11 APPENDIX III

This section presents the analysis of variance of GEH as a response variable and the dynamic traffic assignment parameters as factors for all network models.

11.1 VITORIA MODEL

11.1.1 EXPERIMENT DESCRIPTION

This section presents the validation results of dynamic traffic assignment parameters based on a standard comparison between model and system outputs for a medium-sized urban network of medium size that models a part of the city of Vitoria in Spain.

The set of real traffic data comprises traffic counts gathered at 10 detector stations from 4 April 1999 to 19 May 1999. The level of aggregation was 15 minutes over 24 hours. From the data, we considered only working days and the afternoon peak hour (from 18:00 to 19:00) and calculated the average traffic count for each detector.

Depending on the route choice model employed (proportional, logit or C-logit), the experimental design factors for the simulations were as follows:

- Proportional route choice model:
  - Alpha factor (α), for which values of 0.5, 1, 2 and 3 were considered
  - *Initial K-SP*, for which values of 1, 2 and 3 were considered
  - Maximum number of routes (*MaxNumberRoutes)*, for which values of 2, 3 and 4 were considered

  If these three factors are combined, the total number of experiments is 36 (4 * 3 * 3), each of which was simulated 15 times (replications). The following random seeds were changed: 9182, 1670, 6534, 8159, 8538, 5768, 1277, 1065, 1846, 8740, 1489, 3334, 6232, 6237 and 1870.

- Logit route choice model:
  - Scale factor (θ), for which values of 10, 60, 100 and 600 were considered
  - *Initial K-SP*, for which values of 1, 2 and 3 were considered
  - Maximum number of routes (*MaxNumberRoutes)*, for which values of 2, 3 and 4 were considered

If these three factors are combined, the total number of experiments is 36 (4 * 3 * 3), each of which was simulated 15 times (replications). The random seeds were changed as in the proportional route choice model.

- C-logit route choice model with fixed beta and gamma:
  - Scale factor (θ), for which values of 10, 60, 100 and 600 were considered
  - *Initial K-SP*, for which values of 1, 2 and 3 were considered
  - Maximum number of routes (*MaxNumberRoutes)*, for which values of 2, 3 and 4 were considered
  - Beta (β) fixed to 0.15
  - Gamma (γ) fixed to 1

  If these factors are combined, the total number of experiments is 36 (4 * 3 * 3), each of which was simulated 15 times (replications). The random seeds were changed as in the proportional route choice model.

- C-logit route choice model with varying beta and gamma:
  - Scale factor (θ) fixed to 60
  - *Initial K-SP* fixed to 2
  - Maximum number of routes (*MaxNumberRoutes)* fixed to 4
  - Beta (β), for which values of 0.10, 0.15, 0.50 and 1 were considered
  - Gamma (γ), for which values of 0.5, 1, 1.5 and 2 were considered

  If these factors are combined, the total number of experiments is 16 (4 * 4), each of which was simulated 15 times (replications). The random seeds were changed as in the proportional route choice model.

- C-logit route choice model changing the scale factor, *Initial K-SP*, beta and gamma:
  - Scale factor (θ), for which values of 10, 60 and 100 were considered
  - *Initial K-SP*, for which of 2 and 3 were considered
  - Maximum number of routes (*MaxNumberRoutes)* fixed to 4
  - Beta (β), for which values of 0.10, 0.15, 0.50 and 1 were considered

- Gamma (γ), for which values of 0.5, 1, 1.5 and 2 were considered

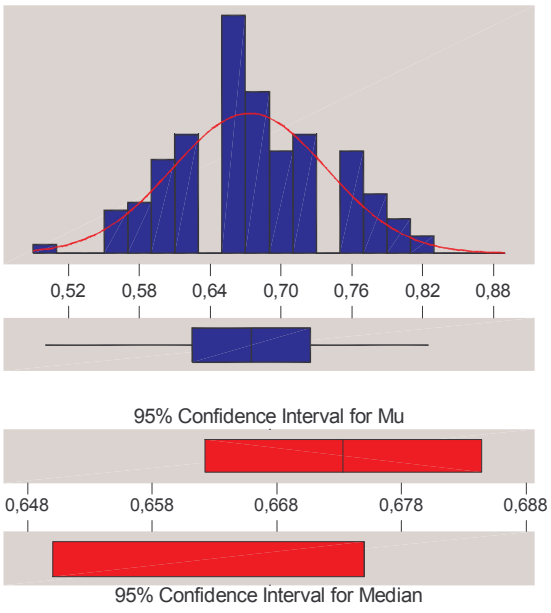
If these factors are combined, the total number of experiments is 144 (3 * 2 * 4 * 4), each of which was simulated 15 times (replications). The random seeds were changed as in the proportional route choice model.

11.1.2 EXPERIMENT RESULTS

11.1.2.1 PROPORTIONAL ROUTE CHOICE

ROUTE CHOICE: PROPORTIONAL
DESIGN FACTOR α, LEVELS 0.5, 1.0, 2.0, 3.0
DESIGN FACTOR INITIAL K-SP (Kinitial), LEVELS 1, 2, 3
DESIGN FACTOR MAXNUMBERROUTES (Number of Alternatives), LEVELS 2, 3, 4

11.1.2.1.1 GEH AS A FUNCTION OF α



Variable: GEH
Alpha Factor: 0,5

Anderson-Darling Normality Test

A-Squared:	1,223
P-Value:	0,003
Mean	0,673333
StDev	0,065235
Variance	4,26E-03
Skewness	9,44E-02
Kurtosis	-3,2E-01
N	135
Minimum	0,500000
1st Quartile	0,625000
Median	0,675000
3rd Quartile	0,725000
Maximum	0,825000

95% Confidence Interval for Mu

0,662229	0,684438

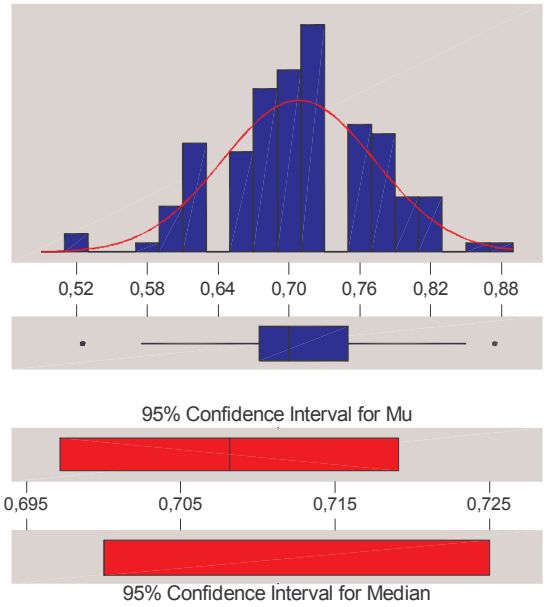
95% Confidence Interval for Sigma

0,058272	0,074103

95% Confidence Interval for Median

0,650000	0,675000

Descriptive Statistics



Variable: GEH

Alpha Factor: 1,0

Anderson-Darling Normality Test

A-Squared:	0,963
P-Value:	0,015
Mean	0,708148
StDev	0,064344
Variance	4,14E-03
Skewness	-1,1E-01
Kurtosis	0,118766
N	135
Minimum	0,525000
1st Quartile	0,675000
Median	0,700000
3rd Quartile	0,750000
Maximum	0,875000

95% Confidence Interval for Mu

0,697195 0,719101

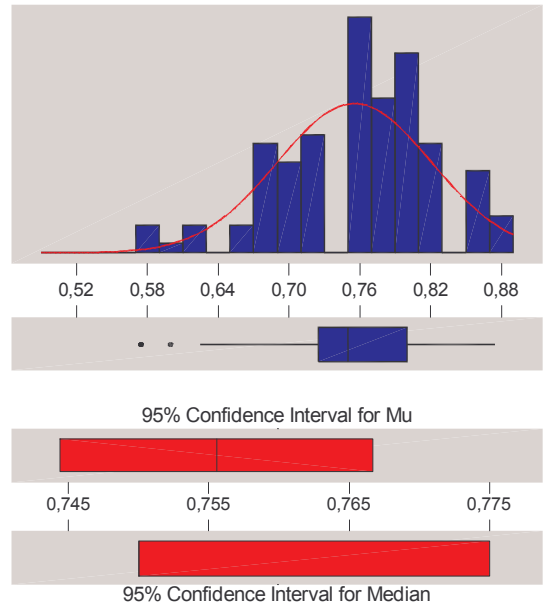
95% Confidence Interval for Sigma

0,057477 0,073091

95% Confidence Interval for Median

0,700000 0,725000

Descriptive Statistics



Variable: GEH

Alpha Factor: 2,0

Anderson-Darling Normality Test

A-Squared:	1,492
P-Value:	0,001
Mean	0,755556
StDev	0,065411
Variance	4,28E-03
Skewness	-5,3E-01
Kurtosis	0,140738
N	135
Minimum	0,575000
1st Quartile	0,725000
Median	0,750000
3rd Quartile	0,800000
Maximum	0,875000

95% Confidence Interval for Mu

0,744421 0,766690

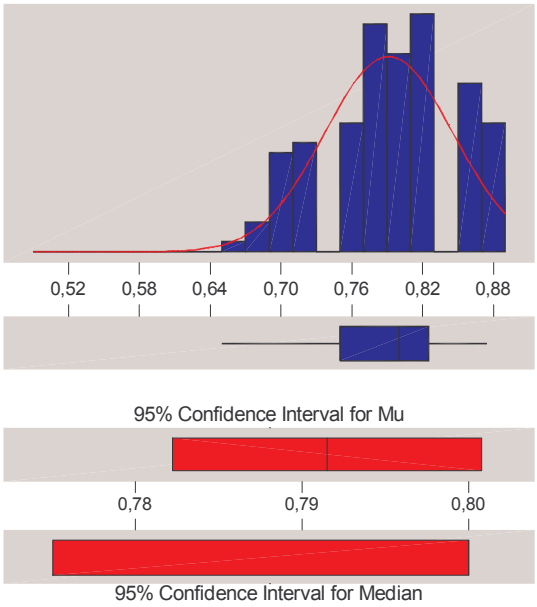
95% Confidence Interval for Sigma

0,058429 0,074303

95% Confidence Interval for Median

0,750000 0,775000

Descriptive Statistics



Variable: GEH
Alpha Factor: 3,0

Anderson-Darling Normality Test

A-Squared:	1,920
P-Value:	0,000
Mean	0,791481
StDev	0,054564
Variance	2,98E-03
Skewness	-3,5E-01
Kurtosis	-6,3E-01
N	135
Minimum	0,650000
1st Quartile	0,750000
Median	0,800000
3rd Quartile	0,825000
Maximum	0,875000

95% Confidence Interval for Mu

0,782193	0,800770

95% Confidence Interval for Sigma

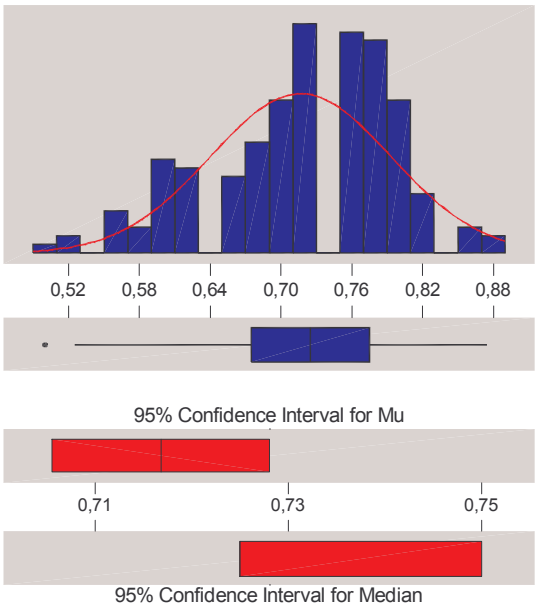
0,048740	0,061981

95% Confidence Interval for Median

0,775000	0,800000

11.1.2.1.2 GEH AS A FUNCTION OF INITIAL K-SP

Descriptive Statistics



Variable: GEH
Kinitial: 1

Anderson-Darling Normality Test

A-Squared:	2,706
P-Value:	0,000
Mean	0,716806
StDev	0,076490
Variance	5,85E-03
Skewness	-5,7E-01
Kurtosis	-1,3E-01
N	180
Minimum	0,500000
1st Quartile	0,675000
Median	0,725000
3rd Quartile	0,775000
Maximum	0,875000

95% Confidence Interval for Mu

0,705555	0,728056

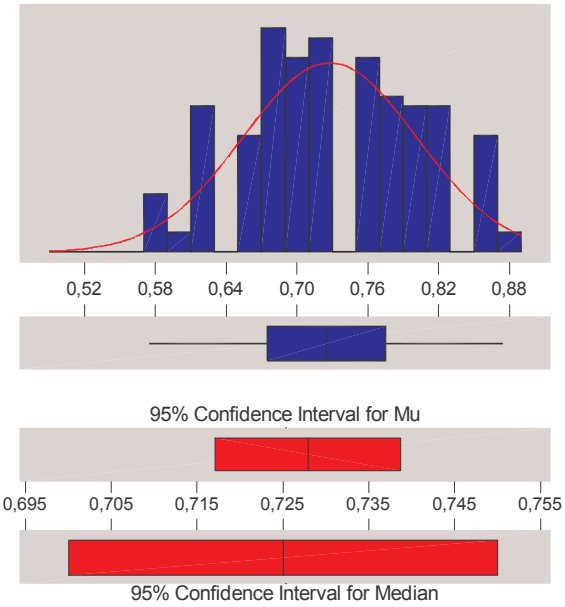
95% Confidence Interval for Sigma

0,069321	0,085327

95% Confidence Interval for Median

0,725000	0,750000

Descriptive Statistics



Variable: GEH
Kinitial: 2

Anderson-Darling Normality Test

A-Squared:	1,467
P-Value:	0,001
Mean	0,727917
StDev	0,073674
Variance	5,43E-03
Skewness	-2,9E-02
Kurtosis	-7,8E-01
N	180
Minimum	0,575000
1st Quartile	0,675000
Median	0,725000
3rd Quartile	0,775000
Maximum	0,875000

95% Confidence Interval for Mu

0,717081 0,738753

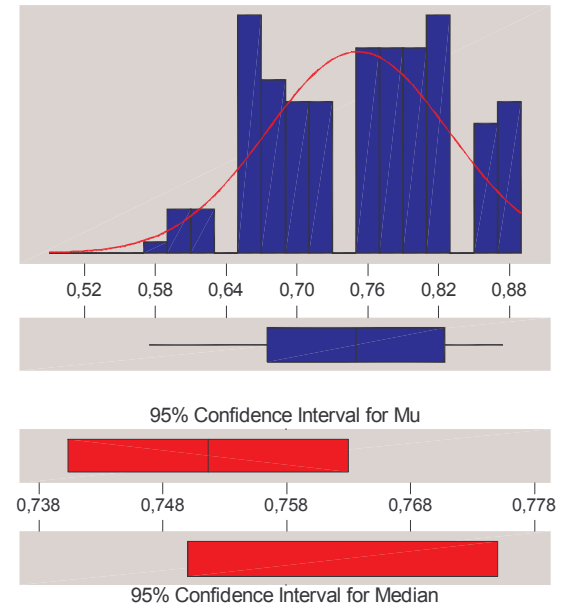
95% Confidence Interval for Sigma

0,066769 0,082186

95% Confidence Interval for Median

0,700000 0,750000

Descriptive Statistics



Variable: GEH
Kinitial: 3

Anderson-Darling Normality Test

A-Squared:	2,484
P-Value:	0,000
Mean	0,751667
StDev	0,076890
Variance	5,91E-03
Skewness	-1,4E-01
Kurtosis	-1,02832
N	180
Minimum	0,575000
1st Quartile	0,675000
Median	0,750000
3rd Quartile	0,825000
Maximum	0,875000

