-.072	.900	-5.85	8.00	.669	.852	
1.60	-.014	.895	-9.01	8.20	.674	.852	
1.70	.038	.892		8.40	.678	.852	
1.80	.084	.888		8.60	.682	.853	
1.90	.125	.885		8.80	.686	.853	
2.00	.161	.882		9.00	.689	.853	
2.10	.194	.879		9.20	.693	.854	
2.20	.224	.876		9.40	.696	.854	
2.30	.251	.874		9.60	.700	.854	
2.40	.276	.872		9.80	.703	.855	
2.50	.298	.870		10.00	.706	.855	
2.60	.319	.868		10.20	.709	.855	
2.70	.339	.866		10.40	.711	.856	
2.80	.356	.865		10.60	.714	.856	
2.90	.373	.863		10.80	.717	.856	
3.00	.389	.862		11.00	.719	.857	
3.10	.403	.861		11.20	.722	.857	
3.20	.417	.860		11.40	.724	.857	
3.30	.429	.859		11.60	.727	.858	
3.40	.441	.858		11.80	.729	.858	
3.50	.452	.857		12.00	.731	.858	
3.60	.463	.856		12.20	.733	.859	
3.70	.473	.855		12.40	.735	.859	
3.80	.482	.855		12.60	.737	.859	
3.90	.491	.854		12.80	.739	.860	
4.00	.500	.854		13.00	.741	.860	
4.10	.508	.853		13.20	.743	.860	
4.20	.516	.853		13.40	.745	.861	
4.30	.523	.852		13.60	.747	.861	
4.40	.530	.852		13.80	.748	.861	
4.50	.537	.852		14.00	.750	.862	
4.60	.544	.851		14.20	.752	.862	
4.70	.550	.851		14.40	.753	.862	
4.80	.556	.851		14.60	.755	.863	
4.90	.561	.851		14.80	.756	.863	
5.00	.567	.850		15.00	.758	.863	

TABLE 3.2(CONTINUED)

GAMMA = .55

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-15.506	.991	-1.86	5.20	.535	.835	
.20	-7.262	.982	-1.91	5.40	.545	.835	
.30	-4.518	.973	-1.96	5.60	.555	.835	
.40	-3.149	.964	-2.02	5.80	.564	.835	
.50	-2.330	.955	-2.09	6.00	.573	.835	
.60	-1.786	.947	-2.18	6.20	.581	.835	
.70	-1.398	.939	-2.27	6.40	.589	.835	
.80	-1.109	.932	-2.38	6.60	.596	.835	
.90	-.885	.925	-2.50	6.80	.603	.835	
1.00	-.707	.918	-2.65	7.00	.609	.836	
1.10	-.562	.911	-2.82	7.20	.615	.836	
1.20	-.442	.905	-3.02	7.40	.621	.836	
1.30	-.340	.900	-3.28	7.60	.626	.836	
1.40	-.254	.894	-3.60	7.80	.631	.837	
1.50	-.180	.890	-4.02	8.00	.636	.837	
1.60	-.115	.885	-4.64	8.20	.641	.837	
1.70	-.058	.881	-5.69	8.40	.646	.838	
1.80	-.008	.877	-9.29	8.60	.650	.838	
1.90	.037	.873		8.80	.654	.838	
2.00	.077	.870		9.00	.658	.839	
2.10	.113	.867		9.20	.662	.839	
2.20	.146	.864		9.40	.666	.839	
2.30	.176	.861		9.60	.669	.840	
2.40	.203	.859		9.80	.673	.840	
2.50	.228	.857		10.00	.676	.840	
2.60	.251	.855		10.20	.679	.841	
2.70	.272	.853		10.40	.683	.841	
2.80	.292	.851		10.60	.686	.842	
2.90	.310	.850		10.80	.688	.842	
3.00	.327	.848		11.00	.691	.842	
3.10	.343	.847		11.20	.694	.843	
3.20	.358	.846		11.40	.697	.843	
3.30	.372	.844		11.60	.699	.844	
3.40	.385	.843		11.80	.702	.844	
3.50	.398	.842		12.00	.704	.844	
3.60	.409	.842		12.20	.706	.845	
3.70	.420	.841		12.40	.709	.845	
3.80	.431	.840		12.60	.711	.845	
3.90	.441	.839		12.80	.713	.846	
4.00	.450	.839		13.00	.715	.846	
4.10	.459	.838		13.20	.717	.847	
4.20	.467	.838		13.40	.719	.847	
4.30	.476	.837		13.60	.721	.847	
4.40	.483	.837		13.80	.723	.848	
4.50	.491	.837		14.00	.725	.848	
4.60	.498	.836		14.20	.727	.848	
4.70	.505	.836		14.40	.729	.849	
4.80	.511	.836		14.60	.730	.849	
4.90	.517	.836		14.80	.732	.849	
5.00	.523	.836		15.00	.734	.850	

TABLE 3.2(CONTINUED)

GAMMA = .60

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-17.007	.990	-1.70	5.20	.493	.820	
.20	-8.013	.980	-1.74	5.40	.504	.820	
.30	-5.020	.970	-1.78	5.60	.515	.820	
.40	-3.526	.961	-1.83	5.80	.525	.820	
.50	-2.633	.951	-1.88	6.00	.534	.820	
.60	-2.039	.942	-1.94	6.20	.543	.820	
.70	-1.617	.934	-2.01	6.40	.551	.820	
.80	-1.301	.926	-2.09	6.60	.559	.820	
.90	-1.057	.918	-2.19	6.80	.566	.820	
1.00	-.862	.910	-2.29	7.00	.573	.821	
1.10	-.704	.903	-2.41	7.20	.580	.821	
1.20	-.573	.897	-2.56	7.40	.586	.821	
1.30	-.462	.891	-2.72	7.60	.592	.821	
1.40	-.368	.885	-2.92	7.80	.598	.822	
1.50	-.287	.879	-3.16	8.00	.603	.822	
1.60	-.216	.874	-3.47	8.20	.609	.822	
1.70	-.154	.870	-3.87	8.40	.614	.823	
1.80	-.099	.866	-4.45	8.60	.618	.823	
1.90	-.050	.862	-5.45	8.80	.623	.824	
2.00	-.007	.858	-8.84	9.00	.627	.824	
2.10	.033	.855		9.20	.631	.824	
2.20	.069	.852		9.40	.636	.825	
2.30	.101	.849		9.60	.639	.825	
2.40	.131	.846		9.80	.643	.826	
2.50	.158	.844		10.00	.647	.826	
2.60	.183	.841		10.20	.650	.826	
2.70	.206	.839		10.40	.654	.827	
2.80	.228	.838		10.60	.657	.827	
2.90	.248	.836		10.80	.660	.828	
3.00	.266	.834		11.00	.663	.828	
3.10	.284	.833		11.20	.666	.828	
3.20	.300	.831		11.40	.669	.829	
3.30	.315	.830		11.60	.672	.829	
3.40	.329	.829		11.80	.675	.830	
3.50	.343	.828		12.00	.677	.830	
3.60	.356	.827		12.20	.680	.831	
3.70	.368	.826		12.40	.682	.831	
3.80	.379	.826		12.60	.685	.831	
3.90	.390	.825		12.80	.687	.832	
4.00	.400	.824		13.00	.689	.832	
4.10	.410	.824		13.20	.692	.833	
4.20	.419	.823		13.40	.694	.833	
4.30	.428	.823		13.60	.696	.833	
4.40	.436	.822		13.80	.698	.834	
4.50	.444	.822		14.00	.700	.834	
4.60	.452	.822		14.20	.702	.835	
4.70	.460	.821		14.40	.704	.835	
4.80	.467	.821		14.60	.706	.835	
4.90	.474	.821		14.80	.708	.836	
5.00	.480	.821		15.00	.709	.836	

TABLE 3.2(CONTINUED)

GAMMA = .65

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-18.507	.989	-1.56	5.20	.450	.805	
.20	-8.764	.978	-1.59	5.40	.463	.805	
.30	-5.522	.968	-1.62	5.60	.474	.805	
.40	-3.904	.957	-1.66	5.80	.485	.805	
.50	-2.935	.947	-1.70	6.00	.495	.805	
.60	-2.292	.938	-1.75	6.20	.505	.805	
.70	-1.835	.928	-1.81	6.40	.514	.805	
.80	-1.493	.919	-1.87	6.60	.522	.805	
.90	-1.228	.911	-1.94	6.80	.530	.805	
1.00	-1.017	.903	-2.02	7.00	.538	.806	
1.10	-.846	.895	-2.11	7.20	.545	.806	
1.20	-.704	.888	-2.21	7.40	.552	.806	
1.30	-.584	.881	-2.33	7.60	.558	.807	
1.40	-.482	.875	-2.47	7.80	.564	.807	
1.50	-.394	.869	-2.63	8.00	.570	.807	
1.60	-.318	.864	-2.82	8.20	.576	.808	
1.70	-.250	.859	-3.04	8.40	.581	.808	
1.80	-.191	.854	-3.33	8.60	.586	.808	
1.90	-.138	.850	-3.71	8.80	.591	.809	
2.00	-.090	.846	-4.24	9.00	.596	.809	
2.10	-.048	.843	-5.13	9.20	.601	.810	
2.20	-.009	.839	-7.72	9.40	.605	.810	
2.30	.026	.836		9.60	.609	.811	
2.40	.058	.833		9.80	.613	.811	
2.50	.088	.831		10.00	.617	.811	
2.60	.115	.828		10.20	.621	.812	
2.70	.140	.826		10.40	.625	.812	
2.80	.163	.824		10.60	.628	.813	
2.90	.185	.822		10.80	.632	.813	
3.00	.205	.820		11.00	.635	.814	
3.10	.224	.819		11.20	.638	.814	
3.20	.241	.817		11.40	.642	.815	
3.30	.258	.816		11.60	.645	.815	
3.40	.273	.815		11.80	.647	.816	
3.50	.288	.814		12.00	.650	.816	
3.60	.302	.813		12.20	.653	.816	
3.70	.315	.812		12.40	.656	.817	
3.80	.327	.811		12.60	.658	.817	
3.90	.339	.810		12.80	.661	.818	
4.00	.350	.810		13.00	.663	.818	
4.10	.361	.809		13.20	.666	.819	
4.20	.371	.808		13.40	.668	.819	
4.30	.380	.808		13.60	.671	.819	
4.40	.389	.807		13.80	.673	.820	
4.50	.398	.807		14.00	.675	.820	
4.60	.407	.807		14.20	.677	.821	
4.70	.415	.806		14.40	.679	.821	
4.80	.422	.806		14.60	.681	.822	
4.90	.430	.806		14.80	.683	.822	
5.00	.437	.806		15.00	.685	.822	

TABLE 3.2(CONTINUED)

GAMMA = .70

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-20.008	.988	-1.45	5.20	.408	.790	
.20	-9.516	.977	-1.47	5.40	.421	.790	
.30	-6.023	.965	-1.50	5.60	.434	.790	
.40	-4.281	.954	-1.52	5.80	.446	.790	
.50	-3.238	.943	-1.56	6.00	.456	.790	
.60	-2.545	.933	-1.60	6.20	.467	.790	
.70	-2.053	.923	-1.64	6.40	.476	.790	
.80	-1.684	.913	-1.69	6.60	.485	.790	
.90	-1.400	.904	-1.74	6.80	.494	.790	
1.00	-1.173	.895	-1.81	7.00	.502	.791	
1.10	-.988	.887	-1.87	7.20	.510	.791	
1.20	-.835	.879	-1.95	7.40	.517	.791	
1.30	-.706	.872	-2.04	7.60	.524	.792	
1.40	-.596	.866	-2.14	7.80	.531	.792	
1.50	-.501	.859	-2.25	8.00	.537	.792	
1.60	-.419	.854	-2.38	8.20	.543	.793	
1.70	-.347	.848	-2.53	8.40	.549	.793	
1.80	-.283	.843	-2.71	8.60	.555	.794	
1.90	-.225	.839	-2.92	8.80	.560	.794	
2.00	-.174	.834	-3.18	9.00	.565	.795	
2.10	-.128	.830	-3.52	9.20	.570	.795	
2.20	-.087	.827	-4.00	9.40	.575	.796	
2.30	-.049	.824	-4.75	9.60	.579	.796	
2.40	-.014	.820	-6.55	9.80	.584	.796	
2.50	.018	.818		10.00	.588	.797	
2.60	.047	.815		10.20	.592	.797	
2.70	.074	.813		10.40	.596	.798	
2.80	.099	.810		10.60	.600	.798	
2.90	.122	.808		10.80	.604	.799	
3.00	.144	.807		11.00	.607	.799	
3.10	.164	.805		11.20	.611	.800	
3.20	.183	.803		11.40	.614	.800	
3.30	.201	.802		11.60	.617	.801	
3.40	.218	.801		11.80	.620	.801	
3.50	.233	.800		12.00	.623	.802	
3.60	.248	.798		12.20	.626	.802	
3.70	.262	.797		12.40	.629	.803	
3.80	.275	.797		12.60	.632	.803	
3.90	.288	.796		12.80	.635	.804	
4.00	.300	.795		13.00	.638	.804	
4.10	.311	.794		13.20	.640	.805	
4.20	.322	.794		13.40	.643	.805	
4.30	.333	.793		13.60	.645	.806	
4.40	.342	.793		13.80	.648	.806	
4.50	.352	.792		14.00	.650	.807	
4.60	.361	.792		14.20	.652	.807	
4.70	.370	.791		14.40	.655	.807	
4.80	.378	.791		14.60	.657	.808	
4.90	.386	.791		14.80	.659	.808	
5.00	.394	.791		15.00	.661	.809	

TABLE 3.2(CONTINUED)

GAMMA = .75

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-21.508	.988	-1.35	5.20	.366	.775	
.20	-10.267	.975	-1.36	5.40	.380	.775	
.30	-6.525	.963	-1.38	5.60	.393	.775	
.40	-4.658	.951	-1.41	5.80	.406	.775	
.50	-3.541	.939	-1.43	6.00	.418	.775	
.60	-2.799	.928	-1.46	6.20	.429	.775	
.70	-2.271	.917	-1.50	6.40	.439	.775	
.80	-1.876	.907	-1.54	6.60	.449	.775	
.90	-1.571	.897	-1.58	6.80	.458	.775	
1.00	-1.328	.888	-1.63	7.00	.467	.776	
1.10	-1.130	.879	-1.68	7.20	.475	.776	
1.20	-.966	.871	-1.74	7.40	.483	.776	
1.30	-.828	.863	-1.81	7.60	.490	.777	
1.40	-.710	.856	-1.89	7.80	.497	.777	
1.50	-.609	.849	-1.97	8.00	.504	.778	
1.60	-.520	.843	-2.06	8.20	.511	.778	
1.70	-.443	.837	-2.17	8.40	.517	.779	
1.80	-.374	.832	-2.29	8.60	.523	.779	
1.90	-.313	.827	-2.43	8.80	.529	.779	
2.00	-.258	.823	-2.60	9.00	.534	.780	
2.10	-.209	.818	-2.79	9.20	.539	.780	
2.20	-.164	.814	-3.03	9.40	.544	.781	
2.30	-.124	.811	-3.33	9.60	.549	.781	
2.40	-.086	.808	-3.74	9.80	.554	.782	
2.50	-.052	.805	-4.36	10.00	.559	.782	
2.60	-.021	.802	-5.58	10.20	.563	.783	
2.70	.008	.799		10.40	.567	.784	
2.80	.035	.797		10.60	.571	.784	
2.90	.060	.795		10.80	.575	.785	
3.00	.083	.793		11.00	.579	.785	
3.10	.104	.791		11.20	.583	.786	
3.20	.125	.789		11.40	.586	.786	
3.30	.144	.788		11.60	.590	.787	
3.40	.162	.786		11.80	.593	.787	
3.50	.179	.785		12.00	.597	.788	
3.60	.194	.784		12.20	.600	.788	
3.70	.209	.783		12.40	.603	.789	
3.80	.224	.782		12.60	.606	.789	
3.90	.237	.781		12.80	.609	.790	
4.00	.250	.780		13.00	.612	.790	
4.10	.262	.780		13.20	.614	.791	
4.20	.274	.779		13.40	.617	.791	
4.30	.285	.778		13.60	.620	.792	
4.40	.295	.778		13.80	.622	.792	
4.50	.306	.777		14.00	.625	.793	
4.60	.315	.777		14.20	.627	.793	
4.70	.325	.777		14.40	.630	.794	
4.80	.333	.776		14.60	.632	.794	
4.90	.342	.776		14.80	.635	.795	
5.00	.350	.776		15.00	.637	.795	

TABLE 3.2(CONTINUED)

GAMMA = .80

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-23.009	.987	-1.26	5.20	.323	.760	
.20	-11.018	.973	-1.27	5.40	.339	.760	
.30	-7.026	.960	-1.29	5.60	.353	.760	
.40	-5.035	.948	-1.31	5.80	.366	.760	
.50	-3.844	.935	-1.33	6.00	.379	.760	
.60	-3.052	.923	-1.35	6.20	.391	.760	
.70	-2.489	.912	-1.38	6.40	.402	.760	
.80	-2.068	.901	-1.41	6.60	.412	.760	
.90	-1.742	.890	-1.44	6.80	.422	.760	
1.00	-1.483	.880	-1.48	7.00	.431	.761	
1.10	-1.272	.871	-1.53	7.20	.440	.761	
1.20	-1.097	.862	-1.57	7.40	.448	.762	
1.30	-.950	.854	-1.63	7.60	.456	.762	
1.40	-.824	.846	-1.68	7.80	.464	.762	
1.50	-.716	.839	-1.75	8.00	.471	.763	
1.60	-.622	.833	-1.82	8.20	.478	.763	
1.70	-.539	.827	-1.90	8.40	.485	.764	
1.80	-.466	.821	-1.99	8.60	.491	.764	
1.90	-.401	.816	-2.09	8.80	.497	.765	
2.00	-.342	.811	-2.20	9.00	.503	.765	
2.10	-.289	.806	-2.33	9.20	.509	.766	
2.20	-.242	.802	-2.48	9.40	.514	.766	
2.30	-.198	.798	-2.66	9.60	.519	.767	
2.40	-.159	.795	-2.87	9.80	.524	.767	
2.50	-.123	.792	-3.14	10.00	.529	.768	
2.60	-.089	.789	-3.48	10.20	.534	.769	
2.70	-.058	.786	-3.98	10.40	.538	.769	
2.80	-.030	.783	-4.82	10.60	.543	.770	
2.90	-.003	.781	-7.90	10.80	.547	.770	
3.00	.022	.779		11.00	.551	.771	
3.10	.045	.777		11.20	.555	.771	
3.20	.066	.775		11.40	.559	.772	
3.30	.087	.774		11.60	.563	.772	
3.40	.106	.772		11.80	.566	.773	
3.50	.124	.771		12.00	.570	.774	
3.60	.141	.770		12.20	.573	.774	
3.70	.157	.768		12.40	.576	.775	
3.80	.172	.767		12.60	.580	.775	
3.90	.186	.767		12.80	.583	.776	
4.00	.200	.766		13.00	.586	.776	
4.10	.213	.765		13.20	.589	.777	
4.20	.225	.764		13.40	.592	.777	
4.30	.237	.764		13.60	.595	.778	
4.40	.249	.763		13.80	.597	.778	
4.50	.259	.763		14.00	.600	.779	
4.60	.270	.762		14.20	.603	.779	
4.70	.280	.762		14.40	.605	.780	
4.80	.289	.761		14.60	.608	.780	
4.90	.298	.761		14.80	.610	.781	
5.00	.307	.761		15.00	.613	.781	

TABLE 3.2(CONTINUED)

GAMMA = .85

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-24.509	.986	-1.18	5.20	.281	.745	
.20	-11.769	.972	-1.19	5.40	.297	.745	
.30	-7.528	.958	-1.20	5.60	.313	.745	
.40	-5.412	.944	-1.22	5.80	.327	.745	
.50	-4.146	.931	-1.23	6.00	.340	.745	
.60	-3.305	.918	-1.25	6.20	.352	.745	
.70	-2.707	.906	-1.28	6.40	.364	.745	
.80	-2.260	.895	-1.30	6.60	.375	.745	
.90	-1.914	.883	-1.33	6.80	.386	.746	
1.00	-1.638	.873	-1.36	7.00	.396	.746	
1.10	-1.414	.863	-1.39	7.20	.405	.746	
1.20	-1.228	.854	-1.43	7.40	.414	.747	
1.30	-1.072	.845	-1.47	7.60	.422	.747	
1.40	-.938	.837	-1.52	7.80	.430	.747	
1.50	-.823	.829	-1.57	8.00	.438	.748	
1.60	-.723	.822	-1.63	8.20	.445	.748	
1.70	-.635	.816	-1.69	8.40	.453	.749	
1.80	-.557	.810	-1.76	8.60	.459	.750	
1.90	-.488	.804	-1.83	8.80	.466	.750	
2.00	-.426	.799	-1.92	9.00	.472	.751	
2.10	-.370	.794	-2.01	9.20	.478	.751	
2.20	-.319	.790	-2.11	9.40	.484	.752	
2.30	-.273	.786	-2.23	9.60	.489	.752	
2.40	-.231	.782	-2.37	9.80	.495	.753	
2.50	-.193	.779	-2.52	10.00	.500	.753	
2.60	-.157	.775	-2.71	10.20	.505	.754	
2.70	-.124	.773	-2.94	10.40	.509	.755	
2.80	-.094	.770	-3.23	10.60	.514	.755	
2.90	-.066	.767	-3.62	10.80	.519	.756	
3.00	-.039	.765	-4.21	11.00	.523	.756	
3.10	-.015	.763	-5.42	11.20	.527	.757	
3.20	.008	.761		11.40	.531	.758	
3.30	.030	.760		11.60	.535	.758	
3.40	.050	.758		11.80	.539	.759	
3.50	.069	.757		12.00	.543	.759	
3.60	.087	.755		12.20	.546	.760	
3.70	.104	.754		12.40	.550	.761	
3.80	.120	.753		12.60	.553	.761	
3.90	.135	.752		12.80	.557	.762	
4.00	.150	.751		13.00	.560	.762	
4.10	.164	.750		13.20	.563	.763	
4.20	.177	.749		13.40	.566	.763	
4.30	.190	.749		13.60	.569	.764	
4.40	.202	.748		13.80	.572	.765	
4.50	.213	.748		14.00	.575	.765	
4.60	.224	.747		14.20	.578	.766	
4.70	.234	.747		14.40	.581	.766	
4.80	.245	.746		14.60	.583	.767	
4.90	.254	.746		14.80	.586	.767	
5.00	.264	.746		15.00	.588	.768	

TABLE 3.2(CONTINUED)

GAMMA = .90

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-26.010	.985	-1.12	5.20	.239	.730	
.20	-12.520	.970	-1.12	5.40	.256	.730	
.30	-8.030	.955	-1.13	5.60	.272	.730	
.40	-5.790	.941	-1.14	5.80	.287	.730	
.50	-4.449	.927	-1.15	6.00	.301	.730	
.60	-3.558	.914	-1.17	6.20	.314	.730	
.70	-2.925	.901	-1.19	6.40	.327	.730	
.80	-2.451	.888	-1.21	6.60	.338	.730	
.90	-2.085	.877	-1.23	6.80	.350	.731	
1.00	-1.793	.865	-1.25	7.00	.360	.731	
1.10	-1.556	.855	-1.28	7.20	.370	.731	
1.20	-1.359	.845	-1.31	7.40	.379	.732	
1.30	-1.193	.836	-1.35	7.60	.388	.732	
1.40	-1.052	.827	-1.38	7.80	.397	.733	
1.50	-.930	.819	-1.42	8.00	.405	.733	
1.60	-.824	.812	-1.47	8.20	.413	.734	
1.70	-.731	.805	-1.52	8.40	.420	.734	
1.80	-.649	.798	-1.57	8.60	.427	.735	
1.90	-.576	.793	-1.63	8.80	.434	.735	
2.00	-.510	.787	-1.69	9.00	.441	.736	
2.10	-.451	.782	-1.76	9.20	.447	.737	
2.20	-.397	.777	-1.84	9.40	.453	.737	
2.30	-.348	.773	-1.93	9.60	.459	.738	
2.40	-.304	.769	-2.02	9.80	.465	.738	
2.50	-.263	.766	-2.13	10.00	.470	.739	
2.60	-.225	.762	-2.25	10.20	.475	.740	
2.70	-.191	.759	-2.39	10.40	.481	.740	
2.80	-.158	.756	-2.55	10.60	.485	.741	
2.90	-.128	.754	-2.75	10.80	.490	.741	
3.00	-.101	.751	-2.99	11.00	.495	.742	
3.10	-.075	.749	-3.29	11.20	.499	.743	
3.20	-.050	.747	-3.72	11.40	.504	.743	
3.30	-.027	.745	-4.42	11.60	.508	.744	
3.40	-.006	.744	-6.30	11.80	.512	.745	
3.50	.014	.742		12.00	.516	.745	
3.60	.033	.741		12.20	.520	.746	
3.70	.051	.740		12.40	.523	.746	
3.80	.068	.738		12.60	.527	.747	
3.90	.085	.737		12.80	.531	.748	
4.00	.100	.736		13.00	.534	.748	
4.10	.115	.736		13.20	.537	.749	
4.20	.129	.735		13.40	.541	.749	
4.30	.142	.734		13.60	.544	.750	
4.40	.155	.733		13.80	.547	.751	
4.50	.167	.733		14.00	.550	.751	
4.60	.178	.732		14.20	.553	.752	
4.70	.189	.732		14.40	.556	.752	
4.80	.200	.731		14.60	.559	.753	
4.90	.210	.731		14.80	.561	.754	
5.00	.220	.731		15.00	.564	.754	

TABLE 3.2(CONTINUED)

GAMMA = .95

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-27.511	.984	-1.06	5.20	.197	.715	
.20	-13.271	.968	-1.06	5.40	.215	.715	
.30	-8.531	.953	-1.07	5.60	.232	.715	
.40	-6.167	.938	-1.07	5.80	.248	.715	
.50	-4.752	.923	-1.08	6.00	.262	.715	
.60	-3.812	.909	-1.09	6.20	.276	.715	
.70	-3.143	.895	-1.11	6.40	.289	.715	
.80	-2.643	.882	-1.12	6.60	.302	.715	
.90	-2.256	.870	-1.14	6.80	.313	.716	
1.00	-1.949	.858	-1.16	7.00	.324	.716	
1.10	-1.698	.847	-1.18	7.20	.335	.716	
1.20	-1.490	.836	-1.21	7.40	.345	.717	
1.30	-1.315	.827	-1.24	7.60	.354	.717	
1.40	-1.166	.818	-1.27	7.80	.363	.718	
1.50	-1.038	.809	-1.30	8.00	.372	.718	
1.60	-.926	.801	-1.34	8.20	.380	.719	
1.70	-.827	.794	-1.38	8.40	.388	.719	
1.80	-.741	.787	-1.42	8.60	.396	.720	
1.90	-.663	.781	-1.46	8.80	.403	.721	
2.00	-.594	.775	-1.52	9.00	.410	.721	
2.10	-.531	.770	-1.57	9.20	.417	.722	
2.20	-.475	.765	-1.63	9.40	.423	.723	
2.30	-.423	.761	-1.69	9.60	.429	.723	
2.40	-.376	.756	-1.77	9.80	.435	.724	
2.50	-.333	.753	-1.84	10.00	.441	.724	
2.60	-.293	.749	-1.93	10.20	.446	.725	
2.70	-.257	.746	-2.03	10.40	.452	.726	
2.80	-.223	.743	-2.13	10.60	.457	.726	
2.90	-.191	.740	-2.26	10.80	.462	.727	
3.00	-.162	.738	-2.40	11.00	.467	.728	
3.10	-.134	.735	-2.56	11.20	.471	.728	
3.20	-.109	.733	-2.76	11.40	.476	.729	
3.30	-.085	.731	-3.00	11.60	.480	.730	
3.40	-.062	.730	-3.32	11.80	.485	.730	
3.50	-.041	.728	-3.78	12.00	.489	.731	
3.60	-.020	.726	-4.56	12.20	.493	.732	
3.70	-.001	.725	-7.84	12.40	.497	.732	
3.80	.017	.724		12.60	.501	.733	
3.90	.034	.723		12.80	.505	.734	
4.00	.050	.722		13.00	.508	.734	
4.10	.065	.721		13.20	.512	.735	
4.20	.080	.720		13.40	.515	.736	
4.30	.094	.719		13.60	.519	.736	
4.40	.108	.719		13.80	.522	.737	
4.50	.120	.718		14.00	.525	.737	
4.60	.133	.717		14.20	.528	.738	
4.70	.144	.717		14.40	.531	.739	
4.80	.156	.717		14.60	.534	.739	
4.90	.167	.716		14.80	.537	.740	
5.00	.177	.716		15.00	.540	.740	

TABLE 3.2(CONTINUED)

GAMMA = 1.00

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-29.011	.983	-1.00	5.20	.154	.700	
.20	-14.022	.967	-1.00	5.40	.173	.700	
.30	-9.033	.951	-1.01	5.60	.191	.700	
.40	-6.544	.935	-1.01	5.80	.208	.700	
.50	-5.055	.919	-1.02	6.00	.224	.700	
.60	-4.065	.904	-1.03	6.20	.238	.700	
.70	-3.361	.890	-1.04	6.40	.252	.700	
.80	-2.835	.876	-1.05	6.60	.265	.700	
.90	-2.428	.863	-1.06	6.80	.277	.701	
1.00	-2.104	.850	-1.08	7.00	.289	.701	
1.10	-1.840	.839	-1.10	7.20	.300	.701	
1.20	-1.621	.828	-1.12	7.40	.310	.702	
1.30	-1.437	.818	-1.14	7.60	.320	.702	
1.40	-1.280	.808	-1.17	7.80	.330	.703	
1.50	-1.145	.799	-1.19	8.00	.339	.703	
1.60	-1.027	.791	-1.22	8.20	.348	.704	
1.70	-.924	.783	-1.26	8.40	.356	.705	
1.80	-.832	.776	-1.29	8.60	.364	.705	
1.90	-.751	.769	-1.33	8.80	.371	.706	
2.00	-.678	.763	-1.37	9.00	.379	.707	
2.10	-.612	.758	-1.41	9.20	.386	.707	
2.20	-.552	.753	-1.46	9.40	.393	.708	
2.30	-.498	.748	-1.51	9.60	.399	.709	
2.40	-.449	.744	-1.57	9.80	.405	.709	
2.50	-.403	.740	-1.63	10.00	.411	.710	
2.60	-.361	.736	-1.69	10.20	.417	.711	
2.70	-.323	.732	-1.76	10.40	.423	.711	
2.80	-.287	.729	-1.84	10.60	.428	.712	
2.90	-.254	.726	-1.93	10.80	.434	.713	
3.00	-.223	.724	-2.02	11.00	.439	.713	
3.10	-.194	.721	-2.13	11.20	.444	.714	
3.20	-.167	.719	-2.25	11.40	.448	.715	
3.30	-.142	.717	-2.39	11.60	.453	.716	
3.40	-.118	.715	-2.55	11.80	.458	.716	
3.50	-.095	.714	-2.75	12.00	.462	.717	
3.60	-.074	.712	-2.99	12.20	.466	.718	
3.70	-.054	.711	-3.31	12.40	.470	.718	
3.80	-.035	.709	-3.76	12.60	.475	.719	
3.90	-.017	.708	-4.56	12.80	.478	.720	
4.00	.000	.707		13.00	.482	.720	
4.10	.016	.706		13.20	.486	.721	
4.20	.032	.705		13.40	.490	.722	
4.30	.047	.704		13.60	.493	.722	
4.40	.061	.704		13.80	.497	.723	
4.50	.074	.703		14.00	.500	.724	
4.60	.087	.703		14.20	.503	.724	
4.70	.099	.702		14.40	.507	.725	
4.80	.111	.702		14.60	.510	.726	
4.90	.123	.701		14.80	.513	.726	
5.00	.134	.701		15.00	.516	.727	

TABLE 3.2(CONTINUED)

GAMMA = 1.05

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-30.512	.983	-.95	5.20	.112	.685	
.20	-14.773	.965	-.95	5.40	.132	.685	
.30	-9.535	.948	-.95	5.60	.151	.685	
.40	-6.921	.931	-.96	5.80	.168	.685	
.50	-5.357	.915	-.96	6.00	.185	.685	
.60	-4.318	.899	-.97	6.20	.200	.685	
.70	-3.579	.884	-.98	6.40	.215	.685	
.80	-3.027	.870	-.98	6.60	.228	.685	
.90	-2.599	.856	-1.00	6.80	.241	.686	
1.00	-2.259	.843	-1.01	7.00	.253	.686	
1.10	-1.982	.831	-1.02	7.20	.265	.686	
1.20	-1.752	.819	-1.04	7.40	.276	.687	
1.30	-1.559	.808	-1.06	7.60	.286	.688	
1.40	-1.394	.798	-1.08	7.80	.296	.688	
1.50	-1.252	.789	-1.10	8.00	.306	.689	
1.60	-1.128	.780	-1.13	8.20	.315	.689	
1.70	-1.020	.772	-1.15	8.40	.324	.690	
1.80	-.924	.765	-1.18	8.60	.332	.691	
1.90	-.838	.758	-1.21	8.80	.340	.691	
2.00	-.762	.752	-1.25	9.00	.348	.692	
2.10	-.692	.746	-1.28	9.20	.355	.693	
2.20	-.630	.740	-1.32	9.40	.362	.693	
2.30	-.573	.735	-1.36	9.60	.369	.694	
2.40	-.521	.731	-1.40	9.80	.376	.695	
2.50	-.473	.726	-1.45	10.00	.382	.695	
2.60	-.429	.723	-1.50	10.20	.388	.696	
2.70	-.389	.719	-1.56	10.40	.394	.697	
2.80	-.351	.716	-1.62	10.60	.400	.698	
2.90	-.317	.713	-1.68	10.80	.405	.698	
3.00	-.284	.710	-1.75	11.00	.411	.699	
3.10	-.254	.707	-1.83	11.20	.416	.700	
3.20	-.225	.705	-1.91	11.40	.421	.701	
3.30	-.199	.703	-2.00	11.60	.426	.701	
3.40	-.174	.701	-2.11	11.80	.431	.702	
3.50	-.150	.699	-2.23	12.00	.435	.703	
3.60	-.128	.698	-2.36	12.20	.440	.703	
3.70	-.107	.696	-2.52	12.40	.444	.704	
3.80	-.087	.695	-2.71	12.60	.448	.705	
3.90	-.068	.694	-2.94	12.80	.452	.706	
4.00	-.050	.692	-3.24	13.00	.456	.706	
4.10	-.033	.691	-3.67	13.20	.460	.707	
4.20	-.017	.691	-4.40	13.40	.464	.708	
4.30	-.001	.690	-7.42	13.60	.468	.708	
4.40	.014	.689		13.80	.471	.709	
4.50	.028	.688		14.00	.475	.710	
4.60	.041	.688		14.20	.478	.710	
4.70	.054	.687		14.40	.482	.711	
4.80	.067	.687		14.60	.485	.712	
4.90	.079	.686		14.80	.488	.712	
5.00	.090	.686		15.00	.492	.713	

TABLE 3.2(CONTINUED)

GAMMA = 1.10

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-32.012	.982	-.91	5.20	.070	.670	
.20	-15.524	.964	-.91	5.40	.091	.670	
.30	-10.036	.946	-.91	5.60	.110	.670	
.40	-7.298	.928	-.91	5.80	.129	.670	
.50	-5.660	.911	-.91	6.00	.146	.670	
.60	-4.571	.894	-.91	6.20	.162	.670	
.70	-3.797	.879	-.92	6.40	.177	.670	
.80	-3.218	.864	-.93	6.60	.191	.670	
.90	-2.771	.849	-.94	6.80	.205	.671	
1.00	-2.414	.835	-.95	7.00	.218	.671	
1.10	-2.124	.823	-.96	7.20	.230	.672	
1.20	-1.883	.811	-.97	7.40	.241	.672	
1.30	-1.681	.799	-.99	7.60	.252	.673	
1.40	-1.508	.789	-1.00	7.80	.263	.673	
1.50	-1.359	.779	-1.02	8.00	.273	.674	
1.60	-1.230	.770	-1.04	8.20	.282	.674	
1.70	-1.116	.761	-1.06	8.40	.291	.675	
1.80	-1.015	.754	-1.09	8.60	.300	.676	
1.90	-.926	.746	-1.11	8.80	.309	.677	
2.00	-.845	.740	-1.14	9.00	.317	.677	
2.10	-.773	.734	-1.17	9.20	.324	.678	
2.20	-.708	.728	-1.20	9.40	.332	.679	
2.30	-.648	.723	-1.23	9.60	.339	.679	
2.40	-.593	.718	-1.27	9.80	.346	.680	
2.50	-.543	.713	-1.31	10.00	.353	.681	
2.60	-.498	.709	-1.35	10.20	.359	.682	
2.70	-.455	.706	-1.39	10.40	.365	.682	
2.80	-.416	.702	-1.44	10.60	.371	.683	
2.90	-.379	.699	-1.49	10.80	.377	.684	
3.00	-.345	.696	-1.54	11.00	.383	.685	
3.10	-.313	.694	-1.60	11.20	.388	.686	
3.20	-.284	.691	-1.66	11.40	.393	.686	
3.30	-.256	.689	-1.73	11.60	.398	.687	
3.40	-.230	.687	-1.81	11.80	.403	.688	
3.50	-.205	.685	-1.89	12.00	.408	.689	
3.60	-.182	.683	-1.98	12.20	.413	.689	
3.70	-.159	.682	-2.08	12.40	.418	.690	
3.80	-.139	.680	-2.19	12.60	.422	.691	
3.90	-.119	.679	-2.32	12.80	.426	.692	
4.00	-.100	.678	-2.46	13.00	.430	.692	
4.10	-.082	.677	-2.64	13.20	.435	.693	
4.20	-.065	.676	-2.85	13.40	.439	.694	
4.30	-.049	.675	-3.13	13.60	.442	.695	
4.40	-.033	.674	-3.51	13.80	.446	.695	
4.50	-.018	.673	-4.12	14.00	.450	.696	
4.60	-.004	.673	-5.70	14.20	.454	.697	
4.70	.009	.672		14.40	.457	.697	
4.80	.022	.672		14.60	.461	.698	
4.90	.035	.671		14.80	.464	.699	
5.00	.047	.671		15.00	.467	.699	

TABLE 3.2(CONTINUED)

GAMMA = 1.15

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-33.513	.981	-.87	5.20	.027	.655	
.20	-16.275	.962	-.86	5.40	.049	.655	
.30	-10.538	.943	-.86	5.60	.070	.655	
.40	-7.676	.925	-.86	5.80	.089	.655	
.50	-5.963	.907	-.86	6.00	.107	.655	
.60	-4.825	.890	-.87	6.20	.124	.655	
.70	-4.015	.873	-.87	6.40	.140	.655	
.80	-3.410	.857	-.87	6.60	.155	.655	
.90	-2.942	.842	-.88	6.80	.169	.656	
1.00	-2.569	.828	-.89	7.00	.182	.656	
1.10	-2.266	.815	-.90	7.20	.195	.657	
1.20	-2.014	.802	-.91	7.40	.207	.657	
1.30	-1.803	.790	-.92	7.60	.218	.658	
1.40	-1.622	.779	-.94	7.80	.229	.658	
1.50	-1.467	.769	-.95	8.00	.240	.659	
1.60	-1.331	.759	-.97	8.20	.250	.660	
1.70	-1.212	.751	-.99	8.40	.259	.660	
1.80	-1.107	.742	-1.01	8.60	.268	.661	
1.90	-1.013	.735	-1.03	8.80	.277	.662	
2.00	-.929	.728	-1.05	9.00	.286	.663	
2.10	-.854	.721	-1.07	9.20	.294	.663	
2.20	-.785	.716	-1.10	9.40	.301	.664	
2.30	-.723	.710	-1.13	9.60	.309	.665	
2.40	-.666	.705	-1.16	9.80	.316	.666	
2.50	-.614	.700	-1.19	10.00	.323	.666	
2.60	-.566	.696	-1.22	10.20	.330	.667	
2.70	-.521	.692	-1.26	10.40	.336	.668	
2.80	-.480	.689	-1.29	10.60	.343	.669	
2.90	-.442	.685	-1.33	10.80	.349	.670	
3.00	-.406	.682	-1.38	11.00	.355	.670	
3.10	-.373	.680	-1.42	11.20	.360	.671	
3.20	-.342	.677	-1.47	11.40	.366	.672	
3.30	-.313	.675	-1.52	11.60	.371	.673	
3.40	-.285	.673	-1.58	11.80	.376	.674	
3.50	-.260	.671	-1.64	12.00	.381	.674	
3.60	-.235	.669	-1.70	12.20	.386	.675	
3.70	-.212	.667	-1.77	12.40	.391	.676	
3.80	-.190	.666	-1.85	12.60	.396	.677	
3.90	-.170	.664	-1.94	12.80	.400	.678	
4.00	-.150	.663	-2.03	13.00	.405	.678	
4.10	-.131	.662	-2.14	13.20	.409	.679	
4.20	-.113	.661	-2.25	13.40	.413	.680	
4.30	-.097	.660	-2.39	13.60	.417	.681	
4.40	-.080	.659	-2.55	13.80	.421	.681	
4.50	-.065	.659	-2.74	14.00	.425	.682	
4.60	-.050	.658	-2.99	14.20	.429	.683	
4.70	-.036	.657	-3.31	14.40	.432	.684	
4.80	-.022	.657	-3.79	14.60	.436	.684	
4.90	-.009	.656	-4.72	14.80	.440	.685	
5.00	.004	.656		15.00	.443	.686	

TABLE 3.2(CONTINUED)