95% Confidence Interval for Mu

0,740358 0,762976

95% Confidence Interval for Sigma

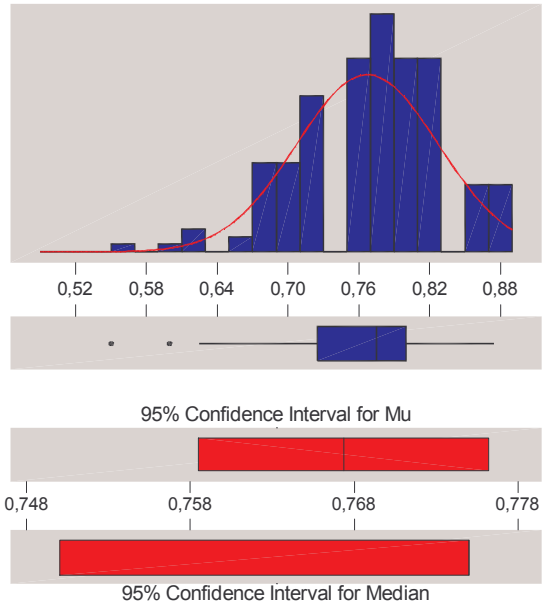
0,069683 0,085772

95% Confidence Interval for Median

0,750000 0,775000

11.1.2.1.3 GEH AS A FUNCTION OF THE NUMBER OF ALTERNATIVES

Descriptive Statistics



Variable: GEH

Numalternati: 2

Anderson-Darling Normality Test

A-Squared:	1,809
P-Value:	0,000
Mean	0,767361
StDev	0,060150
Variance	3,62E-03
Skewness	-5,1E-01
Kurtosis	0,375198
N	180
Minimum	0,550000
1st Quartile	0,725000
Median	0,775000
3rd Quartile	0,800000
Maximum	0,875000

95% Confidence Interval for Mu

0,758514 0,776208

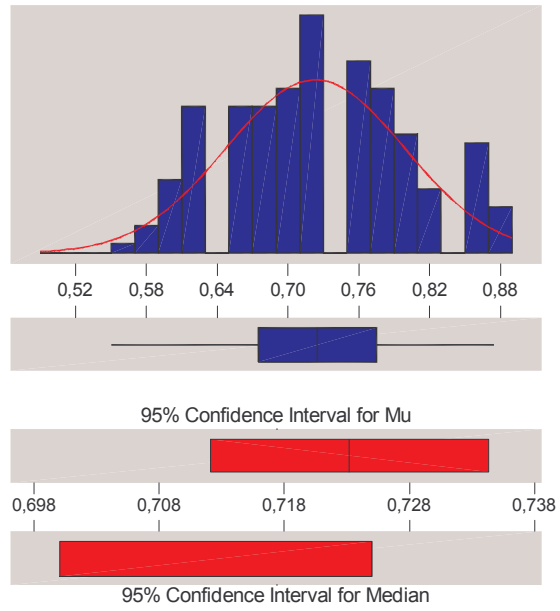
95% Confidence Interval for Sigma

0,054512 0,067099

95% Confidence Interval for Median

0,750000 0,775000

Descriptive Statistics



Variable: GEH

Numalternati: 3

Anderson-Darling Normality Test

A-Squared:	1,245
P-Value:	0,003
Mean	0,723194
StDev	0,075673
Variance	5,73E-03
Skewness	6,24E-02
Kurtosis	-7,0E-01
N	180
Minimum	0,550000
1st Quartile	0,675000
Median	0,725000
3rd Quartile	0,775000
Maximum	0,875000

95% Confidence Interval for Mu

0,712064 0,734325

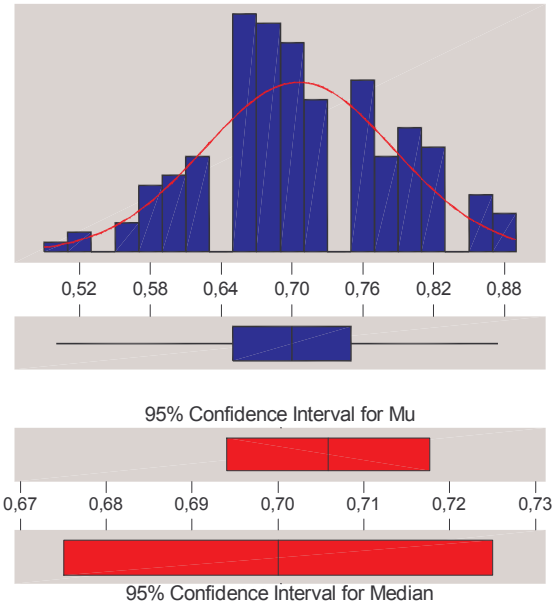
95% Confidence Interval for Sigma

0,068581 0,084416

95% Confidence Interval for Median

0,700000 0,725000

Descriptive Statistics



Variable: GEH
Numalternati: 4

Anderson-Darling Normality Test

A-Squared:	1,217
P-Value:	0,003

Mean	0,705833
StDev	0,080375
Variance	6,46E-03
Skewness	4,77E-02
Kurtosis	-4,4E-01
N	180

Minimum	0,500000
1st Quartile	0,650000
Median	0,700000
3rd Quartile	0,750000
Maximum	0,875000

95% Confidence Interval for Mu

0,694012	0,717655

95% Confidence Interval for Sigma

0,072842	0,089661

95% Confidence Interval for Median

0,675000	0,725000

11.1.2.1.4 General Linear Model: GEH versus Alpha Factor; Kinitial; Numalternatives

```
Factor     Type Levels Values
Alpha Fa   fixed      4 0,5 1,0 2,0 3,0
Kinitial   fixed      3 1 2 3
Numalter   fixed      3 2 3 4

Analysis of Variance for GEH, using Adjusted SS for Tests

Source                    DF     Seq SS     Adj SS     Adj MS        F      P
Alpha Fa                   3   1.093977   1.093977   0.364659   135.10  0.000
Kinitial                   2   0.114169   0.114169   0.057084    21.15  0.000
Numalter                   2   0.362266   0.362266   0.181133    67.11  0.000
Alpha Fa*Kinitial          6   0.034072   0.034072   0.005679     2.10  0.051
Alpha Fa*Numalter          6   0.112141   0.112141   0.018690     6.92  0.000
Kinitial*Numalter          4   0.075116   0.075116   0.018779     6.96  0.000
Alpha Fa*Kinitial*
Numalter                  12   0.039144   0.039144   0.003262     1.21  0.274
Error                    504   1.360417   1.360417   0.002699
Total                    539   3.191301

Unusual Observations for GEH

Obs       GEH       Fit      SE Fit  Residual   St Resid
  8  0.550000  0.691667    0.013415 -0.141667     -2.82R
 16  0.800000  0.650000    0.013415  0.150000      2.99R
 38  0.500000  0.638333    0.013415 -0.138333     -2.76R
 42  0.750000  0.638333    0.013415  0.111667      2.22R
 45  0.800000  0.638333    0.013415  0.161667      3.22R
 65  0.775000  0.665000    0.013415  0.110000      2.19R
136  0.600000  0.716667    0.013415 -0.116667     -2.32R
168  0.750000  0.648333    0.013415  0.101667      2.03R
172  0.525000  0.648333    0.013415 -0.123333     -2.46R
173  0.525000  0.648333    0.013415 -0.123333     -2.46R
180  0.750000  0.648333    0.013415  0.101667      2.03R
316  0.675000  0.783333    0.013415 -0.108333     -2.16R
330  0.675000  0.783333    0.013415 -0.108333     -2.16R
337  0.575000  0.715000    0.013415 -0.140000     -2.79R
339  0.600000  0.715000    0.013415 -0.115000     -2.29R
```

```
340  0.825000  0.715000    0.013415  0.110000      2.19R
342  0.850000  0.715000    0.013415  0.135000      2.69R
359  0.575000  0.706667    0.013415 -0.131667     -2.62R
395  0.575000  0.718333    0.013415 -0.143333     -2.86R
403  0.850000  0.718333    0.013415  0.131667      2.62R
447  0.650000  0.776667    0.013415 -0.126667     -2.52R
492  0.675000  0.790000    0.013415 -0.115000     -2.29R
530  0.700000  0.805000    0.013415 -0.105000     -2.09R

R denotes an observation with a large standardised residual.
```

11.1.2.1.5 COEFFICIENTS OF THE GENERAL LINEAR MODEL: GEH VERSUS ALPHA FACTOR; KINITIAL; NUMALTERNATIVES

0.732130
-0.058796
-0.023981
0.023426
-0.015324
-0.004213
0.035231
-0.008935
0.001991
0.001435
-0.007824
0.011620
0.013102
-0.016343
0.013102
-0.007731
0.017176
-0.000880
0.000880
0.002824
-0.022037
0.008796
0.006019
-0.006065
0.005370
-0.002130
-0.014907
0.017176
0.001296
0.006019
-0.002315
0.001991
-0.005741
-0.009352
0.006204
-0.007824

11.1.2.2 LOGIT ROUTE CHOICE

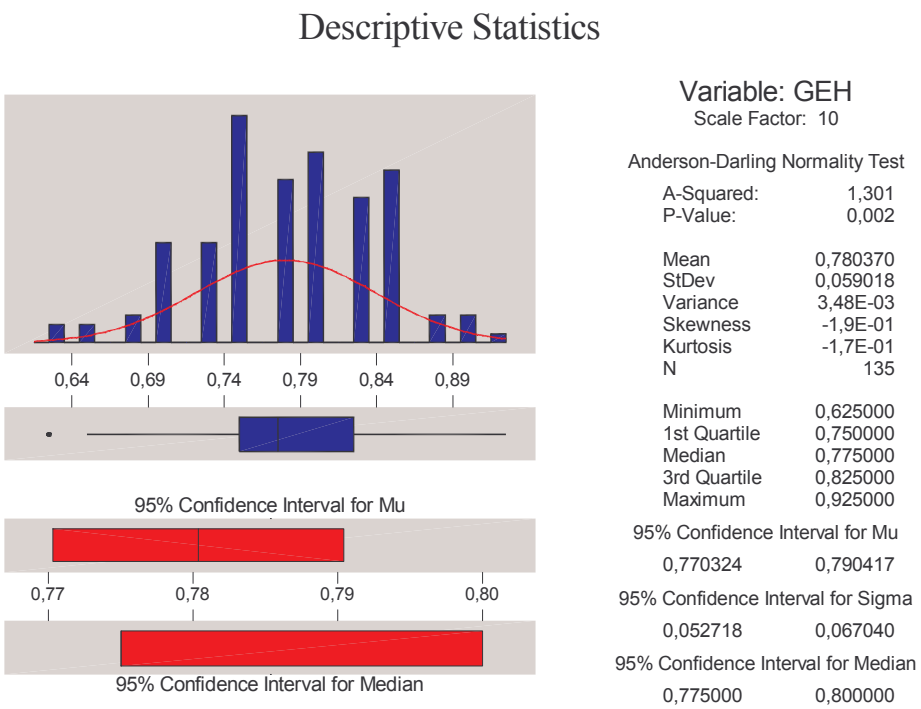
ROUTE CHOICE: CLOGIT

DESIGN FACTOR θ, LEVELS 10, 60, 100, 600

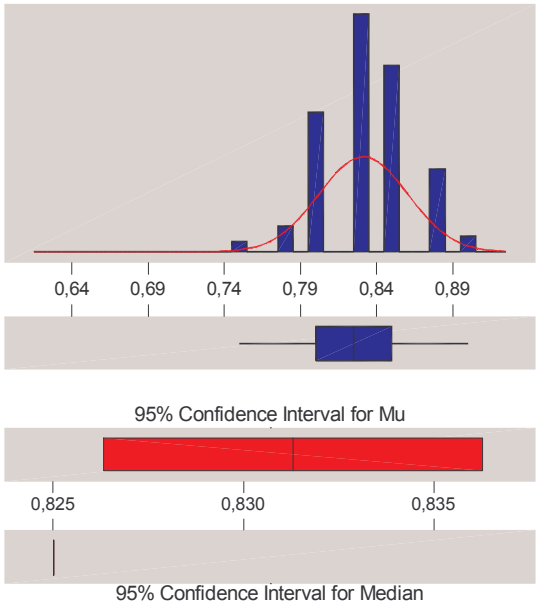
DESIGN FACTOR INITIAL K-SP (Kinitial), LEVELS 1, 2, 3

DESIGN FACTOR MAXIMUM NUMBER OF ROUTES (NUMBER OF ALTERNATIVES), LEVELS 2, 3, 4

11.1.2.2.1 GEH AS A FUNCTION OF θ



Descriptive Statistics



Variable: GEH

Scale Factor: 60

Anderson-Darling Normality Test

A-Squared:	4,098
P-Value:	0,000
Mean	0,831296
StDev	0,029250
Variance	8,56E-04
Skewness	-7,9E-02
Kurtosis	5,73E-02
N	135
Minimum	0,750000
1st Quartile	0,800000
Median	0,825000
3rd Quartile	0,850000
Maximum	0,900000

95% Confidence Interval for Mu

0,826317	0,836275

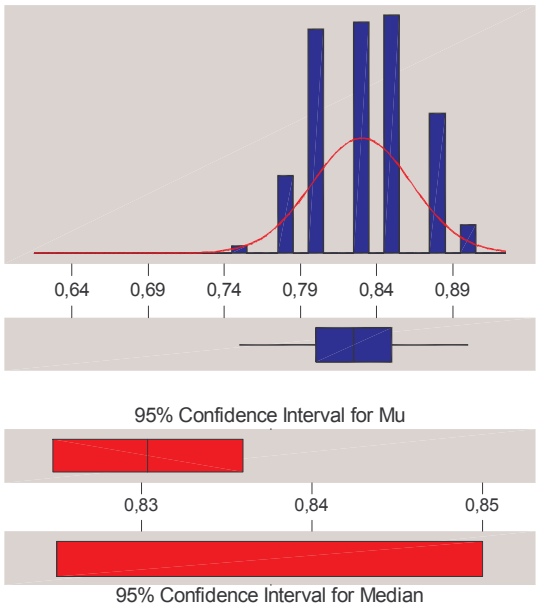
95% Confidence Interval for Sigma

0,026128	0,033226

95% Confidence Interval for Median

0,825000	0,825000

Descriptive Statistics



Variable: GEH

Scale Factor: 100

Anderson-Darling Normality Test

A-Squared:	3,511
P-Value:	0,000
Mean	0,830370
StDev	0,032665
Variance	1,07E-03
Skewness	2,12E-02
Kurtosis	-6,6E-01
N	135
Minimum	0,750000
1st Quartile	0,800000
Median	0,825000
3rd Quartile	0,850000
Maximum	0,900000

95% Confidence Interval for Mu

0,824810	0,835931

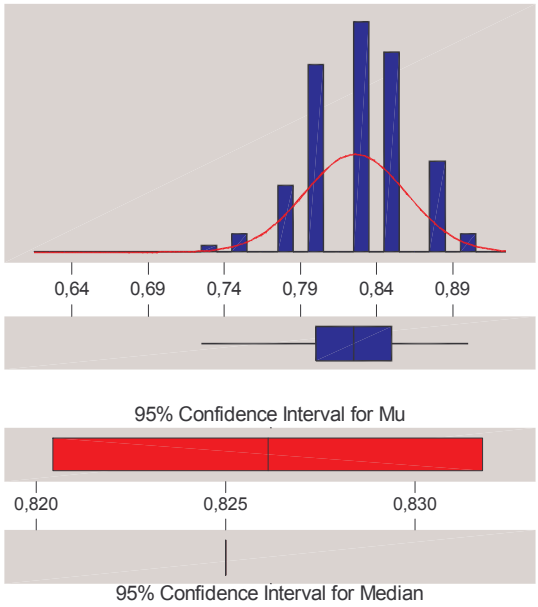
95% Confidence Interval for Sigma

0,029179	0,037106

95% Confidence Interval for Median

0,825000	0,850000

Descriptive Statistics



Variable: GEH

Scale Factor: 600

Anderson-Darling Normality Test

A-Squared:	3,158
P-Value:	0,000

Mean	0,826111
StDev	0,033299
Variance	1,11E-03
Skewness	-2,0E-01
Kurtosis	-1,8E-02
N	135

Minimum	0,725000
1st Quartile	0,800000
Median	0,825000
3rd Quartile	0,850000
Maximum	0,900000

95% Confidence Interval for Mu

0,820443	0,831779

95% Confidence Interval for Sigma

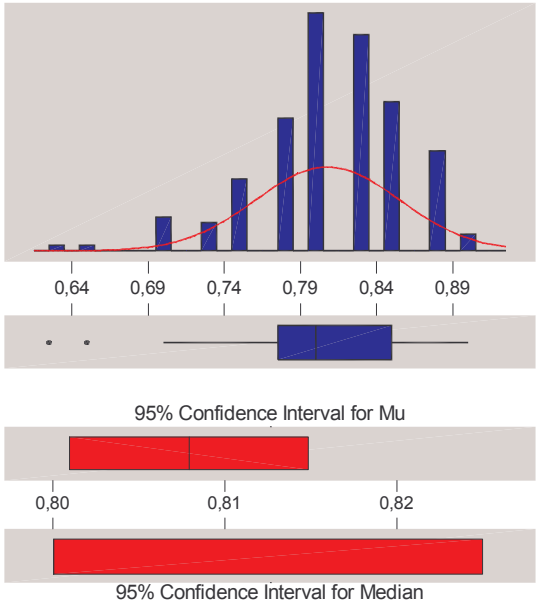
0,029745	0,037826

95% Confidence Interval for Median

0,825000	0,825000

11.1.2.2.2 GEH AS A FUNCTION OF INITIAL K-SP

Descriptive Statistics



Variable: GEH
Kinitial: 1

Anderson-Darling Normality Test

A-Squared:	3,113
P-Value:	0,000
Mean	0,807917
StDev	0,047307
Variance	2,24E-03
Skewness	-7,4E-01
Kurtosis	1,14110
N	180
Minimum	0,625000
1st Quartile	0,775000
Median	0,800000
3rd Quartile	0,850000
Maximum	0,900000

95% Confidence Interval for Mu

0,800959 0,814875

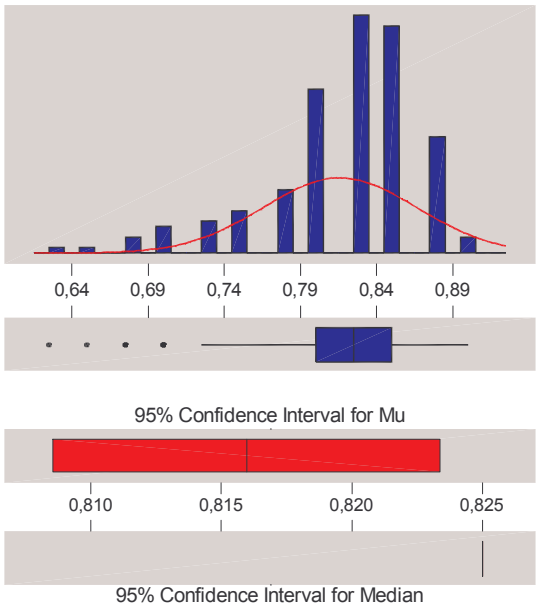
95% Confidence Interval for Sigma

0,042873 0,052772

95% Confidence Interval for Median

0,800000 0,825000

Descriptive Statistics



Variable: GEH
Kinitial: 2

Anderson-Darling Normality Test

A-Squared:	6,369
P-Value:	0,000
Mean	0,815972
StDev	0,050401
Variance	2,54E-03
Skewness	-1,21231
Kurtosis	1,65020
N	180
Minimum	0,625000
1st Quartile	0,800000
Median	0,825000
3rd Quartile	0,850000
Maximum	0,900000

95% Confidence Interval for Mu

0,808559 0,823385

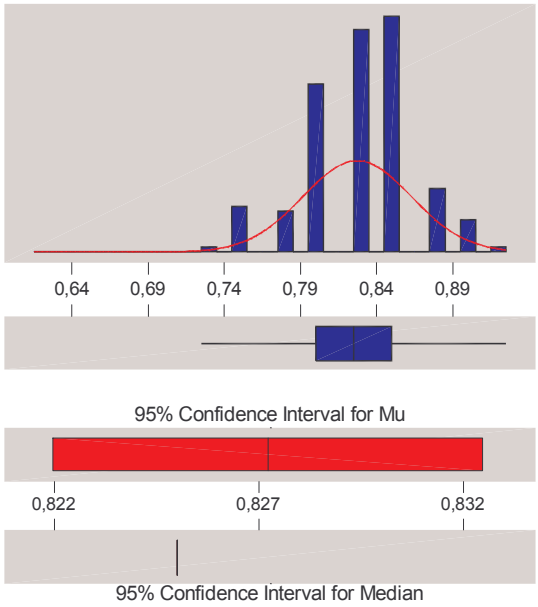
95% Confidence Interval for Sigma

0,045677 0,056223

95% Confidence Interval for Median

0,825000 0,825000

Descriptive Statistics



Variable: GEH

Kinitial: 3

Anderson-Darling Normality Test

A-Squared:	4,490
P-Value:	0,000
Mean	0,827222
StDev	0,035679
Variance	1,27E-03
Skewness	-2,4E-01
Kurtosis	0,253118
N	180
Minimum	0,725000
1st Quartile	0,800000
Median	0,825000
3rd Quartile	0,850000
Maximum	0,925000

95% Confidence Interval for Mu

0,821975	0,832470

95% Confidence Interval for Sigma

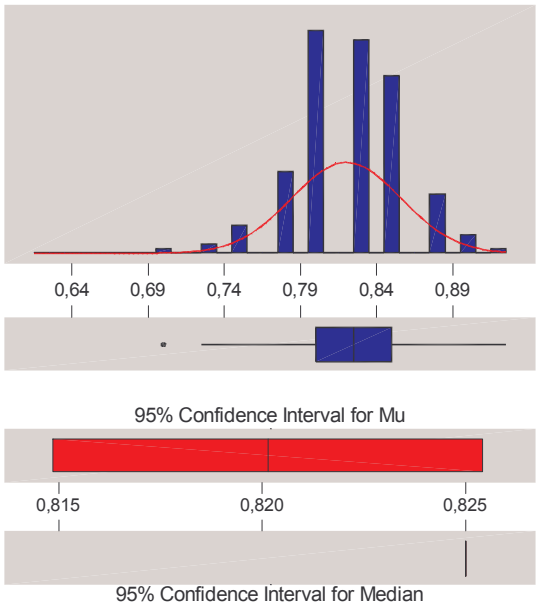
0,032334	0,039800

95% Confidence Interval for Median

0,825000	0,825000

11.1.2.2.3 GEH AS A FUNCTION OF THE NUMBER OF ALTERNATIVES

Descriptive Statistics



Variable: GEH

Numalternati: 2

Anderson-Darling Normality Test

A-Squared:	3,899
P-Value:	0,000
Mean	0,820139
StDev	0,035855
Variance	1,29E-03
Skewness	-1,5E-01
Kurtosis	0,558338
N	180
Minimum	0,700000
1st Quartile	0,800000
Median	0,825000
3rd Quartile	0,850000
Maximum	0,925000

95% Confidence Interval for Mu

0,814865	0,825413

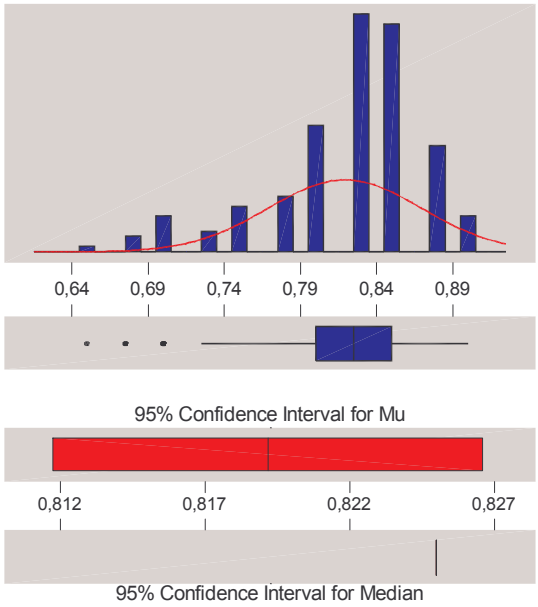
95% Confidence Interval for Sigma

0,032494	0,039997

95% Confidence Interval for Median

0,825000	0,825000

Descriptive Statistics



Variable: GEH
Numalternati: 3

Anderson-Darling Normality Test

A-Squared:	6,364
P-Value:	0,000
Mean	0,819167
StDev	0,050424
Variance	2,54E-03
Skewness	-1,07679
Kurtosis	1,09175
N	180
Minimum	0,650000
1st Quartile	0,800000
Median	0,825000
3rd Quartile	0,850000
Maximum	0,900000

95% Confidence Interval for Mu

0,811750	0,826583

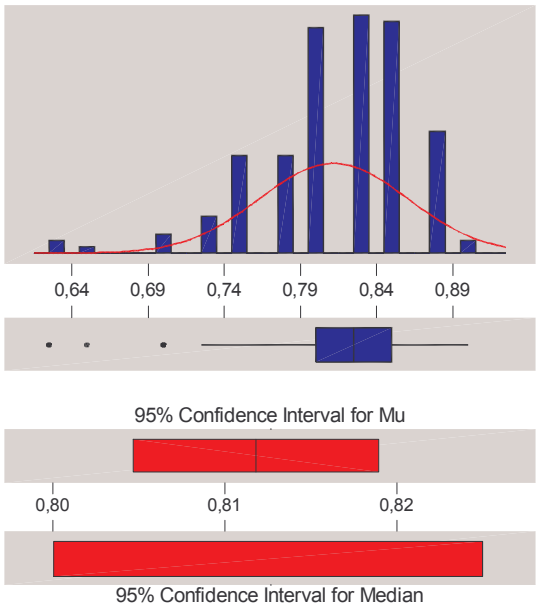
95% Confidence Interval for Sigma

0,045698	0,056249

95% Confidence Interval for Median

0,825000	0,825000

Descriptive Statistics



Variable: GEH
Numalternati: 4

Anderson-Darling Normality Test

A-Squared:	4,088
P-Value:	0,000
Mean	0,811806
StDev	0,048686
Variance	2,37E-03
Skewness	-1,04767
Kurtosis	1,79816
N	180
Minimum	0,625000
1st Quartile	0,800000
Median	0,825000
3rd Quartile	0,850000
Maximum	0,900000

95% Confidence Interval for Mu

0,804645	0,818966

95% Confidence Interval for Sigma

0,044123	0,054310

95% Confidence Interval for Median

0,800000	0,825000

11.1.2.2.4 GENERAL LINEAR MODEL: GEH VERSUS SCALE FACTOR; KINITIAL; NUMALTERNATIVES

```
Factor     Type Levels Values
Scale Fa  fixed      4  10  60 100 600
Kinitial  fixed      3 1 2 3
Numalter  fixed      3 2 3 4

Analysis of Variance for GEH, using Adjusted SS for Tests

Source                      DF     Seq SS     Adj SS     Adj MS       F      P
Scale Fa                     3   0.244065   0.244065   0.081355   68.56  0.000
Kinitial                     2   0.033850   0.033850   0.016925   14.26  0.000
Numalter                     2   0.007475   0.007475   0.003737    3.15  0.044
Scale Fa*Kinitial            6   0.080706   0.080706   0.013451   11.34  0.000
Scale Fa*Numalter            6   0.095692   0.095692   0.015949   13.44  0.000
Kinitial*Numalter            4   0.026810   0.026810   0.006703    5.65  0.000
Scale Fa*Kinitial*
Numalter                    12   0.030329   0.030329   0.002527    2.13  0.014
Error                      504   0.598083   0.598083   0.001187
Total                      539   1.117009

Unusual Observations for GEH

Obs       GEH       Fit      SE Fit  Residual   St Resid
 10  0.700000  0.776667    0.008894 -0.076667     -2.30R
 16  0.825000  0.741667    0.008894  0.083333      2.50R
 17  0.650000  0.741667    0.008894 -0.091667     -2.75R
 39  0.850000  0.760000    0.008894  0.090000      2.70R
 41  0.625000  0.760000    0.008894 -0.135000     -4.06R
 61  0.800000  0.731667    0.008894  0.068333      2.05R
 70  0.800000  0.731667    0.008894  0.068333      2.05R
 73  0.800000  0.731667    0.008894  0.068333      2.05R
 75  0.800000  0.731667    0.008894  0.068333      2.05R
 78  0.800000  0.730000    0.008894  0.070000      2.10R
 80  0.625000  0.730000    0.008894 -0.105000     -3.16R
 85  0.650000  0.730000    0.008894 -0.080000     -2.40R
 91  0.750000  0.846667    0.008894 -0.096667     -2.90R
105  0.925000  0.846667    0.008894  0.078333      2.35R
110  0.750000  0.835000    0.008894 -0.085000     -2.55R
126  0.850000  0.778333    0.008894  0.071667      2.15R
133  0.850000  0.778333    0.008894  0.071667      2.15R
152  0.750000  0.828333    0.008894 -0.078333     -2.35R
183  0.900000  0.833333    0.008894  0.066667      2.00R
228  0.750000  0.830000    0.008894 -0.080000     -2.40R
244  0.900000  0.833333    0.008894  0.066667      2.00R
392  0.750000  0.825000    0.008894 -0.075000     -2.25R
395  0.900000  0.825000    0.008894  0.075000      2.25R
410  0.875000  0.803333    0.008894  0.071667      2.15R
411  0.725000  0.803333    0.008894 -0.078333     -2.35R
418  0.875000  0.803333    0.008894  0.071667      2.15R
425  0.900000  0.831667    0.008894  0.068333      2.05R
434  0.900000  0.831667    0.008894  0.068333      2.05R
444  0.750000  0.833333    0.008894 -0.083333     -2.50R
503  0.750000  0.820000    0.008894 -0.070000     -2.10R
529  0.900000  0.828333    0.008894  0.071667      2.15R

R denotes an observation with a large standardised residual.
```

11.1.2.2.5 COEFFICIENTS OF THE GENERAL LINEAR MODEL: GEH VERSUS SCALE FACTOR; KINITIAL; NUMALTERNATIVES

0.817037
-0.036667
0.014259
0.013333
-0.009120

-0.001065
0.003102
0.002130
-0.011806
-0.017639
0.001157
0.009769
0.004861
0.004028
0.032083
-0.013056
-0.008843
0.002685
-0.008472
0.004722
-0.010602
-0.000463
0.009259
-0.005185
-0.007361
-0.006389
0.017222
-0.013889
0.006343
0.000648
-0.010185
0.007037
-0.001806
0.004167
-0.000556
0.000000