GAMMA = 1.20

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-35.013	.980	-.83	5.20	-.015	.640	-4.04
.20	-17.027	.960	-.83	5.40	.008	.640	
.30	-11.040	.941	-.82	5.60	.030	.640	
.40	-8.053	.921	-.82	5.80	.050	.640	
.50	-6.265	.903	-.82	6.00	.068	.640	
.60	-5.078	.885	-.82	6.20	.086	.640	
.70	-4.233	.868	-.82	6.40	.102	.640	
.80	-3.602	.851	-.83	6.60	.118	.640	
.90	-3.113	.835	-.83	6.80	.133	.641	
1.00	-2.725	.821	-.84	7.00	.147	.641	
1.10	-2.408	.807	-.85	7.20	.160	.642	
1.20	-2.146	.793	-.85	7.40	.172	.642	
1.30	-1.925	.781	-.86	7.60	.184	.643	
1.40	-1.736	.770	-.87	7.80	.196	.644	
1.50	-1.574	.759	-.89	8.00	.207	.644	
1.60	-1.433	.749	-.90	8.20	.217	.645	
1.70	-1.308	.740	-.92	8.40	.227	.646	
1.80	-1.199	.731	-.93	8.60	.237	.646	
1.90	-1.101	.723	-.95	8.80	.246	.647	
2.00	-1.013	.716	-.97	9.00	.255	.648	
2.10	-.934	.709	-.99	9.20	.263	.649	
2.20	-.863	.703	-1.01	9.40	.271	.650	
2.30	-.798	.697	-1.03	9.60	.279	.650	
2.40	-.738	.692	-1.06	9.80	.286	.651	
2.50	-.684	.687	-1.09	10.00	.294	.652	
2.60	-.634	.683	-1.11	10.20	.301	.653	
2.70	-.587	.679	-1.14	10.40	.307	.654	
2.80	-.544	.675	-1.17	10.60	.314	.654	
2.90	-.505	.672	-1.21	10.80	.320	.655	
3.00	-.467	.669	-1.24	11.00	.326	.656	
3.10	-.433	.666	-1.28	11.20	.332	.657	
3.20	-.400	.663	-1.32	11.40	.338	.658	
3.30	-.370	.661	-1.36	11.60	.344	.659	
3.40	-.341	.658	-1.40	11.80	.349	.659	
3.50	-.314	.656	-1.45	12.00	.354	.660	
3.60	-.289	.654	-1.50	12.20	.360	.661	
3.70	-.265	.653	-1.55	12.40	.365	.662	
3.80	-.242	.651	-1.61	12.60	.369	.663	
3.90	-.221	.650	-1.67	12.80	.374	.664	
4.00	-.200	.649	-1.74	13.00	.379	.664	
4.10	-.180	.647	-1.81	13.20	.383	.665	
4.20	-.162	.646	-1.89	13.40	.388	.666	
4.30	-.144	.645	-1.97	13.60	.392	.667	
4.40	-.127	.645	-2.07	13.80	.396	.668	
4.50	-.111	.644	-2.18	14.00	.400	.668	
4.60	-.096	.643	-2.30	14.20	.404	.669	
4.70	-.081	.643	-2.45	14.40	.408	.670	
4.80	-.067	.642	-2.62	14.60	.412	.671	
4.90	-.053	.642	-2.82	14.80	.415	.671	
5.00	-.040	.641	-3.09	15.00	.419	.672	

TABLE 3.2(CONTINUED)

GAMMA = 1.25

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-36.514	.979	-.79	5.20	-.057	.626	-2.65
.20	-17.778	.959	-.79	5.40	-.033	.625	-3.14
.30	-11.541	.938	-.79	5.60	-.011	.625	-4.22
.40	-8.430	.918	-.78	5.80	.010	.625	
.50	-6.568	.899	-.78	6.00	.029	.625	
.60	-5.331	.880	-.78	6.20	.048	.625	
.70	-4.451	.862	-.78	6.40	.065	.625	
.80	-3.794	.845	-.78	6.60	.081	.625	
.90	-3.285	.829	-.79	6.80	.097	.626	
1.00	-2.880	.813	-.79	7.00	.111	.626	
1.10	-2.550	.798	-.80	7.20	.125	.627	
1.20	-2.277	.785	-.80	7.40	.138	.627	
1.30	-2.046	.772	-.81	7.60	.150	.628	
1.40	-1.850	.760	-.82	7.80	.162	.629	
1.50	-1.681	.749	-.83	8.00	.174	.629	
1.60	-1.534	.739	-.84	8.20	.185	.630	
1.70	-1.405	.729	-.85	8.40	.195	.631	
1.80	-1.290	.720	-.87	8.60	.205	.632	
1.90	-1.188	.712	-.88	8.80	.214	.632	
2.00	-1.097	.704	-.90	9.00	.223	.633	
2.10	-1.015	.697	-.92	9.20	.232	.634	
2.20	-.940	.691	-.93	9.40	.241	.635	
2.30	-.873	.685	-.95	9.60	.249	.636	
2.40	-.811	.679	-.98	9.80	.257	.637	
2.50	-.754	.674	-1.00	10.00	.264	.637	
2.60	-.702	.670	-1.02	10.20	.272	.638	
2.70	-.653	.666	-1.04	10.40	.279	.639	
2.80	-.609	.662	-1.07	10.60	.285	.640	
2.90	-.567	.658	-1.10	10.80	.292	.641	
3.00	-.529	.655	-1.13	11.00	.298	.642	
3.10	-.493	.652	-1.16	11.20	.305	.643	
3.20	-.459	.649	-1.19	11.40	.311	.644	
3.30	-.427	.646	-1.22	11.60	.316	.644	
3.40	-.397	.644	-1.26	11.80	.322	.645	
3.50	-.369	.642	-1.29	12.00	.328	.646	
3.60	-.343	.640	-1.33	12.20	.333	.647	
3.70	-.318	.638	-1.38	12.40	.338	.648	
3.80	-.294	.637	-1.42	12.60	.343	.649	
3.90	-.271	.635	-1.47	12.80	.348	.650	
4.00	-.250	.634	-1.52	13.00	.353	.650	
4.10	-.230	.633	-1.57	13.20	.357	.651	
4.20	-.210	.632	-1.63	13.40	.362	.652	
4.30	-.192	.631	-1.69	13.60	.366	.653	
4.40	-.174	.630	-1.76	13.80	.371	.654	
4.50	-.157	.629	-1.83	14.00	.375	.655	
4.60	-.141	.628	-1.91	14.20	.379	.655	
4.70	-.126	.628	-2.00	14.40	.383	.656	
4.80	-.111	.627	-2.10	14.60	.387	.657	
4.90	-.097	.627	-2.21	14.80	.391	.658	
5.00	-.083	.626	-2.33	15.00	.395	.658	

TABLE 3.2(CONTINUED)

GAMMA = 1.30

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-38.014	.978	-.76	5.20	-.099	.611	-2.10
.20	-18.529	.957	-.76	5.40	-.075	.610	-2.33
.30	-12.043	.936	-.75	5.60	-.051	.610	-2.65
.40	-8.807	.915	-.75	5.80	-.030	.610	-3.14
.50	-6.871	.895	-.75	6.00	-.009	.610	-4.24
.60	-5.584	.875	-.74	6.20	.010	.610	
.70	-4.669	.857	-.74	6.40	.028	.610	
.80	-3.985	.839	-.74	6.60	.044	.610	
.90	-3.456	.822	-.75	6.80	.060	.611	
1.00	-3.035	.806	-.75	7.00	.076	.611	
1.10	-2.692	.790	-.75	7.20	.090	.612	
1.20	-2.408	.776	-.76	7.40	.104	.612	
1.30	-2.168	.763	-.76	7.60	.116	.613	
1.40	-1.964	.750	-.77	7.80	.129	.614	
1.50	-1.788	.739	-.78	8.00	.141	.615	
1.60	-1.635	.728	-.79	8.20	.152	.615	
1.70	-1.501	.718	-.80	8.40	.163	.616	
1.80	-1.382	.709	-.81	8.60	.173	.617	
1.90	-1.276	.700	-.82	8.80	.183	.618	
2.00	-1.181	.692	-.84	9.00	.192	.619	
2.10	-1.095	.685	-.85	9.20	.202	.619	
2.20	-1.018	.678	-.87	9.40	.210	.620	
2.30	-.948	.672	-.88	9.60	.219	.621	
2.40	-.883	.667	-.90	9.80	.227	.622	
2.50	-.824	.661	-.92	10.00	.235	.623	
2.60	-.770	.657	-.94	10.20	.242	.624	
2.70	-.720	.652	-.96	10.40	.250	.625	
2.80	-.673	.648	-.98	10.60	.257	.626	
2.90	-.630	.644	-1.00	10.80	.264	.627	
3.00	-.590	.641	-1.03	11.00	.270	.627	
3.10	-.552	.638	-1.05	11.20	.277	.628	
3.20	-.517	.635	-1.08	11.40	.283	.629	
3.30	-.484	.632	-1.11	11.60	.289	.630	
3.40	-.453	.630	-1.14	11.80	.295	.631	
3.50	-.424	.628	-1.17	12.00	.301	.632	
3.60	-.396	.626	-1.20	12.20	.306	.633	
3.70	-.370	.624	-1.23	12.40	.312	.634	
3.80	-.346	.622	-1.27	12.60	.317	.635	
3.90	-.322	.621	-1.31	12.80	.322	.636	
4.00	-.300	.619	-1.34	13.00	.327	.636	
4.10	-.279	.618	-1.39	13.20	.332	.637	
4.20	-.259	.617	-1.43	13.40	.337	.638	
4.30	-.240	.616	-1.48	13.60	.341	.639	
4.40	-.221	.615	-1.53	13.80	.346	.640	
4.50	-.204	.614	-1.58	14.00	.350	.641	
4.60	-.187	.613	-1.64	14.20	.354	.642	
4.70	-.171	.613	-1.70	14.40	.358	.642	
4.80	-.155	.612	-1.77	14.60	.363	.643	
4.90	-.141	.612	-1.84	14.80	.367	.644	
5.00	-.126	.611	-1.92	15.00	.370	.645	

TABLE 3.2(CONTINUED)

GAMMA = 1.35

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-39.515	.978	-.73	5.20	-.142	.596	-1.76
.20	-19.280	.955	-.73	5.40	-.116	.595	-1.91
.30	-12.545	.933	-.72	5.60	-.092	.595	-2.09
.40	-9.184	.912	-.72	5.80	-.069	.595	-2.31
.50	-7.174	.891	-.71	6.00	-.048	.595	-2.62
.60	-5.838	.871	-.71	6.20	-.028	.595	-3.08
.70	-4.887	.851	-.71	6.40	-.010	.595	-4.07
.80	-4.177	.832	-.71	6.60	.008	.595	
.90	-3.628	.815	-.71	6.80	.024	.596	
1.00	-3.190	.798	-.71	7.00	.040	.596	
1.10	-2.834	.782	-.71	7.20	.055	.597	
1.20	-2.539	.768	-.72	7.40	.069	.598	
1.30	-2.290	.754	-.72	7.60	.083	.598	
1.40	-2.078	.741	-.73	7.80	.095	.599	
1.50	-1.896	.729	-.73	8.00	.108	.600	
1.60	-1.737	.718	-.74	8.20	.119	.600	
1.70	-1.597	.707	-.75	8.40	.130	.601	
1.80	-1.473	.698	-.76	8.60	.141	.602	
1.90	-1.363	.689	-.77	8.80	.151	.603	
2.00	-1.265	.681	-.78	9.00	.161	.604	
2.10	-1.176	.673	-.79	9.20	.171	.605	
2.20	-1.096	.666	-.81	9.40	.180	.606	
2.30	-1.022	.660	-.82	9.60	.189	.607	
2.40	-.956	.654	-.84	9.80	.197	.608	
2.50	-.894	.648	-.85	10.00	.205	.608	
2.60	-.838	.643	-.87	10.20	.213	.609	
2.70	-.786	.639	-.88	10.40	.221	.610	
2.80	-.737	.635	-.90	10.60	.228	.611	
2.90	-.693	.631	-.92	10.80	.235	.612	
3.00	-.651	.627	-.94	11.00	.242	.613	
3.10	-.612	.624	-.96	11.20	.249	.614	
3.20	-.575	.621	-.99	11.40	.255	.615	
3.30	-.541	.618	-1.01	11.60	.262	.616	
3.40	-.509	.616	-1.03	11.80	.268	.617	
3.50	-.479	.613	-1.06	12.00	.274	.618	
3.60	-.450	.611	-1.09	12.20	.280	.619	
3.70	-.423	.609	-1.11	12.40	.285	.620	
3.80	-.397	.608	-1.14	12.60	.291	.621	
3.90	-.373	.606	-1.17	12.80	.296	.622	
4.00	-.350	.605	-1.21	13.00	.301	.622	
4.10	-.328	.603	-1.24	13.20	.306	.623	
4.20	-.307	.602	-1.27	13.40	.311	.624	
4.30	-.287	.601	-1.31	13.60	.316	.625	
4.40	-.268	.600	-1.35	13.80	.320	.626	
4.50	-.250	.599	-1.39	14.00	.325	.627	
4.60	-.233	.598	-1.43	14.20	.329	.628	
4.70	-.216	.598	-1.48	14.40	.334	.629	
4.80	-.200	.597	-1.53	14.60	.338	.629	
4.90	-.184	.597	-1.58	14.80	.342	.630	
5.00	-.170	.596	-1.64	15.00	.346	.631	

TABLE 3.2(CONTINUED)

GAMMA = 1.40

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-41.016	.977	-.71	5.20	-.184	.581	-1.52
.20	-20.031	.954	-.70	5.40	-.157	.580	-1.63
.30	-13.046	.931	-.69	5.60	-.132	.580	-1.75
.40	-9.561	.908	-.69	5.80	-.109	.580	-1.89
.50	-7.476	.887	-.68	6.00	-.087	.580	-2.06
.60	-6.091	.866	-.68	6.20	-.067	.580	-2.27
.70	-5.105	.846	-.68	6.40	-.047	.580	-2.55
.80	-4.369	.826	-.68	6.60	-.029	.580	-2.97
.90	-3.799	.808	-.67	6.80	-.012	.581	-3.79
1.00	-3.345	.791	-.68	7.00	.004	.581	
1.10	-2.976	.774	-.68	7.20	.020	.582	
1.20	-2.670	.759	-.68	7.40	.035	.583	
1.30	-2.412	.745	-.68	7.60	.049	.583	
1.40	-2.192	.731	-.69	7.80	.062	.584	
1.50	-2.003	.719	-.69	8.00	.075	.585	
1.60	-1.838	.707	-.70	8.20	.087	.586	
1.70	-1.693	.696	-.70	8.40	.098	.587	
1.80	-1.565	.686	-.71	8.60	.109	.587	
1.90	-1.451	.677	-.72	8.80	.120	.588	
2.00	-1.349	.669	-.73	9.00	.130	.589	
2.10	-1.257	.661	-.74	9.20	.140	.590	
2.20	-1.173	.654	-.75	9.40	.150	.591	
2.30	-1.097	.647	-.76	9.60	.159	.592	
2.40	-1.028	.641	-.78	9.80	.167	.593	
2.50	-.964	.635	-.79	10.00	.176	.594	
2.60	-.906	.630	-.80	10.20	.184	.595	
2.70	-.852	.625	-.82	10.40	.192	.596	
2.80	-.802	.621	-.83	10.60	.200	.597	
2.90	-.755	.617	-.85	10.80	.207	.598	
3.00	-.712	.613	-.87	11.00	.214	.599	
3.10	-.672	.610	-.89	11.20	.221	.600	
3.20	-.634	.607	-.91	11.40	.228	.601	
3.30	-.598	.604	-.92	11.60	.234	.602	
3.40	-.565	.601	-.95	11.80	.241	.603	
3.50	-.533	.599	-.97	12.00	.247	.604	
3.60	-.504	.597	-.99	12.20	.253	.605	
3.70	-.476	.595	-1.01	12.40	.259	.606	
3.80	-.449	.593	-1.04	12.60	.264	.607	
3.90	-.424	.591	-1.06	12.80	.270	.607	
4.00	-.400	.590	-1.09	13.00	.275	.608	
4.10	-.377	.589	-1.12	13.20	.280	.609	
4.20	-.356	.587	-1.14	13.40	.285	.610	
4.30	-.335	.586	-1.17	13.60	.290	.611	
4.40	-.315	.585	-1.21	13.80	.295	.612	
4.50	-.296	.584	-1.24	14.00	.300	.613	
4.60	-.278	.584	-1.27	14.20	.305	.614	
4.70	-.261	.583	-1.31	14.40	.309	.615	
4.80	-.244	.582	-1.35	14.60	.314	.616	
4.90	-.228	.582	-1.39	14.80	.318	.617	
5.00	-.213	.581	-1.43	15.00	.322	.618	

TABLE 3.2(CONTINUED)

GAMMA = 1.45

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-42.516	.976	-.68	5.20	-.226	.566	-1.34
.20	-20.782	.952	-.67	5.40	-.199	.565	-1.42
.30	-13.548	.928	-.67	5.60	-.173	.565	-1.51
.40	-9.939	.905	-.66	5.80	-.148	.565	-1.61
.50	-7.779	.883	-.66	6.00	-.126	.565	-1.72
.60	-6.344	.861	-.65	6.20	-.105	.565	-1.85
.70	-5.323	.840	-.65	6.40	-.085	.565	-2.01
.80	-4.561	.820	-.64	6.60	-.066	.565	-2.21
.90	-3.970	.801	-.64	6.80	-.048	.566	-2.47
1.00	-3.501	.783	-.64	7.00	-.031	.566	-2.83
1.10	-3.118	.766	-.64	7.20	-.015	.567	-3.46
1.20	-2.801	.750	-.64	7.40	.000	.568	
1.30	-2.534	.735	-.65	7.60	.015	.568	
1.40	-2.306	.722	-.65	7.80	.028	.569	
1.50	-2.110	.709	-.65	8.00	.041	.570	
1.60	-1.939	.697	-.66	8.20	.054	.571	
1.70	-1.789	.686	-.66	8.40	.066	.572	
1.80	-1.657	.675	-.67	8.60	.078	.573	
1.90	-1.538	.666	-.68	8.80	.089	.574	
2.00	-1.433	.657	-.68	9.00	.099	.575	
2.10	-1.337	.649	-.69	9.20	.109	.576	
2.20	-1.251	.641	-.70	9.40	.119	.576	
2.30	-1.172	.634	-.71	9.60	.129	.577	
2.40	-1.100	.628	-.72	9.80	.138	.578	
2.50	-1.035	.622	-.73	10.00	.146	.579	
2.60	-.974	.617	-.75	10.20	.155	.580	
2.70	-.918	.612	-.76	10.40	.163	.581	
2.80	-.866	.607	-.77	10.60	.171	.582	
2.90	-.818	.603	-.79	10.80	.179	.583	
3.00	-.773	.599	-.80	11.00	.186	.584	
3.10	-.731	.596	-.82	11.20	.193	.585	
3.20	-.692	.593	-.83	11.40	.200	.587	
3.30	-.655	.590	-.85	11.60	.207	.588	
3.40	-.621	.587	-.87	11.80	.214	.589	
3.50	-.588	.585	-.89	12.00	.220	.590	
3.60	-.557	.582	-.91	12.20	.226	.591	
3.70	-.528	.580	-.93	12.40	.232	.591	
3.80	-.501	.579	-.95	12.60	.238	.592	
3.90	-.475	.577	-.97	12.80	.244	.593	
4.00	-.450	.575	-.99	13.00	.249	.594	
4.10	-.426	.574	-1.01	13.20	.255	.595	
4.20	-.404	.573	-1.04	13.40	.260	.596	
4.30	-.383	.572	-1.06	13.60	.265	.597	
4.40	-.362	.570	-1.09	13.80	.270	.598	
4.50	-.343	.570	-1.11	14.00	.275	.599	
4.60	-.324	.569	-1.14	14.20	.280	.600	
4.70	-.306	.568	-1.17	14.40	.284	.601	
4.80	-.289	.567	-1.20	14.60	.289	.602	
4.90	-.272	.567	-1.23	14.80	.293	.603	
5.00	-.256	.566	-1.27	15.00	.298	.604	

TABLE 3.2(CONTINUED)

GAMMA = 1.50

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-44.017	.975	-.66	5.20	-.269	.551	-1.19
.20	-21.533	.950	-.65	5.40	-.240	.550	-1.26
.30	-14.050	.926	-.64	5.60	-.213	.550	-1.32
.40	-10.316	.902	-.64	5.80	-.188	.550	-1.40
.50	-8.082	.879	-.63	6.00	-.165	.550	-1.48
.60	-6.597	.856	-.62	6.20	-.143	.550	-1.58
.70	-5.541	.835	-.62	6.40	-.122	.550	-1.69
.80	-4.752	.814	-.62	6.60	-.103	.550	-1.81
.90	-4.142	.794	-.61	6.80	-.084	.551	-1.95
1.00	-3.656	.776	-.61	7.00	-.067	.551	-2.13
1.10	-3.260	.758	-.61	7.20	-.050	.552	-2.36
1.20	-2.932	.742	-.61	7.40	-.034	.553	-2.67
1.30	-2.656	.726	-.61	7.60	-.019	.554	-3.15
1.40	-2.420	.712	-.61	7.80	-.005	.554	-4.33
1.50	-2.217	.699	-.62	8.00	.008	.555	
1.60	-2.041	.686	-.62	8.20	.021	.556	
1.70	-1.886	.675	-.63	8.40	.034	.557	
1.80	-1.748	.664	-.63	8.60	.046	.558	
1.90	-1.626	.654	-.64	8.80	.057	.559	
2.00	-1.516	.645	-.64	9.00	.068	.560	
2.10	-1.418	.637	-.65	9.20	.079	.561	
2.20	-1.328	.629	-.66	9.40	.089	.562	
2.30	-1.247	.622	-.67	9.60	.099	.563	
2.40	-1.173	.615	-.68	9.80	.108	.564	
2.50	-1.105	.609	-.69	10.00	.117	.565	
2.60	-1.042	.604	-.70	10.20	.126	.566	
2.70	-.984	.599	-.71	10.40	.134	.567	
2.80	-.931	.594	-.72	10.60	.142	.568	
2.90	-.881	.590	-.73	10.80	.150	.569	
3.00	-.834	.586	-.74	11.00	.158	.570	
3.10	-.791	.582	-.76	11.20	.165	.571	
3.20	-.750	.579	-.77	11.40	.173	.572	
3.30	-.712	.576	-.78	11.60	.180	.573	
3.40	-.677	.573	-.80	11.80	.186	.574	
3.50	-.643	.570	-.82	12.00	.193	.575	
3.60	-.611	.568	-.83	12.20	.199	.576	
3.70	-.581	.566	-.85	12.40	.206	.577	
3.80	-.553	.564	-.87	12.60	.212	.578	
3.90	-.526	.562	-.88	12.80	.218	.579	
4.00	-.500	.561	-.90	13.00	.223	.580	
4.10	-.476	.559	-.92	13.20	.229	.581	
4.20	-.452	.558	-.94	13.40	.234	.582	
4.30	-.430	.557	-.96	13.60	.240	.583	
4.40	-.409	.556	-.99	13.80	.245	.584	
4.50	-.389	.555	-1.01	14.00	.250	.585	
4.60	-.369	.554	-1.03	14.20	.255	.586	
4.70	-.351	.553	-1.06	14.40	.260	.587	
4.80	-.333	.552	-1.08	14.60	.264	.588	
4.90	-.316	.552	-1.11	14.80	.269	.589	
5.00	-.300	.551	-1.13	15.00	.274	.590	

TABLE 3.2(CONTINUED)

GAMMA = 1.55

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-45.517	.974	-.64	5.20	-.311	.536	-1.07
.20	-22.284	.949	-.63	5.40	-.281	.535	-1.12
.30	-14.551	.923	-.62	5.60	-.254	.535	-1.18
.40	-10.693	.899	-.61	5.80	-.228	.535	-1.24
.50	-8.385	.875	-.60	6.00	-.204	.535	-1.30
.60	-6.851	.851	-.60	6.20	-.181	.535	-1.37
.70	-5.759	.829	-.59	6.40	-.159	.535	-1.45
.80	-4.944	.808	-.59	6.60	-.139	.535	-1.54
.90	-4.313	.787	-.59	6.80	-.120	.536	-1.64
1.00	-3.811	.768	-.58	7.00	-.102	.537	-1.75
1.10	-3.402	.750	-.58	7.20	-.085	.537	-1.89
1.20	-3.063	.733	-.58	7.40	-.069	.538	-2.05
1.30	-2.778	.717	-.58	7.60	-.053	.539	-2.24
1.40	-2.534	.702	-.58	7.80	-.039	.540	-2.50
1.50	-2.325	.689	-.59	8.00	-.025	.540	-2.87
1.60	-2.142	.676	-.59	8.20	-.011	.541	-3.55
1.70	-1.982	.664	-.59	8.40	.002	.542	
1.80	-1.840	.653	-.59	8.60	.014	.543	
1.90	-1.714	.643	-.60	8.80	.026	.544	
2.00	-1.600	.633	-.60	9.00	.037	.545	
2.10	-1.498	.625	-.61	9.20	.048	.546	
2.20	-1.406	.617	-.62	9.40	.058	.547	
2.30	-1.322	.609	-.62	9.60	.069	.548	
2.40	-1.245	.602	-.63	9.80	.078	.549	
2.50	-1.175	.596	-.64	10.00	.088	.550	
2.60	-1.110	.591	-.65	10.20	.097	.552	
2.70	-1.050	.585	-.66	10.40	.105	.553	
2.80	-.995	.580	-.67	10.60	.114	.554	
2.90	-.943	.576	-.68	10.80	.122	.555	
3.00	-.895	.572	-.69	11.00	.130	.556	
3.10	-.851	.568	-.70	11.20	.138	.557	
3.20	-.809	.565	-.71	11.40	.145	.558	
3.30	-.769	.562	-.73	11.60	.152	.559	
3.40	-.733	.559	-.74	11.80	.159	.560	
3.50	-.698	.556	-.75	12.00	.166	.561	
3.60	-.665	.554	-.77	12.20	.173	.562	
3.70	-.634	.551	-.78	12.40	.179	.563	
3.80	-.604	.549	-.80	12.60	.185	.564	
3.90	-.576	.548	-.81	12.80	.192	.565	
4.00	-.550	.546	-.83	13.00	.198	.566	
4.10	-.525	.545	-.84	13.20	.203	.568	
4.20	-.501	.543	-.86	13.40	.209	.569	
4.30	-.478	.542	-.88	13.60	.214	.570	
4.40	-.456	.541	-.90	13.80	.220	.571	
4.50	-.435	.540	-.92	14.00	.225	.572	
4.60	-.415	.539	-.94	14.20	.230	.573	
4.70	-.396	.538	-.96	14.40	.235	.574	
4.80	-.378	.538	-.98	14.60	.240	.575	
4.90	-.360	.537	-1.00	14.80	.245	.576	
5.00	-.343	.536	-1.02	15.00	.249	.577	

TABLE 3.2(CONTINUED)

GAMMA = 1.60

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-47.018	.973	-.62	5.20	-.353	.521	-.97
.20	-23.035	.947	-.61	5.40	-.323	.520	-1.01
.30	-15.053	.921	-.60	5.60	-.294	.520	-1.06
.40	-11.070	.895	-.59	5.80	-.267	.520	-1.11
.50	-8.687	.871	-.58	6.00	-.242	.520	-1.16
.60	-7.104	.847	-.58	6.20	-.219	.520	-1.22
.70	-5.977	.823	-.57	6.40	-.197	.520	-1.28
.80	-5.136	.801	-.57	6.60	-.176	.520	-1.34
.90	-4.485	.781	-.56	6.80	-.156	.521	-1.42
1.00	-3.966	.761	-.56	7.00	-.138	.522	-1.50
1.10	-3.544	.742	-.56	7.20	-.120	.522	-1.59
1.20	-3.194	.725	-.55	7.40	-.103	.523	-1.69
1.30	-2.900	.708	-.55	7.60	-.087	.524	-1.81
1.40	-2.648	.693	-.55	7.80	-.072	.525	-1.95
1.50	-2.432	.679	-.55	8.00	-.058	.526	-2.12
1.60	-2.243	.665	-.56	8.20	-.044	.527	-2.33
1.70	-2.078	.653	-.56	8.40	-.031	.527	-2.62
1.80	-1.931	.642	-.56	8.60	-.018	.528	-3.07
1.90	-1.801	.631	-.57	8.80	-.006	.530	-4.05
2.00	-1.684	.621	-.57	9.00	.006	.531	
2.10	-1.579	.613	-.57	9.20	.017	.532	
2.20	-1.484	.604	-.58	9.40	.028	.533	
2.30	-1.397	.597	-.59	9.60	.038	.534	
2.40	-1.318	.590	-.59	9.80	.049	.535	
2.50	-1.245	.583	-.60	10.00	.058	.536	
2.60	-1.178	.577	-.61	10.20	.068	.537	
2.70	-1.116	.572	-.62	10.40	.077	.538	
2.80	-1.059	.567	-.62	10.60	.085	.539	
2.90	-1.006	.562	-.63	10.80	.094	.540	
3.00	-.957	.558	-.64	11.00	.102	.542	
3.10	-.910	.554	-.65	11.20	.110	.543	
3.20	-.867	.551	-.66	11.40	.118	.544	
3.30	-.827	.547	-.67	11.60	.125	.545	
3.40	-.788	.544	-.68	11.80	.132	.546	
3.50	-.752	.542	-.70	12.00	.139	.547	
3.60	-.719	.539	-.71	12.20	.146	.548	
3.70	-.687	.537	-.72	12.40	.153	.549	
3.80	-.656	.535	-.73	12.60	.159	.550	
3.90	-.627	.533	-.75	12.80	.165	.551	
4.00	-.600	.531	-.76	13.00	.172	.552	
4.10	-.574	.530	-.78	13.20	.178	.554	
4.20	-.549	.528	-.79	13.40	.183	.555	
4.30	-.526	.527	-.81	13.60	.189	.556	
4.40	-.503	.526	-.82	13.80	.195	.557	
4.50	-.481	.525	-.84	14.00	.200	.558	
4.60	-.461	.524	-.86	14.20	.205	.559	
4.70	-.441	.523	-.87	14.40	.210	.560	
4.80	-.422	.523	-.89	14.60	.215	.561	
4.90	-.404	.522	-.91	14.80	.220	.562	
5.00	-.386	.521	-.93	15.00	.225	.563	

TABLE 3.2(CONTINUED)

GAMMA = 1.65

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-48.518	.973	-.60	5.20	-.396	.506	-.88
.20	-23.787	.945	-.59	5.40	-.364	.505	-.92
.30	-15.555	.918	-.58	5.60	-.334	.505	-.96
.40	-11.447	.892	-.57	5.80	-.307	.505	-1.00
.50	-8.990	.866	-.56	6.00	-.281	.505	-1.04
.60	-7.357	.842	-.55	6.20	-.257	.505	-1.09
.70	-6.195	.818	-.55	6.40	-.234	.505	-1.14
.80	-5.328	.795	-.54	6.60	-.213	.505	-1.19
.90	-4.656	.774	-.54	6.80	-.192	.506	-1.25
1.00	-4.121	.753	-.53	7.00	-.173	.507	-1.31
1.10	-3.686	.734	-.53	7.20	-.155	.507	-1.38
1.20	-3.325	.716	-.53	7.40	-.138	.508	-1.45
1.30	-3.021	.699	-.53	7.60	-.121	.509	-1.53
1.40	-2.762	.683	-.53	7.80	-.106	.510	-1.63
1.50	-2.539	.669	-.53	8.00	-.091	.511	-1.73
1.60	-2.345	.655	-.53	8.20	-.076	.512	-1.86
1.70	-2.174	.642	-.53	8.40	-.063	.513	-2.00
1.80	-2.023	.630	-.53	8.60	-.050	.514	-2.18
1.90	-1.889	.620	-.53	8.80	-.037	.515	-2.40
2.00	-1.768	.610	-.54	9.00	-.025	.516	-2.72
2.10	-1.660	.600	-.54	9.20	-.013	.517	-3.23
2.20	-1.561	.592	-.55	9.40	-.002	.518	-4.74
2.30	-1.472	.584	-.55	9.60	.008	.519	
2.40	-1.390	.577	-.56	9.80	.019	.520	
2.50	-1.315	.570	-.56	10.00	.029	.521	
2.60	-1.246	.564	-.57	10.20	.038	.523	
2.70	-1.183	.558	-.58	10.40	.048	.524	
2.80	-1.124	.553	-.58	10.60	.057	.525	
2.90	-1.069	.549	-.59	10.80	.065	.526	
3.00	-1.018	.544	-.60	11.00	.074	.527	
3.10	-.970	.540	-.61	11.20	.082	.528	
3.20	-.926	.537	-.62	11.40	.090	.529	
3.30	-.884	.533	-.63	11.60	.098	.531	
3.40	-.844	.530	-.64	11.80	.105	.532	
3.50	-.807	.527	-.65	12.00	.112	.533	
3.60	-.772	.525	-.66	12.20	.119	.534	
3.70	-.739	.523	-.67	12.40	.126	.535	
3.80	-.708	.520	-.68	12.60	.133	.536	
3.90	-.678	.518	-.69	12.80	.139	.537	
4.00	-.650	.517	-.70	13.00	.146	.538	
4.10	-.623	.515	-.72	13.20	.152	.540	
4.20	-.598	.514	-.73	13.40	.158	.541	
4.30	-.573	.512	-.74	13.60	.164	.542	
4.40	-.550	.511	-.76	13.80	.169	.543	
4.50	-.528	.510	-.77	14.00	.175	.544	
4.60	-.506	.509	-.78	14.20	.180	.545	
4.70	-.486	.508	-.80	14.40	.186	.546	
4.80	-.466	.508	-.81	14.60	.191	.547	
4.90	-.448	.507	-.83	14.80	.196	.548	
5.00	-.430	.507	-.85	15.00	.201	.549	

TABLE 3.2(CONTINUED)

GAMMA = 1.70

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-50.019	.972	-.58	5.20	-.438	.491	-.80
.20	-24.538	.944	-.57	5.40	-.405	.490	-.83
.30	-16.056	.916	-.56	5.60	-.375	.490	-.87
.40	-11.825	.889	-.55	5.80	-.347	.490	-.90
.50	-9.293	.862	-.54	6.00	-.320	.490	-.94
.60	-7.610	.837	-.53	6.20	-.295	.490	-.98
.70	-6.413	.812	-.53	6.40	-.272	.490	-1.02
.80	-5.519	.789	-.52	6.60	-.250	.490	-1.06
.90	-4.827	.767	-.52	6.80	-.229	.491	-1.11
1.00	-4.276	.746	-.51	7.00	-.209	.492	-1.16
1.10	-3.828	.726	-.51	7.20	-.190	.492	-1.21
1.20	-3.456	.707	-.51	7.40	-.172	.493	-1.27
1.30	-3.143	.690	-.50	7.60	-.155	.494	-1.33
1.40	-2.876	.674	-.50	7.80	-.139	.495	-1.40
1.50	-2.646	.658	-.50	8.00	-.124	.496	-1.48
1.60	-2.446	.644	-.50	8.20	-.109	.497	-1.56
1.70	-2.270	.631	-.50	8.40	-.095	.498	-1.65
1.80	-2.115	.619	-.50	8.60	-.081	.499	-1.76
1.90	-1.976	.608	-.50	8.80	-.069	.500	-1.88
2.00	-1.852	.598	-.51	9.00	-.056	.501	-2.03
2.10	-1.740	.588	-.51	9.20	-.044	.502	-2.21
2.20	-1.639	.580	-.51	9.40	-.033	.503	-2.44
2.30	-1.547	.571	-.52	9.60	-.022	.505	-2.77
2.40	-1.463	.564	-.52	9.80	-.011	.506	-3.33
2.50	-1.385	.557	-.53	10.00	-.001	.507	-5.71
2.60	-1.314	.551	-.53	10.20	.009	.508	
2.70	-1.249	.545	-.54	10.40	.019	.509	
2.80	-1.188	.540	-.55	10.60	.028	.510	
2.90	-1.132	.535	-.55	10.80	.037	.512	
3.00	-1.079	.530	-.56	11.00	.046	.513	
3.10	-1.030	.526	-.57	11.20	.054	.514	
3.20	-.984	.523	-.57	11.40	.062	.515	
3.30	-.941	.519	-.58	11.60	.070	.516	
3.40	-.900	.516	-.59	11.80	.078	.518	
3.50	-.862	.513	-.60	12.00	.085	.519	
3.60	-.826	.510	-.61	12.20	.093	.520	
3.70	-.792	.508	-.62	12.40	.100	.521	
3.80	-.760	.506	-.63	12.60	.107	.522	
3.90	-.729	.504	-.64	12.80	.113	.523	
4.00	-.700	.502	-.65	13.00	.120	.525	
4.10	-.672	.500	-.66	13.20	.126	.526	
4.20	-.646	.499	-.67	13.40	.132	.527	
4.30	-.621	.498	-.68	13.60	.138	.528	
4.40	-.597	.496	-.70	13.80	.144	.529	
4.50	-.574	.495	-.71	14.00	.150	.530	
4.60	-.552	.494	-.72	14.20	.156	.531	
4.70	-.531	.494	-.73	14.40	.161	.532	
4.80	-.511	.493	-.75	14.60	.166	.533	
4.90	-.492	.492	-.76	14.80	.172	.534	
5.00	-.473	.492	-.77	15.00	.177	.536	

TABLE 3.2(CONTINUED)

GAMMA = 1.75

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-51.519	.971	-.56	5.20	-.480	.476	-.74
.20	-25.289	.942	-.55	5.40	-.447	.475	-.76
.30	-16.558	.913	-.54	5.60	-.415	.475	-.79
.40	-12.202	.886	-.53	5.80	-.386	.475	-.82
.50	-9.595	.858	-.52	6.00	-.359	.475	-.85
.60	-7.864	.832	-.51	6.20	-.333	.475	-.89
.70	-6.631	.807	-.51	6.40	-.309	.475	-.92
.80	-5.711	.783	-.50	6.60	-.286	.476	-.96
.90	-4.999	.760	-.50	6.80	-.265	.476	-.99
1.00	-4.432	.738	-.49	7.00	-.244	.477	-1.04
1.10	-3.970	.718	-.49	7.20	-.225	.477	-1.08
1.20	-3.587	.699	-.48	7.40	-.207	.478	-1.13
1.30	-3.265	.681	-.48	7.60	-.189	.479	-1.18
1.40	-2.990	.664	-.48	7.80	-.173	.480	-1.23
1.50	-2.754	.648	-.48	8.00	-.157	.481	-1.29
1.60	-2.547	.634	-.48	8.20	-.142	.482	-1.35
1.70	-2.366	.621	-.48	8.40	-.127	.483	-1.42
1.80	-2.206	.608	-.48	8.60	-.113	.484	-1.49
1.90	-2.064	.597	-.48	8.80	-.100	.485	-1.57
2.00	-1.936	.586	-.48	9.00	-.087	.487	-1.67
2.10	-1.821	.576	-.48	9.20	-.075	.488	-1.77
2.20	-1.716	.567	-.48	9.40	-.063	.489	-1.89
2.30	-1.622	.559	-.49	9.60	-.052	.490	-2.04
2.40	-1.535	.551	-.49	9.80	-.041	.491	-2.22
2.50	-1.456	.544	-.50	10.00	-.030	.492	-2.45
2.60	-1.382	.538	-.50	10.20	-.020	.494	-2.78
2.70	-1.315	.532	-.51	10.40	-.010	.495	-3.33
2.80	-1.252	.526	-.51	10.60	-.000	.496	-5.94
2.90	-1.194	.521	-.52	10.80	.009	.497	
3.00	-1.140	.517	-.52	11.00	.018	.499	
3.10	-1.090	.512	-.53	11.20	.026	.500	
3.20	-1.042	.509	-.54	11.40	.035	.501	
3.30	-.998	.505	-.54	11.60	.043	.502	
3.40	-.956	.502	-.55	11.80	.051	.503	
3.50	-.917	.499	-.56	12.00	.059	.505	
3.60	-.880	.496	-.57	12.20	.066	.506	
3.70	-.845	.494	-.57	12.40	.073	.507	
3.80	-.811	.491	-.58	12.60	.080	.508	
3.90	-.780	.489	-.59	12.80	.087	.509	
4.00	-.750	.487	-.60	13.00	.094	.511	
4.10	-.722	.486	-.61	13.20	.100	.512	
4.20	-.694	.484	-.62	13.40	.107	.513	
4.30	-.669	.483	-.63	13.60	.113	.514	
4.40	-.644	.482	-.64	13.80	.119	.515	
4.50	-.620	.481	-.65	14.00	.125	.516	
4.60	-.598	.480	-.66	14.20	.131	.517	
4.70	-.576	.479	-.67	14.40	.136	.519	
4.80	-.555	.478	-.69	14.60	.142	.520	
4.90	-.535	.477	-.70	14.80	.147	.521	
5.00	-.516	.477	-.71	15.00	.153	.522	

TABLE 3.2(CONTINUED)