11.1.2.3 C-LOGIT ROUTE CHOICE MODEL WITH FIXED BETA AND GAMMA

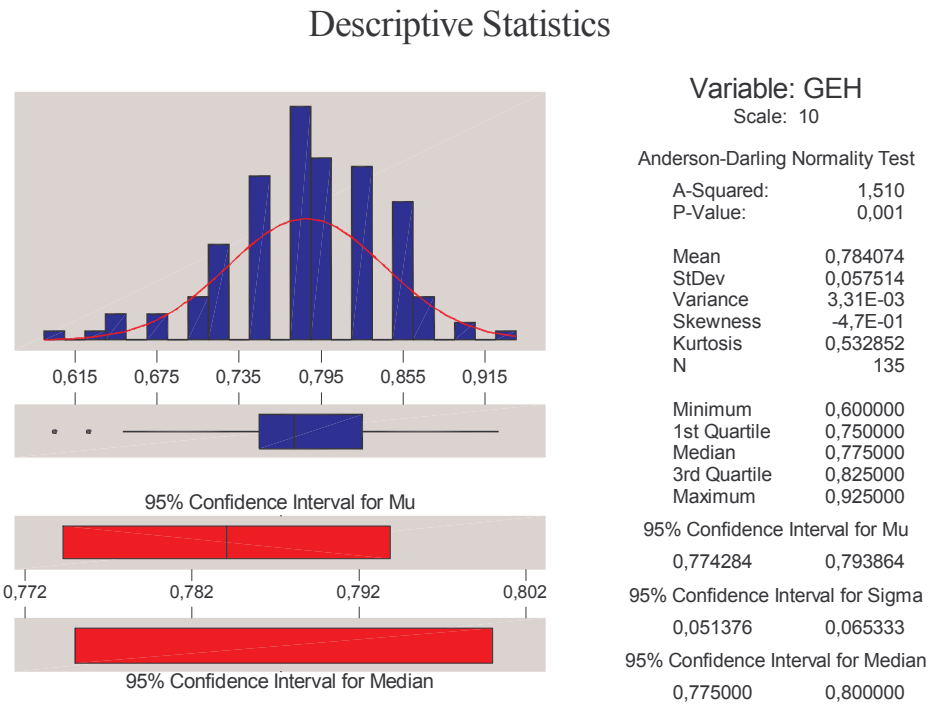
ROUTE CHOICE: CLOGIT (β=0.15 AND γ=1.0 FIXED)

DESIGN FACTOR θ, LEVELS 10, 60, 100, 600

DESIGN FACTOR INITIAL K-SP (KINITIAL), LEVELS 1, 2, 3

DESIGN FACTOR MAXIMUM NUMBER OF ROUTES (NUMBER OF ALTERNATIVES), LEVELS 2, 3, 4

11.1.2.3.1 GEH AS A FUNCTION OF θ



Variable: GEH
Scale: 10

Anderson-Darling Normality Test

A-Squared:	1,510
P-Value:	0,001
Mean	0,784074
StDev	0,057514
Variance	3,31E-03
Skewness	-4,7E-01
Kurtosis	0,532852
N	135
Minimum	0,600000
1st Quartile	0,750000
Median	0,775000
3rd Quartile	0,825000
Maximum	0,925000

95% Confidence Interval for Mu

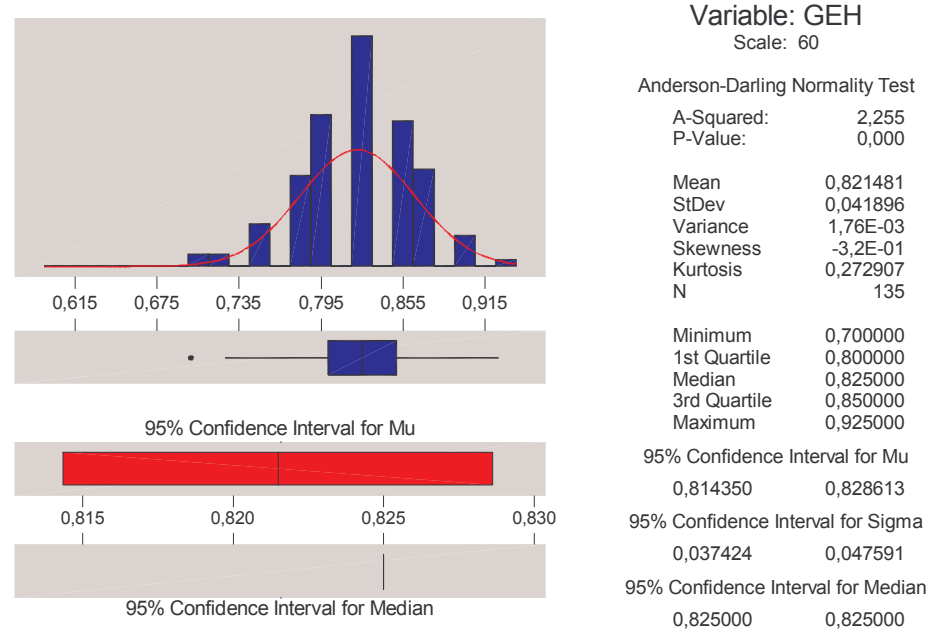
0,774284	0,793864

95% Confidence Interval for Sigma

0,051376	0,065333

95% Confidence Interval for Median

0,775000	0,800000



Variable: GEH
Scale: 60

Anderson-Darling Normality Test

A-Squared:	2,255
P-Value:	0,000
Mean	0,821481
StDev	0,041896
Variance	1,76E-03
Skewness	-3,2E-01
Kurtosis	0,272907
N	135
Minimum	0,700000
1st Quartile	0,800000
Median	0,825000
3rd Quartile	0,850000
Maximum	0,925000

95% Confidence Interval for Mu

0,814350	0,828613

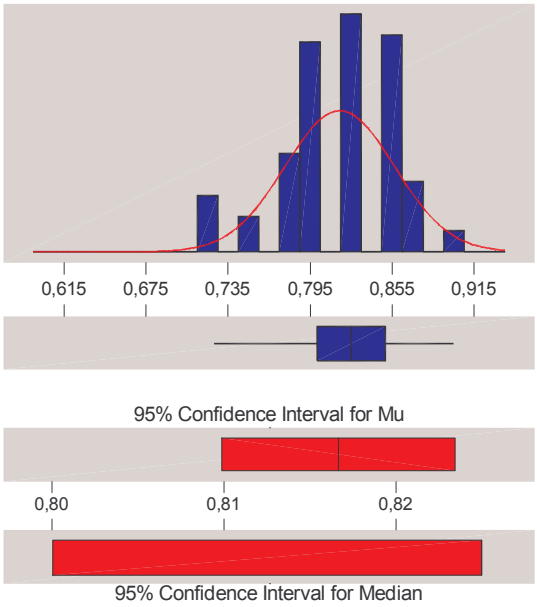
95% Confidence Interval for Sigma

0,037424	0,047591

95% Confidence Interval for Median

0,825000	0,825000

Descriptive Statistics



Variable: GEH

Scale: 100

Anderson-Darling Normality Test

A-Squared:	3,034
P-Value:	0,000
Mean	0,816667
StDev	0,039939
Variance	1,60E-03
Skewness	-4,6E-01
Kurtosis	2,04E-02
N	135
Minimum	0,725000
1st Quartile	0,800000
Median	0,825000
3rd Quartile	0,850000
Maximum	0,900000

95% Confidence Interval for Mu

0,809868	0,823465

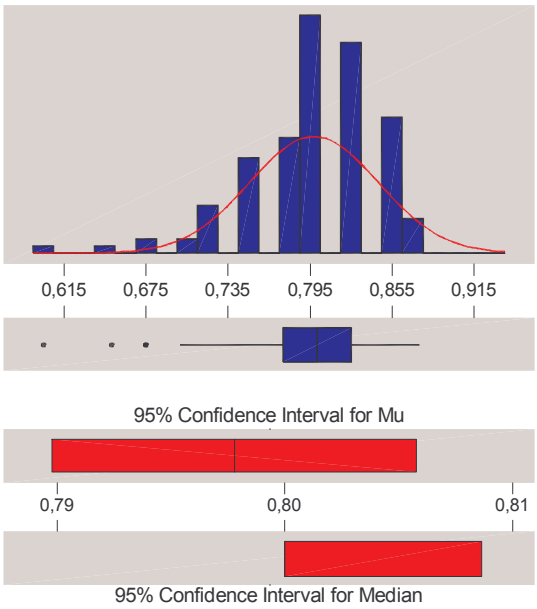
95% Confidence Interval for Sigma

0,035676	0,045368

95% Confidence Interval for Median

0,800000	0,825000

Descriptive Statistics



Variable: GEH

Scale: 600

Anderson-Darling Normality Test

A-Squared:	3,361
P-Value:	0,000
Mean	0,797778
StDev	0,046966
Variance	2,21E-03
Skewness	-1,11021
Kurtosis	2,16332
N	135
Minimum	0,600000
1st Quartile	0,775000
Median	0,800000
3rd Quartile	0,825000
Maximum	0,875000

95% Confidence Interval for Mu

0,789783	0,805773

95% Confidence Interval for Sigma

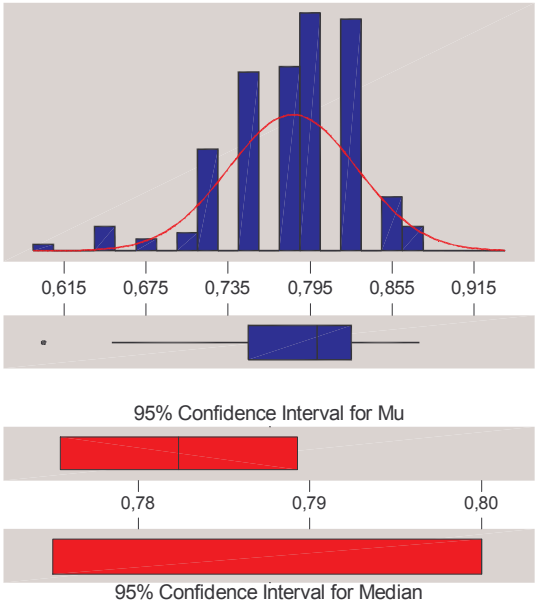
0,041953	0,053351

95% Confidence Interval for Median

0,800000	0,808642

11.1.2.3.2 GEH AS A FUNCTION OF INITIAL K-SP

Descriptive Statistics



Variable: GEH
Kinitial: 1

Anderson-Darling Normality Test

A-Squared:	3,616
P-Value:	0,000
Mean	0,782361
StDev	0,046953
Variance	2,20E-03
Skewness	-7,9E-01
Kurtosis	1,19275
N	180
Minimum	0,600000
1st Quartile	0,750000
Median	0,800000
3rd Quartile	0,825000
Maximum	0,875000

95% Confidence Interval for Mu

0,775455	0,789267

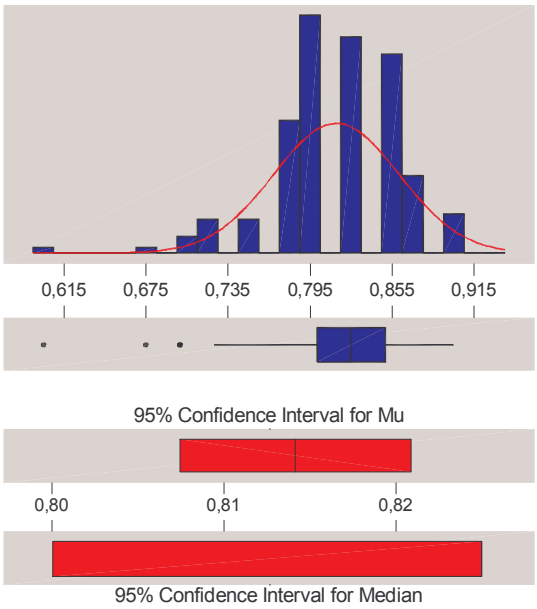
95% Confidence Interval for Sigma

0,042552	0,052377

95% Confidence Interval for Median

0,775000	0,800000

Descriptive Statistics



Variable: GEH
Kinitial: 2

Anderson-Darling Normality Test

A-Squared:	3,388
P-Value:	0,000
Mean	0,814167
StDev	0,045855
Variance	2,10E-03
Skewness	-8,8E-01
Kurtosis	2,38399
N	180
Minimum	0,600000
1st Quartile	0,800000
Median	0,825000
3rd Quartile	0,850000
Maximum	0,900000

95% Confidence Interval for Mu

0,807422	0,820911

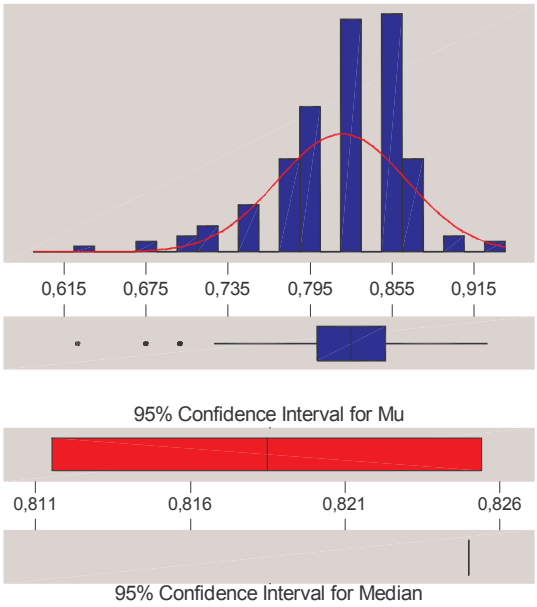
95% Confidence Interval for Sigma

0,041557	0,051152

95% Confidence Interval for Median

0,800000	0,825000

Descriptive Statistics



Variable: GEH
Kinitial: 3

Anderson-Darling Normality Test

A-Squared:	4,775
P-Value:	0,000
Mean	0,818472
StDev	0,047151
Variance	2,22E-03
Skewness	-9,7E-01
Kurtosis	1,74821
N	180
Minimum	0,625000
1st Quartile	0,800000
Median	0,825000
3rd Quartile	0,850000
Maximum	0,925000

95% Confidence Interval for Mu

0,811537 0,825407

95% Confidence Interval for Sigma

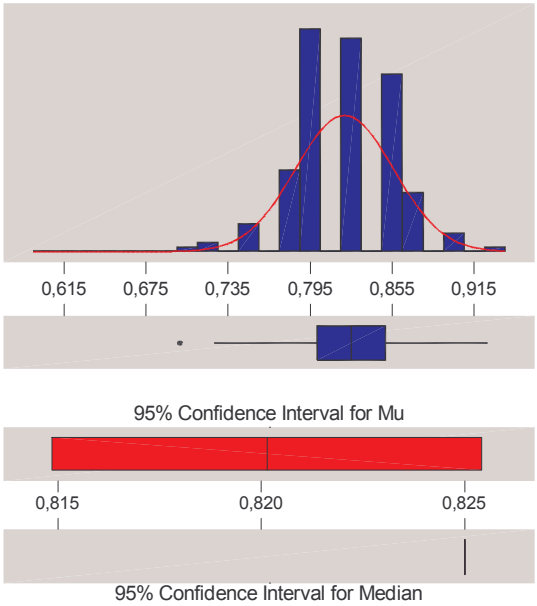
0,042731 0,052598

95% Confidence Interval for Median

0,825000 0,825000

11.1.2.3.3 GEH AS A FUNCTION OF THE NUMBER OF ALTERNATIVES

Descriptive Statistics



Variable: GEH
Numalternati: 2

Anderson-Darling Normality Test

A-Squared:	3,899
P-Value:	0,000
Mean	0,820139
StDev	0,035855
Variance	1,29E-03
Skewness	-1,5E-01
Kurtosis	0,558338
N	180
Minimum	0,700000
1st Quartile	0,800000
Median	0,825000
3rd Quartile	0,850000
Maximum	0,925000

95% Confidence Interval for Mu

0,814865 0,825413

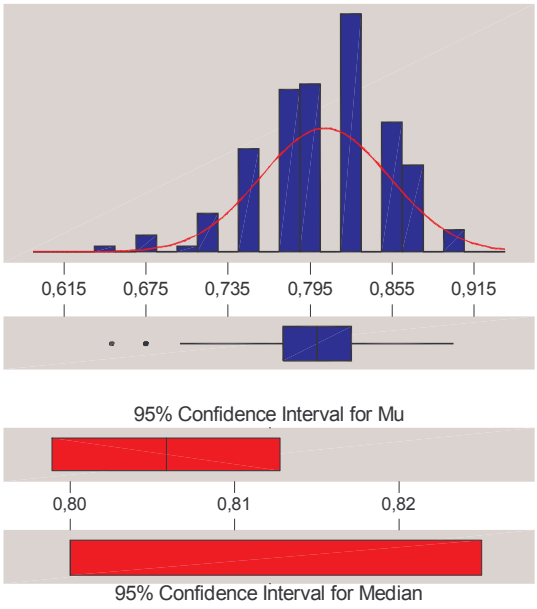
95% Confidence Interval for Sigma

0,032494 0,039997

95% Confidence Interval for Median

0,825000 0,825000

Descriptive Statistics



Variable: GEH
Numalternati: 3

Anderson-Darling Normality Test

A-Squared:	2,599
P-Value:	0,000
Mean	0,805833
StDev	0,047057
Variance	2,21E-03
Skewness	-4,6E-01
Kurtosis	0,345413
N	180
Minimum	0,650000
1st Quartile	0,775000
Median	0,800000
3rd Quartile	0,825000
Maximum	0,900000

95% Confidence Interval for Mu

0,798912	0,812755

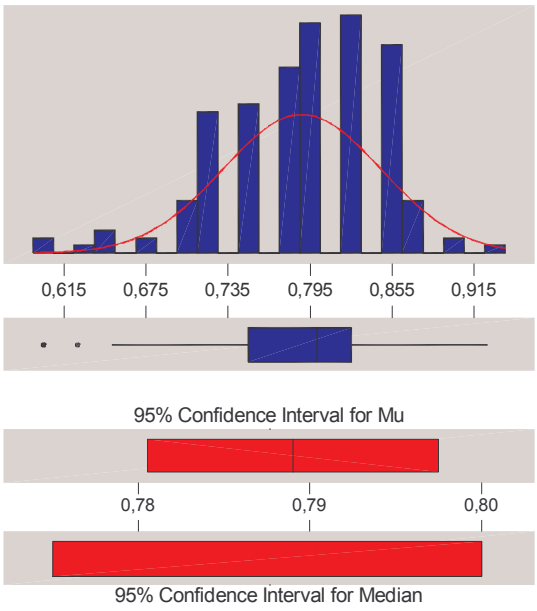
95% Confidence Interval for Sigma

0,042647	0,052494

95% Confidence Interval for Median

0,800000	0,825000

Descriptive Statistics



Variable: GEH
Numalternati: 4

Anderson-Darling Normality Test

A-Squared:	2,680
P-Value:	0,000
Mean	0,789028
StDev	0,057664
Variance	3,33E-03
Skewness	-6,6E-01
Kurtosis	0,612376
N	180
Minimum	0,600000
1st Quartile	0,750000
Median	0,800000
3rd Quartile	0,825000
Maximum	0,925000

95% Confidence Interval for Mu

0,780546	0,797509

95% Confidence Interval for Sigma

0,052259	0,064326

95% Confidence Interval for Median

0,775000	0,800000

11.1.2.3.4 General Linear Model: GEH versus Scale; Kinitial; Numalternatives

```
Factor      Type Levels Values
Scale      fixed      4  10  60 100 600
Kinitial   fixed      3 1 2 3
Numalter   fixed      3 2 3 4

Analysis of Variance for GEH, using Adjusted SS for Tests

Source                    DF     Seq SS     Adj SS     Adj MS       F       P
```

Scale	3	0.121204	0.121204	0.040401	23.91	0.000
Kinitial	2	0.140049	0.140049	0.070024	41.43	0.000
Numalter	2	0.087299	0.087299	0.043649	25.83	0.000
Scale*Kinitial	6	0.022609	0.022609	0.003768	2.23	0.039
Scale*Numalter	6	0.062775	0.062775	0.010463	6.19	0.000
Kinitial*Numalter	4	0.002653	0.002653	0.000663	0.39	0.814
Scale*Kinitial*Numalter	12	0.020662	0.020662	0.001722	1.02	0.430
Error	504	0.851750	0.851750	0.001690		
Total	539	1.309000				

Unusual Observations for GEH

Obs	GEH	Fit	SE Fit	Residual	St Resid
17	0.675000	0.761667	0.010614	-0.086667	-2.18R
35	0.825000	0.731667	0.010614	0.093333	2.35R
36	0.650000	0.731667	0.010614	-0.081667	-2.06R
37	0.650000	0.731667	0.010614	-0.081667	-2.06R
42	0.650000	0.731667	0.010614	-0.081667	-2.06R
79	0.600000	0.741667	0.010614	-0.141667	-3.57R
91	0.750000	0.846667	0.010614	-0.096667	-2.43R
125	0.625000	0.761667	0.010614	-0.136667	-3.44R
132	0.675000	0.761667	0.010614	-0.086667	-2.18R
228	0.750000	0.830000	0.010614	-0.080000	-2.01R
245	0.750000	0.830000	0.010614	-0.080000	-2.01R
260	0.925000	0.828333	0.010614	0.096667	2.43R
266	0.700000	0.828333	0.010614	-0.128333	-3.23R
354	0.725000	0.821667	0.010614	-0.096667	-2.43R
378	0.725000	0.823333	0.010614	-0.098333	-2.48R
386	0.725000	0.823333	0.010614	-0.098333	-2.48R
426	0.650000	0.771667	0.010614	-0.121667	-3.06R
445	0.600000	0.768333	0.010614	-0.168333	-4.24R
449	0.850000	0.768333	0.010614	0.081667	2.06R
477	0.675000	0.790000	0.010614	-0.115000	-2.90R
524	0.675000	0.796667	0.010614	-0.121667	-3.06R
536	0.700000	0.811667	0.010614	-0.111667	-2.81R

R denotes an observation with a large standardised residual.

11.1.2.3.5 COEFFICIENTS OF THE GENERAL LINEAR MODEL: GEH VERSUS SCALE; KINITIAL; NUMALTERNATIVES

0.805000
-0.020926
0.016481
0.011667
-0.022639
0.009167
0.015139
0.000833
-0.004769
-0.008796
-0.002176
0.007685
0.000972
0.005278
0.016343
0.006759
-0.011065
0.002685
-0.006806
0.003056
0.002917

0.001389
-0.000972
-0.000833
-0.014398
-0.003981
0.008380
-0.002870
0.009676
0.000093
-0.008102
0.002315
0.002083
0.003056
-0.001806
0.000833

11.1.2.3.6 General Linear Model: GEH versus Scale; KInitial; NumAlternatives, when the KInitial * NumAlter, Scale*KInitial*NumAlter interaction is removed

```
Factor     Type Levels Values
Scale     fixed      4  10  60 100 600
Kinitial  fixed      3 1 2 3
Numalter  fixed      3 2 3 4

Analysis of Variance for GEH, using Adjusted SS for Tests

Source           DF     Seq SS     Adj SS     Adj MS       F      P
Scale             3   0.121204   0.121204   0.040401   24.01  0.000
Kinitial          2   0.140049   0.140049   0.070024   41.61  0.000
Numalter          2   0.087299   0.087299   0.043649   25.94  0.000
Scale*Kinitial    6   0.022609   0.022609   0.003768    2.24  0.038
Scale*Numalter    6   0.062775   0.062775   0.010463    6.22  0.000
Error           520   0.875065   0.875065   0.001683
Total           539   1.309000

Unusual Observations for GEH

Obs       GEH       Fit      SE Fit  Residual   St Resid
 10  0.700000  0.788148    0.007895 -0.088148     -2.19R
 17  0.675000  0.764259    0.007895 -0.089259     -2.22R
 31  0.800000  0.717593    0.007895  0.082407      2.05R
 35  0.825000  0.717593    0.007895  0.107407      2.67R
 79  0.600000  0.745370    0.007895 -0.145370     -3.61R
 91  0.750000  0.842593    0.007895 -0.092593     -2.30R
105  0.925000  0.842593    0.007895  0.082407      2.05R
125  0.625000  0.772037    0.007895 -0.147037     -3.65R
132  0.675000  0.772037    0.007895 -0.097037     -2.41R
175  0.700000  0.789074    0.007895 -0.089074     -2.21R
228  0.750000  0.833519    0.007895 -0.083519     -2.07R
245  0.750000  0.832963    0.007895 -0.082963     -2.06R
260  0.925000  0.821852    0.007895  0.103148      2.56R
266  0.700000  0.821852    0.007895 -0.121852     -3.03R
349  0.900000  0.818889    0.007895  0.081111      2.01R
354  0.725000  0.818889    0.007895 -0.093889     -2.33R
378  0.725000  0.827778    0.007895 -0.102778     -2.55R
386  0.725000  0.827778    0.007895 -0.102778     -2.55R
426  0.650000  0.769444    0.007895 -0.119444     -2.97R
445  0.600000  0.776111    0.007895 -0.176111     -4.37R
477  0.675000  0.791111    0.007895 -0.116111     -2.88R
524  0.675000  0.797778    0.007895 -0.122778     -3.05R
536  0.700000  0.804444    0.007895 -0.104444     -2.59R

R denotes an observation with a large standardised residual.
```

11.1.2.3.7 COEFFICIENTS OF THE GENERAL LINEAR MODEL: GEH VERSUS SCALE; KINITIAL; NUMALTERNATIVES, WHEN THE INTERACTION KINITIAL * NUMALTER, SCALE*KINITIAL*NUMALTER IS REMOVED

0.805000
-0.020926
0.016481
0.011667
-0.022639
0.009167
0.015139
0.000833
-0.004769
-0.008796
-0.002176
0.007685
0.000972
0.005278
0.016343
0.006759
-0.011065
0.002685
-0.006806
0.003056

11.1.2.4 C-LOGIT ROUTE CHOICE VARYING BETA AND GAMMA

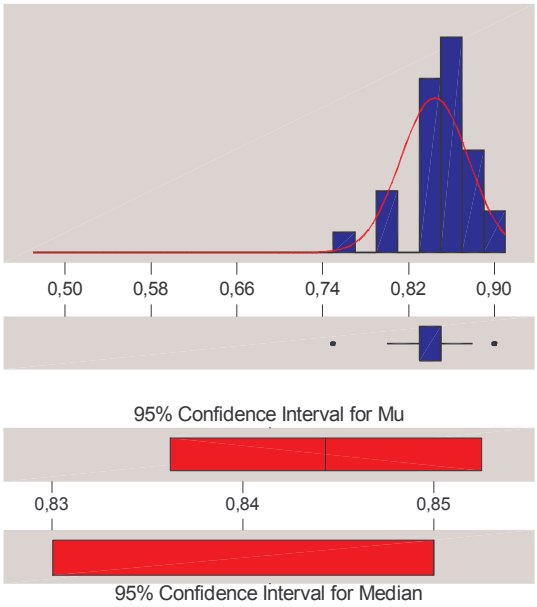
ROUTE CHOICE: CLOGIT (θ=60, INITIAL K-SP=2, AND MAXIMUM NUMBER OF ROUTES =4 FIXED)

DESIGN FACTOR β, LEVELS 0.10, 0.15, 0.5, 1.0

DESIGN FACTOR γ, LEVELS 0.5, 1.0, 1.5, 2.0

11.1.2.4.1 GEH AS A FUNCTION OF β

Descriptive Statistics



Variable: GEH

Beta: 0,10

Anderson-Darling Normality Test

A-Squared:	2,185
P-Value:	0,000
Mean	0,844333
StDev	0,031589
Variance	9,98E-04
Skewness	-6,1E-01
Kurtosis	1,30528
N	60
Minimum	0,750000
1st Quartile	0,830000
Median	0,850000
3rd Quartile	0,850000
Maximum	0,900000

95% Confidence Interval for Mu

0,836173 0,852494

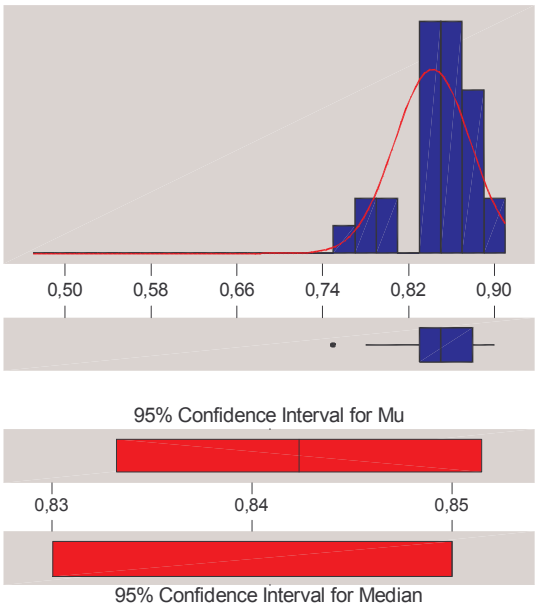
95% Confidence Interval for Sigma

0,026776 0,038528

95% Confidence Interval for Median

0,830000 0,850000

Descriptive Statistics



Variable: GEH

Beta: 0,15

Anderson-Darling Normality Test

A-Squared:	1,852
P-Value:	0,000
Mean	0,842333
StDev	0,035337
Variance	1,25E-03
Skewness	-5,8E-01
Kurtosis	0,300264
N	60
Minimum	0,750000
1st Quartile	0,830000
Median	0,850000
3rd Quartile	0,880000
Maximum	0,900000

95% Confidence Interval for Mu

0,833205 0,851462

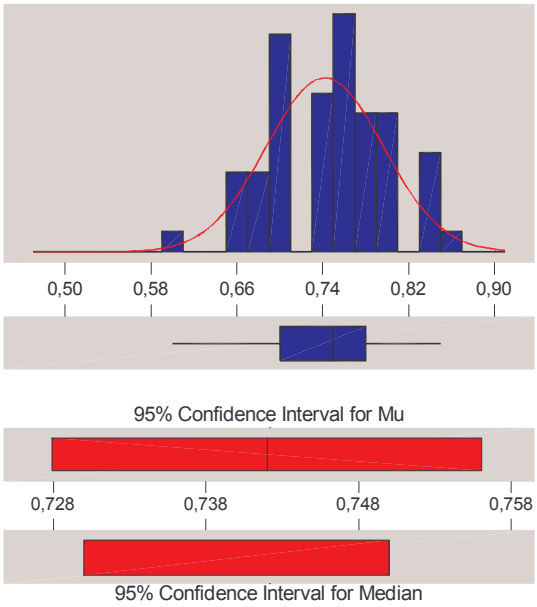
95% Confidence Interval for Sigma

0,029953 0,043099

95% Confidence Interval for Median

0,830000 0,850000

Descriptive Statistics



Variable: GEH
Beta: 0,50

Anderson-Darling Normality Test

A-Squared:	0,707
P-Value:	0,062
Mean	0,742000
StDev	0,054425
Variance	2,96E-03
Skewness	-1,5E-01
Kurtosis	-3,4E-01
N	60
Minimum	0,600000
1st Quartile	0,700000
Median	0,750000
3rd Quartile	0,780000
Maximum	0,850000