GAMMA = 1.80

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-53.020	.970	-.54	5.20	-.522	.461	-.68
.20	-26.040	.940	-.53	5.40	-.488	.460	-.70
.30	-17.060	.911	-.52	5.60	-.456	.460	-.72
.40	-12.579	.882	-.51	5.80	-.426	.460	-.75
.50	-9.898	.854	-.50	6.00	-.398	.460	-.78
.60	-8.117	.827	-.50	6.20	-.371	.460	-.81
.70	-6.850	.801	-.49	6.40	-.346	.460	-.83
.80	-5.903	.777	-.48	6.60	-.323	.461	-.87
.90	-5.170	.753	-.48	6.80	-.301	.461	-.90
1.00	-4.587	.731	-.47	7.00	-.280	.462	-.93
1.10	-4.112	.710	-.47	7.20	-.260	.463	-.97
1.20	-3.718	.690	-.46	7.40	-.241	.463	-1.01
1.30	-3.387	.672	-.46	7.60	-.223	.464	-1.05
1.40	-3.104	.654	-.46	7.80	-.206	.465	-1.09
1.50	-2.861	.638	-.45	8.00	-.190	.466	-1.14
1.60	-2.649	.623	-.45	8.20	-.174	.467	-1.19
1.70	-2.463	.610	-.45	8.40	-.159	.468	-1.24
1.80	-2.298	.597	-.45	8.60	-.145	.470	-1.29
1.90	-2.151	.585	-.45	8.80	-.131	.471	-1.36
2.00	-2.020	.574	-.45	9.00	-.118	.472	-1.42
2.10	-1.901	.564	-.46	9.20	-.106	.473	-1.49
2.20	-1.794	.555	-.46	9.40	-.093	.474	-1.58
2.30	-1.697	.546	-.46	9.60	-.082	.475	-1.67
2.40	-1.607	.538	-.46	9.80	-.070	.477	-1.77
2.50	-1.526	.531	-.47	10.00	-.060	.478	-1.89
2.60	-1.450	.524	-.47	10.20	-.049	.479	-2.03
2.70	-1.381	.518	-.47	10.40	-.039	.480	-2.20
2.80	-1.317	.513	-.48	10.60	-.029	.482	-2.42
2.90	-1.257	.508	-.48	10.80	-.020	.483	-2.73
3.00	-1.201	.503	-.49	11.00	-.010	.484	-3.24
3.10	-1.149	.498	-.49	11.20	-.001	.485	-4.87
3.20	-1.101	.494	-.50	11.40	.007	.487	
3.30	-1.055	.491	-.51	11.60	.016	.488	
3.40	-1.012	.488	-.51	11.80	.024	.489	
3.50	-.972	.484	-.52	12.00	.032	.490	
3.60	-.933	.482	-.53	12.20	.039	.492	
3.70	-.897	.479	-.53	12.40	.047	.493	
3.80	-.863	.477	-.54	12.60	.054	.494	
3.90	-.831	.475	-.55	12.80	.061	.495	
4.00	-.800	.473	-.56	13.00	.068	.497	
4.10	-.771	.471	-.57	13.20	.075	.498	
4.20	-.743	.469	-.57	13.40	.081	.499	
4.30	-.716	.468	-.58	13.60	.088	.500	
4.40	-.691	.467	-.59	13.80	.094	.501	
4.50	-.667	.466	-.60	14.00	.100	.502	
4.60	-.643	.465	-.61	14.20	.106	.504	
4.70	-.621	.464	-.62	14.40	.112	.505	
4.80	-.600	.463	-.63	14.60	.117	.506	
4.90	-.579	.462	-.64	14.80	.123	.507	
5.00	-.560	.462	-.65	15.00	.128	.508	

TABLE 3.2(CONTINUED)

GAMMA = 1.85

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-54.521	.969	-.53	5.20	-.565	.446	-.62
.20	-26.791	.939	-.52	5.40	-.529	.445	-.64
.30	-17.561	.908	-.51	5.60	-.496	.445	-.66
.40	-12.956	.879	-.50	5.80	-.465	.444	-.69
.50	-10.201	.850	-.49	6.00	-.436	.445	-.71
.60	-8.370	.823	-.48	6.20	-.409	.445	-.73
.70	-7.068	.796	-.47	6.40	-.384	.445	-.76
.80	-6.095	.770	-.46	6.60	-.360	.446	-.79
.90	-5.342	.746	-.46	6.80	-.337	.446	-.82
1.00	-4.742	.723	-.45	7.00	-.316	.447	-.84
1.10	-4.254	.702	-.45	7.20	-.295	.448	-.88
1.20	-3.849	.681	-.44	7.40	-.276	.448	-.91
1.30	-3.509	.663	-.44	7.60	-.257	.449	-.94
1.40	-3.218	.645	-.44	7.80	-.240	.450	-.98
1.50	-2.968	.628	-.43	8.00	-.223	.451	-1.01
1.60	-2.750	.613	-.43	8.20	-.207	.453	-1.05
1.70	-2.559	.599	-.43	8.40	-.192	.454	-1.10
1.80	-2.390	.586	-.43	8.60	-.177	.455	-1.14
1.90	-2.239	.574	-.43	8.80	-.163	.456	-1.19
2.00	-2.104	.562	-.43	9.00	-.149	.457	-1.24
2.10	-1.982	.552	-.43	9.20	-.136	.458	-1.29
2.20	-1.872	.542	-.43	9.40	-.124	.460	-1.35
2.30	-1.771	.534	-.43	9.60	-.112	.461	-1.42
2.40	-1.680	.526	-.44	9.80	-.100	.462	-1.49
2.50	-1.596	.518	-.44	10.00	-.089	.463	-1.57
2.60	-1.519	.511	-.44	10.20	-.078	.465	-1.65
2.70	-1.447	.505	-.45	10.40	-.068	.466	-1.75
2.80	-1.381	.499	-.45	10.60	-.058	.467	-1.87
2.90	-1.320	.494	-.45	10.80	-.048	.469	-2.00
3.00	-1.262	.489	-.46	11.00	-.038	.470	-2.16
3.10	-1.209	.485	-.46	11.20	-.029	.471	-2.37
3.20	-1.159	.480	-.47	11.40	-.020	.472	-2.64
3.30	-1.112	.477	-.47	11.60	-.012	.474	-3.07
3.40	-1.068	.473	-.48	11.80	-.003	.475	-4.08
3.50	-1.026	.470	-.48	12.00	.005	.476	
3.60	-.987	.467	-.49	12.20	.013	.478	
3.70	-.950	.465	-.50	12.40	.020	.479	
3.80	-.915	.462	-.50	12.60	.028	.480	
3.90	-.882	.460	-.51	12.80	.035	.481	
4.00	-.850	.458	-.52	13.00	.042	.483	
4.10	-.820	.456	-.53	13.20	.049	.484	
4.20	-.791	.455	-.53	13.40	.056	.485	
4.30	-.764	.453	-.54	13.60	.062	.486	
4.40	-.738	.452	-.55	13.80	.069	.487	
4.50	-.713	.451	-.56	14.00	.075	.489	
4.60	-.689	.450	-.57	14.20	.081	.490	
4.70	-.666	.449	-.57	14.40	.087	.491	
4.80	-.644	.448	-.58	14.60	.093	.492	
4.90	-.623	.447	-.59	14.80	.099	.493	
5.00	-.603	.447	-.60	15.00	.104	.495	

TABLE 3.2(CONTINUED)

GAMMA = 1.90

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-56.021	.968	-.51	5.20	-.607	.431	-.57
.20	-27.542	.937	-.50	5.40	-.571	.430	-.59
.30	-18.063	.906	-.49	5.60	-.537	.430	-.61
.40	-13.333	.876	-.48	5.80	-.505	.429	-.63
.50	-10.504	.846	-.47	6.00	-.475	.429	-.65
.60	-8.623	.818	-.46	6.20	-.447	.430	-.67
.70	-7.286	.790	-.45	6.40	-.421	.430	-.69
.80	-6.286	.764	-.45	6.60	-.397	.431	-.72
.90	-5.513	.739	-.44	6.80	-.373	.431	-.74
1.00	-4.897	.716	-.43	7.00	-.351	.432	-.77
1.10	-4.396	.694	-.43	7.20	-.330	.433	-.79
1.20	-3.980	.673	-.42	7.40	-.310	.434	-.82
1.30	-3.631	.653	-.42	7.60	-.291	.435	-.85
1.40	-3.332	.635	-.42	7.80	-.273	.436	-.88
1.50	-3.075	.618	-.41	8.00	-.256	.437	-.91
1.60	-2.851	.603	-.41	8.20	-.240	.438	-.95
1.70	-2.655	.588	-.41	8.40	-.224	.439	-.98
1.80	-2.481	.574	-.41	8.60	-.209	.440	-1.02
1.90	-2.326	.562	-.41	8.80	-.194	.441	-1.06
2.00	-2.188	.550	-.41	9.00	-.180	.443	-1.10
2.10	-2.063	.540	-.41	9.20	-.167	.444	-1.14
2.20	-1.949	.530	-.41	9.40	-.154	.445	-1.19
2.30	-1.846	.521	-.41	9.60	-.142	.446	-1.24
2.40	-1.752	.513	-.41	9.80	-.130	.448	-1.29
2.50	-1.666	.505	-.41	10.00	-.118	.449	-1.34
2.60	-1.587	.498	-.42	10.20	-.107	.450	-1.41
2.70	-1.513	.492	-.42	10.40	-.097	.452	-1.47
2.80	-1.445	.486	-.42	10.60	-.086	.453	-1.55
2.90	-1.382	.480	-.42	10.80	-.076	.454	-1.63
3.00	-1.324	.475	-.43	11.00	-.066	.456	-1.72
3.10	-1.269	.471	-.43	11.20	-.057	.457	-1.83
3.20	-1.217	.466	-.44	11.40	-.048	.458	-1.95
3.30	-1.169	.463	-.44	11.60	-.039	.459	-2.10
3.40	-1.124	.459	-.45	11.80	-.030	.461	-2.28
3.50	-1.081	.456	-.45	12.00	-.022	.462	-2.52
3.60	-1.041	.453	-.46	12.20	-.014	.463	-2.88
3.70	-1.003	.450	-.46	12.40	-.006	.465	-3.52
3.80	-.967	.448	-.47	12.60	.002	.466	
3.90	-.932	.446	-.47	12.80	.009	.467	
4.00	-.900	.444	-.48	13.00	.016	.469	
4.10	-.869	.442	-.49	13.20	.023	.470	
4.20	-.840	.440	-.49	13.40	.030	.471	
4.30	-.812	.439	-.50	13.60	.037	.472	
4.40	-.785	.437	-.51	13.80	.044	.474	
4.50	-.759	.436	-.52	14.00	.050	.475	
4.60	-.735	.435	-.52	14.20	.056	.476	
4.70	-.711	.434	-.53	14.40	.062	.477	
4.80	-.689	.433	-.54	14.60	.068	.479	
4.90	-.667	.432	-.55	14.80	.074	.480	
5.00	-.646	.432	-.56	15.00	.080	.481	

TABLE 3.2(CONTINUED)

GAMMA = 1.95

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-57.522	.968	-.50	5.20	-.649	.416	-.53
.20	-28.293	.935	-.49	5.40	-.612	.415	-.55
.30	-18.565	.904	-.48	5.60	-.577	.415	-.56
.40	-13.711	.872	-.47	5.80	-.545	.414	-.58
.50	-10.806	.842	-.46	6.00	-.514	.414	-.60
.60	-8.877	.813	-.45	6.20	-.486	.415	-.62
.70	-7.504	.785	-.44	6.40	-.459	.415	-.64
.80	-6.478	.758	-.43	6.60	-.433	.416	-.66
.90	-5.684	.733	-.42	6.80	-.409	.416	-.68
1.00	-5.052	.708	-.42	7.00	-.387	.417	-.70
1.10	-4.538	.686	-.41	7.20	-.365	.418	-.72
1.20	-4.111	.664	-.41	7.40	-.345	.419	-.75
1.30	-3.753	.644	-.40	7.60	-.325	.420	-.77
1.40	-3.446	.626	-.40	7.80	-.307	.421	-.80
1.50	-3.183	.608	-.39	8.00	-.289	.422	-.82
1.60	-2.953	.592	-.39	8.20	-.272	.423	-.85
1.70	-2.751	.577	-.39	8.40	-.256	.424	-.88
1.80	-2.573	.563	-.39	8.60	-.241	.425	-.91
1.90	-2.414	.550	-.39	8.80	-.226	.427	-.94
2.00	-2.271	.539	-.39	9.00	-.211	.428	-.98
2.10	-2.143	.528	-.39	9.20	-.198	.429	-1.01
2.20	-2.027	.518	-.39	9.40	-.185	.430	-1.05
2.30	-1.921	.508	-.39	9.60	-.172	.432	-1.09
2.40	-1.825	.500	-.39	9.80	-.160	.433	-1.13
2.50	-1.736	.492	-.39	10.00	-.148	.434	-1.18
2.60	-1.655	.485	-.39	10.20	-.136	.436	-1.22
2.70	-1.579	.478	-.39	10.40	-.125	.437	-1.27
2.80	-1.510	.472	-.40	10.60	-.115	.438	-1.33
2.90	-1.445	.467	-.40	10.80	-.104	.440	-1.39
3.00	-1.385	.461	-.40	11.00	-.095	.441	-1.45
3.10	-1.328	.457	-.41	11.20	-.085	.443	-1.52
3.20	-1.276	.452	-.41	11.40	-.075	.444	-1.60
3.30	-1.226	.448	-.41	11.60	-.066	.445	-1.68
3.40	-1.180	.445	-.42	11.80	-.058	.447	-1.78
3.50	-1.136	.441	-.42	12.00	-.049	.448	-1.90
3.60	-1.095	.438	-.43	12.20	-.041	.449	-2.03
3.70	-1.055	.436	-.43	12.40	-.033	.451	-2.19
3.80	-1.018	.433	-.44	12.60	-.025	.452	-2.39
3.90	-.983	.431	-.44	12.80	-.017	.453	-2.67
4.00	-.950	.429	-.45	13.00	-.010	.455	-3.11
4.10	-.918	.427	-.45	13.20	-.002	.456	-4.23
4.20	-.888	.425	-.46	13.40	.005	.457	
4.30	-.859	.424	-.47	13.60	.012	.458	
4.40	-.832	.422	-.47	13.80	.018	.460	
4.50	-.805	.421	-.48	14.00	.025	.461	
4.60	-.780	.420	-.49	14.20	.031	.462	
4.70	-.756	.419	-.49	14.40	.038	.464	
4.80	-.733	.418	-.50	14.60	.044	.465	
4.90	-.711	.417	-.51	14.80	.050	.466	
5.00	-.690	.417	-.51	15.00	.056	.467	

TABLE 3.2(CONTINUED)

GAMMA = 2.00

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-59.022	.967	-.49	5.20	-.692	.401	-.49
.20	-29.044	.934	-.48	5.40	-.653	.400	-.50
.30	-19.066	.901	-.46	5.60	-.617	.400	-.52
.40	-14.088	.869	-.45	5.80	-.584	.399	-.53
.50	-11.109	.838	-.44	6.00	-.553	.399	-.55
.60	-9.130	.808	-.43	6.20	-.524	.400	-.57
.70	-7.722	.779	-.42	6.40	-.496	.400	-.58
.80	-6.670	.752	-.42	6.60	-.470	.401	-.60
.90	-5.856	.726	-.41	6.80	-.445	.401	-.62
1.00	-5.208	.701	-.40	7.00	-.422	.402	-.64
1.10	-4.680	.678	-.40	7.20	-.400	.403	-.66
1.20	-4.243	.656	-.39	7.40	-.379	.404	-.68
1.30	-3.874	.635	-.38	7.60	-.359	.405	-.70
1.40	-3.560	.616	-.38	7.80	-.340	.406	-.73
1.50	-3.290	.598	-.38	8.00	-.322	.407	-.75
1.60	-3.054	.582	-.37	8.20	-.305	.408	-.77
1.70	-2.847	.566	-.37	8.40	-.288	.409	-.80
1.80	-2.664	.552	-.37	8.60	-.272	.411	-.82
1.90	-2.501	.539	-.37	8.80	-.257	.412	-.85
2.00	-2.355	.527	-.37	9.00	-.242	.413	-.88
2.10	-2.224	.516	-.37	9.20	-.228	.414	-.91
2.20	-2.105	.505	-.37	9.40	-.215	.416	-.94
2.30	-1.996	.496	-.37	9.60	-.202	.417	-.97
2.40	-1.897	.487	-.37	9.80	-.189	.419	-1.01
2.50	-1.806	.479	-.37	10.00	-.177	.420	-1.04
2.60	-1.723	.472	-.37	10.20	-.166	.421	-1.08
2.70	-1.646	.465	-.37	10.40	-.154	.423	-1.12
2.80	-1.574	.459	-.37	10.60	-.143	.424	-1.16
2.90	-1.508	.453	-.37	10.80	-.133	.425	-1.21
3.00	-1.446	.448	-.38	11.00	-.123	.427	-1.26
3.10	-1.388	.443	-.38	11.20	-.113	.428	-1.31
3.20	-1.334	.438	-.38	11.40	-.103	.430	-1.36
3.30	-1.283	.434	-.39	11.60	-.094	.431	-1.42
3.40	-1.236	.431	-.39	11.80	-.085	.432	-1.49
3.50	-1.191	.427	-.39	12.00	-.076	.434	-1.56
3.60	-1.148	.424	-.40	12.20	-.067	.435	-1.64
3.70	-1.108	.421	-.40	12.40	-.059	.437	-1.73
3.80	-1.070	.419	-.41	12.60	-.051	.438	-1.83
3.90	-1.034	.416	-.41	12.80	-.043	.439	-1.94
4.00	-1.000	.414	-.42	13.00	-.035	.441	-2.08
4.10	-.967	.412	-.42	13.20	-.028	.442	-2.25
4.20	-.937	.411	-.43	13.40	-.021	.443	-2.47
4.30	-.907	.409	-.43	13.60	-.014	.445	-2.79
4.40	-.879	.408	-.44	13.80	-.007	.446	-3.33
4.50	-.852	.406	-.44	14.00	0.000	.447	
4.60	-.826	.405	-.45	14.20	.007	.449	
4.70	-.801	.404	-.46	14.40	.013	.450	
4.80	-.778	.403	-.46	14.60	.019	.451	
4.90	-.755	.403	-.47	14.80	.025	.452	
5.00	-.733	.402	-.48	15.00	.031	.454	

TABLE 3.2(CONTINUED)

GAMMA = 2.10

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-62.023	.965	-.46	5.20	-.776	.371	-.42
.20	-30.547	.930	-.45	5.40	-.736	.370	-.43
.30	-20.070	.896	-.44	5.60	-.698	.370	-.44
.40	-14.842	.863	-.43	5.80	-.663	.369	-.45
.50	-11.715	.830	-.42	6.00	-.631	.369	-.47
.60	-9.636	.799	-.41	6.20	-.600	.370	-.48
.70	-8.158	.768	-.40	6.40	-.571	.370	-.49
.80	-7.053	.739	-.39	6.60	-.544	.371	-.51
.90	-6.199	.712	-.38	6.80	-.518	.371	-.52
1.00	-5.518	.686	-.37	7.00	-.493	.372	-.54
1.10	-4.964	.661	-.37	7.20	-.470	.373	-.55
1.20	-4.505	.638	-.36	7.40	-.448	.374	-.57
1.30	-4.118	.617	-.35	7.60	-.427	.375	-.59
1.40	-3.788	.597	-.35	7.80	-.407	.376	-.60
1.50	-3.504	.578	-.34	8.00	-.388	.377	-.62
1.60	-3.257	.561	-.34	8.20	-.370	.379	-.64
1.70	-3.040	.545	-.34	8.40	-.353	.380	-.66
1.80	-2.848	.530	-.33	8.60	-.336	.381	-.68
1.90	-2.676	.516	-.33	8.80	-.320	.382	-.70
2.00	-2.523	.503	-.33	9.00	-.305	.384	-.72
2.10	-2.385	.491	-.33	9.20	-.290	.385	-.74
2.20	-2.260	.481	-.33	9.40	-.276	.387	-.77
2.30	-2.146	.471	-.33	9.60	-.262	.388	-.79
2.40	-2.042	.461	-.33	9.80	-.249	.389	-.81
2.50	-1.947	.453	-.33	10.00	-.236	.391	-.84
2.60	-1.859	.445	-.33	10.20	-.224	.392	-.86
2.70	-1.778	.438	-.33	10.40	-.212	.394	-.89
2.80	-1.703	.431	-.33	10.60	-.201	.395	-.92
2.90	-1.633	.425	-.33	10.80	-.189	.397	-.95
3.00	-1.568	.420	-.33	11.00	-.179	.398	-.98
3.10	-1.507	.415	-.33	11.20	-.168	.400	-1.01
3.20	-1.451	.410	-.34	11.40	-.158	.401	-1.05
3.30	-1.397	.406	-.34	11.60	-.148	.403	-1.08
3.40	-1.347	.402	-.34	11.80	-.139	.404	-1.12
3.50	-1.300	.399	-.34	12.00	-.130	.405	-1.16
3.60	-1.256	.395	-.35	12.20	-.121	.407	-1.20
3.70	-1.214	.392	-.35	12.40	-.112	.408	-1.25
3.80	-1.174	.390	-.35	12.60	-.104	.410	-1.29
3.90	-1.136	.387	-.36	12.80	-.095	.411	-1.35
4.00	-1.100	.385	-.36	13.00	-.087	.413	-1.40
4.10	-1.066	.383	-.36	13.20	-.079	.414	-1.46
4.20	-1.033	.381	-.37	13.40	-.072	.415	-1.53
4.30	-1.002	.379	-.37	13.60	-.064	.417	-1.60
4.40	-.973	.378	-.38	13.80	-.057	.418	-1.68
4.50	-.944	.377	-.38	14.00	-.050	.420	-1.77
4.60	-.917	.375	-.39	14.20	-.043	.421	-1.87
4.70	-.891	.374	-.39	14.40	-.036	.422	-1.99
4.80	-.866	.373	-.40	14.60	-.030	.424	-2.13
4.90	-.842	.373	-.40	14.80	-.023	.425	-2.30
5.00	-.819	.372	-.41	15.00	-.017	.426	-2.53

TABLE 3.2(CONTINUED)

GAMMA = 2.20

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-65.024	.963	-.44	5.20	-.861	.341	-.36
.20	-32.049	.927	-.43	5.40	-.818	.340	-.37
.30	-21.073	.891	-.42	5.60	-.779	.340	-.38
.40	-15.597	.856	-.40	5.80	-.743	.339	-.39
.50	-12.320	.822	-.39	6.00	-.708	.339	-.40
.60	-10.143	.789	-.38	6.20	-.676	.340	-.41
.70	-8.594	.757	-.37	6.40	-.646	.340	-.42
.80	-7.437	.727	-.36	6.60	-.617	.341	-.43
.90	-6.541	.698	-.35	6.80	-.590	.341	-.44
1.00	-5.828	.671	-.35	7.00	-.564	.342	-.45
1.10	-5.248	.645	-.34	7.20	-.540	.343	-.47
1.20	-4.767	.621	-.33	7.40	-.517	.344	-.48
1.30	-4.362	.599	-.33	7.60	-.495	.345	-.49
1.40	-4.017	.578	-.32	7.80	-.474	.346	-.51
1.50	-3.719	.558	-.32	8.00	-.454	.348	-.52
1.60	-3.460	.540	-.31	8.20	-.435	.349	-.54
1.70	-3.232	.523	-.31	8.40	-.417	.350	-.55
1.80	-3.031	.507	-.30	8.60	-.400	.352	-.57
1.90	-2.851	.493	-.30	8.80	-.383	.353	-.58
2.00	-2.691	.480	-.30	9.00	-.367	.354	-.60
2.10	-2.546	.467	-.30	9.20	-.351	.356	-.61
2.20	-2.415	.456	-.29	9.40	-.336	.357	-.63
2.30	-2.296	.445	-.29	9.60	-.322	.359	-.65
2.40	-2.187	.436	-.29	9.80	-.308	.360	-.67
2.50	-2.087	.427	-.29	10.00	-.295	.362	-.69
2.60	-1.995	.419	-.29	10.20	-.282	.363	-.71
2.70	-1.910	.411	-.29	10.40	-.270	.365	-.73
2.80	-1.831	.404	-.29	10.60	-.258	.367	-.75
2.90	-1.758	.398	-.29	10.80	-.246	.368	-.77
3.00	-1.690	.392	-.29	11.00	-.235	.370	-.79
3.10	-1.627	.387	-.29	11.20	-.224	.371	-.81
3.20	-1.567	.382	-.29	11.40	-.213	.373	-.84
3.30	-1.512	.378	-.30	11.60	-.203	.374	-.86
3.40	-1.459	.374	-.30	11.80	-.193	.376	-.89
3.50	-1.410	.370	-.30	12.00	-.184	.377	-.91
3.60	-1.363	.366	-.30	12.20	-.174	.379	-.94
3.70	-1.319	.363	-.30	12.40	-.165	.380	-.97
3.80	-1.277	.361	-.31	12.60	-.156	.382	-1.00
3.90	-1.238	.358	-.31	12.80	-.147	.383	-1.03
4.00	-1.200	.356	-.31	13.00	-.139	.385	-1.06
4.10	-1.164	.354	-.31	13.20	-.131	.386	-1.10
4.20	-1.130	.352	-.32	13.40	-.123	.388	-1.13
4.30	-1.098	.350	-.32	13.60	-.115	.389	-1.17
4.40	-1.067	.348	-.32	13.80	-.107	.390	-1.21
4.50	-1.037	.347	-.33	14.00	-.100	.392	-1.26
4.60	-1.009	.346	-.33	14.20	-.093	.393	-1.30
4.70	-.981	.345	-.34	14.40	-.086	.395	-1.35
4.80	-.955	.344	-.34	14.60	-.079	.396	-1.40
4.90	-.930	.343	-.34	14.80	-.072	.398	-1.46
5.00	-.906	.342	-.35	15.00	-.065	.399	-1.52

TABLE 3.2(CONTINUED)

GAMMA = 2.30

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-68.026	.962	-.42	5.20	-.945	.311	-.30
.20	-33.551	.924	-.41	5.40	-.901	.310	-.31
.30	-22.076	.886	-.40	5.60	-.860	.310	-.32
.40	-16.351	.850	-.38	5.80	-.822	.309	-.33
.50	-12.925	.814	-.37	6.00	-.786	.309	-.34
.60	-10.649	.779	-.36	6.20	-.752	.310	-.34
.70	-9.030	.746	-.35	6.40	-.720	.310	-.35
.80	-7.820	.715	-.34	6.60	-.691	.311	-.36
.90	-6.884	.685	-.33	6.80	-.662	.311	-.37
1.00	-6.139	.656	-.32	7.00	-.636	.312	-.38
1.10	-5.532	.629	-.32	7.20	-.610	.313	-.39
1.20	-5.029	.604	-.31	7.40	-.586	.314	-.40
1.30	-4.606	.580	-.30	7.60	-.563	.316	-.41
1.40	-4.245	.558	-.29	7.80	-.541	.317	-.43
1.50	-3.933	.538	-.29	8.00	-.520	.318	-.44
1.60	-3.662	.519	-.28	8.20	-.500	.319	-.45
1.70	-3.424	.501	-.28	8.40	-.481	.321	-.46
1.80	-3.214	.485	-.28	8.60	-.463	.322	-.47
1.90	-3.027	.470	-.27	8.80	-.446	.324	-.49
2.00	-2.859	.456	-.27	9.00	-.429	.325	-.50
2.10	-2.707	.443	-.27	9.20	-.413	.327	-.51
2.20	-2.570	.431	-.26	9.40	-.397	.328	-.53
2.30	-2.446	.420	-.26	9.60	-.382	.330	-.54
2.40	-2.332	.410	-.26	9.80	-.368	.331	-.55
2.50	-2.227	.401	-.26	10.00	-.354	.333	-.57
2.60	-2.131	.392	-.26	10.20	-.340	.335	-.58
2.70	-2.042	.385	-.26	10.40	-.327	.336	-.60
2.80	-1.960	.377	-.26	10.60	-.315	.338	-.62
2.90	-1.884	.371	-.26	10.80	-.303	.339	-.63
3.00	-1.813	.365	-.26	11.00	-.291	.341	-.65
3.10	-1.746	.359	-.26	11.20	-.280	.343	-.67
3.20	-1.684	.354	-.26	11.40	-.269	.344	-.68
3.30	-1.626	.349	-.26	11.60	-.258	.346	-.70
3.40	-1.571	.345	-.26	11.80	-.247	.347	-.72
3.50	-1.519	.341	-.26	12.00	-.237	.349	-.74
3.60	-1.470	.338	-.26	12.20	-.227	.350	-.76
3.70	-1.424	.334	-.26	12.40	-.218	.352	-.78
3.80	-1.381	.331	-.27	12.60	-.209	.354	-.80
3.90	-1.339	.329	-.27	12.80	-.200	.355	-.82
4.00	-1.300	.326	-.27	13.00	-.191	.357	-.85
4.10	-1.263	.324	-.27	13.20	-.182	.358	-.87
4.20	-1.227	.322	-.27	13.40	-.174	.360	-.89
4.30	-1.193	.320	-.28	13.60	-.166	.361	-.92
4.40	-1.161	.319	-.28	13.80	-.158	.363	-.94
4.50	-1.130	.317	-.28	14.00	-.150	.364	-.97
4.60	-1.100	.316	-.28	14.20	-.142	.366	-1.00
4.70	-1.071	.315	-.29	14.40	-.135	.367	-1.03
4.80	-1.044	.314	-.29	14.60	-.128	.369	-1.06
4.90	-1.018	.313	-.29	14.80	-.121	.370	-1.09
5.00	-.993	.312	-.30	15.00	-.114	.372	-1.13

TABLE 3.2(CONTINUED)

GAMMA = 2.40

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-71.027	.960	-.40	5.20	-1.030	.281	-.26
.20	-35.053	.920	-.39	5.40	-.984	.280	-.26
.30	-23.079	.881	-.38	5.60	-.941	.280	-.27
.40	-17.105	.843	-.36	5.80	-.901	.279	-.28
.50	-13.531	.806	-.35	6.00	-.863	.279	-.28
.60	-11.156	.770	-.34	6.20	-.828	.280	-.29
.70	-9.466	.735	-.33	6.40	-.795	.280	-.30
.80	-8.204	.702	-.32	6.60	-.764	.281	-.31
.90	-7.227	.671	-.31	6.80	-.735	.281	-.31
1.00	-6.449	.641	-.30	7.00	-.707	.282	-.32
1.10	-5.816	.613	-.29	7.20	-.680	.283	-.33
1.20	-5.291	.587	-.29	7.40	-.655	.285	-.34
1.30	-4.849	.562	-.28	7.60	-.631	.286	-.35
1.40	-4.473	.539	-.27	7.80	-.608	.287	-.36
1.50	-4.148	.518	-.27	8.00	-.587	.288	-.37
1.60	-3.865	.498	-.26	8.20	-.566	.290	-.38
1.70	-3.617	.480	-.25	8.40	-.546	.291	-.39
1.80	-3.397	.463	-.25	8.60	-.527	.293	-.40
1.90	-3.202	.447	-.25	8.80	-.509	.294	-.41
2.00	-3.026	.432	-.24	9.00	-.491	.296	-.42
2.10	-2.868	.419	-.24	9.20	-.474	.297	-.43
2.20	-2.725	.406	-.24	9.40	-.458	.299	-.44
2.30	-2.595	.395	-.23	9.60	-.442	.301	-.45
2.40	-2.477	.384	-.23	9.80	-.427	.302	-.46
2.50	-2.368	.375	-.23	10.00	-.413	.304	-.47
2.60	-2.267	.366	-.23	10.20	-.399	.306	-.49
2.70	-2.175	.358	-.23	10.40	-.385	.307	-.50
2.80	-2.089	.350	-.23	10.60	-.372	.309	-.51
2.90	-2.009	.343	-.22	10.80	-.359	.311	-.52
3.00	-1.935	.337	-.22	11.00	-.347	.312	-.54
3.10	-1.866	.331	-.22	11.20	-.335	.314	-.55
3.20	-1.801	.326	-.22	11.40	-.324	.316	-.56
3.30	-1.740	.321	-.22	11.60	-.312	.317	-.58
3.40	-1.683	.317	-.22	11.80	-.302	.319	-.59
3.50	-1.629	.313	-.23	12.00	-.291	.321	-.61
3.60	-1.578	.309	-.23	12.20	-.281	.322	-.62
3.70	-1.530	.305	-.23	12.40	-.271	.324	-.64
3.80	-1.484	.302	-.23	12.60	-.261	.325	-.65
3.90	-1.441	.300	-.23	12.80	-.252	.327	-.67
4.00	-1.400	.297	-.23	13.00	-.243	.329	-.69
4.10	-1.361	.295	-.23	13.20	-.234	.330	-.70
4.20	-1.324	.293	-.23	13.40	-.225	.332	-.72
4.30	-1.288	.291	-.24	13.60	-.216	.334	-.74
4.40	-1.254	.289	-.24	13.80	-.208	.335	-.76
4.50	-1.222	.288	-.24	14.00	-.200	.337	-.78
4.60	-1.191	.286	-.24	14.20	-.192	.338	-.80
4.70	-1.161	.285	-.24	14.40	-.184	.340	-.82
4.80	-1.133	.284	-.25	14.60	-.177	.341	-.84
4.90	-1.106	.283	-.25	14.80	-.169	.343	-.86
5.00	-1.079	.282	-.25	15.00	-.162	.344	-.88

TABLE 3.2(CONTINUED)

GAMMA = 2.50

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-74.028	.958	-.39	5.20	-1.114	.251	-.22
.20	-36.555	.917	-.37	5.40	-1.066	.250	-.22
.30	-24.083	.876	-.36	5.60	-1.022	.250	-.23
.40	-17.860	.836	-.35	5.80	-.980	.249	-.23
.50	-14.136	.798	-.33	6.00	-.941	.249	-.24
.60	-11.662	.760	-.32	6.20	-.904	.250	-.24
.70	-9.902	.724	-.31	6.40	-.870	.250	-.25
.80	-8.587	.690	-.30	6.60	-.838	.251	-.26
.90	-7.570	.657	-.29	6.80	-.807	.252	-.26
1.00	-6.760	.626	-.28	7.00	-.778	.252	-.27
1.10	-6.100	.597	-.27	7.20	-.750	.254	-.28
1.20	-5.553	.570	-.26	7.40	-.724	.255	-.28
1.30	-5.093	.544	-.26	7.60	-.699	.256	-.29
1.40	-4.701	.520	-.25	7.80	-.675	.257	-.30
1.50	-4.362	.498	-.24	8.00	-.653	.259	-.31
1.60	-4.068	.477	-.24	8.20	-.631	.260	-.31
1.70	-3.809	.458	-.23	8.40	-.610	.262	-.32
1.80	-3.580	.440	-.23	8.60	-.590	.263	-.33
1.90	-3.377	.424	-.22	8.80	-.571	.265	-.34
2.00	-3.194	.409	-.22	9.00	-.553	.266	-.35
2.10	-3.030	.395	-.21	9.20	-.536	.268	-.36
2.20	-2.881	.382	-.21	9.40	-.519	.270	-.37
2.30	-2.745	.370	-.21	9.60	-.502	.271	-.38
2.40	-2.621	.359	-.21	9.80	-.487	.273	-.38
2.50	-2.508	.349	-.20	10.00	-.472	.275	-.39
2.60	-2.403	.340	-.20	10.20	-.457	.277	-.40
2.70	-2.307	.331	-.20	10.40	-.443	.278	-.41
2.80	-2.218	.323	-.20	10.60	-.429	.280	-.42
2.90	-2.135	.316	-.20	10.80	-.416	.282	-.43
3.00	-2.057	.309	-.20	11.00	-.403	.284	-.45
3.10	-1.985	.303	-.20	11.20	-.391	.285	-.46
3.20	-1.917	.298	-.19	11.40	-.379	.287	-.47
3.30	-1.854	.293	-.19	11.60	-.367	.289	-.48
3.40	-1.794	.288	-.19	11.80	-.356	.291	-.49
3.50	-1.738	.284	-.19	12.00	-.345	.292	-.50
3.60	-1.685	.280	-.19	12.20	-.334	.294	-.51
3.70	-1.635	.277	-.20	12.40	-.324	.296	-.53
3.80	-1.588	.273	-.20	12.60	-.314	.297	-.54
3.90	-1.543	.270	-.20	12.80	-.304	.299	-.55
4.00	-1.500	.268	-.20	13.00	-.294	.301	-.56
4.10	-1.459	.265	-.20	13.20	-.285	.302	-.58
4.20	-1.421	.263	-.20	13.40	-.276	.304	-.59
4.30	-1.384	.261	-.20	13.60	-.267	.306	-.61
4.40	-1.348	.259	-.20	13.80	-.258	.307	-.62
4.50	-1.315	.258	-.20	14.00	-.250	.309	-.63
4.60	-1.282	.256	-.21	14.20	-.242	.311	-.65
4.70	-1.252	.255	-.21	14.40	-.234	.312	-.66
4.80	-1.222	.254	-.21	14.60	-.226	.314	-.68
4.90	-1.193	.253	-.21	14.80	-.218	.315	-.70
5.00	-1.166	.252	-.21	15.00	-.211	.317	-.71

TABLE 3.2(CONTINUED)

GAMMA = 2.60

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-77.029	.957	-.37	5.20	-1.199	.221	-.18
.20	-38.058	.914	-.36	5.40	-1.149	.220	-.18
.30	-25.086	.871	-.34	5.60	-1.103	.220	-.19
.40	-18.614	.830	-.33	5.80	-1.059	.219	-.19
.50	-14.742	.790	-.32	6.00	-1.019	.219	-.20
.60	-12.169	.751	-.31	6.20	-.981	.220	-.20
.70	-10.338	.713	-.29	6.40	-.945	.220	-.21
.80	-8.971	.677	-.28	6.60	-.911	.221	-.21
.90	-7.913	.643	-.27	6.80	-.879	.222	-.22
1.00	-7.070	.611	-.26	7.00	-.849	.223	-.22
1.10	-6.384	.581	-.25	7.20	-.820	.224	-.23
1.20	-5.815	.552	-.25	7.40	-.793	.225	-.23
1.30	-5.337	.526	-.24	7.60	-.767	.226	-.24
1.40	-4.929	.501	-.23	7.80	-.742	.228	-.25
1.50	-4.577	.478	-.22	8.00	-.719	.229	-.25
1.60	-4.270	.456	-.22	8.20	-.696	.231	-.26
1.70	-4.002	.436	-.21	8.40	-.675	.232	-.27
1.80	-3.764	.418	-.21	8.60	-.654	.234	-.27
1.90	-3.552	.401	-.20	8.80	-.634	.235	-.28
2.00	-3.362	.385	-.20	9.00	-.615	.237	-.29
2.10	-3.191	.370	-.19	9.20	-.597	.239	-.30
2.20	-3.036	.357	-.19	9.40	-.579	.241	-.30
2.30	-2.895	.345	-.19	9.60	-.562	.242	-.31
2.40	-2.766	.333	-.18	9.80	-.546	.244	-.32
2.50	-2.648	.323	-.18	10.00	-.530	.246	-.33
2.60	-2.540	.313	-.18	10.20	-.515	.248	-.34
2.70	-2.439	.304	-.17	10.40	-.501	.250	-.34
2.80	-2.346	.296	-.17	10.60	-.486	.251	-.35
2.90	-2.260	.289	-.17	10.80	-.473	.253	-.36
3.00	-2.180	.282	-.17	11.00	-.459	.255	-.37
3.10	-2.104	.276	-.17	11.20	-.446	.257	-.38
3.20	-2.034	.270	-.17	11.40	-.434	.259	-.39
3.30	-1.968	.265	-.17	11.60	-.422	.260	-.40
3.40	-1.906	.260	-.17	11.80	-.410	.262	-.41
3.50	-1.848	.255	-.17	12.00	-.399	.264	-.42
3.60	-1.793	.251	-.17	12.20	-.388	.266	-.43
3.70	-1.741	.248	-.17	12.40	-.377	.268	-.44
3.80	-1.691	.244	-.17	12.60	-.366	.269	-.45
3.90	-1.644	.241	-.17	12.80	-.356	.271	-.46
4.00	-1.600	.238	-.17	13.00	-.346	.273	-.47
4.10	-1.558	.236	-.17	13.20	-.336	.275	-.48
4.20	-1.517	.234	-.17	13.40	-.327	.276	-.49
4.30	-1.479	.232	-.17	13.60	-.318	.278	-.50
4.40	-1.442	.230	-.17	13.80	-.309	.280	-.51
4.50	-1.407	.228	-.17	14.00	-.300	.281	-.52
4.60	-1.374	.227	-.17	14.20	-.291	.283	-.53
4.70	-1.342	.225	-.17	14.40	-.283	.285	-.55
4.80	-1.311	.224	-.17	14.60	-.275	.286	-.56
4.90	-1.281	.223	-.18	14.80	-.267	.288	-.57
5.00	-1.253	.222	-.18	15.00	-.259	.290	-.58

TABLE 3.2(CONTINUED)

GAMMA = 2.70

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-80.030	.955	-.36	5.20	-1.284	.191	-.15
.20	-39.560	.910	-.34	5.40	-1.232	.190	-.15
.30	-26.089	.866	-.33	5.60	-1.184	.190	-.15
.40	-19.369	.823	-.32	5.80	-1.139	.189	-.16
.50	-15.347	.781	-.30	6.00	-1.096	.189	-.16
.60	-12.675	.741	-.29	6.20	-1.057	.190	-.16
.70	-10.774	.702	-.28	6.40	-1.020	.190	-.17
.80	-9.354	.665	-.27	6.60	-.985	.191	-.17
.90	-8.255	.630	-.26	6.80	-.951	.192	-.18
1.00	-7.380	.596	-.25	7.00	-.920	.193	-.18
1.10	-6.668	.565	-.24	7.20	-.890	.194	-.19
1.20	-6.077	.535	-.23	7.40	-.862	.195	-.19
1.30	-5.580	.507	-.22	7.60	-.835	.196	-.20
1.40	-5.157	.482	-.21	7.80	-.809	.198	-.20
1.50	-4.791	.458	-.21	8.00	-.785	.199	-.21
1.60	-4.473	.435	-.20	8.20	-.761	.201	-.21
1.70	-4.194	.415	-.19	8.40	-.739	.203	-.22
1.80	-3.947	.395	-.19	8.60	-.718	.204	-.22
1.90	-3.727	.378	-.18	8.80	-.697	.206	-.23
2.00	-3.530	.361	-.18	9.00	-.677	.208	-.24
2.10	-3.352	.346	-.17	9.20	-.658	.210	-.24
2.20	-3.191	.332	-.17	9.40	-.640	.211	-.25
2.30	-3.045	.319	-.16	9.60	-.623	.213	-.26
2.40	-2.911	.308	-.16	9.80	-.606	.215	-.26
2.50	-2.789	.297	-.16	10.00	-.589	.217	-.27
2.60	-2.676	.287	-.15	10.20	-.574	.219	-.28
2.70	-2.572	.277	-.15	10.40	-.558	.221	-.28
2.80	-2.475	.269	-.15	10.60	-.544	.223	-.29
2.90	-2.385	.261	-.15	10.80	-.529	.224	-.30
3.00	-2.302	.254	-.15	11.00	-.515	.226	-.30
3.10	-2.224	.248	-.14	11.20	-.502	.228	-.31
3.20	-2.151	.242	-.14	11.40	-.489	.230	-.32
3.30	-2.082	.236	-.14	11.60	-.477	.232	-.33
3.40	-2.018	.231	-.14	11.80	-.464	.234	-.34
3.50	-1.957	.227	-.14	12.00	-.452	.236	-.34
3.60	-1.900	.222	-.14	12.20	-.441	.237	-.35
3.70	-1.846	.219	-.14	12.40	-.430	.239	-.36
3.80	-1.795	.215	-.14	12.60	-.419	.241	-.37
3.90	-1.746	.212	-.14	12.80	-.408	.243	-.38
4.00	-1.700	.209	-.14	13.00	-.398	.245	-.38
4.10	-1.656	.207	-.14	13.20	-.388	.247	-.39
4.20	-1.614	.204	-.14	13.40	-.378	.248	-.40
4.30	-1.574	.202	-.14	13.60	-.368	.250	-.41
4.40	-1.536	.200	-.14	13.80	-.359	.252	-.42
4.50	-1.500	.199	-.14	14.00	-.350	.254	-.43
4.60	-1.465	.197	-.14	14.20	-.341	.255	-.44
4.70	-1.432	.196	-.14	14.40	-.332	.257	-.45
4.80	-1.400	.194	-.14	14.60	-.324	.259	-.46
4.90	-1.369	.193	-.14	14.80	-.316	.261	-.47
5.00	-1.339	.193	-.15	15.00	-.308	.262	-.48

TABLE 3.2(CONTINUED)

GAMMA = 2.80

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-83.031	.953	-.34	5.20	-1.368	.161	-.12
.20	-41.062	.907	-.33	5.40	-1.314	.160	-.12
.30	-27.093	.861	-.31	5.60	-1.264	.159	-.12
.40	-20.123	.817	-.30	5.80	-1.218	.159	-.13
.50	-15.953	.773	-.29	6.00	-1.174	.159	-.13
.60	-13.182	.731	-.28	6.20	-1.133	.160	-.13
.70	-11.210	.691	-.26	6.40	-1.094	.160	-.13
.80	-9.738	.653	-.25	6.60	-1.058	.161	-.14
.90	-8.598	.616	-.24	6.80	-1.024	.162	-.14
1.00	-7.691	.581	-.23	7.00	-.991	.163	-.15
1.10	-6.952	.549	-.22	7.20	-.960	.164	-.15
1.20	-6.340	.518	-.21	7.40	-.931	.165	-.15
1.30	-5.824	.489	-.20	7.60	-.903	.167	-.16
1.40	-5.385	.462	-.20	7.80	-.876	.168	-.16
1.50	-5.006	.437	-.19	8.00	-.851	.170	-.17
1.60	-4.676	.414	-.18	8.20	-.827	.171	-.17
1.70	-4.386	.393	-.18	8.40	-.803	.173	-.18
1.80	-4.130	.373	-.17	8.60	-.781	.175	-.18
1.90	-3.902	.355	-.16	8.80	-.760	.177	-.19
2.00	-3.697	.338	-.16	9.00	-.739	.178	-.19
2.10	-3.513	.322	-.15	9.20	-.720	.180	-.20
2.20	-3.346	.307	-.15	9.40	-.701	.182	-.20
2.30	-3.195	.294	-.15	9.60	-.683	.184	-.21
2.40	-3.056	.282	-.14	9.80	-.665	.186	-.21
2.50	-2.929	.271	-.14	10.00	-.648	.188	-.22
2.60	-2.812	.260	-.13	10.20	-.632	.190	-.22
2.70	-2.704	.251	-.13	10.40	-.616	.192	-.23
2.80	-2.604	.242	-.13	10.60	-.601	.194	-.24
2.90	-2.511	.234	-.13	10.80	-.586	.196	-.24
3.00	-2.424	.227	-.12	11.00	-.572	.198	-.25
3.10	-2.343	.220	-.12	11.20	-.558	.200	-.25
3.20	-2.268	.214	-.12	11.40	-.544	.202	-.26
3.30	-2.196	.208	-.12	11.60	-.531	.203	-.27
3.40	-2.130	.203	-.12	11.80	-.519	.205	-.27
3.50	-2.067	.198	-.12	12.00	-.506	.207	-.28
3.60	-2.007	.194	-.12	12.20	-.494	.209	-.29
3.70	-1.951	.190	-.12	12.40	-.483	.211	-.29
3.80	-1.898	.186	-.12	12.60	-.471	.213	-.30
3.90	-1.848	.183	-.11	12.80	-.460	.215	-.31
4.00	-1.800	.180	-.11	13.00	-.450	.217	-.32
4.10	-1.754	.177	-.11	13.20	-.439	.219	-.32
4.20	-1.711	.175	-.11	13.40	-.429	.221	-.33
4.30	-1.670	.173	-.11	13.60	-.419	.222	-.34
4.40	-1.630	.171	-.11	13.80	-.409	.224	-.35
4.50	-1.592	.169	-.11	14.00	-.400	.226	-.35
4.60	-1.556	.167	-.11	14.20	-.391	.228	-.36
4.70	-1.522	.166	-.12	14.40	-.382	.230	-.37
4.80	-1.489	.165	-.12	14.60	-.373	.232	-.38
4.90	-1.457	.164	-.12	14.80	-.364	.233	-.39
5.00	-1.426	.163	-.12	15.00	-.356	.235	-.39

TABLE 3.2(CONTINUED)

GAMMA = 2.90

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-86.032	.952	-.33	5.20	-1.453	.131	-.09
.20	-42.564	.904	-.32	5.40	-1.397	.130	-.09
.30	-28.096	.857	-.30	5.60	-1.345	.129	-.10
.40	-20.877	.810	-.29	5.80	-1.297	.129	-.10
.50	-16.558	.765	-.28	6.00	-1.252	.129	-.10
.60	-13.688	.722	-.26	6.20	-1.209	.130	-.10
.70	-11.646	.680	-.25	6.40	-1.169	.130	-.10
.80	-10.121	.640	-.24	6.60	-1.132	.131	-.11
.90	-8.941	.602	-.23	6.80	-1.096	.132	-.11
1.00	-8.001	.566	-.22	7.00	-1.062	.133	-.11
1.10	-7.236	.532	-.21	7.20	-1.030	.134	-.12
1.20	-6.602	.501	-.20	7.40	-1.000	.135	-.12
1.30	-6.068	.471	-.19	7.60	-.971	.137	-.12
1.40	-5.613	.443	-.18	7.80	-.943	.138	-.13
1.50	-5.220	.417	-.17	8.00	-.917	.140	-.13
1.60	-4.879	.393	-.17	8.20	-.892	.142	-.13
1.70	-4.579	.371	-.16	8.40	-.868	.144	-.14
1.80	-4.313	.351	-.15	8.60	-.845	.145	-.14
1.90	-4.077	.331	-.15	8.80	-.823	.147	-.15
2.00	-3.865	.314	-.14	9.00	-.802	.149	-.15
2.10	-3.674	.298	-.14	9.20	-.781	.151	-.16
2.20	-3.502	.283	-.13	9.40	-.762	.153	-.16
2.30	-3.344	.269	-.13	9.60	-.743	.155	-.16
2.40	-3.201	.256	-.12	9.80	-.725	.157	-.17
2.50	-3.069	.245	-.12	10.00	-.707	.159	-.17
2.60	-2.948	.234	-.12	10.20	-.690	.161	-.18
2.70	-2.836	.224	-.11	10.40	-.674	.163	-.18
2.80	-2.732	.215	-.11	10.60	-.658	.165	-.19
2.90	-2.636	.207	-.11	10.80	-.643	.167	-.19
3.00	-2.546	.199	-.11	11.00	-.628	.169	-.20
3.10	-2.463	.192	-.10	11.20	-.613	.171	-.20
3.20	-2.384	.186	-.10	11.40	-.599	.173	-.21
3.30	-2.311	.180	-.10	11.60	-.586	.175	-.22
3.40	-2.242	.174	-.10	11.80	-.573	.177	-.22
3.50	-2.176	.169	-.10	12.00	-.560	.179	-.23
3.60	-2.115	.165	-.10	12.20	-.548	.181	-.23
3.70	-2.057	.161	-.09	12.40	-.536	.183	-.24
3.80	-2.002	.157	-.09	12.60	-.524	.185	-.24
3.90	-1.950	.154	-.09	12.80	-.513	.187	-.25
4.00	-1.900	.151	-.09	13.00	-.501	.189	-.26
4.10	-1.853	.148	-.09	13.20	-.491	.191	-.26
4.20	-1.808	.145	-.09	13.40	-.480	.193	-.27
4.30	-1.765	.143	-.09	13.60	-.470	.195	-.28
4.40	-1.724	.141	-.09	13.80	-.460	.197	-.28
4.50	-1.685	.139	-.09	14.00	-.450	.198	-.29
4.60	-1.648	.138	-.09	14.20	-.440	.200	-.29
4.70	-1.612	.136	-.09	14.40	-.431	.202	-.30
4.80	-1.577	.135	-.09	14.60	-.422	.204	-.31
4.90	-1.544	.134	-.09	14.80	-.413	.206	-.31
5.00	-1.513	.133	-.09	15.00	-.404	.208	-.32

TABLE 3.2(CONTINUED)

GAMMA = 3.00

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-89.033	.950	-.32	5.20	-1.537	.101	-.07
.20	-44.066	.900	-.30	5.40	-1.480	.100	-.07
.30	-29.099	.852	-.29	5.60	-1.426	.099	-.07
.40	-21.632	.804	-.28	5.80	-1.376	.099	-.07
.50	-17.164	.757	-.26	6.00	-1.329	.099	-.07
.60	-14.195	.712	-.25	6.20	-1.285	.100	-.07
.70	-12.083	.669	-.24	6.40	-1.244	.100	-.08
.80	-10.505	.628	-.23	6.60	-1.205	.101	-.08
.90	-9.284	.588	-.22	6.80	-1.168	.102	-.08
1.00	-8.311	.551	-.20	7.00	-1.133	.103	-.08
1.10	-7.520	.516	-.19	7.20	-1.100	.104	-.09
1.20	-6.864	.483	-.18	7.40	-1.069	.106	-.09
1.30	-6.312	.453	-.18	7.60	-1.039	.107	-.09
1.40	-5.841	.424	-.17	7.80	-1.010	.109	-.09
1.50	-5.435	.397	-.16	8.00	-.983	.110	-.10
1.60	-5.081	.372	-.15	8.20	-.957	.112	-.10
1.70	-4.771	.349	-.14	8.40	-.932	.114	-.10
1.80	-4.496	.328	-.14	8.60	-.908	.116	-.11
1.90	-4.252	.308	-.13	8.80	-.886	.118	-.11
2.00	-4.033	.290	-.13	9.00	-.864	.120	-.11
2.10	-3.836	.273	-.12	9.20	-.843	.122	-.12
2.20	-3.657	.258	-.12	9.40	-.822	.124	-.12
2.30	-3.494	.244	-.11	9.60	-.803	.126	-.13
2.40	-3.346	.231	-.11	9.80	-.784	.128	-.13
2.50	-3.209	.219	-.10	10.00	-.766	.130	-.13
2.60	-3.084	.207	-.10	10.20	-.748	.132	-.14
2.70	-2.968	.197	-.10	10.40	-.731	.134	-.14
2.80	-2.861	.188	-.09	10.60	-.715	.136	-.15
2.90	-2.761	.179	-.09	10.80	-.699	.138	-.15
3.00	-2.669	.171	-.09	11.00	-.684	.140	-.16
3.10	-2.582	.164	-.08	11.20	-.669	.142	-.16
3.20	-2.501	.157	-.08	11.40	-.655	.144	-.17
3.30	-2.425	.151	-.08	11.60	-.641	.147	-.17
3.40	-2.353	.146	-.08	11.80	-.627	.149	-.17
3.50	-2.286	.141	-.08	12.00	-.614	.151	-.18
3.60	-2.222	.136	-.08	12.20	-.601	.153	-.18
3.70	-2.162	.132	-.07	12.40	-.589	.155	-.19
3.80	-2.105	.128	-.07	12.60	-.576	.157	-.19
3.90	-2.051	.125	-.07	12.80	-.565	.159	-.20
4.00	-2.000	.121	-.07	13.00	-.553	.161	-.20
4.10	-1.951	.118	-.07	13.20	-.542	.163	-.21
4.20	-1.905	.116	-.07	13.40	-.531	.165	-.22
4.30	-1.860	.113	-.07	13.60	-.520	.167	-.22
4.40	-1.818	.111	-.07	13.80	-.510	.169	-.23
4.50	-1.778	.109	-.07	14.00	-.500	.171	-.23
4.60	-1.739	.108	-.07	14.20	-.490	.173	-.24
4.70	-1.702	.106	-.07	14.40	-.480	.175	-.24
4.80	-1.666	.105	-.07	14.60	-.471	.177	-.25
4.90	-1.632	.104	-.07	14.80	-.462	.179	-.25
5.00	-1.599	.103	-.07	15.00	-.453	.180	-.26

TABLE 3.2(CONTINUED)

GAMMA = 3.10

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-92.034	.948	-.31	5.20	-1.622	.071	-.05
.20	-45.569	.897	-.29	5.40	-1.562	.070	-.05
.30	-30.103	.847	-.28	5.60	-1.507	.069	-.05
.40	-22.386	.797	-.27	5.80	-1.455	.069	-.05
.50	-17.769	.749	-.25	6.00	-1.407	.069	-.05
.60	-14.701	.703	-.24	6.20	-1.362	.070	-.05
.70	-12.519	.658	-.23	6.40	-1.319	.070	-.05
.80	-10.888	.615	-.21	6.60	-1.279	.071	-.05
.90	-9.626	.575	-.20	6.80	-1.240	.072	-.05
1.00	-8.622	.536	-.19	7.00	-1.204	.073	-.06
1.10	-7.804	.500	-.18	7.20	-1.170	.074	-.06
1.20	-7.126	.466	-.17	7.40	-1.138	.076	-.06
1.30	-6.555	.434	-.16	7.60	-1.107	.077	-.06
1.40	-6.069	.405	-.15	7.80	-1.077	.079	-.07
1.50	-5.649	.377	-.15	8.00	-1.049	.081	-.07
1.60	-5.284	.352	-.14	8.20	-1.022	.083	-.07
1.70	-4.963	.328	-.13	8.40	-.997	.085	-.07
1.80	-4.680	.306	-.12	8.60	-.972	.086	-.08
1.90	-4.427	.285	-.12	8.80	-.948	.088	-.08
2.00	-4.201	.267	-.11	9.00	-.926	.090	-.08
2.10	-3.997	.249	-.11	9.20	-.904	.092	-.09
2.20	-3.812	.233	-.10	9.40	-.883	.095	-.09
2.30	-3.644	.219	-.10	9.60	-.863	.097	-.09
2.40	-3.491	.205	-.09	9.80	-.843	.099	-.10
2.50	-3.350	.192	-.09	10.00	-.825	.101	-.10
2.60	-3.220	.181	-.08	10.20	-.807	.103	-.10
2.70	-3.101	.170	-.08	10.40	-.789	.105	-.11
2.80	-2.990	.161	-.08	10.60	-.772	.107	-.11
2.90	-2.887	.152	-.07	10.80	-.756	.110	-.11
3.00	-2.791	.144	-.07	11.00	-.740	.112	-.12
3.10	-2.701	.136	-.07	11.20	-.725	.114	-.12
3.20	-2.618	.129	-.07	11.40	-.710	.116	-.13
3.30	-2.539	.123	-.06	11.60	-.695	.118	-.13
3.40	-2.465	.117	-.06	11.80	-.681	.120	-.13
3.50	-2.395	.112	-.06	12.00	-.668	.122	-.14
3.60	-2.330	.107	-.06	12.20	-.654	.125	-.14
3.70	-2.268	.103	-.06	12.40	-.642	.127	-.15
3.80	-2.209	.099	-.05	12.60	-.629	.129	-.15
3.90	-2.153	.095	-.05	12.80	-.617	.131	-.15
4.00	-2.100	.092	-.05	13.00	-.605	.133	-.16
4.10	-2.050	.089	-.05	13.20	-.593	.135	-.16
4.20	-2.002	.086	-.05	13.40	-.582	.137	-.17
4.30	-1.956	.084	-.05	13.60	-.571	.139	-.17
4.40	-1.912	.082	-.05	13.80	-.560	.141	-.18
4.50	-1.870	.080	-.05	14.00	-.550	.143	-.18
4.60	-1.830	.078	-.05	14.20	-.540	.145	-.19
4.70	-1.792	.076	-.05	14.40	-.530	.147	-.19
4.80	-1.755	.075	-.05	14.60	-.520	.149	-.20
4.90	-1.720	.074	-.05	14.80	-.511	.151	-.20
5.00	-1.686	.073	-.05	15.00	-.501	.153	-.21

TABLE 3.2(CONTINUED)

GAMMA = 3.20

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-95.036	.947	-.30	5.20	-1.706	.041	-.03
.20	-47.071	.894	-.28	5.40	-1.645	.040	-.03
.30	-31.106	.842	-.27	5.60	-1.588	.039	-.03
.40	-23.141	.791	-.25	5.80	-1.535	.039	-.03
.50	-18.375	.741	-.24	6.00	-1.485	.039	-.03
.60	-15.208	.693	-.23	6.20	-1.438	.039	-.03
.70	-12.955	.647	-.22	6.40	-1.394	.040	-.03
.80	-11.272	.603	-.20	6.60	-1.352	.041	-.03
.90	-9.969	.561	-.19	6.80	-1.313	.042	-.03
1.00	-8.932	.521	-.18	7.00	-1.275	.043	-.03
1.10	-8.088	.484	-.17	7.20	-1.240	.045	-.03
1.20	-7.388	.449	-.16	7.40	-1.207	.046	-.04
1.30	-6.799	.416	-.15	7.60	-1.175	.048	-.04
1.40	-6.297	.386	-.14	7.80	-1.144	.049	-.04
1.50	-5.864	.357	-.13	8.00	-1.115	.051	-.04
1.60	-5.487	.331	-.13	8.20	-1.088	.053	-.04
1.70	-5.156	.306	-.12	8.40	-1.061	.055	-.05
1.80	-4.863	.283	-.11	8.60	-1.036	.057	-.05
1.90	-4.602	.262	-.10	8.80	-1.011	.059	-.05
2.00	-4.368	.243	-.10	9.00	-.988	.061	-.05
2.10	-4.158	.225	-.09	9.20	-.965	.063	-.06
2.20	-3.967	.209	-.09	9.40	-.944	.065	-.06
2.30	-3.794	.193	-.08	9.60	-.923	.068	-.06
2.40	-3.635	.179	-.08	9.80	-.903	.070	-.06
2.50	-3.490	.166	-.07	10.00	-.884	.072	-.07
2.60	-3.356	.155	-.07	10.20	-.865	.074	-.07
2.70	-3.233	.144	-.06	10.40	-.847	.076	-.07
2.80	-3.119	.134	-.06	10.60	-.829	.079	-.08
2.90	-3.012	.125	-.06	10.80	-.812	.081	-.08
3.00	-2.913	.116	-.05	11.00	-.796	.083	-.08
3.10	-2.821	.108	-.05	11.20	-.780	.085	-.09
3.20	-2.734	.101	-.05	11.40	-.765	.087	-.09
3.30	-2.653	.095	-.05	11.60	-.750	.090	-.09
3.40	-2.577	.089	-.04	11.80	-.736	.092	-.10
3.50	-2.505	.083	-.04	12.00	-.721	.094	-.10
3.60	-2.437	.079	-.04	12.20	-.708	.096	-.10
3.70	-2.373	.074	-.04	12.40	-.695	.098	-.11
3.80	-2.312	.070	-.04	12.60	-.682	.101	-.11
3.90	-2.255	.066	-.04	12.80	-.669	.103	-.12
4.00	-2.200	.063	-.03	13.00	-.657	.105	-.12
4.10	-2.148	.060	-.03	13.20	-.645	.107	-.12
4.20	-2.098	.057	-.03	13.40	-.633	.109	-.13
4.30	-2.051	.054	-.03	13.60	-.622	.111	-.13
4.40	-2.006	.052	-.03	13.80	-.611	.113	-.13
4.50	-1.963	.050	-.03	14.00	-.600	.116	-.14
4.60	-1.922	.048	-.03	14.20	-.589	.118	-.14
4.70	-1.882	.047	-.03	14.40	-.579	.120	-.15
4.80	-1.844	.045	-.03	14.60	-.569	.122	-.15
4.90	-1.808	.044	-.03	14.80	-.559	.124	-.16
5.00	-1.773	.043	-.03	15.00	-.550	.126	-.16

TABLE 3.2(CONTINUED)

GAMMA = 3.30

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-98.037	.945	-.29	5.20	-1.791	.011	-.01
.20	-48.573	.891	-.27	5.40	-1.728	.010	-.01
.30	-32.109	.837	-.26	5.60	-1.669	.009	-.01
.40	-23.895	.784	-.24	5.80	-1.614	.009	-.01
.50	-18.980	.733	-.23	6.00	-1.562	.009	-.01
.60	-15.714	.683	-.22	6.20	-1.514	.009	-.01
.70	-13.391	.636	-.20	6.40	-1.468	.010	-.01
.80	-11.655	.591	-.19	6.60	-1.426	.011	-.01
.90	-10.312	.547	-.18	6.80	-1.385	.012	-.01
1.00	-9.243	.506	-.17	7.00	-1.347	.013	-.01
1.10	-8.372	.468	-.16	7.20	-1.310	.015	-.01
1.20	-7.650	.432	-.15	7.40	-1.276	.016	-.01
1.30	-7.043	.398	-.14	7.60	-1.243	.018	-.01
1.40	-6.525	.366	-.13	7.80	-1.211	.020	-.01
1.50	-6.078	.337	-.12	8.00	-1.181	.022	-.02
1.60	-5.689	.310	-.11	8.20	-1.153	.023	-.02
1.70	-5.348	.284	-.11	8.40	-1.126	.025	-.02
1.80	-5.046	.261	-.10	8.60	-1.099	.027	-.02
1.90	-4.777	.239	-.09	8.80	-1.074	.030	-.02
2.00	-4.536	.219	-.09	9.00	-1.050	.032	-.03
2.10	-4.319	.201	-.08	9.20	-1.027	.034	-.03
2.20	-4.123	.184	-.07	9.40	-1.005	.036	-.03
2.30	-3.944	.168	-.07	9.60	-.983	.038	-.03
2.40	-3.780	.154	-.06	9.80	-.962	.041	-.04
2.50	-3.630	.140	-.06	10.00	-.942	.043	-.04
2.60	-3.493	.128	-.05	10.20	-.923	.045	-.04
2.70	-3.365	.117	-.05	10.40	-.905	.047	-.04
2.80	-3.247	.107	-.05	10.60	-.887	.050	-.05
2.90	-3.138	.097	-.04	10.80	-.869	.052	-.05
3.00	-3.036	.088	-.04	11.00	-.852	.054	-.05
3.10	-2.940	.081	-.04	11.20	-.836	.057	-.05
3.20	-2.851	.073	-.03	11.40	-.820	.059	-.06
3.30	-2.767	.067	-.03	11.60	-.805	.061	-.06
3.40	-2.689	.060	-.03	11.80	-.790	.064	-.06
3.50	-2.614	.055	-.03	12.00	-.775	.066	-.07
3.60	-2.545	.050	-.02	12.20	-.761	.068	-.07
3.70	-2.478	.045	-.02	12.40	-.747	.070	-.07
3.80	-2.416	.041	-.02	12.60	-.734	.073	-.08
3.90	-2.356	.037	-.02	12.80	-.721	.075	-.08
4.00	-2.300	.033	-.02	13.00	-.709	.077	-.08
4.10	-2.246	.030	-.02	13.20	-.696	.079	-.09
4.20	-2.195	.027	-.01	13.40	-.684	.081	-.09
4.30	-2.146	.025	-.01	13.60	-.673	.084	-.09
4.40	-2.100	.022	-.01	13.80	-.661	.086	-.10
4.50	-2.055	.020	-.01	14.00	-.650	.088	-.10
4.60	-2.013	.019	-.01	14.20	-.639	.090	-.10
4.70	-1.972	.017	-.01	14.40	-.629	.092	-.11
4.80	-1.933	.015	-.01	14.60	-.618	.094	-.11
4.90	-1.895	.014	-.01	14.80	-.608	.096	-.11
5.00	-1.859	.013	-.01	15.00	-.598	.098	-.12

TABLE 3.2(CONTINUED)

GAMMA = 3.40

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-101.038	.943	-.28	5.20	-1.876	-.019	.01
.20	-50.075	.887	-.26	5.40	-1.810	-.020	.01
.30	-33.113	.832	-.25	5.60	-1.750	-.021	.01
.40	-24.649	.778	-.24	5.80	-1.693	-.021	.01
.50	-19.585	.725	-.22	6.00	-1.640	-.021	.01
.60	-16.221	.674	-.21	6.20	-1.590	-.021	.01
.70	-13.827	.625	-.20	6.40	-1.543	-.020	.01
.80	-12.039	.578	-.18	6.60	-1.499	-.019	.01
.90	-10.655	.534	-.17	6.80	-1.457	-.018	.01
1.00	-9.553	.492	-.16	7.00	-1.418	-.017	.01
1.10	-8.656	.452	-.15	7.20	-1.380	-.015	.01
1.20	-7.912	.415	-.14	7.40	-1.345	-.014	.01
1.30	-7.286	.380	-.13	7.60	-1.311	-.012	.01
1.40	-6.753	.347	-.12	7.80	-1.278	-.010	.01
1.50	-6.293	.317	-.11	8.00	-1.248	-.008	.01
1.60	-5.892	.289	-.10	8.20	-1.218	-.006	.00
1.70	-5.540	.263	-.09	8.40	-1.190	-.004	.00
1.80	-5.229	.239	-.09	8.60	-1.163	-.002	.00
1.90	-4.952	.216	-.08	8.80	-1.137	.000	-.00
2.00	-4.704	.196	-.07	9.00	-1.112	.002	-.00
2.10	-4.480	.177	-.07	9.20	-1.088	.005	-.00
2.20	-4.278	.159	-.06	9.40	-1.065	.007	-.01
2.30	-4.093	.143	-.06	9.60	-1.043	.009	-.01
2.40	-3.925	.128	-.05	9.80	-1.022	.012	-.01
2.50	-3.771	.114	-.05	10.00	-1.001	.014	-.01
2.60	-3.629	.102	-.04	10.20	-.981	.016	-.01
2.70	-3.497	.090	-.04	10.40	-.962	.019	-.02
2.80	-3.376	.080	-.03	10.60	-.944	.021	-.02
2.90	-3.263	.070	-.03	10.80	-.926	.023	-.02
3.00	-3.158	.061	-.03	11.00	-.908	.026	-.02
3.10	-3.060	.053	-.02	11.20	-.892	.028	-.03
3.20	-2.968	.045	-.02	11.40	-.875	.030	-.03
3.30	-2.881	.038	-.02	11.60	-.859	.033	-.03
3.40	-2.800	.032	-.01	11.80	-.844	.035	-.03
3.50	-2.724	.026	-.01	12.00	-.829	.037	-.04
3.60	-2.652	.021	-.01	12.20	-.815	.040	-.04
3.70	-2.584	.016	-.01	12.40	-.800	.042	-.04
3.80	-2.519	.012	-.01	12.60	-.787	.044	-.04
3.90	-2.458	.008	-.00	12.80	-.773	.047	-.05
4.00	-2.400	.004	-.00	13.00	-.760	.049	-.05
4.10	-2.345	.001	-.00	13.20	-.748	.051	-.05
4.20	-2.292	-.002	.00	13.40	-.735	.054	-.06
4.30	-2.242	-.005	.00	13.60	-.723	.056	-.06
4.40	-2.194	-.007	.00	13.80	-.711	.058	-.06
4.50	-2.148	-.009	.00	14.00	-.700	.060	-.07
4.60	-2.104	-.011	.01	14.20	-.689	.062	-.07
4.70	-2.062	-.013	.01	14.40	-.678	.065	-.07
4.80	-2.022	-.014	.01	14.60	-.667	.067	-.07
4.90	-1.983	-.016	.01	14.80	-.657	.069	-.08
5.00	-1.946	-.017	.01	15.00	-.647	.071	-.08

TABLE 3.2(CONTINUED)

GAMMA = 3.50

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-104.039	.942	-.27	5.20	-1.960	-.049	.03
.20	-51.578	.884	-.26	5.40	-1.893	-.050	.03
.30	-34.116	.827	-.24	5.60	-1.831	-.051	.03
.40	-25.404	.771	-.23	5.80	-1.772	-.051	.03
.50	-20.191	.717	-.21	6.00	-1.718	-.051	.03
.60	-16.727	.664	-.20	6.20	-1.666	-.051	.03
.70	-14.263	.614	-.19	6.40	-1.618	-.050	.03
.80	-12.422	.566	-.17	6.60	-1.573	-.049	.03
.90	-10.998	.520	-.16	6.80	-1.530	-.048	.03
1.00	-9.863	.477	-.15	7.00	-1.489	-.047	.03
1.10	-8.940	.436	-.14	7.20	-1.450	-.045	.03
1.20	-8.174	.397	-.13	7.40	-1.414	-.043	.03
1.30	-7.530	.362	-.12	7.60	-1.379	-.042	.03
1.40	-6.981	.328	-.11	7.80	-1.345	-.040	.03
1.50	-6.507	.297	-.10	8.00	-1.314	-.038	.03
1.60	-6.095	.268	-.09	8.20	-1.283	-.036	.03
1.70	-5.733	.241	-.08	8.40	-1.254	-.034	.02
1.80	-5.413	.216	-.08	8.60	-1.227	-.031	.02
1.90	-5.127	.193	-.07	8.80	-1.200	-.029	.02
2.00	-4.872	.172	-.06	9.00	-1.174	-.027	.02
2.10	-4.641	.152	-.06	9.20	-1.150	-.025	.02
2.20	-4.433	.134	-.05	9.40	-1.126	-.022	.02
2.30	-4.243	.118	-.05	9.60	-1.103	-.020	.02
2.40	-4.070	.102	-.04	9.80	-1.081	-.018	.01
2.50	-3.911	.088	-.03	10.00	-1.060	-.015	.01
2.60	-3.765	.075	-.03	10.20	-1.040	-.013	.01
2.70	-3.630	.063	-.03	10.40	-1.020	-.010	.01
2.80	-3.505	.052	-.02	10.60	-1.001	-.008	.01
2.90	-3.388	.042	-.02	10.80	-.982	-.005	.00
3.00	-3.280	.033	-.01	11.00	-.965	-.003	.00
3.10	-3.179	.025	-.01	11.20	-.947	-.001	.00
3.20	-3.084	.017	-.01	11.40	-.930	.002	-.00
3.30	-2.996	.010	-.00	11.60	-.914	.004	-.00
3.40	-2.912	.003	-.00	11.80	-.898	.007	-.01
3.50	-2.834	-.002	.00	12.00	-.883	.009	-.01
3.60	-2.759	-.008	.00	12.20	-.868	.012	-.01
3.70	-2.689	-.013	.01	12.40	-.853	.014	-.01
3.80	-2.623	-.017	.01	12.60	-.839	.016	-.02
3.90	-2.560	-.021	.01	12.80	-.825	.019	-.02
4.00	-2.500	-.025	.01	13.00	-.812	.021	-.02
4.10	-2.443	-.028	.01	13.20	-.799	.023	-.02
4.20	-2.389	-.032	.02	13.40	-.786	.026	-.03
4.30	-2.337	-.034	.02	13.60	-.774	.028	-.03
4.40	-2.288	-.037	.02	13.80	-.762	.030	-.03
4.50	-2.241	-.039	.02	14.00	-.750	.033	-.03
4.60	-2.195	-.041	.02	14.20	-.738	.035	-.04
4.70	-2.152	-.043	.02	14.40	-.727	.037	-.04
4.80	-2.111	-.044	.02	14.60	-.716	.039	-.04
4.90	-2.071	-.046	.02	14.80	-.705	.042	-.04
5.00	-2.032	-.047	.03	15.00	-.695	.044	-.05

TABLE 3.2(CONTINUED)

GAMMA = 3.60

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-107.040	.940	-.26	5.20	-2.045	-.079	.04
.20	-53.080	.881	-.25	5.40	-1.976	-.080	.04
.30	-35.119	.822	-.23	5.60	-1.911	-.081	.04
.40	-26.158	.764	-.22	5.80	-1.851	-.081	.05
.50	-20.796	.709	-.20	6.00	-1.795	-.081	.05
.60	-17.234	.655	-.19	6.20	-1.742	-.081	.05
.70	-14.699	.603	-.18	6.40	-1.693	-.080	.05
.80	-12.806	.553	-.16	6.60	-1.646	-.079	.05
.90	-11.340	.506	-.15	6.80	-1.602	-.078	.05
1.00	-10.174	.462	-.14	7.00	-1.560	-.076	.05
1.10	-9.224	.420	-.13	7.20	-1.520	-.075	.05
1.20	-8.437	.380	-.12	7.40	-1.483	-.073	.05
1.30	-7.774	.343	-.11	7.60	-1.447	-.071	.05
1.40	-7.209	.309	-.10	7.80	-1.412	-.069	.05
1.50	-6.722	.277	-.09	8.00	-1.380	-.067	.05
1.60	-6.298	.247	-.08	8.20	-1.349	-.065	.05
1.70	-5.925	.219	-.07	8.40	-1.319	-.063	.04
1.80	-5.596	.194	-.07	8.60	-1.290	-.061	.04
1.90	-5.302	.170	-.06	8.80	-1.263	-.059	.04
2.00	-5.040	.148	-.05	9.00	-1.236	-.056	.04
2.10	-4.803	.128	-.05	9.20	-1.211	-.054	.04
2.20	-4.588	.110	-.04	9.40	-1.187	-.051	.04
2.30	-4.393	.092	-.03	9.60	-1.163	-.049	.04
2.40	-4.215	.077	-.03	9.80	-1.141	-.047	.04
2.50	-4.051	.062	-.02	10.00	-1.119	-.044	.03
2.60	-3.901	.049	-.02	10.20	-1.098	-.042	.03
2.70	-3.762	.037	-.01	10.40	-1.078	-.039	.03
2.80	-3.633	.025	-.01	10.60	-1.058	-.037	.03
2.90	-3.514	.015	-.01	10.80	-1.039	-.034	.03
3.00	-3.402	.006	-.00	11.00	-1.021	-.032	.03
3.10	-3.298	-.003	.00	11.20	-1.003	-.029	.02
3.20	-3.201	-.011	.00	11.40	-.986	-.027	.02
3.30	-3.110	-.018	.01	11.60	-.969	-.024	.02
3.40	-3.024	-.025	.01	11.80	-.952	-.022	.02
3.50	-2.943	-.031	.01	12.00	-.937	-.019	.02
3.60	-2.867	-.037	.02	12.20	-.921	-.017	.01
3.70	-2.795	-.042	.02	12.40	-.906	-.014	.01
3.80	-2.726	-.046	.02	12.60	-.892	-.012	.01
3.90	-2.662	-.051	.02	12.80	-.878	-.009	.01
4.00	-2.600	-.054	.03	13.00	-.864	-.007	.01
4.10	-2.541	-.058	.03	13.20	-.850	-.005	.00
4.20	-2.486	-.061	.03	13.40	-.837	-.002	.00
4.30	-2.433	-.064	.03	13.60	-.825	.000	-.00
4.40	-2.382	-.066	.03	13.80	-.812	.003	-.00
4.50	-2.333	-.069	.03	14.00	-.800	.005	-.00
4.60	-2.287	-.071	.04	14.20	-.788	.007	-.01
4.70	-2.242	-.072	.04	14.40	-.777	.010	-.01
4.80	-2.200	-.074	.04	14.60	-.765	.012	-.01
4.90	-2.159	-.075	.04	14.80	-.754	.014	-.01
5.00	-2.119	-.077	.04	15.00	-.743	.016	-.02

TABLE 3.2(CONTINUED)

GAMMA = 3.70

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-110.041	.938	-.25	5.20	-2.129	-.109	.06
.20	-54.582	.877	-.24	5.40	-2.058	-.110	.06
.30	-36.123	.817	-.22	5.60	-1.992	-.111	.06
.40	-26.913	.758	-.21	5.80	-1.931	-.111	.06
.50	-21.402	.701	-.20	6.00	-1.873	-.111	.06
.60	-17.740	.645	-.18	6.20	-1.819	-.111	.06
.70	-15.135	.592	-.17	6.40	-1.768	-.110	.06
.80	-13.189	.541	-.16	6.60	-1.720	-.109	.06
.90	-11.683	.492	-.14	6.80	-1.674	-.108	.06
1.00	-10.484	.447	-.13	7.00	-1.631	-.106	.06
1.10	-9.508	.404	-.12	7.20	-1.590	-.105	.06
1.20	-8.699	.363	-.11	7.40	-1.551	-.103	.06
1.30	-8.018	.325	-.10	7.60	-1.515	-.101	.06
1.40	-7.437	.290	-.09	7.80	-1.479	-.099	.06
1.50	-6.936	.257	-.08	8.00	-1.446	-.097	.06
1.60	-6.500	.226	-.07	8.20	-1.414	-.095	.06
1.70	-6.118	.198	-.07	8.40	-1.383	-.093	.06
1.80	-5.779	.171	-.06	8.60	-1.354	-.090	.06
1.90	-5.477	.147	-.05	8.80	-1.326	-.088	.06
2.00	-5.207	.125	-.04	9.00	-1.299	-.086	.06
2.10	-4.964	.104	-.04	9.20	-1.273	-.083	.06
2.20	-4.743	.085	-.03	9.40	-1.248	-.081	.06
2.30	-4.543	.067	-.02	9.60	-1.223	-.078	.06
2.40	-4.360	.051	-.02	9.80	-1.200	-.076	.06
2.50	-4.192	.036	-.01	10.00	-1.178	-.073	.06
2.60	-4.037	.022	-.01	10.20	-1.156	-.071	.05
2.70	-3.894	.010	-.00	10.40	-1.135	-.068	.05
2.80	-3.762	-.002	.00	10.60	-1.115	-.065	.05
2.90	-3.639	-.012	.00	10.80	-1.096	-.063	.05
3.00	-3.525	-.022	.01	11.00	-1.077	-.060	.05
3.10	-3.418	-.031	.01	11.20	-1.058	-.058	.05
3.20	-3.318	-.039	.02	11.40	-1.041	-.055	.05
3.30	-3.224	-.047	.02	11.60	-1.023	-.053	.04
3.40	-3.136	-.053	.02	11.80	-1.007	-.050	.04
3.50	-3.053	-.060	.03	12.00	-.990	-.047	.04
3.60	-2.974	-.065	.03	12.20	-.975	-.045	.04
3.70	-2.900	-.071	.03	12.40	-.959	-.042	.04
3.80	-2.830	-.075	.03	12.60	-.944	-.040	.03
3.90	-2.763	-.080	.04	12.80	-.930	-.037	.03
4.00	-2.700	-.084	.04	13.00	-.916	-.035	.03
4.10	-2.640	-.087	.04	13.20	-.902	-.032	.03
4.20	-2.583	-.090	.04	13.40	-.888	-.030	.03
4.30	-2.528	-.093	.04	13.60	-.875	-.027	.03
4.40	-2.476	-.096	.05	13.80	-.862	-.025	.02
4.50	-2.426	-.098	.05	14.00	-.850	-.023	.02
4.60	-2.378	-.100	.05	14.20	-.838	-.020	.02
4.70	-2.332	-.102	.05	14.40	-.826	-.018	.02
4.80	-2.288	-.104	.05	14.60	-.814	-.016	.02
4.90	-2.246	-.105	.05	14.80	-.803	-.013	.01
5.00	-2.206	-.107	.05	15.00	-.792	-.011	.01

TABLE 3.2(CONTINUED)