95% Confidence Interval for Mu

0,727941	0,756059

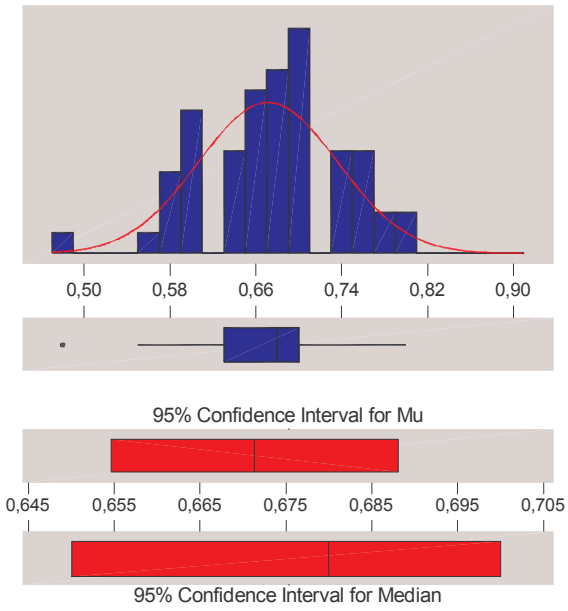
95% Confidence Interval for Sigma

0,046132	0,066380

95% Confidence Interval for Median

0,730000	0,750000

Descriptive Statistics



Variable: GEH
Beta: 1,00

Anderson-Darling Normality Test

A-Squared:	0,569
P-Value:	0,135
Mean	0,671333
StDev	0,064715
Variance	4,19E-03
Skewness	-2,8E-01
Kurtosis	0,176836
N	60
Minimum	0,480000
1st Quartile	0,630000
Median	0,680000
3rd Quartile	0,700000
Maximum	0,800000

95% Confidence Interval for Mu

0,654616	0,688051

95% Confidence Interval for Sigma

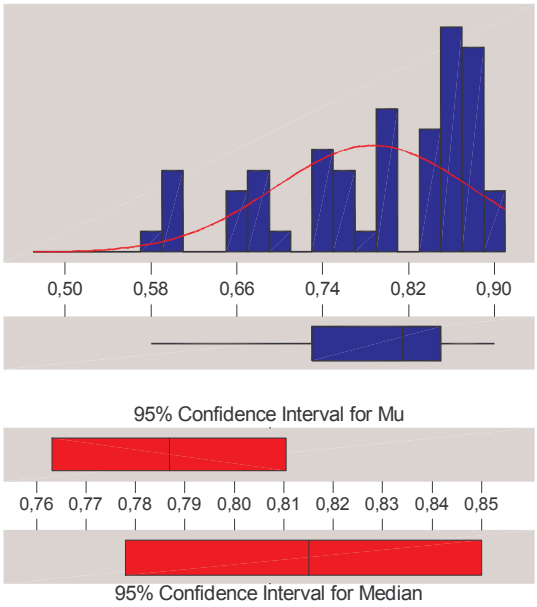
0,054855	0,078930

95% Confidence Interval for Median

0,650000	0,700000

11.1.2.4.2 GEH AS A FUNCTION OF γ

Descriptive Statistics



Variable: GEH

Gamma: 0,5

Anderson-Darling Normality Test

A-Squared:	2,209
P-Value:	0,000
Mean	0,786833
StDev	0,091587
Variance	8,39E-03
Skewness	-7,7E-01
Kurtosis	-5,4E-01
N	60
Minimum	0,580000
1st Quartile	0,730000
Median	0,815000
3rd Quartile	0,850000
Maximum	0,900000

95% Confidence Interval for Mu

0,763174 0,810493

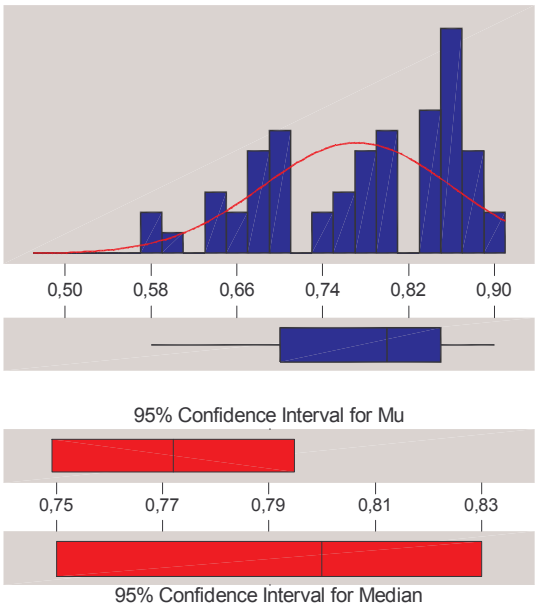
95% Confidence Interval for Sigma

0,077632 0,111705

95% Confidence Interval for Median

0,777920 0,850000

Descriptive Statistics



Variable: GEH

Gamma: 1,0

Anderson-Darling Normality Test

A-Squared:	1,589
P-Value:	0,000
Mean	0,772000
StDev	0,088160
Variance	7,77E-03
Skewness	-5,3E-01
Kurtosis	-8,3E-01
N	60
Minimum	0,580000
1st Quartile	0,700000
Median	0,800000
3rd Quartile	0,850000
Maximum	0,900000

95% Confidence Interval for Mu

0,749226 0,794774

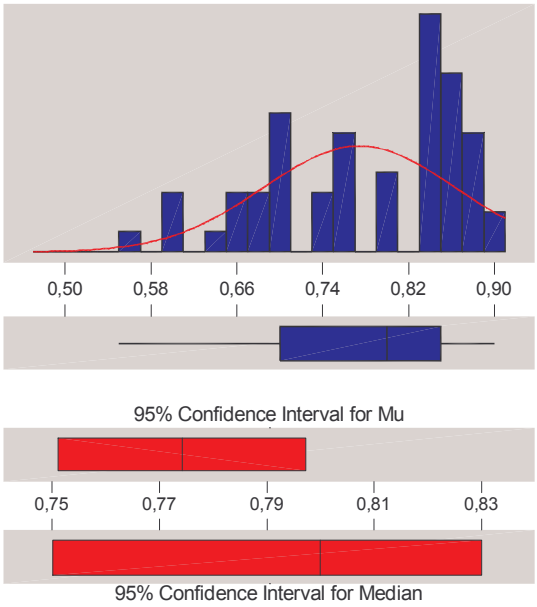
95% Confidence Interval for Sigma

0,074728 0,107526

95% Confidence Interval for Median

0,750000 0,830000

Descriptive Statistics



Variable: GEH
Gamma: 1,5

Anderson-Darling Normality Test

A-Squared:	1,877
P-Value:	0,000
Mean	0,774167
StDev	0,089581
Variance	8,02E-03
Skewness	-5,9E-01
Kurtosis	-6,6E-01
N	60
Minimum	0,550000
1st Quartile	0,700000
Median	0,800000
3rd Quartile	0,850000
Maximum	0,900000

95% Confidence Interval for Mu

0,751025	0,797308

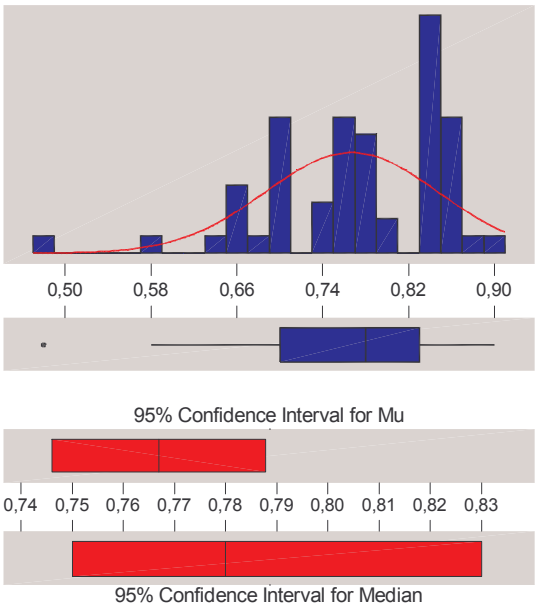
95% Confidence Interval for Sigma

0,075932	0,109258

95% Confidence Interval for Median

0,750000	0,830000

Descriptive Statistics



Variable: GEH
Gamma: 2,0

Anderson-Darling Normality Test

A-Squared:	1,532
P-Value:	0,001
Mean	0,767000
StDev	0,080807
Variance	6,53E-03
Skewness	-1,01199
Kurtosis	1,42358
N	60
Minimum	0,480000
1st Quartile	0,700000
Median	0,780000
3rd Quartile	0,830000
Maximum	0,900000

95% Confidence Interval for Mu

0,746125	0,787875

95% Confidence Interval for Sigma

0,068495	0,098558

95% Confidence Interval for Median

0,750000	0,830000

11.1.2.4.3 General Linear Model: GEH versus Beta; Gamma

```
Factor     Type Levels Values
Beta       fixed      4 0.10 0.15 0.50 1.00
Gamma      fixed      4 0.5 1.0 1.5 2.0

Analysis of Variance for GEH. using Adjusted SS for Tests

Source       DF     Seq SS     Adj SS     Adj MS       F      P
Beta          3   1.270600   1.270600   0.423533  195.47  0.000
Gamma         3   0.012823   0.012823   0.004274    1.97  0.119
Beta*Gamma    9   0.056230   0.056230   0.006248    2.88  0.003
Error       224   0.485347   0.485347   0.002167
Total       239   1.825000

Unusual Observations for GEH

Obs       GEH       Fit      SE Fit  Residual   St Resid
 19  0.750000  0.840000    0.012019 -0.090000     -2.00R
156  0.600000  0.708000    0.012019 -0.108000     -2.40R
158  0.830000  0.708000    0.012019  0.122000      2.71R
203  0.750000  0.656000    0.012019  0.094000      2.09R
211  0.600000  0.691333    0.012019 -0.091333     -2.03R
214  0.800000  0.691333    0.012019  0.108667      2.42R
215  0.600000  0.691333    0.012019 -0.091333     -2.03R
221  0.800000  0.691333    0.012019  0.108667      2.42R
224  0.550000  0.691333    0.012019 -0.141333     -3.14R
226  0.580000  0.682000    0.012019 -0.102000     -2.27R
229  0.780000  0.682000    0.012019  0.098000      2.18R
231  0.480000  0.682000    0.012019 -0.202000     -4.49R
232  0.780000  0.682000    0.012019  0.098000      2.18R

R denotes an observation with a large standardised residual.
```

11.1.2.4.4 COEFFICIENTS OF THE GENERAL LINEAR MODEL: GEH VERSUS BETA; GAMMA

0.775000
0.069333
0.067333
-0.033000
0.011833
-0.003000
-0.000833
-0.000833
-0.001333
0.007167
0.003833
0.001333
0.005167
0.024167
0.012333
-0.033167

11.1.2.5 C-LOGIT ROUTE CHOICE MODEL WITH VARYING SCALE FACTOR, INITIAL K-SP, BETA AND GAMMA

ROUTE CHOICE: CLOGIT (MAXIMUM NUMBER OF ROUTES = 4 FIXED)

DESIGN FACTOR θ, LEVELS 10, 60, 100

DESIGN FACTOR INITIAL K-SP (KINITIAL), LEVELS 2, 3

DESIGN FACTOR β, LEVELS 0.10, 0.15, 0.5, 1.0

DESIGN FACTOR γ, LEVELS 0.5, 1.0, 1.5, 2.0

11.1.2.5.1 GENERAL LINEAR MODEL: GEH VERSUS SCALE; KINITIAL; BETA; GAMMA

```
Factor     Type Levels Values
Scale Fa  fixed      3  10  60 100
Kinitial  fixed      2 2 3
Beta      fixed      4 0,10 0,15 0,50 1,00
Gamma     fixed      4 0.5 1.0 1.5 2.0

Analysis of Variance for GEH. using Adjusted SS for Tests

Source     DF     Seq SS     Adj SS     Adj MS       F      P
Scale Fa    2    0.06329    0.06329    0.03165    7.97  0.000
Kinitial    1    0.61628    0.61628    0.61628  155.19  0.000
Beta        3    6.79386    6.79386    2.26462  570.26  0.000
Gamma       3    0.02420    0.02420    0.00807    2.03  0.108
Error    1430    5.67886    5.67886    0.00397
Total    1439   13.17650

Unusual Observations for GEH

 Obs       GEH       Fit      SE Fit  Residual   St Resid
   6  0.650000  0.815167    0.005251 -0.165167     -2.63R
  10  0.850000  0.717056    0.005251  0.132944      2.12R
  15  0.830000  0.661417    0.005251  0.168583      2.68R
  53  0.650000  0.778160    0.005251 -0.128160     -2.04R
  59  0.530000  0.669993    0.005251 -0.139993     -2.23R
  90  0.500000  0.659743    0.005251 -0.159743     -2.54R
 111  0.850000  0.661417    0.005251  0.188583      3.00R
 112  0.800000  0.663083    0.005251  0.136917      2.18R
 197  0.650000  0.824806    0.005251 -0.174806     -2.78R
 207  0.800000  0.661417    0.005251  0.138583      2.21R
 208  0.880000  0.663083    0.005251  0.216917      3.45R
 280  0.600000  0.759104    0.005251 -0.159104     -2.53R
 285  0.450000  0.614160    0.005251 -0.164160     -2.61R
 289  0.700000  0.836278    0.005251 -0.136278     -2.17R
 383  0.730000  0.604104    0.005251  0.125896      2.00R
 385  0.700000  0.836278    0.005251 -0.136278     -2.17R
 416  0.480000  0.621708    0.005251 -0.141708     -2.26R
 442  0.530000  0.670410    0.005251 -0.140410     -2.24R
 474  0.530000  0.659743    0.005251 -0.129743     -2.07R
 483  0.700000  0.826222    0.005251 -0.126222     -2.01R
 527  0.500000  0.656146    0.005251 -0.156146     -2.49R
 632  0.550000  0.769771    0.005251 -0.219771     -3.50R
 658  0.580000  0.769326    0.005251 -0.189326     -3.01R
 666  0.480000  0.659743    0.005251 -0.179743     -2.86R
 674  0.680000  0.826639    0.005251 -0.146639     -2.34R
 680  0.630000  0.816417    0.005251 -0.186417     -2.97R
 687  0.800000  0.661417    0.005251  0.138583      2.21R
 688  0.800000  0.663083    0.005251  0.136917      2.18R
 731  0.530000  0.669993    0.005251 -0.139993     -2.23R
 732  0.530000  0.671660    0.005251 -0.141660     -2.26R
 755  0.900000  0.768910    0.005251  0.131090      2.09R
 762  0.450000  0.659743    0.005251 -0.209743     -3.34R
 763  0.500000  0.659326    0.005251 -0.159326     -2.54R
 771  0.700000  0.826222    0.005251 -0.126222     -2.01R
 776  0.650000  0.816417    0.005251 -0.166417     -2.65R
 784  0.800000  0.663083    0.005251  0.136917      2.18R
 829  0.480000  0.624826    0.005251 -0.144826     -2.31R
 847  0.780000  0.645479    0.005251  0.134521      2.14R
 911  0.530000  0.656146    0.005251 -0.126146     -2.01R
 926  0.480000  0.615188    0.005251 -0.135188     -2.15R
```

932	0.580000	0.811951	0.005251	-0.231951	-3.69R
954	0.500000	0.659743	0.005251	-0.159743	-2.54R
955	0.530000	0.659326	0.005251	-0.129326	-2.06R
961	0.700000	0.836278	0.005251	-0.136278	-2.17R
963	0.700000	0.826222	0.005251	-0.126222	-2.01R
1017	0.500000	0.680049	0.005251	-0.180049	-2.87R
1018	0.530000	0.670410	0.005251	-0.140410	-2.24R
1052	0.530000	0.660993	0.005251	-0.130993	-2.09R
1068	0.850000	0.718306	0.005251	0.131694	2.10R
1114	0.530000	0.670410	0.005251	-0.140410	-2.24R
1120	0.480000	0.616438	0.005251	-0.136438	-2.17R
1133	0.500000	0.655535	0.005251	-0.155535	-2.48R
1168	0.800000	0.663083	0.005251	0.136917	2.18R
1199	0.530000	0.656146	0.005251	-0.126146	-2.01R
1219	0.650000	0.810285	0.005251	-0.160285	-2.55R
1284	0.650000	0.822618	0.005251	-0.172618	-2.75R
1341	0.480000	0.614160	0.005251	-0.134160	-2.14R
1355	0.850000	0.716639	0.005251	0.133361	2.12R
1360	0.830000	0.663083	0.005251	0.166917	2.66R
1402	0.480000	0.670410	0.005251	-0.190410	-3.03R
1436	0.530000	0.660993	0.005251	-0.130993	-2.09R

R denotes an observation with a large standardised residual.