GAMMA = 3.80

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-113.042	.937	-.25	5.20	-2.214	-.138	.07
.20	-56.084	.874	-.23	5.40	-2.141	-.140	.07
.30	-37.126	.812	-.22	5.60	-2.073	-.141	.07
.40	-27.667	.751	-.20	5.80	-2.010	-.141	.07
.50	-22.007	.692	-.19	6.00	-1.951	-.141	.08
.60	-18.247	.635	-.18	6.20	-1.895	-.141	.08
.70	-15.571	.581	-.16	6.40	-1.842	-.140	.08
.80	-13.573	.528	-.15	6.60	-1.793	-.139	.08
.90	-12.026	.479	-.14	6.80	-1.746	-.138	.08
1.00	-10.794	.432	-.12	7.00	-1.702	-.136	.08
1.10	-9.792	.387	-.11	7.20	-1.660	-.135	.08
1.20	-8.961	.346	-.10	7.40	-1.620	-.133	.08
1.30	-8.261	.307	-.09	7.60	-1.583	-.131	.08
1.40	-7.665	.270	-.08	7.80	-1.546	-.129	.08
1.50	-7.151	.237	-.07	8.00	-1.512	-.127	.08
1.60	-6.703	.205	-.06	8.20	-1.479	-.125	.08
1.70	-6.310	.176	-.06	8.40	-1.448	-.122	.08
1.80	-5.962	.149	-.05	8.60	-1.417	-.120	.08
1.90	-5.653	.124	-.04	8.80	-1.388	-.117	.08
2.00	-5.375	.101	-.03	9.00	-1.361	-.115	.08
2.10	-5.125	.080	-.03	9.20	-1.334	-.112	.08
2.20	-4.899	.060	-.02	9.40	-1.308	-.110	.08
2.30	-4.693	.042	-.01	9.60	-1.284	-.107	.08
2.40	-4.505	.025	-.01	9.80	-1.260	-.105	.07
2.50	-4.332	.010	-.00	10.00	-1.237	-.102	.07
2.60	-4.173	-.004	.00	10.20	-1.215	-.099	.07
2.70	-4.027	-.017	.01	10.40	-1.193	-.097	.07
2.80	-3.891	-.029	.01	10.60	-1.172	-.094	.07
2.90	-3.765	-.040	.02	10.80	-1.152	-.092	.07
3.00	-3.647	-.050	.02	11.00	-1.133	-.089	.07
3.10	-3.537	-.059	.02	11.20	-1.114	-.086	.07
3.20	-3.434	-.067	.03	11.40	-1.096	-.084	.07
3.30	-3.338	-.075	.03	11.60	-1.078	-.081	.06
3.40	-3.247	-.082	.03	11.80	-1.061	-.078	.06
3.50	-3.162	-.088	.04	12.00	-1.044	-.076	.06
3.60	-3.082	-.094	.04	12.20	-1.028	-.073	.06
3.70	-3.005	-.100	.04	12.40	-1.012	-.071	.06
3.80	-2.933	-.105	.04	12.60	-.997	-.068	.06
3.90	-2.865	-.109	.05	12.80	-.982	-.065	.06
4.00	-2.800	-.113	.05	13.00	-.967	-.063	.05
4.10	-2.738	-.117	.05	13.20	-.953	-.060	.05
4.20	-2.679	-.120	.05	13.40	-.939	-.058	.05
4.30	-2.623	-.123	.06	13.60	-.926	-.055	.05
4.40	-2.570	-.126	.06	13.80	-.913	-.053	.05
4.50	-2.518	-.128	.06	14.00	-.900	-.050	.05
4.60	-2.469	-.130	.06	14.20	-.887	-.048	.04
4.70	-2.422	-.132	.06	14.40	-.875	-.045	.04
4.80	-2.377	-.134	.06	14.60	-.863	-.043	.04
4.90	-2.334	-.135	.07	14.80	-.852	-.041	.04
5.00	-2.292	-.136	.07	15.00	-.840	-.038	.04

TABLE 3.2(CONTINUED)

GAMMA = 3.90

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-116.043	.935	-.24	5.20	-2.298	-.168	.08
.20	-57.586	.871	-.23	5.40	-2.224	-.170	.08
.30	-38.129	.807	-.21	5.60	-2.154	-.171	.09
.40	-28.421	.745	-.20	5.80	-2.089	-.171	.09
.50	-22.613	.684	-.18	6.00	-2.028	-.171	.09
.60	-18.753	.626	-.17	6.20	-1.971	-.171	.09
.70	-16.007	.570	-.15	6.40	-1.917	-.170	.09
.80	-13.956	.516	-.14	6.60	-1.867	-.169	.09
.90	-12.369	.465	-.13	6.80	-1.819	-.168	.09
1.00	-11.105	.417	-.12	7.00	-1.773	-.166	.09
1.10	-10.076	.371	-.11	7.20	-1.730	-.164	.09
1.20	-9.223	.329	-.09	7.40	-1.689	-.163	.10
1.30	-8.505	.289	-.08	7.60	-1.651	-.161	.10
1.40	-7.893	.251	-.07	7.80	-1.613	-.159	.10
1.50	-7.365	.217	-.07	8.00	-1.578	-.156	.10
1.60	-6.906	.184	-.06	8.20	-1.544	-.154	.10
1.70	-6.502	.154	-.05	8.40	-1.512	-.152	.10
1.80	-6.145	.127	-.04	8.60	-1.481	-.149	.10
1.90	-5.828	.101	-.03	8.80	-1.451	-.147	.09
2.00	-5.543	.077	-.03	9.00	-1.423	-.144	.09
2.10	-5.286	.055	-.02	9.20	-1.395	-.142	.09
2.20	-5.054	.035	-.01	9.40	-1.369	-.139	.09
2.30	-4.843	.017	-.01	9.60	-1.344	-.136	.09
2.40	-4.649	-.000	.00	9.80	-1.319	-.134	.09
2.50	-4.472	-.016	.01	10.00	-1.296	-.131	.09
2.60	-4.309	-.030	.01	10.20	-1.273	-.128	.09
2.70	-4.159	-.044	.02	10.40	-1.251	-.126	.09
2.80	-4.019	-.056	.02	10.60	-1.230	-.123	.09
2.90	-3.890	-.067	.02	10.80	-1.209	-.120	.09
3.00	-3.769	-.077	.03	11.00	-1.189	-.118	.09
3.10	-3.657	-.087	.03	11.20	-1.170	-.115	.09
3.20	-3.551	-.095	.04	11.40	-1.151	-.112	.08
3.30	-3.452	-.103	.04	11.60	-1.133	-.109	.08
3.40	-3.359	-.110	.04	11.80	-1.115	-.107	.08
3.50	-3.272	-.117	.05	12.00	-1.098	-.104	.08
3.60	-3.189	-.123	.05	12.20	-1.081	-.101	.08
3.70	-3.111	-.129	.05	12.40	-1.065	-.099	.08
3.80	-3.037	-.134	.06	12.60	-1.049	-.096	.08
3.90	-2.967	-.138	.06	12.80	-1.034	-.093	.08
4.00	-2.900	-.142	.06	13.00	-1.019	-.091	.07
4.10	-2.837	-.146	.06	13.20	-1.005	-.088	.07
4.20	-2.776	-.149	.06	13.40	-.990	-.086	.07
4.30	-2.719	-.152	.07	13.60	-.977	-.083	.07
4.40	-2.664	-.155	.07	13.80	-.963	-.080	.07
4.50	-2.611	-.158	.07	14.00	-.950	-.078	.07
4.60	-2.561	-.160	.07	14.20	-.937	-.075	.07
4.70	-2.512	-.162	.07	14.40	-.925	-.073	.06
4.80	-2.466	-.164	.08	14.60	-.912	-.070	.06
4.90	-2.422	-.165	.08	14.80	-.900	-.068	.06
5.00	-2.379	-.166	.08	15.00	-.889	-.065	.06

TABLE 3.2(CONTINUED)

GAMMA = 4.00

SKEW	ALPHA	BETA	NSY	SKEW	ALPHA	BETA	NSY
.10	-119.044	.933	-.23	5.20	-2.383	-.198	.09
.20	-59.089	.867	-.22	5.40	-2.306	-.200	.10
.30	-39.132	.802	-.20	5.60	-2.235	-.201	.10
.40	-29.176	.738	-.19	5.80	-2.168	-.201	.10
.50	-23.218	.676	-.18	6.00	-2.106	-.201	.10
.60	-19.260	.616	-.16	6.20	-2.047	-.201	.10
.70	-16.443	.559	-.15	6.40	-1.992	-.200	.10
.80	-14.340	.504	-.13	6.60	-1.940	-.199	.11
.90	-12.712	.451	-.12	6.80	-1.891	-.198	.11
1.00	-11.415	.402	-.11	7.00	-1.844	-.196	.11
1.10	-10.360	.355	-.10	7.20	-1.800	-.194	.11
1.20	-9.485	.311	-.09	7.40	-1.758	-.192	.11
1.30	-8.749	.270	-.08	7.60	-1.718	-.190	.11
1.40	-8.121	.232	-.07	7.80	-1.680	-.188	.11
1.50	-7.580	.196	-.06	8.00	-1.644	-.186	.11
1.60	-7.108	.163	-.05	8.20	-1.610	-.184	.11
1.70	-6.695	.133	-.04	8.40	-1.576	-.181	.11
1.80	-6.329	.104	-.03	8.60	-1.545	-.179	.11
1.90	-6.003	.078	-.02	8.80	-1.514	-.176	.11
2.00	-5.711	.054	-.02	9.00	-1.485	-.174	.11
2.10	-5.447	.031	-.01	9.20	-1.457	-.171	.11
2.20	-5.209	.011	-.00	9.40	-1.430	-.168	.11
2.30	-4.992	-.008	.00	9.60	-1.404	-.166	.11
2.40	-4.794	-.026	.01	9.80	-1.379	-.163	.11
2.50	-4.613	-.042	.01	10.00	-1.354	-.160	.11
2.60	-4.445	-.057	.02	10.20	-1.331	-.157	.11
2.70	-4.291	-.070	.02	10.40	-1.309	-.155	.11
2.80	-4.148	-.083	.03	10.60	-1.287	-.152	.11
2.90	-4.015	-.094	.03	10.80	-1.266	-.149	.11
3.00	-3.892	-.105	.04	11.00	-1.245	-.146	.10
3.10	-3.776	-.115	.04	11.20	-1.225	-.143	.10
3.20	-3.668	-.123	.05	11.40	-1.206	-.141	.10
3.30	-3.566	-.131	.05	11.60	-1.187	-.138	.10
3.40	-3.471	-.139	.05	11.80	-1.169	-.135	.10
3.50	-3.381	-.146	.06	12.00	-1.152	-.132	.10
3.60	-3.296	-.152	.06	12.20	-1.135	-.130	.10
3.70	-3.216	-.158	.06	12.40	-1.118	-.127	.10
3.80	-3.140	-.163	.07	12.60	-1.102	-.124	.10
3.90	-3.068	-.167	.07	12.80	-1.086	-.121	.10
4.00	-3.000	-.172	.07	13.00	-1.071	-.119	.09
4.10	-2.935	-.175	.07	13.20	-1.056	-.116	.09
4.20	-2.873	-.179	.08	13.40	-1.042	-.113	.09
4.30	-2.814	-.182	.08	13.60	-1.027	-.111	.09
4.40	-2.757	-.185	.08	13.80	-1.013	-.108	.09
4.50	-2.704	-.187	.08	14.00	-1.000	-.106	.09
4.60	-2.652	-.190	.08	14.20	-.987	-.103	.09
4.70	-2.602	-.192	.09	14.40	-.974	-.100	.09
4.80	-2.555	-.193	.09	14.60	-.961	-.098	.08
4.90	-2.509	-.195	.09	14.80	-.949	-.095	.08
5.00	-2.466	-.196	.09	15.00	-.937	-.093	.08

Chapter 4

RELATIONSHIPS BETWEEN α, β and γ: $\alpha = \alpha\ (\beta, \gamma)$

4.1 Use of Table 4.1

Functional relationships between α and G_x (dependent variables) and β and γ (independent variables) for three parameter log normally related variates are given in Table 4.1.

Variable names and title headings are the same as for Table 3.1. The values of γ are given in increments 0.05 for $0 < \gamma < 2$ and in increments of 0.10 for $2 < \gamma < 4$.

The values of β are listed in descending order until the minimum value of β is reached (corresponding to $G_x = 5.87$). The minimum value of β is denoted by an M. After the minimum value is reached, increasing value of β are listed, corresponding to the upper branches of Figures 2.3 and 2.4. The listing is terminated after the first value of β for which the corresponding skew value G_x exceeds 15.

Example 4.1:

For illustrative purposes (as in Example 3.1) a three parameter log normal probability distribution is to be fitted to the data of Table 3.1 using the median method. Examining Table 3.1 we see that there are an even number of values, hence the median is the arithmetic average of the 30th and 31st ranked floods:

$$x = 22400/2 + 22400/2 = 22400$$

The estimated median to mean ratio is computed as $\hat{\beta} = 22400/24853 = .901$. Entering Table 4.1, the following values are recorded:

β	γ	α
.910	.50	-.240
.900	.50	-.079
.910	.55	-.534
.900	.55	-.346

After double interpolation, the estimate of α is $\hat{\alpha} = -0.203$. Since the estimated value is relatively small in absolute value, we again elect not to attempt to correct for bias in the estimate of α. The theoretical line is plotted in exactly the same way as in example 3.1. The theoretical and sample cumulative distribution functions are plotted in Figure 4.1.

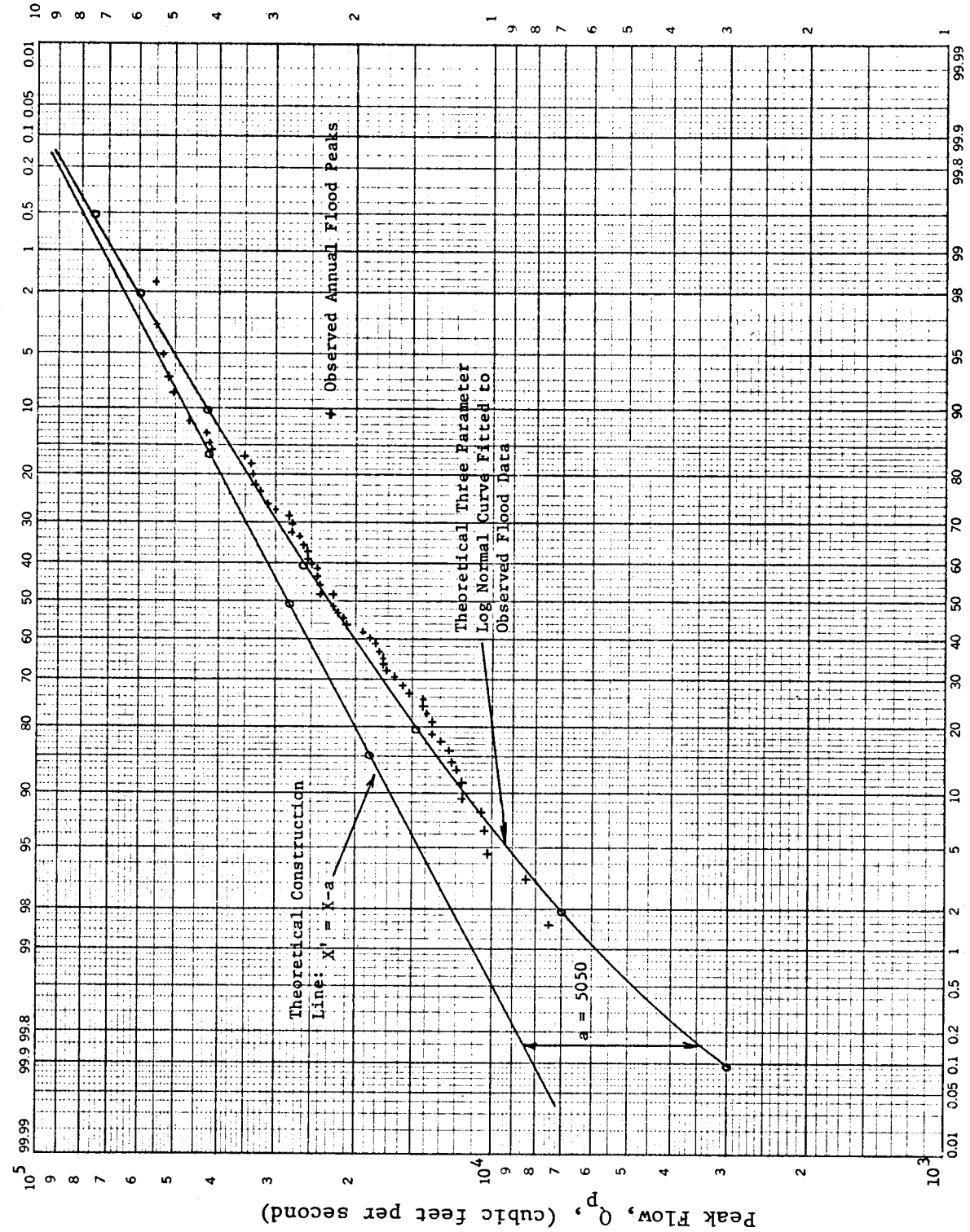

Fig. 4.1 Fit of Three Parameter Distribution to Skykomish River Flood Data Using Median Method.

Table 4.1 α and G_x as Functions of β and γ

GAMMA = .05

BETA	ALPHA	SKEW	NSY
.990	.892	1.49	
.985M	.961	5.87	
.990	.986	61.45	

GAMMA = .10

BETA	ALPHA	SKEW	NSY
.990	.515	.63	
.980	.784	1.49	
.970	.918	5.43	
.970M	.921	5.87	
.970	.925	6.37	
.980	.973	61.45	

GAMMA = .15

BETA	ALPHA	SKEW	NSY
.990	-.110	.41	-17.12
.980	.469	.87	
.970	.676	1.49	
.960	.800	2.67	
.955M	.882	5.87	
.960	.932	17.17	

GAMMA = .20

BETA	ALPHA	SKEW	NSY
.990	-.985	.30	-6.92
.980	.031	.63	
.970	.381	1.00	
.960	.568	1.49	
.950	.696	2.25	
.940	.835	5.43	
.940M	.843	5.87	
.940	.850	6.37	
.950	.921	23.77	

GAMMA = .25

BETA	ALPHA	SKEW	NSY
.990	-2.110	.24	-4.79
.980	-.532	.49	-6.44
.970	.005	.77	
.960	.284	1.09	
.950	.460	1.49	
.940	.591	2.06	
.930	.706	3.16	
.925M	.803	5.87	
.930	.870	12.91	
.940	.909	28.70	

GAMMA = .30

BETA	ALPHA	SKEW	NSY
.990	-3.485	.20	-3.74
.980	-1.220	.41	-4.38
.970	-.454	.63	-5.60
.960	-.062	.87	-10.12
.950	.182	1.15	
.940	.353	1.49	
.930	.485	1.95	
.920	.600	2.67	
.910	.753	5.43	

TABLE 4.1(CONTINUED)

GAMMA = .30 (CONT.)

BETA	ALPHA	SKEW	NSY
.910M	.764	5.87	
.910	.775	6.37	
.920	.863	17.17	

GAMMA = .35

BETA	ALPHA	SKEW	NSY
.990	-5.110	.17	-3.09
.980	-2.032	.35	-3.42
.970	-.996	.53	-3.91
.960	-.469	.73	-4.74
.950	-.145	.95	-6.76
.940	.078	1.19	
.930	.245	1.49	
.920	.379	1.87	
.910	.496	2.42	
.900	.613	3.46	
.895M	.725	5.87	
.900	.806	11.24	
.910	.853	20.73	

GAMMA = .40

BETA	ALPHA	SKEW	NSY
.990	-6.985	.15	-2.65
.980	-2.970	.30	-2.84
.970	-1.621	.46	-3.09
.960	-.938	.63	-3.45
.950	-.522	.81	-4.01
.940	-.237	1.00	-5.08
.930	-.027	1.23	-9.46
.920	.137	1.49	
.910	.272	1.82	
.900	.391	2.25	
.890	.505	2.95	
.880	.670	5.43	

GAMMA = .40 (CONT.)

BETA	ALPHA	SKEW	NSY
.880M	.686	5.87	
.880	.700	6.37	
.890	.803	14.43	
.900	.842	23.77	

GAMMA = .45

BETA	ALPHA	SKEW	NSY
.990	-9.110	.13	-2.32
.980	-4.032	.27	-2.44
.970	-2.329	.41	-2.59
.960	-1.470	.55	-2.78
.950	-.947	.71	-3.05
.940	-.593	.87	-3.43
.930	-.334	1.05	-4.06
.920	-.133	1.25	-5.40
.910	.029	1.49	
.900	.166	1.77	
.890	.286	2.14	
.880	.400	2.67	
.870	.523	3.66	
.865M	.646	5.87	
.870	.739	10.33	
.880	.795	17.17	

GAMMA = .50

BETA	ALPHA	SKEW	NSY
.990	-11.485	.12	-2.07
.980	-5.220	.24	-2.14
.970	-3.121	.37	-2.24
.960	-2.064	.49	-2.36
.950	-1.423	.63	-2.50
.940	-.990	.77	-2.70
.930	-.675	.92	-2.97
.920	-.433	1.09	-3.36

TABLE 4.1(CONTINUED)

GAMMA = .50 (CONT.)

BETA	ALPHA	SKEW	NSY
.910	-.240	1.28	-4.04
.900	-.079	1.49	-5.71
.890	.059	1.74	
.880	.181	2.06	
.870	.296	2.49	
.860	.411	3.16	
.850	.588	5.43	
.850M	.607	5.87	
.850	.625	6.37	
.860	.740	12.91	
.870	.785	19.61	

GAMMA = .55

BETA	ALPHA	SKEW	NSY
.990	-14.110	.11	-1.86
.980	-6.532	.22	-1.92
.970	-3.996	.33	-1.98
.960	-2.720	.45	-2.06
.950	-1.948	.57	-2.15
.940	-1.428	.69	-2.26
.930	-1.051	.82	-2.41
.920	-.763	.97	-2.60
.910	-.534	1.12	-2.86
.900	-.346	1.29	-3.26
.890	-.187	1.49	-3.97
.880	-.048	1.72	-5.99
.870	.076	2.00	
.860	.191	2.36	
.850	.305	2.87	
.840	.433	3.82	
.835M	.568	5.87	
.840	.672	9.74	
.850	.735	15.15	

GAMMA = .60

BETA	ALPHA	SKEW	NSY
.990	-16.985	.10	-1.70
.980	-7.970	.20	-1.74
.970	-4.955	.30	-1.78
.960	-3.439	.41	-1.83
.950	-2.524	.52	-1.89
.940	-1.907	.63	-1.96
.930	-1.462	.75	-2.05
.920	-1.124	.87	-2.16
.910	-.856	1.00	-2.30
.900	-.637	1.15	-2.48
.890	-.453	1.31	-2.74
.880	-.295	1.49	-3.13
.870	-.156	1.70	-3.86
.860	-.030	1.95	-6.28
.850	.087	2.25	
.840	.200	2.67	
.830	.319	3.32	
.820	.506	5.43	
.820M	.528	5.87	
.820	.550	6.37	
.830	.676	11.93	
.840	.727	17.17	

GAMMA = .65

BETA	ALPHA	SKEW	NSY
.990	-20.110	.09	-1.56
.980	-9.532	.19	-1.59
.970	-5.996	.28	-1.62
.960	-4.221	.38	-1.65
.950	-3.149	.47	-1.69
.940	-2.429	.58	-1.74
.930	-1.909	.68	-1.80
.920	-1.515	.79	-1.87
.910	-1.204	.91	-1.95
.900	-.952	1.04	-2.05
.890	-.740	1.17	-2.18
.880	-.560	1.32	-2.36
.870	-.403	1.49	-2.61
.860	-.263	1.68	-2.99
.850	-.136	1.90	-3.72
.840	-.018	2.18	-6.62

TABLE 4.1(CONTINUED)

GAMMA = .65 (CONT.)

BETA	ALPHA	SKEW	NSY
.830	.096	2.53	
.820	.211	3.03	
.810	.344	3.94	
.805M	.489	5.87	
.810	.604	9.33	
.820	.673	13.84	
.830	.717	19.02	

GAMMA = .70

BETA	ALPHA	SKEW	NSY
.990	-23.485	.09	-1.44
.980	-11.220	.17	-1.46
.970	-7.121	.26	-1.48
.960	-5.064	.35	-1.51
.950	-3.824	.44	-1.54
.940	-2.991	.53	-1.57
.930	-2.392	.63	-1.61
.920	-1.938	.73	-1.65
.910	-1.581	.83	-1.71
.900	-1.291	.95	-1.77
.890	-1.050	1.06	-1.85
.880	-.845	1.19	-1.95
.870	-.667	1.33	-2.07
.860	-.511	1.49	-2.24
.850	-.370	1.67	-2.48
.840	-.242	1.87	-2.85
.830	-.123	2.11	-3.58
.820	-.009	2.42	-7.27
.810	.105	2.82	
.800	.227	3.46	
.790	.423	5.43	
.790M	.450	5.87	
.790	.475	6.37	
.800	.611	11.24	
.810	.667	15.57	

GAMMA = .75

BETA	ALPHA	SKEW	NSY
.990	-27.110	.08	-1.34
.980	-13.032	.16	-1.36
.970	-8.330	.24	-1.37
.960	-5.971	.32	-1.39
.950	-4.549	.41	-1.41
.940	-3.596	.49	-1.43
.930	-2.910	.58	-1.46
.920	-2.392	.67	-1.49
.910	-1.984	.77	-1.53
.900	-1.655	.87	-1.57
.890	-1.381	.98	-1.62
.880	-1.149	1.09	-1.68
.870	-.950	1.21	-1.75
.860	-.774	1.34	-1.84
.850	-.619	1.49	-1.96
.840	-.478	1.65	-2.12
.830	-.349	1.84	-2.35
.820	-.228	2.06	-2.71
.810	-.113	2.33	-3.43
.800	.000	2.67	
.790	.117	3.16	
.780	.256	4.04	
.775M	.410	5.87	
.780	.535	9.02	
.790	.610	12.91	
.800	.658	17.17	

GAMMA = .80

BETA	ALPHA	SKEW	NSY
.990	-30.985	.08	-1.26
.980	-14.970	.15	-1.27
.970	-9.621	.23	-1.28
.960	-6.940	.30	-1.29
.950	-5.324	.38	-1.30
.940	-4.242	.46	-1.32
.930	-3.464	.54	-1.34
.920	-2.877	.63	-1.36
.910	-2.416	.72	-1.38
.900	-2.043	.81	-1.41
.890	-1.735	.90	-1.45
.880	-1.474	1.00	-1.48

TABLE 4.1(CONTINUED)

GAMMA = .80 (CONT.)

BETA	ALPHA	SKEW	NSY
.870	-1.250	1.11	-1.53
.860	-1.055	1.23	-1.59
.850	-.882	1.35	-1.66
.840	-.726	1.49	-1.74
.830	-.585	1.64	-1.85
.820	-.455	1.82	-2.00
.810	-.333	2.02	-2.22
.800	-.218	2.25	-2.58
.790	-.104	2.55	-3.31
.780	.010	2.95	
.770	.136	3.57	
.760	.341	5.43	
.760M	.371	5.87	
.760	.400	6.37	
.770	.545	10.73	
.780	.606	14.43	
.790	.649	18.67	

GAMMA = .85

BETA	ALPHA	SKEW	NSY
.990	-35.110	.07	-1.18
.980	-17.032	.14	-1.19
.970	-10.997	.21	-1.19
.960	-7.971	.29	-1.20
.950	-6.149	.36	-1.21
.940	-4.930	.43	-1.22
.930	-4.054	.51	-1.24
.920	-3.393	.59	-1.25
.910	-2.875	.67	-1.27
.900	-2.456	.75	-1.29
.890	-2.111	.84	-1.31
.880	-1.820	.93	-1.34
.870	-1.570	1.03	-1.37
.860	-1.352	1.13	-1.41
.850	-1.161	1.24	-1.45
.840	-.989	1.36	-1.50
.830	-.834	1.49	-1.57
.820	-.693	1.63	-1.65
.810	-.562	1.79	-1.75
.800	-.439	1.98	-1.90
.790	-.322	2.19	-2.11

GAMMA = .85 (CONT.)

BETA	ALPHA	SKEW	NSY
.780	-.209	2.46	-2.45
.770	-.095	2.80	-3.21
.760	.024	3.27	
.750	.168	4.13	
.745M	.332	5.87	
.750	.465	8.78	
.760	.547	12.22	
.770	.599	15.85	

GAMMA = .90

BETA	ALPHA	SKEW	NSY
.990	-39.485	.07	-1.11
.980	-19.220	.13	-1.12
.970	-12.455	.20	-1.12
.960	-9.065	.27	-1.13
.950	-7.024	.34	-1.13
.940	-5.659	.41	-1.14
.930	-4.679	.48	-1.15
.920	-3.940	.55	-1.16
.910	-3.361	.63	-1.17
.900	-2.895	.71	-1.19
.890	-2.510	.79	-1.20
.880	-2.186	.87	-1.22
.870	-1.908	.96	-1.24
.860	-1.667	1.05	-1.27
.850	-1.455	1.15	-1.30
.840	-1.266	1.25	-1.33
.830	-1.097	1.37	-1.37
.820	-.942	1.49	-1.42
.810	-.800	1.62	-1.48
.800	-.669	1.77	-1.56
.790	-.545	1.95	-1.66
.780	-.427	2.14	-1.80
.770	-.313	2.38	-2.00
.760	-.200	2.67	-2.35
.750	-.084	3.06	-3.17
.740	.045	3.66	
.730	.258	5.43	
.730M	.292	5.87	
.730	.325	6.37	
.740	.479	10.33	

TABLE 4.1(CONTINUED)

GAMMA = .90 (CONT.)

BETA	ALPHA	SKEW	NSY
.750	.543	13.58	
.760	.590	17.17	

GAMMA = .95

BETA	ALPHA	SKEW	NSY
.990	-44.110	.06	-1.05
.980	-21.532	.13	-1.06
.970	-13.997	.19	-1.06
.960	-10.221	.25	-1.06
.950	-7.949	.32	-1.07
.940	-6.430	.39	-1.07
.930	-5.340	.45	-1.08
.920	-4.518	.52	-1.08
.910	-3.875	.59	-1.09
.900	-3.358	.66	-1.10
.890	-2.931	.74	-1.11
.880	-2.572	.82	-1.13
.870	-2.265	.90	-1.14
.860	-1.999	.98	-1.16
.850	-1.766	1.07	-1.18
.840	-1.559	1.17	-1.20
.830	-1.373	1.27	-1.23
.820	-1.204	1.37	-1.26
.810	-1.050	1.49	-1.30
.800	-.908	1.62	-1.34
.790	-.776	1.76	-1.40
.780	-.651	1.92	-1.47
.770	-.532	2.10	-1.57
.760	-.417	2.31	-1.70
.750	-.304	2.57	-1.90
.740	-.190	2.90	-2.26
.730	-.068	3.37	-3.22
.720	.080	4.20	
.715M	.253	5.87	
.720	.395	8.59	
.730	.482	11.68	
.740	.538	14.85	
.750	.581	18.42	

GAMMA = 1.00

BETA	ALPHA	SKEW	NSY
.990	-48.985	.06	-1.00
.980	-23.970	.12	-1.00
.970	-15.622	.18	-1.00
.960	-11.440	.24	-1.00
.950	-8.924	.30	-1.01
.940	-7.242	.37	-1.01
.930	-6.036	.43	-1.01
.920	-5.128	.49	-1.02
.910	-4.418	.56	-1.02
.900	-3.846	.63	-1.03
.890	-3.375	.70	-1.04
.880	-2.979	.77	-1.05
.870	-2.641	.84	-1.06
.860	-2.349	.92	-1.07
.850	-2.093	1.00	-1.08
.840	-1.866	1.09	-1.10
.830	-1.663	1.18	-1.11
.820	-1.479	1.28	-1.14
.810	-1.312	1.38	-1.16
.800	-1.158	1.49	-1.19
.790	-1.016	1.61	-1.23
.780	-.883	1.74	-1.27
.770	-.757	1.89	-1.32
.760	-.637	2.06	-1.39
.750	-.522	2.25	-1.49
.740	-.409	2.49	-1.62
.730	-.295	2.78	-1.82
.720	-.177	3.16	-2.20
.710	-.045	3.75	-3.50
.700	.176	5.43	
.700M	.214	5.87	
.700	.250	6.37	
.710	.412	10.01	
.720	.481	12.91	
.730	.530	16.04	

TABLE 4.1(CONTINUED)

GAMMA = 1.05

BETA	ALPHA	SKEW	NSY
.990	-54.110	.06	-.95
.980	-26.532	.11	-.95
.970	-17.330	.17	-.95
.960	-12.721	.23	-.95
.950	-9.950	.29	-.95
.940	-8.097	.35	-.95
.930	-6.769	.41	-.96
.920	-5.769	.47	-.96
.910	-4.987	.53	-.96
.900	-4.359	.60	-.97
.890	-3.841	.66	-.97
.880	-3.407	.73	-.98
.870	-3.037	.80	-.98
.860	-2.716	.87	-.99
.850	-2.436	.95	-1.00
.840	-2.188	1.02	-1.01
.830	-1.967	1.11	-1.02
.820	-1.767	1.19	-1.04
.810	-1.586	1.29	-1.06
.800	-1.419	1.38	-1.08
.790	-1.266	1.49	-1.10
.780	-1.123	1.60	-1.13
.770	-.990	1.73	-1.16
.760	-.863	1.87	-1.20
.750	-.743	2.03	-1.25
.740	-.627	2.21	-1.32
.730	-.513	2.42	-1.41
.720	-.400	2.67	-1.54
.710	-.284	3.00	-1.75
.700	-.160	3.46	-2.17
.690	-.007	4.26	-5.42
.685M	.175	5.87	
.690	.325	8.43	
.700	.417	11.24	
.710	.476	14.06	
.720	.522	17.17	

GAMMA = 1.10

BETA	ALPHA	SKEW	NSY
.990	-59.485	.05	-.91
.980	-29.220	.11	-.91
.970	-19.122	.16	-.91
.960	-14.065	.22	-.91
.950	-11.025	.28	-.91
.940	-8.993	.33	-.91
.930	-7.537	.39	-.91
.920	-6.441	.45	-.91
.910	-5.585	.51	-.91
.900	-4.897	.57	-.91
.890	-4.330	.63	-.92
.880	-3.856	.69	-.92
.870	-3.451	.76	-.92
.860	-3.101	.82	-.93
.850	-2.796	.89	-.93
.840	-2.526	.97	-.94
.830	-2.285	1.04	-.95
.820	-2.068	1.12	-.96
.810	-1.872	1.21	-.97
.800	-1.692	1.29	-.99
.790	-1.527	1.39	-1.00
.780	-1.374	1.49	-1.02
.770	-1.231	1.60	-1.04
.760	-1.097	1.72	-1.07
.750	-.970	1.85	-1.10
.740	-.848	2.00	-1.14
.730	-.731	2.16	-1.19
.720	-.617	2.36	-1.25
.710	-.504	2.58	-1.34
.700	-.390	2.87	-1.47
.690	-.270	3.25	-1.69
.680	-.134	3.82	-2.21
.670	.094	5.43	
.670M	.135	5.87	
.670	.175	6.37	
.680	.344	9.74	
.690	.417	12.37	
.700	.470	15.15	

TABLE 4.1(CONTINUED)

GAMMA = 1.15

BETA	ALPHA	SKEW	NSY
.990	-65.110	.05	-.87
.980	-32.032	.10	-.87
.970	-20.997	.16	-.86
.960	-15.471	.21	-.86
.950	-12.150	.26	-.86
.940	-9.930	.32	-.86
.930	-8.340	.37	-.86
.920	-7.144	.43	-.86
.910	-6.210	.48	-.86
.900	-5.459	.54	-.86
.890	-4.842	.60	-.87
.880	-4.325	.66	-.87
.870	-3.884	.72	-.87
.860	-3.504	.78	-.87
.850	-3.172	.85	-.88
.840	-2.879	.92	-.88
.830	-2.618	.99	-.89
.820	-2.383	1.06	-.89
.810	-2.171	1.14	-.90
.800	-1.977	1.22	-.91
.790	-1.799	1.30	-.92
.780	-1.635	1.39	-.93
.770	-1.482	1.49	-.95
.760	-1.339	1.59	-.97
.750	-1.204	1.71	-.99
.740	-1.076	1.83	-1.01
.730	-.954	1.97	-1.04
.720	-.836	2.12	-1.08
.710	-.722	2.30	-1.13
.700	-.609	2.51	-1.19
.690	-.495	2.76	-1.28
.680	-.378	3.08	-1.42
.670	-.251	3.53	-1.66
.660	-.093	4.32	-2.42
.655M	.096	5.87	
.660	.254	8.29	
.670	.351	10.89	
.680	.414	13.43	
.690	.462	16.19	

GAMMA = 1.20

BETA	ALPHA	SKEW	NSY
.990	-70.985	.05	-.83
.980	-34.970	.10	-.83
.970	-22.955	.15	-.83
.960	-16.940	.20	-.83
.950	-13.325	.25	-.82
.940	-10.909	.30	-.82
.930	-9.180	.36	-.82
.920	-7.879	.41	-.82
.910	-6.863	.46	-.82
.900	-6.047	.52	-.82
.890	-5.377	.57	-.82
.880	-4.815	.63	-.82
.870	-4.337	.69	-.82
.860	-3.925	.75	-.82
.850	-3.565	.81	-.83
.840	-3.247	.87	-.83
.830	-2.965	.94	-.83
.820	-2.711	1.00	-.84
.810	-2.482	1.07	-.84
.800	-2.274	1.15	-.85
.790	-2.082	1.23	-.86
.780	-1.906	1.31	-.86
.770	-1.742	1.40	-.87
.760	-1.590	1.49	-.89
.750	-1.446	1.59	-.90
.740	-1.311	1.70	-.92
.730	-1.183	1.82	-.94
.720	-1.060	1.95	-.96
.710	-.941	2.09	-.99
.700	-.826	2.25	-1.02
.690	-.713	2.45	-1.07
.680	-.600	2.67	-1.13
.670	-.485	2.95	-1.22
.660	-.363	3.32	-1.37
.650	-.224	3.89	-1.66
.640	.011	5.43	
.640M	.057	5.87	
.640	.100	6.37	
.650	.276	9.52	
.660	.353	11.93	
.670	.408	14.43	
.680	.453	17.17	

TABLE 4.1(CONTINUED)

GAMMA = 1.25

BETA	ALPHA	SKEW	NSY
.990	-77.110	.05	-.80
.980	-38.032	.10	-.79
.970	-24.997	.14	-.79
.960	-18.471	.19	-.79
.950	-14.550	.24	-.79
.940	-11.930	.29	-.79
.930	-10.055	.34	-.78
.920	-8.644	.39	-.78
.910	-7.544	.44	-.78
.900	-6.660	.49	-.78
.890	-5.934	.55	-.78
.880	-5.326	.60	-.78
.870	-4.809	.66	-.78
.860	-4.363	.71	-.78
.850	-3.974	.77	-.78
.840	-3.631	.83	-.78
.830	-3.327	.89	-.79
.820	-3.053	.95	-.79
.810	-2.807	1.02	-.79
.800	-2.582	1.09	-.80
.790	-2.377	1.16	-.80
.780	-2.188	1.24	-.81
.770	-2.013	1.32	-.81
.760	-1.850	1.40	-.82
.750	-1.698	1.49	-.83
.740	-1.554	1.59	-.84
.730	-1.419	1.69	-.85
.720	-1.289	1.80	-.87
.710	-1.166	1.92	-.89
.700	-1.047	2.06	-.91
.690	-.931	2.21	-.94
.680	-.817	2.39	-.97
.670	-.704	2.59	-1.02
.660	-.590	2.84	-1.08
.650	-.472	3.16	-1.18
.640	-.342	3.60	-1.33
.630	-.180	4.37	-1.74
.625M	.017	5.87	
.630	.183	8.18	
.640	.285	10.59	
.650	.351	12.91	
.660	.402	15.39	

GAMMA = 1.30

BETA	ALPHA	SKEW	NSY
.990	-83.485	.05	-.77
.980	-41.220	.09	-.76
.970	-27.122	.14	-.76
.960	-20.065	.19	-.76
.950	-15.825	.23	-.76
.940	-12.993	.28	-.75
.930	-10.966	.33	-.75
.920	-9.441	.38	-.75
.910	-8.252	.42	-.75
.900	-7.298	.47	-.75
.890	-6.514	.52	-.75
.880	-5.857	.58	-.74
.870	-5.299	.63	-.74
.860	-4.819	.68	-.74
.850	-4.400	.74	-.74
.840	-4.031	.79	-.74
.830	-3.703	.85	-.75
.820	-3.409	.91	-.75
.810	-3.144	.97	-.75
.800	-2.903	1.04	-.75
.790	-2.683	1.10	-.75
.780	-2.481	1.17	-.76
.770	-2.294	1.25	-.76
.760	-2.120	1.32	-.77
.750	-1.958	1.40	-.77
.740	-1.806	1.49	-.78
.730	-1.662	1.58	-.79
.720	-1.526	1.68	-.80
.710	-1.396	1.79	-.81
.700	-1.272	1.90	-.82
.690	-1.152	2.03	-.84
.680	-1.036	2.18	-.86
.670	-.922	2.34	-.89
.660	-.809	2.53	-.92
.650	-.695	2.75	-.97
.640	-.579	3.03	-1.04
.630	-.455	3.39	-1.13
.620	-.312	3.94	-1.32
.610	-.071	5.43	-2.37
.610M	-.022	5.87	-3.42
.610	.025	6.37	
.620	.207	9.33	
.630	.288	11.56	
.640	.346	13.84	
.650	.394	16.30	

TABLE 4.1(CONTINUED)

GAMMA = 1.35

BETA	ALPHA	SKEW	NSY
.990	-90.110	.04	-.74
.980	-44.532	.09	-.73
.970	-29.330	.13	-.73
.960	-21.721	.18	-.73
.950	-17.150	.22	-.73
.940	-14.097	.27	-.72
.930	-11.912	.31	-.72
.920	-10.269	.36	-.72
.910	-8.988	.41	-.72
.900	-7.960	.46	-.71
.890	-7.116	.50	-.71
.880	-6.410	.55	-.71
.870	-5.810	.60	-.71
.860	-5.293	.65	-.71
.850	-4.842	.71	-.71
.840	-4.446	.76	-.71
.830	-4.093	.81	-.71
.820	-3.778	.87	-.71
.810	-3.494	.93	-.71
.800	-3.236	.99	-.71
.790	-3.001	1.05	-.71
.780	-2.784	1.12	-.71
.770	-2.585	1.18	-.72
.760	-2.400	1.25	-.72
.750	-2.227	1.33	-.72
.740	-2.066	1.41	-.73
.730	-1.913	1.49	-.73
.720	-1.770	1.58	-.74
.710	-1.633	1.67	-.75
.700	-1.503	1.77	-.76
.690	-1.378	1.89	-.77
.680	-1.258	2.01	-.78
.670	-1.141	2.14	-.80
.660	-1.026	2.29	-.82
.650	-.913	2.47	-.85
.640	-.800	2.67	-.88
.630	-.685	2.92	-.93
.620	-.565	3.23	-.99
.610	-.432	3.66	-1.10
.600	-.266	4.41	-1.35
.595M	-.061	5.87	-2.42
.600	.112	8.07	
.610	.218	10.33	
.620	.287	12.47	
.630	.341	14.72	
.640	.385	17.17	

GAMMA = 1.40

BETA	ALPHA	SKEW	NSY
.990	-96.985	.04	-.71
.980	-47.970	.09	-.71
.970	-31.622	.13	-.70
.960	-23.440	.17	-.70
.950	-18.525	.22	-.70
.940	-15.243	.26	-.70
.930	-12.894	.30	-.69
.920	-11.129	.35	-.69
.910	-9.752	.39	-.69
.900	-8.648	.44	-.69
.890	-7.741	.48	-.68
.880	-6.983	.53	-.68
.870	-6.339	.58	-.68
.860	-5.784	.63	-.68
.850	-5.301	.68	-.68
.840	-4.876	.73	-.68
.830	-4.499	.78	-.68
.820	-4.161	.83	-.68
.810	-3.857	.89	-.67
.800	-3.582	.95	-.67
.790	-3.330	1.00	-.68
.780	-3.099	1.06	-.68
.770	-2.886	1.13	-.68
.760	-2.689	1.19	-.68
.750	-2.506	1.26	-.68
.740	-2.334	1.33	-.68
.730	-2.173	1.41	-.69
.720	-2.021	1.49	-.69
.710	-1.877	1.57	-.70
.700	-1.741	1.67	-.70
.690	-1.610	1.76	-.71
.680	-1.484	1.87	-.72
.670	-1.363	1.99	-.73
.660	-1.246	2.11	-.74
.650	-1.131	2.25	-.76
.640	-1.017	2.42	-.78
.630	-.904	2.60	-.80
.620	-.790	2.82	-.84
.610	-.673	3.10	-.89
.600	-.547	3.46	-.96
.590	-.401	4.00	-1.09
.580	-.153	5.43	-1.64
.580M	-.101	5.87	-1.95
.580	-.050	6.37	-2.51
.590	.139	9.17	
.600	.223	11.24	
.610	.284	13.34	
.620	.334	15.57	

TABLE 4.1(CONTINUED)

GAMMA = 1.45

BETA	ALPHA	SKEW	NSY
.990	-104.110	.04	-.69
.980	-51.532	.08	-.68
.970	-33.997	.12	-.68
.960	-25.221	.17	-.68
.950	-19.950	.21	-.67
.940	-16.430	.25	-.67
.930	-13.912	.29	-.67
.920	-12.020	.34	-.66
.910	-10.544	.38	-.66
.900	-9.361	.42	-.66
.890	-8.389	.47	-.66
.880	-7.577	.51	-.65
.870	-6.887	.56	-.65
.860	-6.293	.60	-.65
.850	-5.777	.65	-.65
.840	-5.322	.70	-.65
.830	-4.919	.75	-.65
.820	-4.558	.80	-.64
.810	-4.233	.85	-.64
.800	-3.939	.91	-.64
.790	-3.671	.96	-.64
.780	-3.425	1.02	-.64
.770	-3.199	1.08	-.64
.760	-2.989	1.14	-.64
.750	-2.794	1.20	-.64
.740	-2.612	1.27	-.65
.730	-2.442	1.34	-.65
.720	-2.281	1.41	-.65
.710	-2.129	1.49	-.65
.700	-1.985	1.57	-.66
.690	-1.848	1.66	-.66
.680	-1.717	1.75	-.67
.670	-1.591	1.85	-.67
.660	-1.469	1.96	-.68
.650	-1.351	2.09	-.69
.640	-1.235	2.22	-.70
.630	-1.122	2.37	-.72
.620	-1.009	2.54	-.74
.610	-.895	2.74	-.77
.600	-.779	2.99	-.80
.590	-.657	3.29	-.85
.580	-.522	3.72	-.93
.570	-.352	4.45	-1.10
.565M	-.140	5.87	-1.65
.570	.041	7.99	
.580	.151	10.11	
.590	.223	12.10	
.600	.279	14.16	

GAMMA = 1.45 (CONT.)

BETA	ALPHA	SKEW	NSY
.610	.326	16.39	

GAMMA = 1.50

BETA	ALPHA	SKEW	NSY
.990	-111.485	.04	-.66
.980	-55.220	.08	-.66
.970	-36.455	.12	-.66
.960	-27.065	.16	-.65
.950	-21.425	.20	-.65
.940	-17.660	.24	-.65
.930	-14.966	.28	-.64
.920	-12.942	.32	-.64
.910	-11.364	.37	-.64
.900	-10.098	.41	-.63
.890	-9.060	.45	-.63
.880	-8.192	.49	-.63
.870	-7.455	.54	-.63
.860	-6.821	.58	-.62
.850	-6.269	.63	-.62
.840	-5.783	.67	-.62
.830	-5.353	.72	-.62
.820	-4.969	.77	-.62
.810	-4.623	.82	-.62
.800	-4.309	.87	-.61
.790	-4.024	.92	-.61
.780	-3.762	.98	-.61
.770	-3.521	1.03	-.61
.760	-3.299	1.09	-.61
.750	-3.092	1.15	-.61
.740	-2.899	1.21	-.61
.730	-2.719	1.28	-.61
.720	-2.549	1.34	-.61
.710	-2.389	1.41	-.62
.700	-2.237	1.49	-.62
.690	-2.093	1.57	-.62
.680	-1.956	1.65	-.62
.670	-1.824	1.74	-.63
.660	-1.697	1.84	-.63
.650	-1.575	1.95	-.64
.640	-1.456	2.06	-.65
.630	-1.340	2.19	-.66

TABLE 4.1(CONTINUED)

GAMMA = 1.50 (CONT.)

BETA	ALPHA	SKEW	NSY
.620	-1.226	2.33	-.67
.610	-1.113	2.49	-.68
.600	-1.000	2.67	-.70
.590	-.885	2.89	-.73
.580	-.766	3.16	-.76
.570	-.638	3.52	-.82
.560	-.489	4.04	-.91
.550	-.236	5.43	-1.26
.550M	-.179	5.87	-1.43
.550	-.125	6.37	-1.67
.560	.069	9.02	
.570	.157	10.97	
.580	.221	12.91	
.590	.273	14.96	
.600	.317	17.17	

GAMMA = 1.55

BETA	ALPHA	SKEW	NSY
.990	-119.110	.04	-.64
.980	-59.032	.08	-.64
.970	-38.997	.12	-.63
.960	-28.971	.16	-.63
.950	-22.950	.19	-.63
.940	-18.930	.23	-.62
.930	-16.055	.27	-.62
.920	-13.895	.31	-.62
.910	-12.211	.35	-.61
.900	-10.861	.39	-.61
.890	-9.753	.44	-.61
.880	-8.827	.48	-.61
.870	-8.042	.52	-.60
.860	-7.366	.56	-.60
.850	-6.777	.61	-.60
.840	-6.261	.65	-.60
.830	-5.802	.70	-.59
.820	-5.393	.74	-.59
.810	-5.025	.79	-.59
.800	-4.692	.84	-.59
.790	-4.388	.89	-.59
.780	-4.110	.94	-.59
.770	-3.855	.99	-.58

GAMMA = 1.55 (CONT.)

BETA	ALPHA	SKEW	NSY
.760	-3.619	1.04	-.58
.750	-3.399	1.10	-.58
.740	-3.195	1.16	-.58
.730	-3.004	1.22	-.58
.720	-2.825	1.28	-.58
.710	-2.656	1.35	-.58
.700	-2.497	1.42	-.58
.690	-2.345	1.49	-.58
.680	-2.201	1.57	-.59
.670	-2.063	1.65	-.59
.660	-1.931	1.73	-.59
.650	-1.804	1.83	-.60
.640	-1.681	1.93	-.60
.630	-1.561	2.04	-.61
.620	-1.445	2.16	-.61
.610	-1.330	2.29	-.62
.600	-1.217	2.44	-.64
.590	-1.104	2.61	-.65
.580	-.990	2.81	-.67
.570	-.873	3.05	-.70
.560	-.750	3.35	-.73
.550	-.612	3.77	-.79
.540	-.438	4.49	-.92
.535M	-.219	5.87	-1.26
.540	-.031	7.91	-2.68
.550	.084	9.92	
.560	.158	11.78	
.570	.217	13.69	
.580	.265	15.72	

GAMMA = 1.60

BETA	ALPHA	SKEW	NSY
.990	-126.985	.04	-.62
.980	-62.970	.08	-.62
.970	-41.622	.11	-.61
.960	-30.940	.15	-.61
.950	-24.525	.19	-.61
.940	-20.243	.23	-.60
.930	-17.180	.26	-.60
.920	-14.879	.30	-.60
.910	-13.086	.34	-.59

TABLE 4.1(CONTINUED)

GAMMA = 1.60 (CONT.)

BETA	ALPHA	SKEW	NSY
.900	-11.648	.38	-.59
.890	-10.469	.42	-.59
.880	-9.484	.46	-.58
.870	-8.648	.50	-.58
.860	-7.928	.54	-.58
.850	-7.303	.59	-.58
.840	-6.753	.63	-.57
.830	-6.266	.67	-.57
.820	-5.831	.72	-.57
.810	-5.440	.76	-.57
.800	-5.086	.81	-.57
.790	-4.764	.85	-.56
.780	-4.470	.90	-.56
.770	-4.199	.95	-.56
.760	-3.949	1.00	-.56
.750	-3.717	1.06	-.56
.740	-3.501	1.11	-.56
.730	-3.299	1.17	-.56
.720	-3.110	1.23	-.55
.710	-2.932	1.29	-.55
.700	-2.764	1.35	-.55
.690	-2.604	1.42	-.55
.680	-2.453	1.49	-.55
.670	-2.309	1.56	-.56
.660	-2.171	1.64	-.56
.650	-2.038	1.73	-.56
.640	-1.910	1.82	-.56
.630	-1.787	1.91	-.57
.620	-1.667	2.02	-.57
.610	-1.550	2.13	-.58
.600	-1.435	2.25	-.58
.590	-1.322	2.39	-.59
.580	-1.209	2.55	-.60
.570	-1.095	2.74	-.62
.560	-.980	2.95	-.64
.550	-.859	3.22	-.66
.540	-.729	3.57	-.70
.530	-.577	4.09	-.77
.520	-.318	5.43	-1.02
.520M	-.258	5.87	-1.12
.520	-.200	6.37	-1.27
.530	.000	8.90	
.540	.091	10.73	
.550	.157	12.54	
.560	.211	14.43	
.570	.257	16.46	

GAMMA = 1.65

BETA	ALPHA	SKEW	NSY
.990	-135.110	.04	-.60
.980	-67.032	.07	-.60
.970	-44.330	.11	-.59
.960	-32.971	.15	-.59
.950	-26.150	.18	-.59
.940	-21.597	.22	-.58
.930	-18.341	.26	-.58
.920	-15.895	.29	-.58
.910	-13.989	.33	-.57
.900	-12.461	.37	-.57
.890	-11.208	.41	-.57
.880	-10.161	.45	-.56
.870	-9.273	.49	-.56
.860	-8.509	.53	-.56
.850	-7.845	.57	-.56
.840	-7.261	.61	-.55
.830	-6.745	.65	-.55
.820	-6.283	.69	-.55
.810	-5.869	.73	-.55
.800	-5.493	.78	-.54
.790	-5.152	.82	-.54
.780	-4.840	.87	-.54
.770	-4.553	.92	-.54
.760	-4.289	.97	-.54
.750	-4.044	1.02	-.53
.740	-3.815	1.07	-.53
.730	-3.602	1.12	-.53
.720	-3.403	1.18	-.53
.710	-3.215	1.23	-.53
.700	-3.038	1.29	-.53
.690	-2.871	1.36	-.53
.680	-2.712	1.42	-.53
.670	-2.561	1.49	-.53
.660	-2.416	1.56	-.53
.650	-2.278	1.64	-.53
.640	-2.145	1.72	-.53
.630	-2.017	1.80	-.53
.620	-1.893	1.90	-.53
.610	-1.772	2.00	-.54
.600	-1.655	2.10	-.54
.590	-1.540	2.22	-.55
.580	-1.426	2.36	-.55
.570	-1.313	2.50	-.56
.560	-1.200	2.67	-.57
.550	-1.085	2.87	-.59
.540	-.967	3.11	-.61
.530	-.842	3.41	-.64
.520	-.702	3.82	-.68

TABLE 4.1(CONTINUED)

GAMMA = 1.65 (CONT.)

BETA	ALPHA	SKEW	NSY
.510	-.523	4.52	-.77
.505M	-.297	5.87	-1.01
.510	-.103	7.84	-1.65
.520	.016	9.74	
.530	.094	11.49	
.540	.154	13.27	
.550	.205	15.15	

GAMMA = 1.70

BETA	ALPHA	SKEW	NSY
.990	-143.485	.04	-.58
.980	-71.220	.07	-.58
.970	-47.122	.11	-.58
.960	-35.065	.14	-.57
.950	-27.825	.18	-.57
.940	-22.993	.21	-.57
.930	-19.537	.25	-.56
.920	-16.942	.29	-.56
.910	-14.920	.32	-.56
.900	-13.299	.36	-.55
.890	-11.969	.40	-.55
.880	-10.859	.43	-.55
.870	-9.917	.47	-.54
.860	-9.107	.51	-.54
.850	-8.403	.55	-.54
.840	-7.785	.59	-.53
.830	-7.238	.63	-.53
.820	-6.749	.67	-.53
.810	-6.310	.71	-.53
.800	-5.913	.75	-.52
.790	-5.552	.80	-.52
.780	-5.222	.84	-.52
.770	-4.919	.89	-.52
.760	-4.639	.93	-.51
.750	-4.380	.98	-.51
.740	-4.140	1.03	-.51
.730	-3.915	1.08	-.51
.720	-3.705	1.13	-.51
.710	-3.507	1.19	-.51
.700	-3.321	1.24	-.50
.690	-3.145	1.30	-.50

GAMMA = 1.70 (CONT.)

BETA	ALPHA	SKEW	NSY
.680	-2.978	1.36	-.50
.670	-2.820	1.42	-.50
.660	-2.669	1.49	-.50
.650	-2.524	1.56	-.50
.640	-2.386	1.63	-.50
.630	-2.252	1.71	-.50
.620	-2.124	1.79	-.50
.610	-1.999	1.88	-.50
.600	-1.878	1.98	-.51
.590	-1.760	2.08	-.51
.580	-1.644	2.19	-.51
.570	-1.530	2.32	-.52
.560	-1.417	2.46	-.53
.550	-1.304	2.61	-.53
.540	-1.190	2.80	-.54
.530	-1.074	3.01	-.56
.520	-.952	3.27	-.58
.510	-.820	3.62	-.61
.500	-.665	4.13	-.66
.490	-.401	5.43	-.84
.490M	-.336	5.87	-.92
.490	-.275	6.37	-1.01
.500	-.070	8.78	-1.87
.510	.024	10.52	
.520	.093	12.22	
.530	.149	13.98	
.540	.197	15.85	

GAMMA = 1.75

BETA	ALPHA	SKEW	NSY
.990	-152.110	.03	-.57
.980	-75.532	.07	-.56
.970	-49.997	.10	-.56
.960	-37.221	.14	-.56
.950	-29.550	.17	-.55
.940	-24.431	.21	-.55
.930	-20.770	.24	-.55
.920	-18.020	.28	-.54
.910	-15.878	.31	-.54
.900	-14.161	.35	-.54
.890	-12.754	.38	-.53

TABLE 4.1(CONTINUED)

GAMMA = 1.75 (CONT.)

BETA	ALPHA	SKEW	NSY
.880	-11.578	.42	-.53
.870	-10.581	.46	-.53
.860	-9.724	.49	-.52
.850	-8.979	.53	-.52
.840	-8.325	.57	-.52
.830	-7.746	.61	-.51
.820	-7.229	.65	-.51
.810	-6.765	.69	-.51
.800	-6.345	.73	-.51
.790	-5.964	.77	-.50
.780	-5.615	.81	-.50
.770	-5.295	.86	-.50
.760	-5.000	.90	-.50
.750	-4.727	.95	-.49
.740	-4.473	.99	-.49
.730	-4.237	1.04	-.49
.720	-4.015	1.09	-.49
.710	-3.807	1.14	-.48
.700	-3.612	1.19	-.48
.690	-3.427	1.25	-.48
.680	-3.252	1.30	-.48
.670	-3.086	1.36	-.48
.660	-2.928	1.43	-.48
.650	-2.777	1.49	-.48
.640	-2.632	1.56	-.48
.630	-2.493	1.63	-.48
.620	-2.360	1.70	-.48
.610	-2.231	1.78	-.48
.600	-2.105	1.87	-.48
.590	-1.984	1.96	-.48
.580	-1.865	2.06	-.48
.570	-1.749	2.17	-.48
.560	-1.635	2.29	-.49
.550	-1.522	2.42	-.49
.540	-1.409	2.56	-.50
.530	-1.295	2.73	-.51
.520	-1.180	2.93	-.52
.510	-1.060	3.16	-.53
.500	-.933	3.46	-.55
.490	-.791	3.86	-.59
.480	-.609	4.55	-.66
.475M	-.376	5.87	-.83
.480	-.175	7.77	-1.22
.490	-.052	9.59	-2.03
.500	.028	11.24	
.510	.091	12.91	
.520	.143	14.66	
.530	.189	16.52	

GAMMA = 1.80

BETA	ALPHA	SKEW	NSY
.990	-160.985	.03	-.55
.980	-79.970	.07	-.55
.970	-52.955	.10	-.54
.960	-39.440	.13	-.54
.950	-31.325	.17	-.54
.940	-25.910	.20	-.53
.930	-22.037	.23	-.53
.920	-19.129	.27	-.53
.910	-16.864	.30	-.52
.900	-15.049	.34	-.52
.890	-13.561	.37	-.52
.880	-12.318	.41	-.51
.870	-11.264	.44	-.51
.860	-10.358	.48	-.51
.850	-9.571	.52	-.50
.840	-8.880	.55	-.50
.830	-8.268	.59	-.50
.820	-7.722	.63	-.49
.810	-7.232	.67	-.49
.800	-6.789	.71	-.49
.790	-6.387	.75	-.49
.780	-6.019	.79	-.48
.770	-5.682	.83	-.48
.760	-5.371	.87	-.48
.750	-5.083	.91	-.48
.740	-4.816	.96	-.47
.730	-4.567	1.00	-.47
.720	-4.334	1.05	-.47
.710	-4.116	1.10	-.47
.700	-3.910	1.15	-.46
.690	-3.716	1.20	-.46
.680	-3.533	1.25	-.46
.670	-3.359	1.31	-.46
.660	-3.193	1.37	-.46
.650	-3.036	1.43	-.46
.640	-2.885	1.49	-.45
.630	-2.740	1.56	-.45
.620	-2.601	1.62	-.45
.610	-2.467	1.70	-.45
.600	-2.337	1.77	-.45
.590	-2.212	1.86	-.45
.580	-2.090	1.95	-.45
.570	-1.971	2.04	-.45
.560	-1.854	2.14	-.46
.550	-1.739	2.25	-.46
.540	-1.626	2.38	-.46
.530	-1.513	2.52	-.47
.520	-1.400	2.67	-.47

TABLE 4.1(CONTINUED)

GAMMA = 1.80 (CONT.)

BETA	ALPHA	SKEW	NSY
.510	-1.285	2.85	-.48
.500	-1.168	3.06	-.49
.490	-1.044	3.32	-.51
.480	-.910	3.66	-.53
.470	-.752	4.17	-.57
.460	-.483	5.43	-.70
.459M	-.415	5.87	-.76
.460	-.350	6.37	-.83
.470	-.140	8.68	-1.32
.480	-.042	10.33	-2.14
.490	.029	11.93	
.500	.087	13.58	
.510	.137	15.31	

GAMMA = 1.85

BETA	ALPHA	SKEW	NSY
.990	-170.110	.03	-.54
.980	-84.532	.06	-.53
.970	-55.997	.10	-.53
.960	-41.721	.13	-.53
.950	-33.150	.16	-.52
.940	-27.431	.20	-.52
.930	-23.341	.23	-.51
.920	-20.270	.26	-.51
.910	-17.878	.29	-.51
.900	-15.961	.33	-.50
.890	-14.390	.36	-.50
.880	-13.078	.40	-.50
.870	-11.966	.43	-.49
.860	-11.010	.47	-.49
.850	-10.179	.50	-.49
.840	-9.450	.54	-.48
.830	-8.805	.57	-.48
.820	-8.230	.61	-.48
.810	-7.713	.65	-.48
.800	-7.246	.68	-.47
.790	-6.822	.72	-.47
.780	-6.435	.76	-.47
.770	-6.080	.80	-.46
.760	-5.752	.84	-.46
.750	-5.450	.88	-.46

GAMMA = 1.85 (CONT.)

BETA	ALPHA	SKEW	NSY
.740	-5.169	.93	-.46
.730	-4.907	.97	-.45
.720	-4.662	1.02	-.45
.710	-4.433	1.06	-.45
.700	-4.217	1.11	-.45
.690	-4.014	1.16	-.44
.680	-3.821	1.21	-.44
.670	-3.639	1.26	-.44
.660	-3.466	1.31	-.44
.650	-3.301	1.37	-.44
.640	-3.143	1.43	-.43
.630	-2.992	1.49	-.43
.620	-2.848	1.55	-.43
.610	-2.708	1.62	-.43
.600	-2.574	1.69	-.43
.590	-2.444	1.77	-.43
.580	-2.318	1.85	-.43
.570	-2.196	1.93	-.43
.560	-2.076	2.02	-.43
.550	-1.959	2.12	-.43
.540	-1.844	2.23	-.43
.530	-1.730	2.34	-.43
.520	-1.617	2.47	-.44
.510	-1.504	2.62	-.44
.500	-1.391	2.79	-.45
.490	-1.274	2.98	-.46
.480	-1.153	3.21	-.47
.470	-1.025	3.50	-.48
.460	-.880	3.91	-.51
.450	-.694	4.58	-.56
.444M	-.454	5.87	-.70
.450	-.247	7.72	-.96
.460	-.120	9.46	-1.37
.470	-.037	11.02	-2.18
.480	.027	12.59	
.490	.082	14.22	
.500	.129	15.95	

TABLE 4.1(CONTINUED)

GAMMA = 1.90

BETA	ALPHA	SKEW	NSY
.990	-179.485	.03	-.52
.980	-89.220	.06	-.52
.970	-59.122	.09	-.52
.960	-44.065	.13	-.51
.950	-35.025	.16	-.51
.940	-28.993	.19	-.50
.930	-24.680	.22	-.50
.920	-21.442	.25	-.50
.910	-18.920	.29	-.49
.900	-16.899	.32	-.49
.890	-15.243	.35	-.49
.880	-13.860	.39	-.48
.870	-12.687	.42	-.48
.860	-11.680	.45	-.48
.850	-10.804	.49	-.47
.840	-10.037	.52	-.47
.830	-9.357	.56	-.47
.820	-8.751	.59	-.46
.810	-8.207	.63	-.46
.800	-7.716	.66	-.46
.790	-7.269	.70	-.45
.780	-6.862	.74	-.45
.770	-6.488	.78	-.45
.760	-6.144	.82	-.45
.750	-5.826	.86	-.44
.740	-5.531	.90	-.44
.730	-5.256	.94	-.44
.720	-4.999	.98	-.44
.710	-4.758	1.03	-.43
.700	-4.532	1.07	-.43
.690	-4.319	1.12	-.43
.680	-4.117	1.17	-.43
.670	-3.926	1.21	-.42
.660	-3.745	1.27	-.42
.650	-3.573	1.32	-.42
.640	-3.408	1.37	-.42
.630	-3.251	1.43	-.42
.620	-3.100	1.49	-.41
.610	-2.956	1.55	-.41
.600	-2.816	1.62	-.41
.590	-2.681	1.69	-.41
.580	-2.551	1.76	-.41
.570	-2.425	1.84	-.41
.560	-2.302	1.92	-.41
.550	-2.182	2.00	-.41
.540	-2.064	2.10	-.41
.530	-1.949	2.20	-.41
.520	-1.835	2.31	-.41

GAMMA = 1.90 (CONT.)

BETA	ALPHA	SKEW	NSY
.510	-1.722	2.43	-.41
.500	-1.609	2.57	-.41
.490	-1.495	2.73	-.42
.480	-1.380	2.90	-.43
.470	-1.261	3.11	-.43
.460	-1.136	3.37	-.45
.450	-1.000	3.71	-.46
.440	-.839	4.20	-.49
.430	-.565	5.43	-.59
.429M	-.494	5.87	-.64
.430	-.425	6.37	-.69
.440	-.210	8.59	-1.01
.450	-.109	10.16	-1.39
.460	-.036	11.68	-2.17
.470	.024	13.22	
.480	.075	14.85	
.490	.121	16.57	

GAMMA = 1.95

BETA	ALPHA	SKEW	NSY
.990	-189.110	.03	-.51
.980	-94.032	.06	-.51
.970	-62.330	.09	-.50
.960	-46.471	.12	-.50
.950	-36.950	.15	-.49
.940	-30.597	.19	-.49
.930	-26.055	.22	-.49
.920	-22.645	.25	-.48
.910	-19.989	.28	-.48
.900	-17.861	.31	-.48
.890	-16.118	.34	-.47
.880	-14.662	.38	-.47
.870	-13.428	.41	-.47
.860	-12.367	.44	-.46
.850	-11.446	.47	-.46
.840	-10.638	.51	-.46
.830	-9.923	.54	-.45
.820	-9.286	.58	-.45
.810	-8.714	.61	-.45
.800	-8.197	.65	-.44
.790	-7.728	.68	-.44

TABLE 4.1(CONTINUED)

GAMMA = 1.95 (CONT.)

BETA	ALPHA	SKEW	NSY
.780	-7.300	.72	-.44
.770	-6.907	.75	-.43
.760	-6.546	.79	-.43
.750	-6.212	.83	-.43
.740	-5.902	.87	-.43
.730	-5.613	.91	-.42
.720	-5.344	.95	-.42
.710	-5.092	.99	-.42
.700	-4.855	1.04	-.42
.690	-4.631	1.08	-.41
.680	-4.421	1.13	-.41
.670	-4.221	1.17	-.41
.660	-4.032	1.22	-.41
.650	-3.852	1.27	-.40
.640	-3.680	1.32	-.40
.630	-3.516	1.38	-.40
.620	-3.359	1.43	-.40
.610	-3.208	1.49	-.39
.600	-3.063	1.55	-.39
.590	-2.924	1.61	-.39
.580	-2.789	1.68	-.39
.570	-2.658	1.75	-.39
.560	-2.531	1.82	-.39
.550	-2.408	1.90	-.39
.540	-2.287	1.99	-.39
.530	-2.169	2.08	-.39
.520	-2.054	2.18	-.39
.510	-1.939	2.28	-.39
.500	-1.826	2.40	-.39
.490	-1.713	2.53	-.39
.480	-1.600	2.67	-.39
.470	-1.486	2.84	-.40
.460	-1.368	3.03	-.40
.450	-1.246	3.26	-.41
.440	-1.116	3.55	-.42
.430	-.969	3.94	-.44
.420	-.779	4.61	-.49
.414M	-.533	5.87	-.59
.420	-.319	7.67	-.78
.430	-.189	9.33	-1.04
.440	-.103	10.82	-1.39
.450	-.036	12.30	-2.11
.460	.020	13.84	
.470	.068	15.45	

GAMMA = 2.00

BETA	ALPHA	SKEW	NSY
.990	-198.985	.03	-.50
.980	-98.970	.06	-.49
.970	-65.622	.09	-.49
.960	-48.940	.12	-.49
.950	-38.925	.15	-.48
.940	-32.243	.18	-.48
.930	-27.466	.21	-.47
.920	-23.879	.24	-.47
.910	-21.086	.27	-.47
.900	-18.849	.30	-.46
.890	-17.015	.33	-.46
.880	-15.485	.37	-.46
.870	-14.187	.40	-.45
.860	-13.073	.43	-.45
.850	-12.105	.46	-.45
.840	-11.256	.49	-.44
.830	-10.505	.53	-.44
.820	-9.835	.56	-.44
.810	-9.234	.59	-.43
.800	-8.692	.63	-.43
.790	-8.199	.66	-.43
.780	-7.749	.70	-.42
.770	-7.338	.73	-.42
.760	-6.958	.77	-.42
.750	-6.608	.81	-.42
.740	-6.283	.84	-.41
.730	-5.980	.88	-.41
.720	-5.698	.92	-.41
.710	-5.434	.96	-.40
.700	-5.186	1.00	-.40
.690	-4.952	1.05	-.40
.680	-4.732	1.09	-.40
.670	-4.523	1.13	-.39
.660	-4.325	1.18	-.39
.650	-4.137	1.23	-.39
.640	-3.958	1.28	-.39
.630	-3.787	1.33	-.38
.620	-3.624	1.38	-.38
.610	-3.467	1.43	-.38
.600	-3.316	1.49	-.38
.590	-3.171	1.55	-.38
.580	-3.031	1.61	-.37
.570	-2.896	1.68	-.37
.560	-2.765	1.74	-.37
.550	-2.638	1.82	-.37
.540	-2.514	1.89	-.37
.530	-2.393	1.97	-.37
.520	-2.275	2.06	-.37

TABLE 4.1(CONTINUED)

GAMMA = 2.00 (CONT.)

BETA	ALPHA	SKEW	NSY
.510	-2.158	2.15	-.37
.500	-2.044	2.25	-.37
.490	-1.930	2.37	-.37
.480	-1.817	2.49	-.37
.470	-1.704	2.62	-.37
.460	-1.591	2.78	-.37
.450	-1.475	2.95	-.38
.440	-1.355	3.16	-.38
.430	-1.228	3.42	-.39
.420	-1.090	3.75	-.40
.410	-.926	4.23	-.43
.400	-.648	5.43	-.51
.399M	-.572	5.87	-.54
.400	-.500	6.37	-.58
.410	-.280	8.50	-.81
.420	-.177	10.01	-1.04
.430	-.101	11.45	-1.38
.440	-.039	12.91	-2.02
.450	.014	14.43	
.460	.061	16.04	

GAMMA = 2.10

BETA	ALPHA	SKEW	NSY
.990	-219.485	.03	-.47
.980	-109.220	.06	-.47
.970	-72.455	.09	-.47
.960	-54.065	.11	-.46
.950	-43.025	.14	-.46
.940	-35.660	.17	-.45
.930	-30.395	.20	-.45
.920	-26.442	.23	-.45
.910	-23.364	.26	-.44
.900	-20.899	.29	-.44
.890	-18.879	.32	-.44
.880	-17.193	.35	-.43
.870	-15.765	.38	-.43
.860	-14.537	.41	-.43
.850	-13.472	.44	-.42
.840	-12.537	.47	-.42
.830	-11.711	.50	-.42
.820	-10.974	.53	-.41

GAMMA = 2.10 (CONT.)

BETA	ALPHA	SKEW	NSY
.810	-10.314	.56	-.41
.800	-9.717	.60	-.41
.790	-9.176	.63	-.40
.780	-8.682	.66	-.40
.770	-8.230	.69	-.40
.760	-7.814	.73	-.40
.750	-7.430	.76	-.39
.740	-7.073	.80	-.39
.730	-6.742	.83	-.39
.720	-6.433	.87	-.38
.710	-6.144	.91	-.38
.700	-5.872	.95	-.38
.690	-5.617	.98	-.37
.680	-5.376	1.02	-.37
.670	-5.149	1.06	-.37
.660	-4.933	1.11	-.37
.650	-4.729	1.15	-.36
.640	-4.534	1.19	-.36
.630	-4.348	1.24	-.36
.620	-4.171	1.29	-.35
.610	-4.001	1.33	-.35
.600	-3.839	1.38	-.35
.590	-3.682	1.44	-.35
.580	-3.532	1.49	-.34
.570	-3.387	1.55	-.34
.560	-3.247	1.60	-.34
.550	-3.111	1.67	-.34
.540	-2.979	1.73	-.34
.530	-2.851	1.80	-.33
.520	-2.727	1.87	-.33
.510	-2.605	1.95	-.33
.500	-2.486	2.03	-.33
.490	-2.368	2.11	-.33
.480	-2.253	2.21	-.33
.470	-2.139	2.31	-.33
.460	-2.026	2.42	-.33
.450	-1.913	2.54	-.33
.440	-1.800	2.67	-.33
.430	-1.686	2.82	-.33
.420	-1.569	3.00	-.33
.410	-1.448	3.21	-.34
.400	-1.320	3.46	-.34
.390	-1.180	3.79	-.35
.380	-1.013	4.26	-.37
.370	-.730	5.43	-.43
.369M	-.651	5.87	-.46
.370	-.575	6.37	-.49
.380	-.350	8.43	-.66

TABLE 4.1(CONTINUED)

GAMMA = 2.10 (CONT.)

BETA	ALPHA	SKEW	NSY
.390	-.244	9.87	-.82
.400	-.166	11.24	-1.02
.410	-.102	12.63	-1.30
.420	-.048	14.06	-1.80
.430	.000	15.57	

GAMMA = 2.20

BETA	ALPHA	SKEW	NSY
.990	-240.985	.03	-.45
.980	-119.970	.05	-.45
.970	-79.622	.08	-.44
.960	-59.440	.11	-.44
.950	-47.325	.14	-.44
.940	-39.243	.16	-.43
.930	-33.466	.19	-.43
.920	-29.130	.22	-.43
.910	-25.753	.25	-.42
.900	-23.049	.28	-.42
.890	-20.834	.30	-.42
.880	-18.985	.33	-.41
.870	-17.419	.36	-.41
.860	-16.073	.39	-.41
.850	-14.905	.42	-.40
.840	-13.882	.45	-.40
.830	-12.976	.48	-.40
.820	-12.169	.51	-.39
.810	-11.446	.54	-.39
.800	-10.793	.57	-.39
.790	-10.201	.60	-.38
.780	-9.661	.63	-.38
.770	-9.166	.66	-.38
.760	-8.711	.69	-.37
.750	-8.291	.72	-.37
.740	-7.902	.76	-.37
.730	-7.540	.79	-.36
.720	-7.203	.82	-.36
.710	-6.887	.86	-.36
.700	-6.592	.89	-.36
.690	-6.314	.93	-.35
.680	-6.052	.97	-.35
.670	-5.804	1.00	-.35

GAMMA = 2.20 (CONT.)

BETA	ALPHA	SKEW	NSY
.660	-5.570	1.04	-.34
.650	-5.348	1.08	-.34
.640	-5.137	1.12	-.34
.630	-4.936	1.16	-.33
.620	-4.744	1.21	-.33
.610	-4.560	1.25	-.33
.600	-4.385	1.29	-.33
.590	-4.216	1.34	-.32
.580	-4.054	1.39	-.32
.570	-3.898	1.44	-.32
.560	-3.748	1.49	-.32
.550	-3.603	1.54	-.31
.540	-3.462	1.60	-.31
.530	-3.326	1.66	-.31
.520	-3.194	1.72	-.31
.510	-3.065	1.78	-.30
.500	-2.939	1.85	-.30
.490	-2.817	1.92	-.30
.480	-2.697	2.00	-.30
.470	-2.579	2.08	-.30
.460	-2.463	2.16	-.29
.450	-2.348	2.25	-.29
.440	-2.235	2.36	-.29
.430	-2.122	2.46	-.29
.420	-2.009	2.58	-.29
.410	-1.895	2.72	-.29
.400	-1.780	2.87	-.29
.390	-1.663	3.04	-.29
.380	-1.541	3.25	-.29
.370	-1.411	3.50	-.30
.360	-1.269	3.82	-.31
.350	-1.100	4.29	-.32
.340	-.813	5.43	-.37
.339M	-.730	5.87	-.39
.340	-.650	6.37	-.42
.350	-.421	8.36	-.55
.360	-.312	9.74	-.66
.370	-.232	11.06	-.80
.380	-.166	12.37	-.97
.390	-.110	13.73	-1.20
.400	-.061	15.15	-1.57

TABLE 4.1(CONTINUED)

GAMMA = 2.30

BETA	ALPHA	SKEW	NSY
.990	-263.485	.03	-.43
.980	-131.220	.05	-.43
.970	-87.122	.08	-.42
.960	-65.065	.10	-.42
.950	-51.825	.13	-.42
.940	-42.993	.16	-.41
.930	-36.680	.18	-.41
.920	-31.942	.21	-.41
.910	-28.253	.24	-.40
.900	-25.299	.26	-.40
.890	-22.879	.29	-.40
.880	-20.860	.32	-.39
.870	-19.149	.34	-.39
.860	-17.681	.37	-.39
.850	-16.406	.40	-.38
.840	-15.288	.43	-.38
.830	-14.300	.45	-.38
.820	-13.420	.48	-.37
.810	-12.631	.51	-.37
.800	-11.919	.54	-.37
.790	-11.273	.57	-.36
.780	-10.684	.60	-.36
.770	-10.145	.63	-.36
.760	-9.650	.66	-.36
.750	-9.192	.69	-.35
.740	-8.769	.72	-.35
.730	-8.375	.75	-.35
.720	-8.008	.78	-.34
.710	-7.665	.81	-.34
.700	-7.344	.85	-.34
.690	-7.042	.88	-.33
.680	-6.758	.92	-.33
.670	-6.489	.95	-.33
.660	-6.235	.99	-.32
.650	-5.995	1.02	-.32
.640	-5.766	1.06	-.32
.630	-5.549	1.10	-.32
.620	-5.341	1.14	-.31
.610	-5.143	1.18	-.31
.600	-4.954	1.22	-.31
.590	-4.772	1.26	-.30
.580	-4.598	1.30	-.30
.570	-4.431	1.35	-.30
.560	-4.269	1.39	-.30
.550	-4.114	1.44	-.29
.540	-3.964	1.49	-.29
.530	-3.818	1.54	-.29
.520	-3.677	1.59	-.28

GAMMA = 2.30 (CONT.)

BETA	ALPHA	SKEW	NSY
.510	-3.541	1.65	-.28
.500	-3.408	1.71	-.28
.490	-3.279	1.77	-.28
.480	-3.152	1.83	-.27
.470	-3.029	1.90	-.27
.460	-2.908	1.97	-.27
.450	-2.789	2.04	-.27
.440	-2.673	2.12	-.26
.430	-2.557	2.21	-.26
.420	-2.443	2.30	-.26
.410	-2.330	2.40	-.26
.400	-2.217	2.51	-.26
.390	-2.104	2.63	-.26
.380	-1.991	2.76	-.26
.370	-1.875	2.91	-.26
.360	-1.756	3.08	-.26
.350	-1.633	3.29	-.26
.340	-1.502	3.53	-.26
.330	-1.358	3.85	-.27
.320	-1.187	4.32	-.28
.310	-.895	5.43	-.31
.309M	-.808	5.87	-.33
.310	-.725	6.37	-.35
.320	-.492	8.29	-.45
.330	-.380	9.63	-.54
.340	-.298	10.89	-.64
.350	-.230	12.14	-.75
.360	-.173	13.43	-.90
.370	-.122	14.77	-1.09
.380	-.076	16.19	-1.37

GAMMA = 2.40

BETA	ALPHA	SKEW	NSY
.990	-286.985	.03	-.41
.980	-142.970	.05	-.41
.970	-94.955	.08	-.41
.960	-70.940	.10	-.40
.950	-56.525	.13	-.40
.940	-46.910	.15	-.40
.930	-40.038	.18	-.39
.920	-34.880	.20	-.39

TABLE 4.1(CONTINUED)

GAMMA = 2.40 (CONT.)

BETA	ALPHA	SKEW	NSY
.910	-30.864	.23	-.39
.900	-27.649	.25	-.38
.890	-25.016	.28	-.38
.880	-22.819	.30	-.38
.870	-20.957	.33	-.37
.860	-19.359	.36	-.37
.850	-17.973	.38	-.37
.840	-16.757	.41	-.36
.830	-15.683	.43	-.36
.820	-14.726	.46	-.36
.810	-13.868	.49	-.35
.800	-13.094	.52	-.35
.790	-12.393	.54	-.35
.780	-11.753	.57	-.34
.770	-11.168	.60	-.34
.760	-10.630	.63	-.34
.750	-10.133	.66	-.34
.740	-9.674	.69	-.33
.730	-9.247	.72	-.33
.720	-8.849	.75	-.33
.710	-8.478	.78	-.32
.700	-8.129	.81	-.32
.690	-7.802	.84	-.32
.680	-7.495	.87	-.31
.670	-7.204	.90	-.31
.660	-6.930	.94	-.31
.650	-6.670	.97	-.30
.640	-6.423	1.00	-.30
.630	-6.188	1.04	-.30
.620	-5.964	1.07	-.30
.610	-5.751	1.11	-.29
.600	-5.547	1.15	-.29
.590	-5.352	1.19	-.29
.580	-5.165	1.23	-.28
.570	-4.985	1.27	-.28
.560	-4.812	1.31	-.28
.550	-4.645	1.35	-.27
.540	-4.485	1.40	-.27
.530	-4.330	1.44	-.27
.520	-4.179	1.49	-.27
.510	-4.034	1.54	-.26
.500	-3.893	1.59	-.26
.490	-3.756	1.64	-.26
.480	-3.622	1.70	-.25
.470	-3.492	1.76	-.25
.460	-3.366	1.82	-.25
.450	-3.241	1.88	-.25
.440	-3.120	1.95	-.24

GAMMA = 2.40 (CONT.)