11.2 AMARA MODEL

11.2.1 EXPERIMENT DESCRIPTION

The set of real traffic data comprises traffic counts gathered at 15 detector stations from 4 April 1999 to 19 May 1999. The level of aggregation was of 1 hour over 24 hours. From the data, we considered only working days and the afternoon peak time (from 18:00 to 20:00) and calculated the average traffic count for each detector. The experiment was carried out to analyse the influence of each dynamic traffic assignment parameter on the model and system outputs.

Depending on the route choice model employed (proportional, logit or C-logit), the experimental design factors for the simulations were as follows:

- Proportional route choice model:
    - Alpha factor (α), for which values of 0.5, 1, 2 and 3 were considered
    - *Initial K-SP*, for which values of 1, 2 and 3 were considered
    - Maximum number of routes (*MaxNumberRoutes)*, for which values of 3, 4 and 5 were considered

  If these three factors are combined, the total number of experiments is 36 (4 * 3 * 3), each of which was simulated 15 times (replications). The following random seeds were changed: 9182, 1670, 6534, 8159, 8538, 5768, 1277, 1065, 1846, 8740, 1489, 3334, 6232, 6237 and 1870.

- Logit route choice model:
    - Scale factor (θ), for which values of 10, 60, 100 and 600 were considered
    - *Initial K-SP*, for which values of 1, 2 and 3 were considered
    - Maximum number of routes (*MaxNumberRoutes)*, for which values of 3, 4 and 5 were considered

  If these three factors are combined, the total number of experiments is 36 (4 * 3 * 3), each of which was simulated 15 times (replications). The random seeds were changed as in the proportional route choice model.

- C-logit route choice model with fixed beta and gamma:
    - Scale factor (θ), for which values of 10, 60, 100 and 600 were considered
    - *Initial K-SP*, for which values of 1, 2 and 3 were considered

- Maximum number of routes (*MaxNumberRoutes)*, for which values of 3, 4 and 5 were considered
- Beta (β) fixed to 0.15
- Gamma (γ) fixed to 1

If these factors are combined, the total number of experiments is 36 (4 * 3 * 3), each of which was simulated 15 times (replications). The random seeds were changed as in the proportional route choice model.

- C-logit route choice model with varying beta and gamma:
  - Scale factor (θ) fixed to 60
  - *Initial K-SP* fixed to 2
  - Maximum number of routes (*MaxNumberRoutes)* fixed to 3 were considered
  - Beta (β), for which values of 0.10, 0.15, 0.50 and 1 were considered
  - Gamma (γ), for which values of 0.5, 1, 1.5 and 2 were considered

If these factors are combined, the total number of experiments is 16 (4 * 4), each of which was simulated 15 times (replications). The random seeds were changed as in the proportional route choice model.

- C-logit route choice model changing the scale factor, *Initial K-SP*, beta and gamma:
  - Scale factor (θ), for which values of 10, 60 and 100 were considered
  - *Initial K-SP*, for which values of 2 and 3 were considered
  - Maximum number of routes (*MaxNumberRoutes)* fixed to 4
  - Beta (β), for which values of 0.10, 0.15, 0.50 and 1 were considered
  - Gamma (γ), for which values of 0.5, 1, 1.5 and 2 were considered

If these factors are combined, the total number of experiments is 144 (3 * 2 * 4 * 4), each of which was simulated 15 times (replications). The random seeds were changed as in the proportional route choice model.

11.2.2 EXPERIMENT RESULTS

In the following sections, we analyse the experiments, which have been grouped by route choice function.

11.2.2.1 PROPORTIONAL ROUTE CHOICE

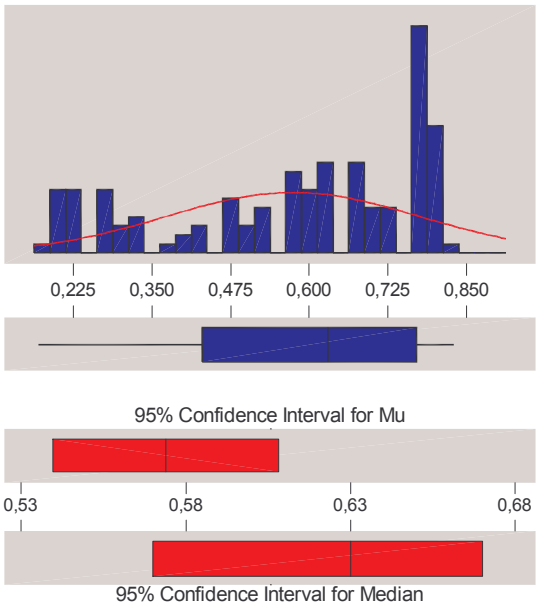
ROUTE CHOICE: PROPORTIONAL

DESIGN FACTOR α, LEVELS 0.5, 1.0, 2.0, 3.0

DESIGN FACTOR INITIAL K-SP (KINITIAL), LEVELS 1, 2, 3

DESIGN FACTOR, MAXIMUM NUMBER OF ROUTES (NUMBER OF ALTERNATIVES), LEVELS 2, 3, 4

11.2.2.1.1 GEH AS A FUNCTION OF α



Variable: GEH
Alpha Factor: 0,5

Anderson-Darling Normality Test

A-Squared:	5,185
P-Value:	0,000
Mean	0,573926
StDev	0,200872
Variance	4,03E-02
Skewness	-6,2E-01
Kurtosis	-9,6E-01
N	135
Minimum	0,170000
1st Quartile	0,430000
Median	0,630000
3rd Quartile	0,770000
Maximum	0,830000

95% Confidence Interval for Mu

0,539733	0,608119

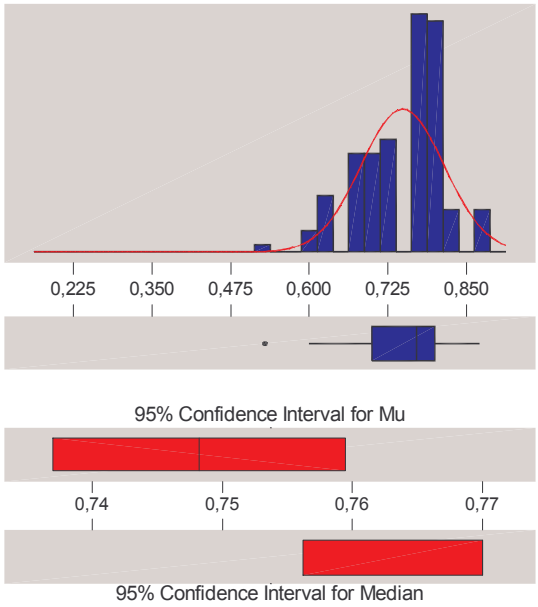
95% Confidence Interval for Sigma

0,179431	0,228177

95% Confidence Interval for Median

0,570000	0,670000

Descriptive Statistics



Variable: GEH

Alpha Factor: 1,0

Anderson-Darling Normality Test

A-Squared:	3,664
P-Value:	0,000
Mean	0,748222
StDev	0,065936
Variance	4,35E-03
Skewness	-6,0E-01
Kurtosis	0,116322
N	135
Minimum	0,530000
1st Quartile	0,700000
Median	0,770000
3rd Quartile	0,800000
Maximum	0,870000

95% Confidence Interval for Mu

0,736998	0,759446

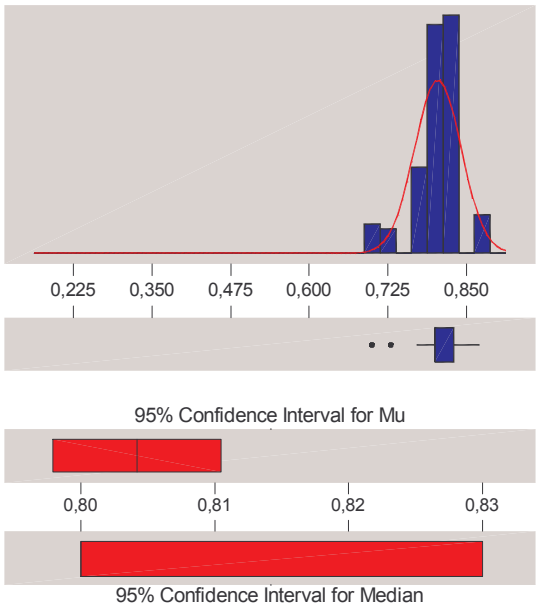
95% Confidence Interval for Sigma

0,058898	0,074899

95% Confidence Interval for Median

0,756173	0,770000

Descriptive Statistics



Variable: GEH

Alpha Factor: 2,0

Anderson-Darling Normality Test

A-Squared:	7,281
P-Value:	0,000
Mean	0,804222
StDev	0,036904
Variance	1,36E-03
Skewness	-9,7E-01
Kurtosis	1,37604
N	135
Minimum	0,700000
1st Quartile	0,800000
Median	0,800000
3rd Quartile	0,830000
Maximum	0,870000

95% Confidence Interval for Mu

0,797940	0,810504

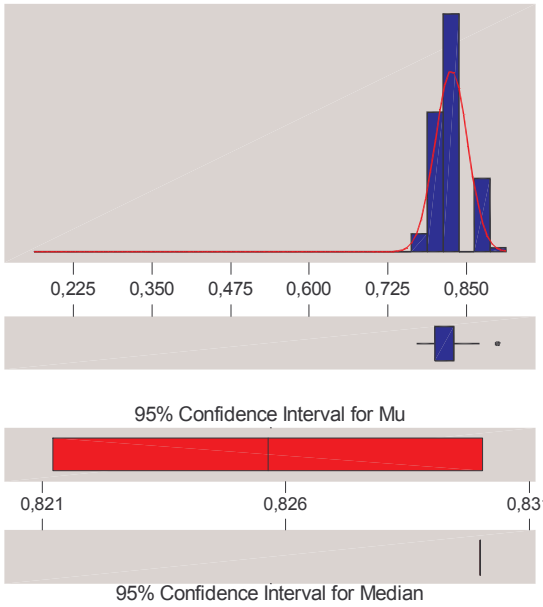
95% Confidence Interval for Sigma

0,032965	0,041920

95% Confidence Interval for Median

0,800000	0,830000

Descriptive Statistics



Variable: GEH

Alpha Factor: 3,0

Anderson-Darling Normality Test

A-Squared:	9,778
P-Value:	0,000

Mean	0,825630
StDev	0,025905
Variance	6,71E-04
Skewness	0,312539
Kurtosis	1,91E-03
N	135

Minimum	0,770000
1st Quartile	0,800000
Median	0,830000
3rd Quartile	0,830000
Maximum	0,900000

95% Confidence Interval for Mu

0,821220	0,830039

95% Confidence Interval for Sigma

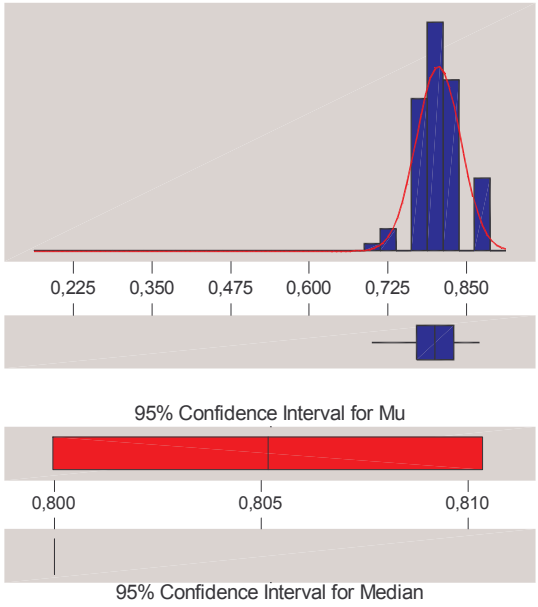
0,023140	0,029426

95% Confidence Interval for Median

0,830000	0,830000

11.2.2.1.2 GEH AS A FUNCTION OF INITIAL K-SP

Descriptive Statistics



Variable: GEH
Kinitial: 1

Anderson-Darling Normality Test

A-Squared:	6,435
P-Value:	0,000
Mean	0,805167
StDev	0,035272
Variance	1,24E-03
Skewness	-6,9E-02
Kurtosis	0,202622
N	180
Minimum	0,700000
1st Quartile	0,770000
Median	0,800000
3rd Quartile	0,830000
Maximum	0,870000

95% Confidence Interval for Mu

0,799979	0,810355

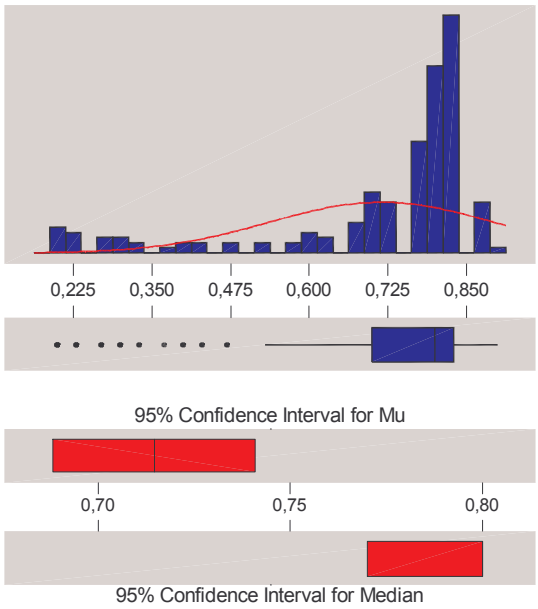
95% Confidence Interval for Sigma

0,031966	0,039347

95% Confidence Interval for Median

0,800000	0,800000

Descriptive Statistics



Variable: GEH
Kinitial: 2

Anderson-Darling Normality Test

A-Squared:	20,200
P-Value:	0,000
Mean	0,714556
StDev	0,178546
Variance	3,19E-02
Skewness	-1,77635
Kurtosis	2,04304
N	180
Minimum	0,200000
1st Quartile	0,700000
Median	0,800000
3rd Quartile	0,830000
Maximum	0,900000

95% Confidence Interval for Mu

0,688295	0,740816

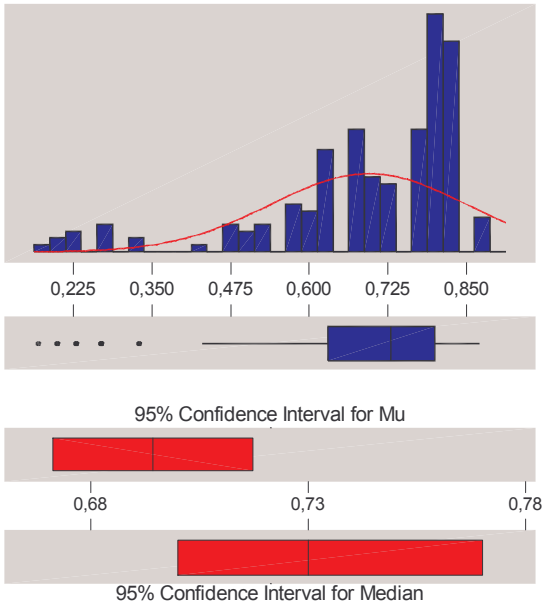
95% Confidence Interval for Sigma

0,161811	0,199172

95% Confidence Interval for Median

0,770000	0,800000

Descriptive Statistics



Variable: GEH
Kinitial: 3

Anderson-Darling Normality Test

A-Squared:	9,582
P-Value:	0,000
Mean	0,694278
StDev	0,155976
Variance	2,43E-02
Skewness	-1,57777
Kurtosis	2,25889
N	180
Minimum	0,170000
1st Quartile	0,630000
Median	0,730000
3rd Quartile	0,800000
Maximum	0,870000