BETA	ALPHA	SKEW	NSY
.430	-3.000	2.02	-.24
.420	-2.883	2.09	-.24
.410	-2.767	2.17	-.24
.400	-2.653	2.25	-.23
.390	-2.539	2.35	-.23
.380	-2.426	2.45	-.23
.370	-2.313	2.55	-.23
.360	-2.200	2.67	-.23
.350	-2.086	2.80	-.23
.340	-1.969	2.95	-.22
.330	-1.850	3.12	-.22
.320	-1.726	3.32	-.22
.310	-1.593	3.57	-.23
.300	-1.447	3.89	-.23
.290	-1.273	4.34	-.24
.280	-.977	5.43	-.26
.279M	-.887	5.87	-.28
.280	-.800	6.37	-.30
.290	-.563	8.23	-.38
.300	-.448	9.52	-.45
.310	-.364	10.73	-.52
.320	-.295	11.93	-.60
.330	-.235	13.16	-.70
.340	-.183	14.43	-.82
.350	-.136	15.77	-.98

GAMMA = 2.50

BETA	ALPHA	SKEW	NSY
.990	-311.485	.02	-.40
.980	-155.220	.05	-.39
.970	-103.122	.07	-.39
.960	-77.065	.10	-.39
.950	-61.425	.12	-.38
.940	-50.993	.14	-.38
.930	-43.538	.17	-.38
.920	-37.942	.19	-.37
.910	-33.587	.22	-.37
.900	-30.099	.24	-.37
.890	-27.243	.27	-.36
.880	-24.861	.29	-.36
.870	-22.842	.32	-.36

TABLE 4.1(CONTINUED)

GAMMA = 2.50 (CONT.)

BETA	ALPHA	SKEW	NSY
.860	-21.110	.34	-.35
.850	-19.606	.37	-.35
.840	-18.289	.39	-.35
.830	-17.124	.42	-.34
.820	-16.087	.44	-.34
.810	-15.158	.47	-.34
.800	-14.320	.49	-.34
.790	-13.560	.52	-.33
.780	-12.867	.55	-.33
.770	-12.234	.57	-.33
.760	-11.652	.60	-.32
.750	-11.114	.63	-.32
.740	-10.617	.66	-.32
.730	-10.156	.68	-.31
.720	-9.726	.71	-.31
.710	-9.324	.74	-.31
.700	-8.948	.77	-.30
.690	-8.595	.80	-.30
.680	-8.263	.83	-.30
.670	-7.949	.86	-.30
.660	-7.653	.89	-.29
.650	-7.373	.92	-.29
.640	-7.107	.95	-.29
.630	-6.854	.99	-.28
.620	-6.613	1.02	-.28
.610	-6.384	1.05	-.28
.600	-6.164	1.09	-.27
.590	-5.955	1.12	-.27
.580	-5.754	1.16	-.27
.570	-5.561	1.20	-.27
.560	-5.376	1.24	-.26
.550	-5.198	1.28	-.26
.540	-5.026	1.32	-.26
.530	-4.860	1.36	-.25
.520	-4.700	1.40	-.25
.510	-4.545	1.44	-.25
.500	-4.395	1.49	-.24
.490	-4.250	1.54	-.24
.480	-4.108	1.59	-.24
.470	-3.971	1.64	-.24
.460	-3.837	1.69	-.23
.450	-3.706	1.74	-.23
.440	-3.579	1.80	-.23
.430	-3.454	1.86	-.22
.420	-3.332	1.92	-.22
.410	-3.212	1.99	-.22
.400	-3.093	2.06	-.22
.390	-2.977	2.13	-.21

GAMMA = 2.50 (CONT.)

BETA	ALPHA	SKEW	NSY
.380	-2.862	2.21	-.21
.370	-2.748	2.30	-.21
.360	-2.635	2.39	-.21
.350	-2.522	2.49	-.20
.340	-2.409	2.59	-.20
.330	-2.295	2.71	-.20
.320	-2.181	2.84	-.20
.310	-2.064	2.99	-.20
.300	-1.943	3.16	-.19
.290	-1.818	3.36	-.19
.280	-1.684	3.60	-.19
.270	-1.536	3.92	-.20
.260	-1.359	4.37	-.20
.250	-1.060	5.43	-.22
.249M	-.965	5.87	-.23
.250	-.875	6.37	-.25
.260	-.634	8.18	-.31
.270	-.517	9.42	-.37
.280	-.430	10.59	-.42
.290	-.359	11.74	-.49
.300	-.299	12.91	-.56
.310	-.245	14.12	-.64
.320	-.197	15.39	-.75

GAMMA = 2.60

BETA	ALPHA	SKEW	NSY
.990	-336.985	.02	-.38
.980	-167.970	.05	-.38
.970	-111.622	.07	-.37
.960	-83.440	.09	-.37
.950	-66.525	.12	-.37
.940	-55.243	.14	-.37
.930	-47.181	.16	-.36
.920	-41.130	.19	-.36
.910	-36.420	.21	-.36
.900	-32.649	.23	-.35
.890	-29.561	.26	-.35
.880	-26.986	.28	-.35
.870	-24.804	.30	-.34
.860	-22.931	.33	-.34
.850	-21.306	.35	-.34

TABLE 4.1(CONTINUED)

GAMMA = 2.60 (CONT.)

BETA	ALPHA	SKEW	NSY
.840	-19.883	.38	-.33
.830	-18.624	.40	-.33
.820	-17.504	.42	-.33
.810	-16.500	.45	-.32
.800	-15.595	.47	-.32
.790	-14.775	.50	-.32
.780	-14.027	.52	-.32
.770	-13.343	.55	-.31
.760	-12.715	.58	-.31
.750	-12.135	.60	-.31
.740	-11.599	.63	-.30
.730	-11.101	.65	-.30
.720	-10.638	.68	-.30
.710	-10.205	.71	-.29
.700	-9.799	.74	-.29
.690	-9.419	.76	-.29
.680	-9.061	.79	-.28
.670	-8.724	.82	-.28
.660	-8.405	.85	-.28
.650	-8.104	.88	-.28
.640	-7.818	.91	-.27
.630	-7.546	.94	-.27
.620	-7.288	.97	-.27
.610	-7.041	1.00	-.26
.600	-6.806	1.04	-.26
.590	-6.581	1.07	-.26
.580	-6.366	1.10	-.25
.570	-6.160	1.14	-.25
.560	-5.961	1.17	-.25
.550	-5.771	1.21	-.25
.540	-5.587	1.25	-.24
.530	-5.411	1.28	-.24
.520	-5.240	1.32	-.24
.510	-5.075	1.36	-.23
.500	-4.916	1.40	-.23
.490	-4.761	1.45	-.23
.480	-4.611	1.49	-.22
.470	-4.465	1.53	-.22
.460	-4.324	1.58	-.22
.450	-4.186	1.63	-.22
.440	-4.052	1.68	-.21
.430	-3.921	1.73	-.21
.420	-3.792	1.79	-.21
.410	-3.667	1.84	-.20
.400	-3.544	1.90	-.20
.390	-3.423	1.97	-.20
.380	-3.304	2.03	-.20
.370	-3.187	2.10	-.19

GAMMA = 2.60 (CONT.)

BETA	ALPHA	SKEW	NSY
.360	-3.071	2.18	-.19
.350	-2.957	2.25	-.19
.340	-2.843	2.34	-.18
.330	-2.730	2.43	-.18
.320	-2.618	2.53	-.18
.310	-2.504	2.63	-.18
.300	-2.391	2.75	-.17
.290	-2.275	2.88	-.17
.280	-2.158	3.03	-.17
.270	-2.036	3.20	-.17
.260	-1.910	3.39	-.17
.250	-1.775	3.63	-.17
.240	-1.625	3.94	-.17
.230	-1.446	4.39	-.17
.220	-1.142	5.43	-.19
.219M	-1.044	5.87	-.19
.220	-.950	6.37	-.21
.230	-.705	8.12	-.26
.240	-.585	9.33	-.30
.250	-.497	10.45	-.35
.260	-.424	11.56	-.39
.270	-.362	12.68	-.45
.280	-.307	13.84	-.51
.290	-.258	15.04	-.58

GAMMA = 2.70

BETA	ALPHA	SKEW	NSY
.990	-363.485	.02	-.37
.980	-181.220	.04	-.36
.970	-120.455	.07	-.36
.960	-90.065	.09	-.36
.950	-71.825	.11	-.35
.940	-59.660	.13	-.35
.930	-50.966	.16	-.35
.920	-44.442	.18	-.35
.910	-39.365	.20	-.34
.900	-35.299	.22	-.34
.890	-31.971	.25	-.34
.880	-29.194	.27	-.33
.870	-26.842	.29	-.33
.860	-24.824	.31	-.33

TABLE 4.1(CONTINUED)

GAMMA = 2.70 (CONT.)

BETA	ALPHA	SKEW	NSY
.850	-23.073	.34	-.32
.840	-21.539	.36	-.32
.830	-20.183	.38	-.32
.820	-18.977	.41	-.31
.810	-17.895	.43	-.31
.800	-16.920	.46	-.31
.790	-16.037	.48	-.31
.780	-15.232	.50	-.30
.770	-14.496	.53	-.30
.760	-13.820	.55	-.30
.750	-13.196	.58	-.29
.740	-12.619	.60	-.29
.730	-12.084	.63	-.29
.720	-11.585	.65	-.28
.710	-11.120	.68	-.28
.700	-10.684	.71	-.28
.690	-10.275	.73	-.28
.680	-9.891	.76	-.27
.670	-9.529	.79	-.27
.660	-9.187	.81	-.27
.650	-8.863	.84	-.26
.640	-8.557	.87	-.26
.630	-8.265	.90	-.26
.620	-7.988	.93	-.25
.610	-7.724	.96	-.25
.600	-7.472	.99	-.25
.590	-7.232	1.02	-.25
.580	-7.001	1.05	-.24
.570	-6.781	1.08	-.24
.560	-6.569	1.12	-.24
.550	-6.365	1.15	-.23
.540	-6.170	1.18	-.23
.530	-5.981	1.22	-.23
.520	-5.799	1.25	-.22
.510	-5.624	1.29	-.22
.500	-5.454	1.33	-.22
.490	-5.290	1.37	-.22
.480	-5.131	1.41	-.21
.470	-4.977	1.45	-.21
.460	-4.827	1.49	-.21
.450	-4.681	1.53	-.20
.440	-4.539	1.58	-.20
.430	-4.401	1.62	-.20
.420	-4.266	1.67	-.19
.410	-4.135	1.72	-.19
.400	-4.006	1.77	-.19
.390	-3.880	1.83	-.19
.380	-3.756	1.89	-.18

GAMMA = 2.70 (CONT.)

BETA	ALPHA	SKEW	NSY
.370	-3.635	1.95	-.18
.360	-3.515	2.01	-.18
.350	-3.397	2.07	-.17
.340	-3.281	2.14	-.17
.330	-3.166	2.22	-.17
.320	-3.052	2.29	-.16
.310	-2.939	2.38	-.16
.300	-2.826	2.47	-.16
.290	-2.713	2.57	-.16
.280	-2.600	2.67	-.15
.270	-2.486	2.79	-.15
.260	-2.370	2.92	-.15
.250	-2.252	3.06	-.15
.240	-2.129	3.23	-.14
.230	-2.002	3.43	-.14
.220	-1.865	3.66	-.14
.210	-1.713	3.97	-.14
.200	-1.532	4.41	-.14
.190	-1.225	5.43	-.15
.189M	-1.123	5.87	-.16
.190	-1.025	6.37	-.17
.200	-.776	8.07	-.21
.210	-.654	9.25	-.24
.220	-.564	10.33	-.28
.230	-.489	11.40	-.32
.240	-.426	12.47	-.36
.250	-.370	13.58	-.41
.260	-.319	14.72	-.46
.270	-.272	15.92	-.53

GAMMA = 2.80

BETA	ALPHA	SKEW	NSY
.990	-390.985	.02	-.35
.980	-194.970	.04	-.35
.970	-129.622	.06	-.35
.960	-96.940	.09	-.34
.950	-77.325	.11	-.34
.940	-64.243	.13	-.34
.930	-54.895	.15	-.34
.920	-47.880	.17	-.33
.910	-42.420	.19	-.33

TABLE 4.1(CONTINUED)

GAMMA = 2.80 (CONT.)

BETA	ALPHA	SKEW	NSY
.900	-38.049	.22	-.33
.890	-34.471	.24	-.32
.880	-31.486	.26	-.32
.870	-28.958	.28	-.32
.860	-26.789	.30	-.31
.850	-24.907	.33	-.31
.840	-23.258	.35	-.31
.830	-21.801	.37	-.31
.820	-20.505	.39	-.30
.810	-19.343	.42	-.30
.800	-18.296	.44	-.30
.790	-17.347	.46	-.29
.780	-16.483	.48	-.29
.770	-15.692	.51	-.29
.760	-14.966	.53	-.28
.750	-14.297	.56	-.28
.740	-13.678	.58	-.28
.730	-13.103	.60	-.28
.720	-12.568	.63	-.27
.710	-12.069	.65	-.27
.700	-11.602	.68	-.27
.690	-11.164	.70	-.26
.680	-10.752	.73	-.26
.670	-10.364	.75	-.26
.660	-9.998	.78	-.26
.650	-9.651	.81	-.25
.640	-9.323	.83	-.25
.630	-9.011	.86	-.25
.620	-8.715	.89	-.24
.610	-8.432	.92	-.24
.600	-8.163	.95	-.24
.590	-7.906	.97	-.23
.580	-7.660	1.00	-.23
.570	-7.424	1.03	-.23
.560	-7.198	1.06	-.23
.550	-6.982	1.10	-.22
.540	-6.773	1.13	-.22
.530	-6.572	1.16	-.22
.520	-6.379	1.19	-.21
.510	-6.192	1.23	-.21
.500	-6.012	1.26	-.21
.490	-5.837	1.30	-.20
.480	-5.669	1.33	-.20
.470	-5.505	1.37	-.20
.460	-5.346	1.41	-.20
.450	-5.192	1.45	-.19
.440	-5.043	1.49	-.19
.430	-4.897	1.53	-.19

GAMMA = 2.80 (CONT.)

BETA	ALPHA	SKEW	NSY
.420	-4.755	1.57	-.18
.410	-4.616	1.62	-.18
.400	-4.481	1.67	-.18
.390	-4.349	1.71	-.17
.380	-4.220	1.76	-.17
.370	-4.093	1.82	-.17
.360	-3.969	1.87	-.17
.350	-3.847	1.93	-.16
.340	-3.726	1.99	-.16
.330	-3.608	2.05	-.16
.320	-3.491	2.11	-.15
.310	-3.376	2.18	-.15
.300	-3.261	2.25	-.15
.290	-3.148	2.33	-.14
.280	-3.035	2.42	-.14
.270	-2.922	2.51	-.14
.260	-2.809	2.60	-.13
.250	-2.695	2.71	-.13
.240	-2.581	2.82	-.13
.230	-2.464	2.95	-.13
.220	-2.345	3.10	-.12
.210	-2.222	3.26	-.12
.200	-2.093	3.46	-.12
.190	-1.955	3.69	-.12
.180	-1.802	4.00	-.11
.170	-1.618	4.43	-.11
.160	-1.307	5.43	-.12
.159M	-1.201	5.87	-.13
.160	-1.100	6.37	-.13
.170	-.847	8.03	-.17
.180	-.723	9.17	-.20
.190	-.630	10.22	-.22
.200	-.555	11.24	-.26
.210	-.490	12.28	-.29
.220	-.432	13.34	-.33
.230	-.380	14.43	-.37
.240	-.333	15.57	-.42

TABLE 4.1(CONTINUED)

GAMMA = 2.90

BETA	ALPHA	SKEW	NSY
.990	-419.485	.02	-.34
.980	-209.220	.04	-.34
.970	-139.122	.06	-.34
.960	-104.065	.08	-.33
.950	-83.025	.10	-.33
.940	-68.993	.12	-.33
.930	-58.966	.15	-.32
.920	-51.442	.17	-.32
.910	-45.587	.19	-.32
.900	-40.900	.21	-.31
.890	-37.062	.23	-.31
.880	-33.861	.25	-.31
.870	-31.150	.27	-.31
.860	-28.824	.29	-.30
.850	-26.807	.31	-.30
.840	-25.039	.34	-.30
.830	-23.478	.36	-.29
.820	-22.088	.38	-.29
.810	-20.843	.40	-.29
.800	-19.721	.42	-.29
.790	-18.704	.44	-.28
.780	-17.778	.47	-.28
.770	-16.932	.49	-.28
.760	-16.154	.51	-.27
.750	-15.437	.53	-.27
.740	-14.774	.56	-.27
.730	-14.159	.58	-.27
.720	-13.587	.60	-.26
.710	-13.053	.63	-.26
.700	-12.553	.65	-.26
.690	-12.084	.68	-.25
.680	-11.644	.70	-.25
.670	-11.229	.72	-.25
.660	-10.837	.75	-.24
.650	-10.467	.77	-.24
.640	-10.116	.80	-.24
.630	-9.783	.83	-.24
.620	-9.467	.85	-.23
.610	-9.166	.88	-.23
.600	-8.878	.91	-.23
.590	-8.604	.93	-.22
.580	-8.342	.96	-.22
.570	-8.091	.99	-.22
.560	-7.850	1.02	-.22
.550	-7.619	1.05	-.21
.540	-7.397	1.08	-.21
.530	-7.184	1.11	-.21
.520	-6.978	1.14	-.20

GAMMA = 2.90 (CONT.)

BETA	ALPHA	SKEW	NSY
.510	-6.780	1.17	-.20
.500	-6.588	1.20	-.20
.490	-6.403	1.24	-.20
.480	-6.224	1.27	-.19
.470	-6.051	1.30	-.19
.460	-5.883	1.34	-.19
.450	-5.720	1.37	-.18
.440	-5.562	1.41	-.18
.430	-5.408	1.45	-.18
.420	-5.258	1.49	-.17
.410	-5.113	1.53	-.17
.400	-4.971	1.57	-.17
.390	-4.832	1.61	-.17
.380	-4.696	1.66	-.16
.370	-4.564	1.71	-.16
.360	-4.434	1.75	-.16
.350	-4.306	1.80	-.15
.340	-4.182	1.85	-.15
.330	-4.059	1.91	-.15
.320	-3.938	1.96	-.14
.310	-3.819	2.02	-.14
.300	-3.702	2.09	-.14
.290	-3.585	2.15	-.13
.280	-3.471	2.22	-.13
.270	-3.357	2.29	-.13
.260	-3.243	2.37	-.12
.250	-3.130	2.45	-.12
.240	-3.018	2.54	-.12
.230	-2.904	2.64	-.11
.220	-2.791	2.74	-.11
.210	-2.676	2.86	-.11
.200	-2.559	2.99	-.11
.190	-2.439	3.13	-.10
.180	-2.315	3.29	-.10
.170	-2.185	3.49	-.10
.160	-2.045	3.72	-.09
.150	-1.890	4.02	-.09
.140	-1.704	4.45	-.09
.130	-1.389	5.43	-.09
.129M	-1.280	5.87	-.10
.130	-1.175	6.37	-.10
.140	-.919	7.99	-.13
.150	-.792	9.09	-.15
.160	-.698	10.11	-.18
.170	-.620	11.10	-.20
.180	-.554	12.10	-.23
.190	-.495	13.12	-.26
.200	-.442	14.16	-.29

TABLE 4.1(CONTINUED)

GAMMA = 2.90 (CONT.)

BETA	ALPHA	SKEW	NSY
.210	-.394	15.25	-.33

GAMMA = 3.00

BETA	ALPHA	SKEW	NSY
.990	-448.985	.02	-.33
.980	-223.970	.04	-.33
.970	-148.955	.06	-.32
.960	-111.440	.08	-.32
.950	-88.925	.10	-.32
.940	-73.910	.12	-.32
.930	-63.181	.14	-.31
.920	-55.130	.16	-.31
.910	-48.865	.18	-.31
.900	-43.850	.20	-.30
.890	-39.743	.22	-.30
.880	-36.319	.24	-.30
.870	-33.419	.26	-.30
.860	-30.932	.28	-.29
.850	-28.773	.30	-.29
.840	-26.883	.32	-.29
.830	-25.213	.34	-.28
.820	-23.727	.37	-.28
.810	-22.396	.39	-.28
.800	-21.196	.41	-.28
.790	-20.109	.43	-.27
.780	-19.120	.45	-.27
.770	-18.215	.47	-.27
.760	-17.384	.49	-.26
.750	-16.618	.52	-.26
.740	-15.910	.54	-.26
.730	-15.253	.56	-.26
.720	-14.641	.58	-.25
.710	-14.071	.61	-.25
.700	-13.537	.63	-.25
.690	-13.037	.65	-.24
.680	-12.567	.67	-.24
.670	-12.124	.70	-.24
.660	-11.706	.72	-.24
.650	-11.312	.75	-.23
.640	-10.937	.77	-.23
.630	-10.583	.79	-.23

GAMMA = 3.00 (CONT.)

BETA	ALPHA	SKEW	NSY
.620	-10.245	.82	-.22
.610	-9.924	.84	-.22
.600	-9.618	.87	-.22
.590	-9.326	.90	-.22
.580	-9.047	.92	-.21
.570	-8.780	.95	-.21
.560	-8.524	.98	-.21
.550	-8.279	1.00	-.20
.540	-8.043	1.03	-.20
.530	-7.816	1.06	-.20
.520	-7.597	1.09	-.20
.510	-7.387	1.12	-.19
.500	-7.184	1.15	-.19
.490	-6.988	1.18	-.19
.480	-6.798	1.21	-.18
.470	-6.615	1.24	-.18
.460	-6.437	1.28	-.18
.450	-6.265	1.31	-.17
.440	-6.098	1.34	-.17
.430	-5.935	1.38	-.17
.420	-5.778	1.41	-.17
.410	-5.624	1.45	-.16
.400	-5.474	1.49	-.16
.390	-5.328	1.53	-.16
.380	-5.186	1.57	-.15
.370	-5.047	1.61	-.15
.360	-4.911	1.65	-.15
.350	-4.778	1.70	-.14
.340	-4.648	1.74	-.14
.330	-4.520	1.79	-.14
.320	-4.394	1.84	-.14
.310	-4.271	1.89	-.13
.300	-4.150	1.95	-.13
.290	-4.030	2.00	-.13
.280	-3.912	2.06	-.12
.270	-3.795	2.12	-.12
.260	-3.680	2.19	-.12
.250	-3.566	2.25	-.11
.240	-3.452	2.33	-.11
.230	-3.339	2.40	-.11
.220	-3.226	2.49	-.10
.210	-3.113	2.58	-.10
.200	-3.000	2.67	-.10
.190	-2.886	2.78	-.09
.180	-2.770	2.89	-.09
.170	-2.653	3.02	-.09
.160	-2.532	3.16	-.08
.150	-2.407	3.32	-.08

TABLE 4.1(CONTINUED)

GAMMA = 3.00 (CONT.)

BETA	ALPHA	SKEW	NSY
.140	-2.276	3.52	-.08
.130	-2.135	3.75	-.07
.120	-1.978	4.04	-.07
.110	-1.789	4.47	-.07
.100	-1.472	5.43	-.07
.099M	-1.358	5.87	-.07
.100	-1.250	6.37	-.08
.110	-.990	7.95	-.10
.120	-.861	9.02	-.12
.130	-.765	10.01	-.13
.140	-.686	10.97	-.16
.150	-.618	11.93	-.18
.160	-.558	12.91	-.20
.170	-.504	13.92	-.23
.180	-.455	14.96	-.26
.190	-.409	16.04	-.29

GAMMA = 3.10

BETA	ALPHA	SKEW	NSY
.990	-479.485	.02	-.32
.980	-239.220	.04	-.32
.970	-159.122	.06	-.31
.960	-119.065	.08	-.31
.950	-95.025	.10	-.31
.940	-78.993	.12	-.31
.930	-67.538	.14	-.30
.920	-58.942	.16	-.30
.910	-52.254	.17	-.30
.900	-46.900	.19	-.29
.890	-42.516	.21	-.29
.880	-38.861	.23	-.29
.870	-35.766	.25	-.29
.860	-33.110	.27	-.28
.850	-30.807	.29	-.28
.840	-28.790	.31	-.28
.830	-27.008	.33	-.27
.820	-25.422	.35	-.27
.810	-24.002	.37	-.27
.800	-22.722	.39	-.27
.790	-21.562	.41	-.26
.780	-20.506	.44	-.26

GAMMA = 3.10 (CONT.)

BETA	ALPHA	SKEW	NSY
.770	-19.541	.46	-.26
.760	-18.655	.48	-.25
.750	-17.838	.50	-.25
.740	-17.083	.52	-.25
.730	-16.383	.54	-.25
.720	-15.731	.56	-.24
.710	-15.123	.58	-.24
.700	-14.555	.61	-.24
.690	-14.022	.63	-.24
.680	-13.521	.65	-.23
.670	-13.050	.67	-.23
.660	-12.605	.70	-.23
.650	-12.184	.72	-.22
.640	-11.786	.74	-.22
.630	-11.409	.77	-.22
.620	-11.050	.79	-.22
.610	-10.708	.81	-.21
.600	-10.383	.84	-.21
.590	-10.073	.86	-.21
.580	-9.776	.89	-.20
.570	-9.492	.91	-.20
.560	-9.220	.94	-.20
.550	-8.960	.96	-.20
.540	-8.709	.99	-.19
.530	-8.469	1.02	-.19
.520	-8.237	1.04	-.19
.510	-8.014	1.07	-.18
.500	-7.799	1.10	-.18
.490	-7.591	1.13	-.18
.480	-7.391	1.16	-.18
.470	-7.196	1.19	-.17
.460	-7.009	1.22	-.17
.450	-6.827	1.25	-.17
.440	-6.650	1.28	-.16
.430	-6.479	1.31	-.16
.420	-6.312	1.35	-.16
.410	-6.151	1.38	-.16
.400	-5.993	1.42	-.15
.390	-5.840	1.45	-.15
.380	-5.690	1.49	-.15
.370	-5.544	1.53	-.14
.360	-5.402	1.57	-.14
.350	-5.262	1.61	-.14
.340	-5.126	1.65	-.13
.330	-4.993	1.69	-.13
.320	-4.862	1.73	-.13
.310	-4.734	1.78	-.13
.300	-4.607	1.83	-.12

TABLE 4.1(CONTINUED)

GAMMA = 3.10 (CONT.)

BETA	ALPHA	SKEW	NSY
.290	-4.484	1.88	-.12
.280	-4.362	1.93	-.12
.270	-4.241	1.98	-.11
.260	-4.123	2.04	-.11
.250	-4.006	2.10	-.11
.240	-3.890	2.16	-.10
.230	-3.775	2.22	-.10
.220	-3.661	2.29	-.10
.210	-3.548	2.36	-.09
.200	-3.435	2.44	-.09
.190	-3.322	2.52	-.09
.180	-3.209	2.61	-.08
.170	-3.095	2.70	-.08
.160	-2.981	2.81	-.08
.150	-2.865	2.92	-.07
.140	-2.747	3.05	-.07
.130	-2.625	3.19	-.07
.120	-2.499	3.35	-.06
.110	-2.367	3.54	-.06
.100	-2.225	3.77	-.05
.090	-2.066	4.07	-.05
.080	-1.875	4.49	-.05
.070	-1.554	5.43	-.05
.069M	-1.437	5.87	-.05
.070	-1.325	6.37	-.05
.080	-1.062	7.91	-.07
.090	-.930	8.96	-.08
.100	-.833	9.92	-.10
.110	-.752	10.85	-.11
.120	-.683	11.78	-.13
.130	-.622	12.72	-.15
.140	-.567	13.69	-.17
.150	-.516	14.68	-.20
.160	-.469	15.72	-.23

GAMMA = 3.20

BETA	ALPHA	SKEW	NSY
.990	-510.985	.02	-.31
.980	-254.970	.04	-.31
.970	-169.622	.06	-.30
.960	-126.940	.08	-.30
.950	-101.325	.09	-.30
.940	-84.243	.11	-.30
.930	-72.038	.13	-.29
.920	-62.880	.15	-.29
.910	-55.754	.17	-.29
.900	-50.050	.19	-.28
.890	-45.380	.21	-.28
.880	-41.486	.23	-.28
.870	-38.189	.25	-.28
.860	-35.360	.26	-.27
.850	-32.907	.28	-.27
.840	-30.758	.30	-.27
.830	-28.861	.32	-.27
.820	-27.172	.34	-.26
.810	-25.660	.36	-.26
.800	-24.297	.38	-.26
.790	-23.062	.40	-.25
.780	-21.938	.42	-.25
.770	-20.911	.44	-.25
.760	-19.968	.46	-.25
.750	-19.099	.48	-.24
.740	-18.295	.50	-.24
.730	-17.550	.52	-.24
.720	-16.857	.54	-.24
.710	-16.210	.56	-.23
.700	-15.606	.59	-.23
.690	-15.039	.61	-.23
.680	-14.506	.63	-.22
.670	-14.005	.65	-.22
.660	-13.532	.67	-.22
.650	-13.086	.69	-.22
.640	-12.663	.72	-.21
.630	-12.261	.74	-.21
.620	-11.880	.76	-.21
.610	-11.518	.78	-.21
.600	-11.173	.81	-.20
.590	-10.843	.83	-.20
.580	-10.528	.85	-.20
.570	-10.227	.88	-.19
.560	-9.939	.90	-.19
.550	-9.663	.93	-.19
.540	-9.397	.95	-.19
.530	-9.142	.98	-.18
.520	-8.897	1.00	-.18

TABLE 4.1(CONTINUED)

GAMMA = 3.20 (CONT.)

BETA	ALPHA	SKEW	NSY
.510	-8.661	1.03	-.18
.500	-8.433	1.06	-.17
.490	-8.214	1.08	-.17
.480	-8.001	1.11	-.17
.470	-7.796	1.14	-.17
.460	-7.598	1.17	-.16
.450	-7.406	1.20	-.16
.440	-7.219	1.23	-.16
.430	-7.039	1.26	-.15
.420	-6.863	1.29	-.15
.410	-6.693	1.32	-.15
.400	-6.527	1.35	-.15
.390	-6.366	1.39	-.14
.380	-6.209	1.42	-.14
.370	-6.055	1.45	-.14
.360	-5.906	1.49	-.13
.350	-5.760	1.53	-.13
.340	-5.617	1.56	-.13
.330	-5.478	1.60	-.13
.320	-5.341	1.64	-.12
.310	-5.207	1.68	-.12
.300	-5.076	1.73	-.12
.290	-4.947	1.77	-.11
.280	-4.821	1.82	-.11
.270	-4.696	1.86	-.11
.260	-4.574	1.91	-.10
.250	-4.453	1.96	-.10
.240	-4.334	2.02	-.10
.230	-4.216	2.07	-.09
.220	-4.100	2.13	-.09
.210	-3.984	2.19	-.09
.200	-3.870	2.25	-.08
.190	-3.756	2.32	-.08
.180	-3.643	2.39	-.08
.170	-3.530	2.47	-.07
.160	-3.418	2.55	-.07
.150	-3.305	2.64	-.07
.140	-3.191	2.74	-.06
.130	-3.076	2.84	-.06
.120	-2.959	2.95	-.06
.110	-2.840	3.08	-.05
.100	-2.718	3.22	-.05
.090	-2.591	3.38	-.04
.080	-2.458	3.57	-.04
.070	-2.314	3.80	-.04
.060	-2.154	4.09	-.03
.050	-1.961	4.50	-.03
.040	-1.637	5.43	-.03

GAMMA = 3.20 (CONT.)

BETA	ALPHA	SKEW	NSY
.039M	-1.516	5.87	-.03
.040	-1.400	6.37	-.03
.050	-1.134	7.87	-.04
.060	-1.000	8.90	-.05
.070	-.900	9.83	-.06
.080	-.818	10.73	-.08
.090	-.748	11.63	-.09
.100	-.685	12.54	-.11
.110	-.629	13.47	-.13
.120	-.578	14.43	-.15
.130	-.530	15.43	-.17

GAMMA = 3.30

BETA	ALPHA	SKEW	NSY
.990	-543.485	.02	-.30
.980	-271.220	.04	-.30
.970	-180.455	.05	-.29
.960	-135.065	.07	-.29
.950	-107.825	.09	-.29
.940	-89.660	.11	-.29
.930	-76.681	.13	-.28
.920	-66.942	.15	-.28
.910	-59.365	.16	-.28
.900	-53.300	.18	-.28
.890	-48.335	.20	-.27
.880	-44.194	.22	-.27
.870	-40.689	.24	-.27
.860	-37.682	.26	-.26
.850	-35.074	.28	-.26
.840	-32.790	.29	-.26
.830	-30.773	.31	-.26
.820	-28.978	.33	-.25
.810	-27.370	.35	-.25
.800	-25.922	.37	-.25
.790	-24.610	.39	-.25
.780	-23.416	.41	-.24
.770	-22.324	.43	-.24
.760	-21.322	.45	-.24
.750	-20.399	.47	-.24
.740	-19.546	.49	-.23
.730	-18.754	.51	-.23

TABLE 4.1(CONTINUED)

GAMMA = 3.30 (CONT.)

BETA	ALPHA	SKEW	NSY
.720	-18.018	.53	-.23
.710	-17.332	.55	-.22
.700	-16.690	.57	-.22
.690	-16.088	.59	-.22
.680	-15.523	.61	-.22
.670	-14.991	.63	-.21
.660	-14.489	.65	-.21
.650	-14.015	.67	-.21
.640	-13.567	.69	-.21
.630	-13.141	.71	-.20
.620	-12.737	.73	-.20
.610	-12.353	.76	-.20
.600	-11.987	.78	-.20
.590	-11.638	.80	-.19
.580	-11.304	.82	-.19
.570	-10.985	.85	-.19
.560	-10.680	.87	-.18
.550	-10.388	.89	-.18
.540	-10.107	.92	-.18
.530	-9.837	.94	-.18
.520	-9.578	.97	-.17
.510	-9.328	.99	-.17
.500	-9.087	1.02	-.17
.490	-8.855	1.04	-.17
.480	-8.631	1.07	-.16
.470	-8.414	1.09	-.16
.460	-8.205	1.12	-.16
.450	-8.002	1.15	-.15
.440	-7.806	1.18	-.15
.430	-7.615	1.21	-.15
.420	-7.431	1.23	-.15
.410	-7.251	1.26	-.14
.400	-7.077	1.29	-.14
.390	-6.907	1.32	-.14
.380	-6.742	1.36	-.13
.370	-6.581	1.39	-.13
.360	-6.424	1.42	-.13
.350	-6.271	1.46	-.13
.340	-6.122	1.49	-.12
.330	-5.976	1.53	-.12
.320	-5.833	1.56	-.12
.310	-5.693	1.60	-.11
.300	-5.556	1.64	-.11
.290	-5.422	1.68	-.11
.280	-5.290	1.72	-.10
.270	-5.161	1.76	-.10
.260	-5.034	1.80	-.10
.250	-4.909	1.85	-.10

GAMMA = 3.30 (CONT.)

BETA	ALPHA	SKEW	NSY
.240	-4.786	1.90	-.09
.230	-4.665	1.95	-.09
.220	-4.545	2.00	-.09
.210	-4.427	2.05	-.08
.200	-4.310	2.10	-.08
.190	-4.194	2.16	-.08
.180	-4.079	2.22	-.07
.170	-3.965	2.29	-.07
.160	-3.852	2.36	-.07
.150	-3.739	2.43	-.06
.140	-3.626	2.50	-.06
.130	-3.513	2.58	-.06
.120	-3.400	2.67	-.05
.110	-3.286	2.77	-.05
.100	-3.171	2.87	-.04
.090	-3.054	2.98	-.04
.080	-2.934	3.11	-.04
.070	-2.811	3.25	-.03
.060	-2.683	3.41	-.03
.050	-2.548	3.59	-.02
.040	-2.403	3.82	-.02
.030	-2.242	4.11	-.02
.020	-2.046	4.52	-.01
.010	-1.719	5.43	-.01
.009M	-1.594	5.87	-.01
.010	-1.475	6.37	-.01
.020	-1.206	7.84	-.02
.030	-1.070	8.84	-.02
.040	-.968	9.74	-.04
.050	-.885	10.62	-.05
.060	-.813	11.49	-.06
.070	-.749	12.37	-.07
.080	-.692	13.27	-.09
.090	-.639	14.20	-.10
.100	-.591	15.15	-.12

TABLE 4.1(CONTINUED)

GAMMA = 3.40

BETA	ALPHA	SKEW	NSY
.990	-576.985	.02	-.29
.980	-287.970	.04	-.29
.970	-191.622	.05	-.29
.960	-143.440	.07	-.28
.950	-114.525	.09	-.28
.940	-95.243	.11	-.28
.930	-81.466	.12	-.28
.920	-71.130	.14	-.27
.910	-63.087	.16	-.27
.900	-56.650	.18	-.27
.890	-51.380	.20	-.26
.880	-46.986	.21	-.26
.870	-43.266	.23	-.26
.860	-40.075	.25	-.26
.850	-37.307	.27	-.25
.840	-34.884	.29	-.25
.830	-32.743	.30	-.25
.820	-30.839	.32	-.25
.810	-29.134	.34	-.24
.800	-27.597	.36	-.24
.790	-26.206	.38	-.24
.780	-24.939	.40	-.24
.770	-23.781	.41	-.23
.760	-22.718	.43	-.23
.750	-21.739	.45	-.23
.740	-20.834	.47	-.23
.730	-19.995	.49	-.22
.720	-19.215	.51	-.22
.710	-18.487	.53	-.22
.700	-17.807	.55	-.22
.690	-17.169	.57	-.21
.680	-16.571	.59	-.21
.670	-16.007	.61	-.21
.660	-15.476	.63	-.20
.650	-14.974	.65	-.20
.640	-14.498	.67	-.20
.630	-14.048	.69	-.20
.620	-13.620	.71	-.19
.610	-13.213	.73	-.19
.600	-12.826	.75	-.19
.590	-12.457	.77	-.19
.580	-12.104	.80	-.18
.570	-11.767	.82	-.18
.560	-11.444	.84	-.18
.550	-11.134	.86	-.18
.540	-10.838	.89	-.17
.530	-10.553	.91	-.17
.520	-10.279	.93	-.17

GAMMA = 3.40 (CONT.)

BETA	ALPHA	SKEW	NSY
.510	-10.015	.96	-.16
.500	-9.761	.98	-.16
.490	-9.516	1.00	-.16
.480	-9.279	1.03	-.16
.470	-9.051	1.05	-.15
.460	-8.830	1.08	-.15
.450	-8.616	1.10	-.15
.440	-8.409	1.13	-.15
.430	-8.209	1.16	-.14
.420	-8.014	1.19	-.14
.410	-7.826	1.21	-.14
.400	-7.642	1.24	-.13
.390	-7.464	1.27	-.13
.380	-7.290	1.30	-.13
.370	-7.121	1.33	-.13
.360	-6.957	1.36	-.12
.350	-6.796	1.39	-.12
.340	-6.640	1.42	-.12
.330	-6.487	1.46	-.11
.320	-6.338	1.49	-.11
.310	-6.191	1.52	-.11
.300	-6.049	1.56	-.11
.290	-5.909	1.60	-.10
.280	-5.771	1.63	-.10
.270	-5.637	1.67	-.10
.260	-5.505	1.71	-.09
.250	-5.375	1.75	-.09
.240	-5.247	1.79	-.09
.230	-5.122	1.84	-.08
.220	-4.998	1.88	-.08
.210	-4.877	1.93	-.08
.200	-4.756	1.98	-.08
.190	-4.638	2.03	-.07
.180	-4.520	2.08	-.07
.170	-4.404	2.14	-.07
.160	-4.289	2.19	-.06
.150	-4.174	2.25	-.06
.140	-4.061	2.32	-.06
.130	-3.948	2.39	-.05
.120	-3.835	2.46	-.05
.110	-3.722	2.53	-.05
.100	-3.609	2.61	-.04
.090	-3.495	2.70	-.04
.080	-3.381	2.80	-.03
.070	-3.265	2.90	-.03
.060	-3.148	3.01	-.03
.050	-3.027	3.13	-.02
.040	-2.904	3.27	-.02

TABLE 4.1(CONTINUED)

GAMMA = 3.40 (CONT.)

BETA	ALPHA	SKEW	NSY
.030	-2.775	3.43	-.01
.020	-2.639	3.62	-.01
.010	-2.493	3.84	-.00
-.000	-2.329	4.13	.00
-.010	-2.132	4.54	.01
-.020	-1.801	5.43	.01
-.021M	-1.673	5.87	.01
-.020	-1.550	6.37	.01
-.010	-1.277	7.81	.01
-.000	-1.139	8.78	.00
.010	-1.036	9.67	-.01
.020	-.951	10.52	-.02
.030	-.878	11.36	-.03
.040	-.813	12.22	-.04
.050	-.755	13.08	-.05
.060	-.701	13.98	-.06
.070	-.652	14.89	-.08
.080	-.606	15.85	-.10

GAMMA = 3.50

BETA	ALPHA	SKEW	NSY
.990	-611.485	.02	-.28
.980	-305.220	.03	-.28
.970	-203.122	.05	-.28
.960	-152.065	.07	-.28
.950	-121.425	.09	-.27
.940	-100.993	.10	-.27
.930	-86.395	.12	-.27
.920	-75.442	.14	-.26
.910	-66.920	.15	-.26
.900	-60.100	.17	-.26
.890	-54.516	.19	-.26
.880	-49.861	.21	-.25
.870	-45.920	.22	-.25
.860	-42.539	.24	-.25
.850	-39.607	.26	-.25
.840	-37.040	.28	-.24
.830	-34.773	.29	-.24
.820	-32.756	.31	-.24
.810	-30.950	.33	-.24
.800	-29.322	.35	-.23

GAMMA = 3.50 (CONT.)

BETA	ALPHA	SKEW	NSY
.790	-27.849	.37	-.23
.780	-26.507	.38	-.23
.770	-25.281	.40	-.23
.760	-24.156	.42	-.22
.750	-23.120	.44	-.22
.740	-22.162	.46	-.22
.730	-21.274	.48	-.22
.720	-20.448	.49	-.21
.710	-19.677	.51	-.21
.700	-18.957	.53	-.21
.690	-18.283	.55	-.21
.680	-17.649	.57	-.20
.670	-17.053	.59	-.20
.660	-16.491	.61	-.20
.650	-15.960	.63	-.20
.640	-15.458	.65	-.19
.630	-14.981	.67	-.19
.620	-14.529	.69	-.19
.610	-14.099	.71	-.19
.600	-13.690	.73	-.18
.590	-13.300	.75	-.18
.580	-12.927	.77	-.18
.570	-12.571	.79	-.17
.560	-12.230	.81	-.17
.550	-11.903	.83	-.17
.540	-11.590	.86	-.17
.530	-11.289	.88	-.16
.520	-11.000	.90	-.16
.510	-10.722	.92	-.16
.500	-10.454	.95	-.16
.490	-10.196	.97	-.15
.480	-9.946	.99	-.15
.470	-9.706	1.02	-.15
.460	-9.473	1.04	-.15
.450	-9.248	1.06	-.14
.440	-9.030	1.09	-.14
.430	-8.819	1.11	-.14
.420	-8.615	1.14	-.13
.410	-8.416	1.17	-.13
.400	-8.223	1.19	-.13
.390	-8.036	1.22	-.13
.380	-7.854	1.25	-.12
.370	-7.677	1.28	-.12
.360	-7.504	1.30	-.12
.350	-7.336	1.33	-.12
.340	-7.172	1.36	-.11
.330	-7.012	1.39	-.11
.320	-6.855	1.43	-.11

TABLE 4.1(CONTINUED)

GAMMA = 3.50 (CONT.)

BETA	ALPHA	SKEW	NSY
.310	-6.703	1.46	-.10
.300	-6.553	1.49	-.10
.290	-6.407	1.52	-.10
.280	-6.264	1.56	-.10
.270	-6.124	1.59	-.09
.260	-5.987	1.63	-.09
.250	-5.852	1.67	-.09
.240	-5.719	1.70	-.08
.230	-5.589	1.74	-.08
.220	-5.461	1.78	-.08
.210	-5.335	1.83	-.07
.200	-5.211	1.87	-.07
.190	-5.089	1.91	-.07
.180	-4.968	1.96	-.07
.170	-4.849	2.01	-.06
.160	-4.731	2.06	-.06
.150	-4.614	2.11	-.06
.140	-4.498	2.17	-.05
.130	-4.384	2.23	-.05
.120	-4.270	2.29	-.05
.110	-4.156	2.35	-.04
.100	-4.043	2.42	-.04
.090	-3.931	2.49	-.04
.080	-3.818	2.56	-.03
.070	-3.705	2.64	-.03
.060	-3.591	2.73	-.02
.050	-3.476	2.82	-.02
.040	-3.360	2.93	-.02
.030	-3.242	3.04	-.01
.020	-3.121	3.16	-.01
.010	-2.996	3.30	-.00
-.000	-2.866	3.46	.00
-.010	-2.729	3.64	.00
-.020	-2.582	3.86	.01
-.030	-2.417	4.15	.01
-.040	-2.217	4.55	.02
-.050	-1.884	5.43	.03
-.051M	-1.752	5.87	.03
-.050	-1.625	6.37	.03
-.040	-1.349	7.77	.03
-.030	-1.209	8.73	.02
-.020	-1.104	9.59	.02
-.010	-1.018	10.42	.01
-.000	-.943	11.24	.00
.010	-.878	12.07	-.01
.020	-.818	12.91	-.02
.030	-.764	13.77	-.03
.040	-.713	14.66	-.04

GAMMA = 3.50 (CONT.)

BETA	ALPHA	SKEW	NSY
.050	-.666	15.57	-.06

GAMMA = 3.60

BETA	ALPHA	SKEW	NSY
.990	-646.985	.02	-.28
.980	-322.970	.03	-.27
.970	-214.955	.05	-.27
.960	-160.940	.07	-.27
.950	-128.525	.08	-.27
.940	-106.910	.10	-.26
.930	-91.466	.12	-.26
.920	-79.880	.13	-.26
.910	-70.865	.15	-.25
.900	-63.650	.17	-.25
.890	-57.744	.18	-.25
.880	-52.819	.20	-.25
.870	-48.650	.22	-.24
.860	-45.075	.23	-.24
.850	-41.974	.25	-.24
.840	-39.259	.27	-.24
.830	-36.861	.29	-.23
.820	-34.728	.30	-.23
.810	-32.818	.32	-.23
.800	-31.097	.34	-.23
.790	-29.539	.36	-.22
.780	-28.121	.37	-.22
.770	-26.825	.39	-.22
.760	-25.636	.41	-.22
.750	-24.540	.43	-.21
.740	-23.527	.44	-.21
.730	-22.589	.46	-.21
.720	-21.716	.48	-.21
.710	-20.902	.50	-.20
.700	-20.141	.52	-.20
.690	-19.429	.53	-.20
.680	-18.759	.55	-.20
.670	-18.130	.57	-.19
.660	-17.536	.59	-.19
.650	-16.975	.61	-.19
.640	-16.445	.63	-.19
.630	-15.942	.65	-.18

TABLE 4.1(CONTINUED)

GAMMA = 3.60 (CONT.)

BETA	ALPHA	SKEW	NSY
.620	-15.465	.67	-.18
.610	-15.011	.69	-.18
.600	-14.579	.71	-.18
.590	-14.167	.73	-.17
.580	-13.774	.75	-.17
.570	-13.398	.77	-.17
.560	-13.039	.79	-.17
.550	-12.694	.81	-.16
.540	-12.364	.83	-.16
.530	-12.047	.85	-.16
.520	-11.742	.87	-.16
.510	-11.449	.89	-.15
.500	-11.167	.91	-.15
.490	-10.895	.94	-.15
.480	-10.632	.96	-.15
.470	-10.379	.98	-.14
.460	-10.134	1.00	-.14
.450	-9.898	1.03	-.14
.440	-9.669	1.05	-.14
.430	-9.447	1.07	-.13
.420	-9.232	1.10	-.13
.410	-9.023	1.12	-.13
.400	-8.821	1.15	-.12
.390	-8.624	1.17	-.12
.380	-8.433	1.20	-.12
.370	-8.247	1.23	-.12
.360	-8.066	1.25	-.11
.350	-7.890	1.28	-.11
.340	-7.718	1.31	-.11
.330	-7.550	1.34	-.11
.320	-7.387	1.37	-.10
.310	-7.227	1.40	-.10
.300	-7.071	1.43	-.10
.290	-6.918	1.46	-.09
.280	-6.769	1.49	-.09
.270	-6.623	1.52	-.09
.260	-6.480	1.56	-.09
.250	-6.339	1.59	-.08
.240	-6.202	1.62	-.08
.230	-6.066	1.66	-.08
.220	-5.934	1.70	-.07
.210	-5.803	1.74	-.07
.200	-5.675	1.77	-.07
.190	-5.548	1.82	-.07
.180	-5.424	1.86	-.06
.170	-5.301	1.90	-.06
.160	-5.180	1.95	-.06
.150	-5.060	1.99	-.05

GAMMA = 3.60 (CONT.)

BETA	ALPHA	SKEW	NSY
.140	-4.941	2.04	-.05
.130	-4.824	2.09	-.05
.120	-4.708	2.14	-.04
.110	-4.593	2.20	-.04
.100	-4.479	2.25	-.04
.090	-4.365	2.32	-.03
.080	-4.252	2.38	-.03
.070	-4.139	2.45	-.03
.060	-4.026	2.52	-.02
.050	-3.913	2.59	-.02
.040	-3.800	2.67	-.02
.030	-3.686	2.76	-.01
.020	-3.571	2.85	-.01
.010	-3.454	2.95	-.00
-.000	-3.335	3.06	.00
-.010	-3.214	3.19	.00
-.020	-3.088	3.32	.01
-.030	-2.958	3.48	.01
-.040	-2.820	3.66	.02
-.050	-2.671	3.89	.02
-.060	-2.504	4.17	.03
-.070	-2.303	4.57	.03
-.080	-1.966	5.43	.04
-.081M	-1.830	5.87	.05
-.080	-1.700	6.37	.05
-.070	-1.422	7.75	.05
-.060	-1.279	8.68	.04
-.050	-1.172	9.52	.04
-.040	-1.085	10.33	.03
-.030	-1.009	11.13	.03
-.020	-.942	11.93	.02
-.010	-.882	12.74	.01
-.000	-.826	13.58	.00
.010	-.775	14.43	-.01
.020	-.727	15.31	-.02

TABLE 4.1(CONTINUED)

GAMMA = 3.70

BETA	ALPHA	SKEW	NSY
.990	-683.485	.02	-.27
.980	-341.220	.03	-.27
.970	-227.122	.05	-.26
.960	-170.065	.06	-.26
.950	-135.825	.08	-.26
.940	-112.993	.10	-.26
.930	-96.681	.11	-.25
.920	-84.442	.13	-.25
.910	-74.920	.15	-.25
.900	-67.300	.16	-.25
.890	-61.062	.18	-.24
.880	-55.861	.20	-.24
.870	-51.458	.21	-.24
.860	-47.682	.23	-.24
.850	-44.407	.24	-.23
.840	-41.540	.26	-.23
.830	-39.008	.28	-.23
.820	-36.756	.29	-.23
.810	-34.739	.31	-.22
.800	-32.923	.33	-.22
.790	-31.277	.35	-.22
.780	-29.780	.36	-.22
.770	-28.412	.38	-.21
.760	-27.157	.40	-.21
.750	-26.000	.41	-.21
.740	-24.932	.43	-.21
.730	-23.941	.45	-.20
.720	-23.020	.47	-.20
.710	-22.161	.48	-.20
.700	-21.358	.50	-.20
.690	-20.607	.52	-.19
.680	-19.901	.54	-.19
.670	-19.236	.55	-.19
.660	-18.610	.57	-.19
.650	-18.019	.59	-.18
.640	-17.459	.61	-.18
.630	-16.929	.63	-.18
.620	-16.426	.65	-.18
.610	-15.948	.67	-.17
.600	-15.492	.68	-.17
.590	-15.058	.70	-.17
.580	-14.644	.72	-.17
.570	-14.248	.74	-.16
.560	-13.870	.76	-.16
.550	-13.507	.78	-.16
.540	-13.159	.80	-.16
.530	-12.825	.82	-.15
.520	-12.505	.84	-.15

GAMMA = 3.70 (CONT.)

BETA	ALPHA	SKEW	NSY
.510	-12.196	.86	-.15
.500	-11.899	.88	-.15
.490	-11.613	.91	-.14
.480	-11.337	.93	-.14
.470	-11.071	.95	-.14
.460	-10.814	.97	-.14
.450	-10.565	.99	-.13
.440	-10.324	1.02	-.13
.430	-10.091	1.04	-.13
.420	-9.865	1.06	-.13
.410	-9.646	1.08	-.12
.400	-9.434	1.11	-.12
.390	-9.228	1.13	-.12
.380	-9.027	1.16	-.12
.370	-8.832	1.18	-.11
.360	-8.643	1.21	-.11
.350	-8.458	1.23	-.11
.340	-8.278	1.26	-.10
.330	-8.103	1.29	-.10
.320	-7.932	1.31	-.10
.310	-7.765	1.34	-.10
.300	-7.602	1.37	-.09
.290	-7.442	1.40	-.09
.280	-7.287	1.43	-.09
.270	-7.134	1.46	-.09
.260	-6.985	1.49	-.08
.250	-6.839	1.52	-.08
.240	-6.695	1.55	-.08
.230	-6.555	1.59	-.07
.220	-6.417	1.62	-.07
.210	-6.281	1.66	-.07
.200	-6.148	1.69	-.07
.190	-6.017	1.73	-.06
.180	-5.888	1.77	-.06
.170	-5.762	1.81	-.06
.160	-5.637	1.85	-.05
.150	-5.513	1.89	-.05
.140	-5.391	1.93	-.05
.130	-5.271	1.98	-.04
.120	-5.152	2.02	-.04
.110	-5.035	2.07	-.04
.100	-4.918	2.12	-.04
.090	-4.803	2.17	-.03
.080	-4.688	2.23	-.03
.070	-4.574	2.28	-.03
.060	-4.461	2.34	-.02
.050	-4.348	2.41	-.02
.040	-4.235	2.47	-.01

TABLE 4.1(CONTINUED)

GAMMA = 3.70 (CONT.)

BETA	ALPHA	SKEW	NSY
.030	-4.122	2.54	-.01
.020	-4.009	2.62	-.01
.010	-3.895	2.70	-.00
-.000	-3.781	2.79	.00
-.010	-3.666	2.88	.00
-.020	-3.548	2.98	.01
-.030	-3.429	3.09	.01
-.040	-3.307	3.21	.02
-.050	-3.181	3.35	.02
-.060	-3.049	3.50	.03
-.070	-2.910	3.69	.03
-.080	-2.760	3.91	.04
-.090	-2.591	4.18	.04
-.100	-2.388	4.58	.05
-.110	-2.049	5.43	.06
-.111M	-1.909	5.87	.06
-.110	-1.775	6.37	.06
-.100	-1.494	7.72	.06
-.090	-1.349	8.63	.06
-.080	-1.241	9.46	.06
-.070	-1.152	10.24	.05
-.060	-1.075	11.02	.05
-.050	-1.007	11.80	.04
-.040	-.945	12.59	.03
-.030	-.889	13.40	.03
-.020	-.837	14.22	.02
-.010	-.788	15.07	.01

GAMMA = 3.80

BETA	ALPHA	SKEW	NSY
.990	-720.985	.02	-.26
.980	-359.970	.03	-.26
.970	-239.622	.05	-.26
.960	-179.440	.06	-.25
.950	-143.325	.08	-.25
.940	-119.243	.09	-.25
.930	-102.038	.11	-.25
.920	-89.130	.13	-.24
.910	-79.087	.14	-.24
.900	-71.050	.16	-.24
.890	-64.471	.17	-.24

GAMMA = 3.80 (CONT.)

BETA	ALPHA	SKEW	NSY
.880	-58.986	.19	-.23
.870	-54.343	.21	-.23
.860	-50.361	.22	-.23
.850	-46.907	.24	-.23
.840	-43.884	.25	-.22
.830	-41.214	.27	-.22
.820	-38.839	.29	-.22
.810	-36.713	.30	-.22
.800	-34.798	.32	-.21
.790	-33.063	.34	-.21
.780	-31.485	.35	-.21
.770	-30.043	.37	-.21
.760	-28.719	.39	-.21
.750	-27.501	.40	-.20
.740	-26.374	.42	-.20
.730	-25.330	.44	-.20
.720	-24.359	.45	-.20
.710	-23.455	.47	-.19
.700	-22.609	.49	-.19
.690	-21.817	.50	-.19
.680	-21.073	.52	-.19
.670	-20.373	.54	-.18
.660	-19.714	.56	-.18
.650	-19.091	.57	-.18
.640	-18.502	.59	-.18
.630	-17.944	.61	-.17
.620	-17.414	.63	-.17
.610	-16.910	.65	-.17
.600	-16.431	.66	-.17
.590	-15.974	.68	-.16
.580	-15.538	.70	-.16
.570	-15.122	.72	-.16
.560	-14.724	.74	-.16
.550	-14.342	.76	-.15
.540	-13.976	.78	-.15
.530	-13.625	.80	-.15
.520	-13.288	.82	-.15
.510	-12.964	.84	-.14
.500	-12.652	.86	-.14
.490	-12.351	.88	-.14
.480	-12.061	.90	-.14
.470	-11.781	.92	-.13
.460	-11.511	.94	-.13
.450	-11.250	.96	-.13
.440	-10.997	.98	-.13
.430	-10.753	1.00	-.12
.420	-10.516	1.03	-.12
.410	-10.286	1.05	-.12

TABLE 4.1(CONTINUED)

GAMMA = 3.80 (CONT.)

BETA	ALPHA	SKEW	NSY
.400	-10.064	1.07	-.12
.390	-9.847	1.09	-.11
.380	-9.637	1.12	-.11
.370	-9.433	1.14	-.11
.360	-9.234	1.17	-.11
.350	-9.041	1.19	-.10
.340	-8.853	1.21	-.10
.330	-8.670	1.24	-.10
.320	-8.491	1.27	-.10
.310	-8.316	1.29	-.09
.300	-8.146	1.32	-.09
.290	-7.979	1.35	-.09
.280	-7.817	1.37	-.09
.270	-7.658	1.40	-.08
.260	-7.502	1.43	-.08
.250	-7.350	1.46	-.08
.240	-7.201	1.49	-.07
.230	-7.055	1.52	-.07
.220	-6.911	1.55	-.07
.210	-6.770	1.58	-.07
.200	-6.632	1.62	-.06
.190	-6.496	1.65	-.06
.180	-6.363	1.69	-.06
.170	-6.232	1.72	-.05
.160	-6.102	1.76	-.05
.150	-5.975	1.80	-.05
.140	-5.850	1.84	-.05
.130	-5.726	1.88	-.04
.120	-5.604	1.92	-.04
.110	-5.483	1.96	-.04
.100	-5.363	2.00	-.03
.090	-5.245	2.05	-.03
.080	-5.128	2.10	-.03
.070	-5.013	2.15	-.02
.060	-4.897	2.20	-.02
.050	-4.783	2.25	-.02
.040	-4.670	2.31	-.01
.030	-4.556	2.37	-.01
.020	-4.443	2.43	-.01
.010	-4.331	2.50	-.00
-.000	-4.218	2.57	.00
-.010	-4.105	2.65	.00
-.020	-3.991	2.73	.01
-.030	-3.876	2.81	.01
-.040	-3.760	2.90	.02
-.050	-3.643	3.00	.02
-.060	-3.523	3.11	.02
-.070	-3.400	3.24	.03

GAMMA = 3.80 (CONT.)

BETA	ALPHA	SKEW	NSY
-.080	-3.273	3.37	.03
-.090	-3.140	3.53	.04
-.100	-3.000	3.71	.04
-.110	-2.848	3.92	.05
-.120	-2.679	4.20	.05
-.130	-2.473	4.59	.06
-.140	-2.131	5.43	.07
-.141M	-1.987	5.87	.08
-.140	-1.850	6.37	.08
-.130	-1.566	7.69	.08
-.120	-1.419	8.59	.08
-.110	-1.309	9.39	.08
-.100	-1.219	10.16	.07
-.090	-1.141	10.92	.07
-.080	-1.071	11.68	.06
-.070	-1.009	12.44	.06
-.060	-.952	13.22	.05
-.050	-.899	14.02	.05
-.040	-.849	14.85	.04
-.030	-.803	15.69	.03

GAMMA = 3.90

BETA	ALPHA	SKEW	NSY
.990	-759.485	.02	-.25
.980	-379.220	.03	-.25
.970	-252.455	.05	-.25
.960	-189.065	.06	-.25
.950	-151.025	.08	-.24
.940	-125.660	.09	-.24
.930	-107.538	.11	-.24
.920	-93.942	.12	-.24
.910	-83.365	.14	-.23
.900	-74.900	.15	-.23
.890	-67.971	.17	-.23
.880	-62.195	.19	-.23
.870	-57.304	.20	-.23
.860	-53.111	.22	-.22
.850	-49.474	.23	-.22
.840	-46.290	.25	-.22
.830	-43.479	.26	-.22
.820	-40.978	.28	-.21

TABLE 4.1(CONTINUED)

GAMMA = 3.90 (CONT.)

BETA	ALPHA	SKEW	NSY
.810	-38.739	.30	-.21
.800	-36.723	.31	-.21
.790	-34.897	.33	-.21
.780	-33.235	.34	-.20
.770	-31.717	.36	-.20
.760	-30.324	.38	-.20
.750	-29.041	.39	-.20
.740	-27.855	.41	-.19
.730	-26.756	.42	-.19
.720	-25.735	.44	-.19
.710	-24.783	.46	-.19
.700	-23.893	.47	-.19
.690	-23.059	.49	-.18
.680	-22.277	.51	-.18
.670	-21.541	.52	-.18
.660	-20.847	.54	-.18
.650	-20.192	.56	-.17
.640	-19.572	.58	-.17
.630	-18.985	.59	-.17
.620	-18.428	.61	-.17
.610	-17.898	.63	-.16
.600	-17.395	.65	-.16
.590	-16.914	.66	-.16
.580	-16.456	.68	-.16
.570	-16.019	.70	-.15
.560	-15.600	.72	-.15
.550	-15.199	.74	-.15
.540	-14.815	.75	-.15
.530	-14.446	.77	-.14
.520	-14.092	.79	-.14
.510	-13.751	.81	-.14
.500	-13.424	.83	-.14
.490	-13.108	.85	-.14
.480	-12.804	.87	-.13
.470	-12.510	.89	-.13
.460	-12.227	.91	-.13
.450	-11.953	.93	-.13
.440	-11.688	.95	-.12
.430	-11.432	.97	-.12
.420	-11.183	.99	-.12
.410	-10.943	1.01	-.12
.400	-10.709	1.04	-.11
.390	-10.483	1.06	-.11
.380	-10.263	1.08	-.11
.370	-10.049	1.10	-.11
.360	-9.841	1.13	-.10
.350	-9.639	1.15	-.10
.340	-9.442	1.17	-.10

GAMMA = 3.90 (CONT.)

BETA	ALPHA	SKEW	NSY
.330	-9.250	1.20	-.10
.320	-9.063	1.22	-.09
.310	-8.881	1.25	-.09
.300	-8.703	1.27	-.09
.290	-8.530	1.30	-.08
.280	-8.360	1.32	-.08
.270	-8.194	1.35	-.08
.260	-8.032	1.38	-.08
.250	-7.873	1.40	-.07
.240	-7.718	1.43	-.07
.230	-7.566	1.46	-.07
.220	-7.417	1.49	-.07
.210	-7.270	1.52	-.06
.200	-7.127	1.55	-.06
.190	-6.986	1.58	-.06
.180	-6.847	1.61	-.06
.170	-6.711	1.65	-.05
.160	-6.578	1.68	-.05
.150	-6.446	1.72	-.05
.140	-6.316	1.75	-.04
.130	-6.189	1.79	-.04
.120	-6.063	1.82	-.04
.110	-5.938	1.86	-.04
.100	-5.816	1.90	-.03
.090	-5.695	1.95	-.03
.080	-5.575	1.99	-.03
.070	-5.456	2.03	-.02
.060	-5.339	2.08	-.02
.050	-5.222	2.13	-.02
.040	-5.107	2.18	-.01
.030	-4.992	2.23	-.01
.020	-4.878	2.28	-.01
.010	-4.765	2.34	-.00
-.000	-4.652	2.40	.00
-.010	-4.539	2.46	.00
-.020	-4.426	2.53	.01
-.030	-4.313	2.60	.01
-.040	-4.200	2.67	.01
-.050	-4.086	2.75	.02
-.060	-3.971	2.84	.02
-.070	-3.855	2.93	.03
-.080	-3.737	3.03	.03
-.090	-3.616	3.14	.03
-.100	-3.492	3.26	.04
-.110	-3.365	3.39	.04
-.120	-3.231	3.55	.05
-.130	-3.090	3.73	.05
-.140	-2.937	3.94	.06

TABLE 4.1(CONTINUED)

GAMMA = 3.90 (CONT.)

BETA	ALPHA	SKEW	NSY
-.150	-2.766	4.22	.07
-.160	-2.558	4.61	.07
-.170	-2.213	5.43	.08
-.171M	-2.066	5.87	.09
-.170	-1.925	6.37	.09
-.160	-1.638	7.67	.10
-.150	-1.489	8.55	.10
-.140	-1.378	9.33	.09
-.130	-1.286	10.08	.09
-.120	-1.207	10.82	.09
-.110	-1.136	11.56	.08
-.100	-1.073	12.30	.08
-.090	-1.015	13.06	.07
-.080	-.961	13.84	.07
-.070	-.910	14.63	.06
-.060	-.863	15.45	.06

GAMMA = 4.00

BETA	ALPHA	SKEW	NSY
.990	-798.985	.02	-.25
.980	-398.970	.03	-.25
.970	-265.622	.05	-.24
.960	-198.940	.06	-.24
.950	-158.925	.08	-.24
.940	-132.243	.09	-.24
.930	-113.181	.11	-.23
.920	-98.880	.12	-.23
.910	-87.754	.14	-.23
.900	-78.850	.15	-.23
.890	-71.562	.17	-.22
.880	-65.486	.18	-.22
.870	-60.343	.20	-.22
.860	-55.932	.21	-.22
.850	-52.107	.23	-.22
.840	-48.759	.24	-.21
.830	-45.803	.26	-.21
.820	-43.173	.27	-.21
.810	-40.819	.29	-.21
.800	-38.698	.30	-.20
.790	-36.778	.32	-.20
.780	-35.031	.33	-.20

GAMMA = 4.00 (CONT.)

BETA	ALPHA	SKEW	NSY
.770	-33.435	.35	-.20
.760	-31.970	.37	-.19
.750	-30.621	.38	-.19
.740	-29.375	.40	-.19
.730	-28.220	.41	-.19
.720	-27.146	.43	-.19
.710	-26.145	.45	-.18
.700	-25.210	.46	-.18
.690	-24.334	.48	-.18
.680	-23.512	.49	-.18
.670	-22.738	.51	-.17
.660	-22.009	.53	-.17
.650	-21.321	.54	-.17
.640	-20.670	.56	-.17
.630	-20.053	.58	-.16
.620	-19.468	.59	-.16
.610	-18.912	.61	-.16
.600	-18.383	.63	-.16
.590	-17.879	.65	-.15
.580	-17.398	.66	-.15
.570	-16.938	.68	-.15
.560	-16.499	.70	-.15
.550	-16.078	.72	-.15
.540	-15.675	.73	-.14
.530	-15.288	.75	-.14
.520	-14.917	.77	-.14
.510	-14.559	.79	-.14
.500	-14.216	.81	-.13
.490	-13.885	.83	-.13
.480	-13.566	.84	-.13
.470	-13.258	.86	-.13
.460	-12.961	.88	-.12
.450	-12.674	.90	-.12
.440	-12.396	.92	-.12
.430	-12.128	.94	-.12
.420	-11.868	.96	-.11
.410	-11.616	.98	-.11
.400	-11.371	1.00	-.11
.390	-11.134	1.02	-.11
.380	-10.904	1.05	-.10
.370	-10.681	1.07	-.10
.360	-10.463	1.09	-.10
.350	-10.252	1.11	-.10
.340	-10.046	1.13	-.09
.330	-9.846	1.16	-.09
.320	-9.650	1.18	-.09
.310	-9.460	1.20	-.09
.300	-9.274	1.23	-.08

TABLE 4.1(CONTINUED)

GAMMA = 4.00 (CONT.)

BETA	ALPHA	SKEW	NSY
.290	-9.093	1.25	-.08
.280	-8.916	1.28	-.08
.270	-8.743	1.30	-.08
.260	-8.574	1.33	-.07
.250	-8.409	1.35	-.07
.240	-8.247	1.38	-.07
.230	-8.089	1.41	-.07
.220	-7.934	1.43	-.06
.210	-7.782	1.46	-.06
.200	-7.632	1.49	-.06
.190	-7.486	1.52	-.06
.180	-7.342	1.55	-.05
.170	-7.201	1.58	-.05
.160	-7.063	1.61	-.05
.150	-6.926	1.64	-.04
.140	-6.792	1.68	-.04
.130	-6.660	1.71	-.04
.120	-6.530	1.74	-.04
.110	-6.402	1.78	-.03
.100	-6.276	1.82	-.03
.090	-6.151	1.85	-.03
.080	-6.028	1.89	-.02
.070	-5.906	1.93	-.02
.060	-5.786	1.97	-.02
.050	-5.667	2.02	-.02
.040	-5.549	2.06	-.01
.030	-5.433	2.11	-.01
.020	-5.317	2.15	-.01
.010	-5.202	2.20	-.00
-.000	-5.088	2.25	.00
-.010	-4.974	2.31	.00
-.020	-4.861	2.37	.01
-.030	-4.748	2.42	.01
-.040	-4.635	2.49	.01
-.050	-4.522	2.55	.02
-.060	-4.409	2.62	.02
-.070	-4.295	2.70	.02
-.080	-4.181	2.78	.03
-.090	-4.066	2.86	.03
-.100	-3.949	2.95	.04
-.110	-3.830	3.05	.04
-.120	-3.709	3.16	.04
-.130	-3.585	3.28	.05
-.140	-3.456	3.42	.05
-.150	-3.322	3.57	.06
-.160	-3.180	3.75	.06
-.170	-3.026	3.96	.07
-.180	-2.853	4.23	.08

GAMMA = 4.00 (CONT.)

BETA	ALPHA	SKEW	NSY
-.190	-2.643	4.62	.08
-.200	-2.296	5.43	.10
-.201M	-2.145	5.87	.10
-.200	-2.000	6.37	.10
-.190	-1.710	7.64	.11
-.180	-1.560	8.50	.11
-.170	-1.447	9.27	.11
-.160	-1.353	10.01	.11
-.150	-1.273	10.73	.11
-.140	-1.202	11.45	.10
-.130	-1.137	12.17	.10
-.120	-1.078	12.91	.09
-.110	-1.023	13.66	.09
-.100	-.972	14.43	.08
-.090	-.924	15.22	.08

APPENDIX A: FORTRAN SUBROUTINES FOR DETERMINING THE REAL ROOTS OF A CUBIC EQUATION

Two computer subroutines are provided which return the value(s) of the normalized third parameter, α . Subroutine CUBSOL uses the median method (equations 4 and 8, Chapter 2). The input argument is an array of dimension 4 with elements as defined on the comment cards at the beginning of the subroutine list. The return arguments are S and SA where S is the smaller value of α and SA the larger. S corresponds to skew coefficients less than 5.87 and is usually the desired value. NFLAG is an indicator parameter which is set to -1 when there are no real solutions for the given input array. When a real solution exists NFLAG is set to zero. CUBSOL makes use of the cubic solution for the case when all three roots are real (see for example Eshbach (1936)) Function SOL is called from CUBSOL, hence must be included whenever CUBSOL is used.

Subroutine CUBSOL1 uses the skew method (equations 6, Chapter 2) in the solution for α. The input argument is an array of dimension 4 with arguments defined in the subroutine listing. The return argument is S where S is the single real value of α . The subroutine makes use of the closed form solution to a cubic equation for the case of one real and two complex roots.

```
      SUBROUTINE CUBSOL(A,S,SA,NFLAG)
C     THIS IS THE SUBROUTINE USED TO FIND THE TWO REAL VALUES OF A
C     GIVEN THE COEFFICIENT OF VARIATION AND MEDIAN. THE INPUT AR-
C     RAY IS
C     A(1) = 2.*(1.-BETA)
C     A(2) = CV*CV + BETA*BETA - 5. + 4.*BETA
C     A(4) = CV*CV*BETA*BETA - 1. + BETA*BETA
C     A(3) = 2.*(2. - BETA*CV*CV - BETA*(1. + BETA))
C     WHERE BETA = MEDIAN/MEAN RATIO, CV = COEFFICIENT OF VARIATION.
C     NFLAG = -1 IS RETURNED IF SOLUTIONS ARE ALL COMPLEX.  OTHERWISE
C     S IS THE SMALLER OF THE TWO ROOTS (AND NORMALLY THE DESIRED
C     VALUE). FUNCTION SOL MUST BE INCLUDED WHEN CUBSOL IS CALLED.
      DIMENSION A(4)
       NFLAG = 0
      DO 10 J = 1,4
      K = 5-J
      A(K) = A(K)/A(1)
10    CONTINUE
       Q = A(1)*A(3)/3.-A(2)*A(2)/9.
      R = .5*(3.*A(1)*A(2)*A(3)/9. - A(1)*A(1)*A(4)) - A(2)*A(2)*A(2)
     $27.
      IF(Q .GT. 0. .OR. Q*Q*Q+R*R .GT. 0.) GO TO 25
      IF (R .LT. 0.) GO TO 20
      S1 = (SOL(Q,R,0.,1)-A(2)/3.)/A(1)
      S2 = (SOL(Q,R,6.2832/3.,1)-A(2)/3.)/A(1)
      S3 = (SOL(Q,R,6.2832/1.5,1)-A(2)/3.)/A(1)
      S = AMIN1(S1,S2,S3)
     IF(S.EQ.S1) SA=AMIN1(S2,S3)
     IF(S.EQ.S2) SA=AMIN1(S1,S3)
     IF(S.EQ.S3) SA=AMIN1(S1,S2)
      RETURN
20     S1 = (SOL(Q,R,0.,-1)-A(2)/3.)/A(1)
      S2 = (SOL(Q,R,6.2832/3.,-1)-A(2)/3.)/A(1)
      S3 = (SOL(Q,R,6.2832/1.5,-1)-A(2)/3.)/A(1)
      S = AMIN1(S1,S2,S3)
     IF(S.EQ.S1) SA=AMIN1(S2,S3)
     IF(S.EQ.S2) SA=AMIN1(S1,S3)
     IF(S.EQ.S3) SA=AMIN1(S1,S2)
      RETURN
25    NFLAG = -1
      NFLAG = -1
      RETURN
      END
      FUNCTION SOL(Q,R,RK,N)
       IF(N .EQ. -1) GO TO 10
      SOL = 2.*SQRT(-Q)*COS(1./3.*ACOS(R/SQRT(-Q*Q*Q)) + RK)
      RETURN
10    SOL = -2.*SQRT(-Q)*COS(1./3.*ACOS(-R/SQRT(-Q*Q*Q))+ RK)
      RETURN
      END
```

```
      SUBROUTINE CUBSOL1(A,S)
C     THIS IS THE SUBROUTINE WHICH IS USED TO FIND THE SINGLE REAL
C     VALUE OF A WHEN THE SKEW COEFFICIENT AND COEFFICIENT OF VAR-
C     IATION ARE SPECIFIED.  THE INPUT ARRAY IS
C     A(1)=G
C     A(2)=3.*CV-3.*G
C     A(3)=-6.*CV+3.*G
C     A(4)=CV*CV*CV+3.*CV-G
C     WHERE G = SKEW COEFFICIENT AND CV = COEFFICIENT OF VARIATION
      DIMENSION A(4)
      SINH(X) = (EXP(X) -EXP(-X))/2.
      COSH(X) = (EXP(X) + EXP(-X))/2.
      ASINH(X) = ALOG(X + SQRT(X*X+1.))
      ACOSH(X) = ALOG(X + SQRT(X*X-1.))
       Q = A(1)*A(3)/3.-A(2)*A(2)/9.
      R = .5*(3.*A(1)*A(2)*A(3)/9. - A(1)*A(1)*A(4)) - A(2)*A(2)*A(2)/
     +27.
      IF(Q .GT. 0. .OR. Q*Q*Q+R*R .GT. 0.) GO TO 25
      IF (R .LT. 0.) GO TO 20
      S1 = (SQL(Q,R,0.,1)-A(2)/3.)/A(1)
      S2 = (SQL(Q,R,6.2832/3.,1)-A(2)/3.)/A(1)
      S3 = (SQL(Q,R,6.2832/1.5,1)-A(2)/3.)/A(1)
      S = AMIN1(S1,S2,S3)
      RETURN
20     S1 = (SQL(Q,R,0.,-1)-A(2)/3.)/A(1)
      S2 = (SQL(Q,R,6.2832/3.,-1)-A(2)/3.)/A(1)
      S3 = (SQL(Q,R,6.2832/1.5,-1)-A(2)/3.)/A(1)
      S = AMIN1(S1,S2,S3)
      RETURN
25    IF (Q .GT. 0.) GO TO 50
      IF(R .LT. 0.) GO TO 40
      S = 2.*SQRT(-Q)*COSH(1./3.*ACOSH(R/SQRT(-Q*Q*Q)))
      S = (S-A(2)/3.)/A(1)
      RETURN
40     S = -2.*SQRT(-Q)*COSH(1./3.*ACOSH(-R/SQRT(-Q*Q*Q)))
      S = (S-A(2)/3.)/A(1)
      RETURN
50    IF (R .LT. 0.) GO TO 51
      S = 2.*SQRT(Q)*SINH(1./3.*ASINH(R/SQRT(Q*Q*Q)))
      S = (S-A(2)/3.)/A(1)
51    S = -2.*SQRT(Q)*SINH(1./3.*ASINH(-R/SQRT(Q*Q*Q)))
      S = (S-A(2)/3.)/A(1)
      RETURN
      END
```

APPENDIX B: BIAS CORRECTION FACTORS FOR SMALL SAMPLE ESTIMATES OF STANDARD DEVIATION AND SKEW COEFFICIENT

Wallis, et al. (1974) have published bias correction factors for small sample estimates of standard deviation and skew coefficient. They computed these factors for the three parameter log normal distribution for skew coefficients $0.25 \leq G_x \leq 15$. Reproduced below in Tables B.1 and B.2 are the bias correction factors for standard deviation and skew coefficient respectively. In both tables the bias correction factor is defined as the population parameter divided by the mean estimate of the sample parameter (based on 10^5 samples, each sample containing N values of the random variate). For example, in Table B.1: $G_x = 2$, N = 30, bias factor = 1.049. Thus an unbiased estimate of σ_x is $1.049 < S_x >$ where $< S_x >$ is the average estimated value of σ_x.

It is important to note that estimates of standard deviation S_x and skew G_x used by Wallis, et al., are biased estimates. Thus computations for S_x and G_x should follow equations B.1 and B.2, respectively. The biased estimates were used because they provide the minimum mean square estimates of S_x and G_x, respectively, (see, for example, Breiman (1973)).

$$\hat{S}_x^2 = \frac{1}{n} \sum_{i=1}^{n} (x_i - \hat{\mu}_x)^2 \qquad \text{B.1}$$

$$\hat{G}_x = \frac{1}{n} \sum_{i=1}^{n} \frac{(x_i - \hat{\mu}_x)^3}{\hat{S}_x^3} \qquad \text{B.2}$$

(1)

Table B.1 Bias Factors for Standard Deviation -- Three Parameter Log Normal Distribution

	Sequence Length n								
Skew, G_x	10	20	30	40	50	60	70	80	90
0.25	1.085	1.040	1.026	1.020	1.016	1.013	1.011	1.010	1.009
0.50	1.088	1.042	1.028	1.021	1.016	1.014	1.012	1.010	1.009
0.71	1.093	1.044	1.029	1.022	1.017	1.014	1.012	1.011	1.010
1.00	1.101	1.048	1.032	1.024	1.019	1.016	1.014	1.012	1.011
1.14	1.104	1.050	1.033	1.025	1.020	1.017	1.015	1.013	1.011
1.41	1.116	1.057	1.038	1.029	1.023	1.019	1.017	1.015	1.013
2.00	1.141	1.072	1.049	1.038	1.031	1.026	1.023	1.020	1.018
3.00	1.186	1.100	1.071	1.056	1.047	1.041	1.036	1.032	1.029
4.00	1.233	1.131	1.095	1.076	1.065	1.057	1.050	1.045	1.041
5.00	1.276	1.161	1.119	1.096	1.083	1.073	1.065	1.059	1.054
10.00	1.452	1.284	1.221	1.184	1.163	1.147	1.133	1.123	1.114
15.00	1.581	1.378	1.299	1.254	1.226	1.206	1.188	1.175	1.164

(From Table 3, Wallis, et al., 1974; reproduced by kind permission of the American Geophysical Union.)

(1)

Table B.2 Bias Factors for Skew -- Three Parameter Log Normal Distribution

	Sequence Length n								
Skew, G_x	10	20	30	40	50	60	70	80	90
0.25	1.903	1.381	1.246	1.183	1.141	1.116	1.099	1.086	1.076
0.50	1.960	1.413	1.267	1.198	1.156	1.129	1.109	1.096	1.085
0.71	2.019	1.450	1.295	1.220	1.176	1.147	1.126	1.111	1.099
1.00	2.100	1.499	1.331	1.249	1.201	1.168	1.144	1.126	1.113
1.14	2.161	1.534	1.359	1.268	1.221	1.188	1.163	1.144	1.139
1.41	2.251	1.595	1.404	1.309	1.252	1.218	1.189	1.168	1.151
2.00	2.528	1.773	1.545	1.428	1.358	1.307	1.276	1.248	1.220
3.00	3.066	2.120	1.827	1.665	1.573	1.506	1.455	1.414	1.381
4.00	3.641	2.498	2.134	1.931	1.813	1.727	1.659	1.607	1.563
5.00	4.234	2.888	2.453	2.209	2.064	1.959	1.876	1.811	1.757
10.00	7.247	4.880	4.087	3.636	3.362	3.161	3.002	2.876	2.773
15.00	10.239	6.857	5.710	5.055	4.654	4.359	4.126	3.940	3.788

(From Table 4, Wallis, et al., 1974; reproduced by kind permission of the American Geophysical Union.)

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(1) Each bias factor is the ratio of the population value over the mean of samples, each sample of length n.

APPENDIX C: LIST OF SYMBOLS

a	third parameter
$\ln$	logarithm to base e
x	three parameter lognormally distributed random variate
$y = \ln(x-a)$	normally distributed random variate corresponding to x
$\exp(x)$	e^x
$N(p,q)$	normal distribution with mean = p and standard deviation = q
μ_x	population mean of x
σ_x	population standard deviation of x
$\tilde{x}$	population median of x
G_x	population skew coefficient of x
μ_y	population mean of y
σ_y	population standard deviation of y
α	$\frac{a}{\mu_x}$
β	$\frac{x}{\mu_x}$
γ	$\frac{\sigma_x}{\mu_x}$
θ	$\frac{\sigma_x}{\bar{x}-a} = \frac{\gamma}{1-\alpha}$
β_{min}	minimum value of β
$\hat{\mu}_x$	sample estimate of μ_x
$\hat{S}_x$	biased sample estimate of σ_x (see Appendix B)
$\hat{\tilde{x}}$	sample estimate of $\tilde{x}$
$\hat{G}_x$	biased sample estimate of G_x (see Appendix B)
$\hat{\alpha}$	sample estimate of α

$\hat{\mu}_y$	sample estimate of μ_y
$\hat{S}_y$	sample estimate of σ_y
$<\alpha_s>$	mean value of sample estimate of α using the "skew method"
$<\alpha_m>$	mean value of sample estimate of α using the "median method"
K_{b_m}	bias constant for α resulting from "median method"
K_{b_s}	bias constant for α resulting from skew method
ALPHA	α
BETA	β
GAMMA	γ
M	corresponds to β_{min} in Table 4.1
NSY	the number of standard deviations corresponding to the location of $x = 0$ relative to μ_y

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