95% Confidence Interval for Mu

0,671337	0,717219

95% Confidence Interval for Sigma

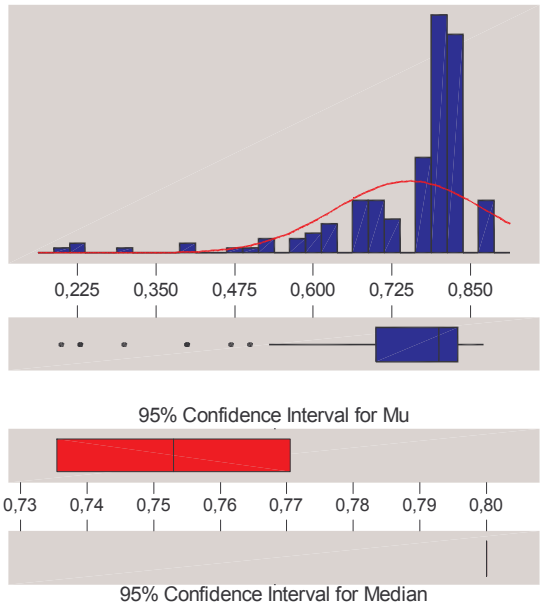
0,141356	0,173995

95% Confidence Interval for Median

0,700000	0,770000

11.2.2.1.3 GEH AS A FUNCTION OF THE NUMBER OF ALTERNATIVES

Descriptive Statistics



Variable: GEH
Numalternati: 3

Anderson-Darling Normality Test

A-Squared:	15,088
P-Value:	0,000
Mean	0,753000
StDev	0,119013
Variance	1,42E-02
Skewness	-2,40043
Kurtosis	6,90412
N	180
Minimum	0,200000
1st Quartile	0,700000
Median	0,800000
3rd Quartile	0,830000
Maximum	0,870000

95% Confidence Interval for Mu

0,735495	0,770505

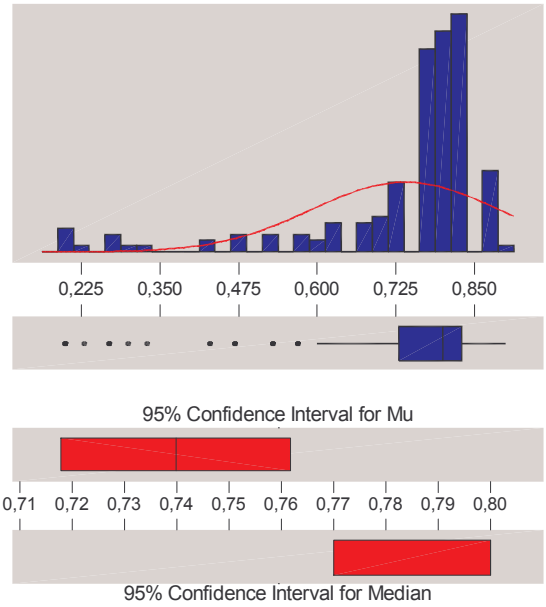
95% Confidence Interval for Sigma

0,107858	0,132762

95% Confidence Interval for Median

0,800000	0,800000

Descriptive Statistics



Variable: GEH
Numalternati: 4

Anderson-Darling Normality Test

A-Squared:	19,376
P-Value:	0,000
Mean	0,739778
StDev	0,149083
Variance	2,22E-02
Skewness	-2,26240
Kurtosis	4,79605
N	180
Minimum	0,200000
1st Quartile	0,730000
Median	0,800000
3rd Quartile	0,830000
Maximum	0,900000

95% Confidence Interval for Mu

0,717850	0,761705

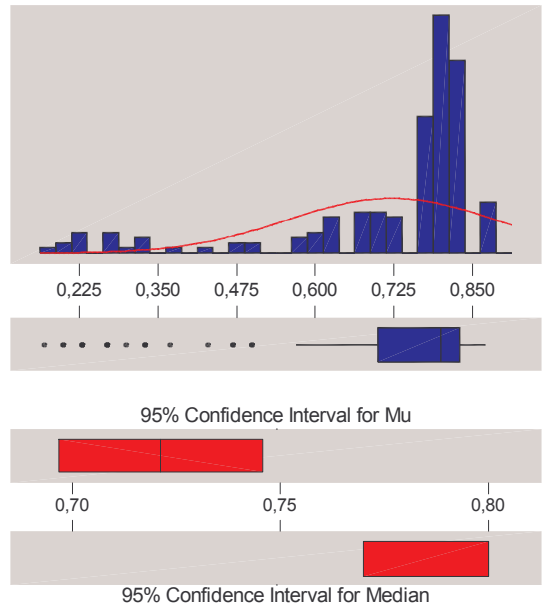
95% Confidence Interval for Sigma

0,135109	0,166306

95% Confidence Interval for Median

0,770000	0,800000

Descriptive Statistics



Variable: GEH
Numalternati: 5

Anderson-Darling Normality Test

A-Squared:	20,061
P-Value:	0,000
Mean	0,721222
StDev	0,166014
Variance	2,76E-02
Skewness	-1,95587
Kurtosis	2,96300
N	180
Minimum	0,170000
1st Quartile	0,700000
Median	0,800000
3rd Quartile	0,830000
Maximum	0,870000

95% Confidence Interval for Mu

0,696805	0,745640

95% Confidence Interval for Sigma

0,150453	0,185192

95% Confidence Interval for Median

0,770000	0,800000

11.2.2.1.4 General Linear Model: GEH versus Alpha Factor; Kinitial; Numalternatives

```
Factor     Type Levels Values
Alpha Fa   fixed      4 0,5 1,0 2,0 3,0
Kinitial   fixed      3 1 2 3
Numalter   fixed      3 3 4 5
```

Analysis of Variance for GEH, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
Alpha Fa	3	5.27703	5.27703	1.75901	313.32	0.000
Kinitial	2	1.25507	1.25507	0.62754	111.78	0.000
Numalter	2	0.09174	0.09174	0.04587	8.17	0.000
Alpha Fa*Kinitial	6	1.80051	1.80051	0.30009	53.45	0.000
Alpha Fa*Numalter	6	0.14283	0.14283	0.02380	4.24	0.000
Kinitial*Numalter	4	0.03647	0.03647	0.00912	1.62	0.167
Alpha Fa*Kinitial* Numalter	12	0.10566	0.10566	0.00881	1.57	0.097
Error	504	2.82952	2.82952	0.00561		
Total	539	11.53884				

Unusual Observations for GEH

Obs	GEH	Fit	SE Fit	Residual	St Resid
46	0.700000	0.506667	0.019346	0.193333	2.67R
47	0.670000	0.506667	0.019346	0.163333	2.26R
53	0.670000	0.506667	0.019346	0.163333	2.26R
54	0.200000	0.506667	0.019346	-0.306667	-4.24R
56	0.670000	0.506667	0.019346	0.163333	2.26R
57	0.230000	0.506667	0.019346	-0.276667	-3.82R
59	0.300000	0.506667	0.019346	-0.206667	-2.86R
61	0.700000	0.480000	0.019346	0.220000	3.04R
63	0.300000	0.480000	0.019346	-0.180000	-2.49R
64	0.270000	0.480000	0.019346	-0.210000	-2.90R
66	0.770000	0.480000	0.019346	0.290000	4.01R
67	0.670000	0.480000	0.019346	0.190000	2.62R
69	0.230000	0.480000	0.019346	-0.250000	-3.45R
70	0.330000	0.480000	0.019346	-0.150000	-2.07R
71	0.630000	0.480000	0.019346	0.150000	2.07R
72	0.200000	0.480000	0.019346	-0.280000	-3.87R
73	0.200000	0.480000	0.019346	-0.280000	-3.87R
75	0.730000	0.480000	0.019346	0.250000	3.45R
76	0.670000	0.391333	0.019346	0.278667	3.85R
77	0.630000	0.391333	0.019346	0.238667	3.30R
78	0.230000	0.391333	0.019346	-0.161333	-2.23R
83	0.670000	0.391333	0.019346	0.278667	3.85R
84	0.200000	0.391333	0.019346	-0.191333	-2.64R
85	0.200000	0.391333	0.019346	-0.191333	-2.64R
86	0.600000	0.391333	0.019346	0.208667	2.88R
87	0.230000	0.391333	0.019346	-0.161333	-2.23R
97	0.230000	0.584667	0.019346	-0.354667	-4.90R
106	0.630000	0.460000	0.019346	0.170000	2.35R
111	0.630000	0.460000	0.019346	0.170000	2.35R
114	0.270000	0.460000	0.019346	-0.190000	-2.62R
115	0.200000	0.460000	0.019346	-0.260000	-3.59R
116	0.630000	0.460000	0.019346	0.170000	2.35R
117	0.200000	0.460000	0.019346	-0.260000	-3.59R
119	0.270000	0.460000	0.019346	-0.190000	-2.62R
122	0.270000	0.420667	0.019346	-0.150667	-2.08R
124	0.630000	0.420667	0.019346	0.209333	2.89R
126	0.670000	0.420667	0.019346	0.249333	3.44R
128	0.570000	0.420667	0.019346	0.149333	2.06R
129	0.270000	0.420667	0.019346	-0.150667	-2.08R
130	0.170000	0.420667	0.019346	-0.250667	-3.46R
131	0.570000	0.420667	0.019346	0.149333	2.06R
132	0.230000	0.420667	0.019346	-0.190667	-2.63R
133	0.230000	0.420667	0.019346	-0.190667	-2.63R
135	0.570000	0.420667	0.019346	0.149333	2.06R
252	0.530000	0.704667	0.019346	-0.174667	-2.41R

R denotes an observation with a large standardised residual.

11.2.2.2 LOGIT ROUTE CHOICE

ROUTE CHOICE: LOGIT

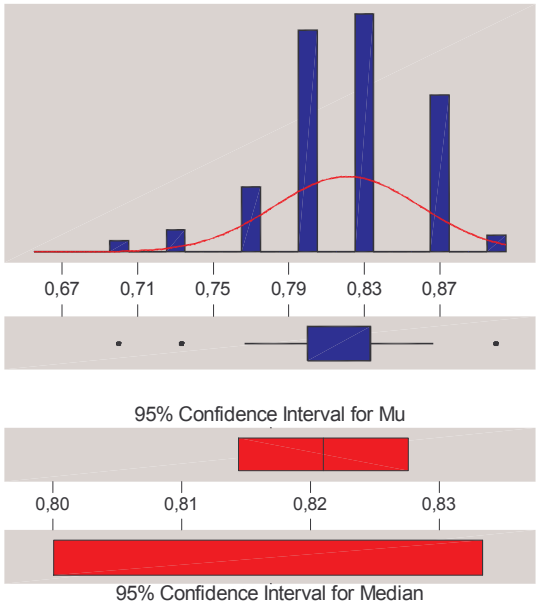
DESIGN FACTOR SCALE PARAMETER θ, LEVELS 10, 60,100

DESIGN FACTOR INITIAL K-SP (KINITIAL), LEVELS 1, 2, 3

DESIGN FACTOR MAXIMUM NUMBER OF ROUTES (NUMBER OF ALTERNATIVES), LEVELS 3, 4, 5

11.2.2.2.1 GEH AS A FUNCTION OF θ

Descriptive Statistics



Variable: GEH
Theta_New: 60

Anderson-Darling Normality Test

A-Squared:	4,737
P-Value:	0,000
Mean	0,820988
StDev	0,038578
Variance	1,49E-03
Skewness	-5,6E-01
Kurtosis	0,530457
N	135
Minimum	0,700000
1st Quartile	0,800000
Median	0,833333
3rd Quartile	0,833333
Maximum	0,900000

95% Confidence Interval for Mu

0,814421	0,827555

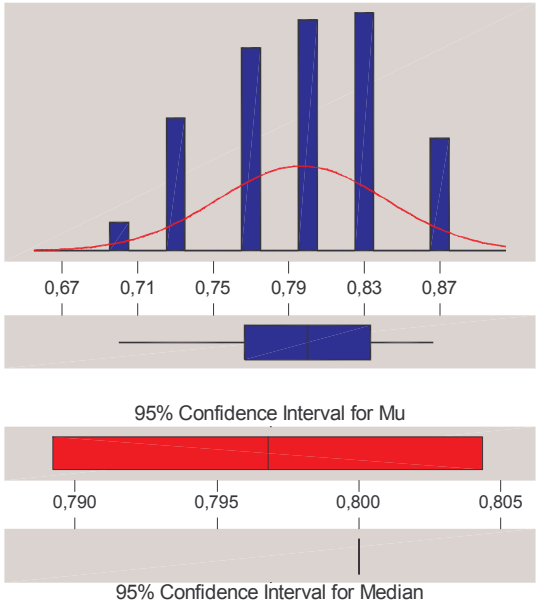
95% Confidence Interval for Sigma

0,034460	0,043822

95% Confidence Interval for Median

0,800000	0,833333

Descriptive Statistics



Variable: GEH
Theta_New: 100

Anderson-Darling Normality Test

A-Squared:	3,627
P-Value:	0,000
Mean	0,796790
StDev	0,044400
Variance	1,97E-03
Skewness	-1,9E-01
Kurtosis	-8,1E-01
N	135
Minimum	0,700000
1st Quartile	0,766667
Median	0,800000
3rd Quartile	0,833333
Maximum	0,866667

95% Confidence Interval for Mu

0,789232	0,804348

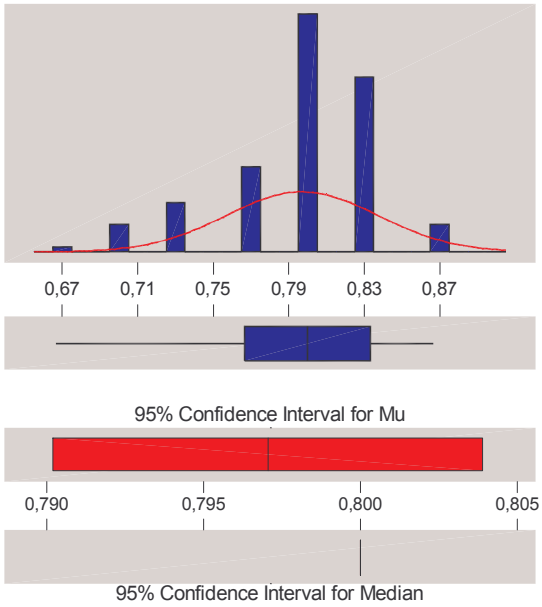
95% Confidence Interval for Sigma

0,039661	0,050436

95% Confidence Interval for Median

0,800000	0,800000

Descriptive Statistics



Variable: GEH
Theta_New: 10

Anderson-Darling Normality Test

A-Squared:	6,324
P-Value:	0,000
Mean	0,797037
StDev	0,040204
Variance	1,62E-03
Skewness	-8,4E-01
Kurtosis	0,596687
N	135
Minimum	0,666667
1st Quartile	0,766667
Median	0,800000
3rd Quartile	0,833333
Maximum	0,866667

95% Confidence Interval for Mu

0,790193	0,803881

95% Confidence Interval for Sigma

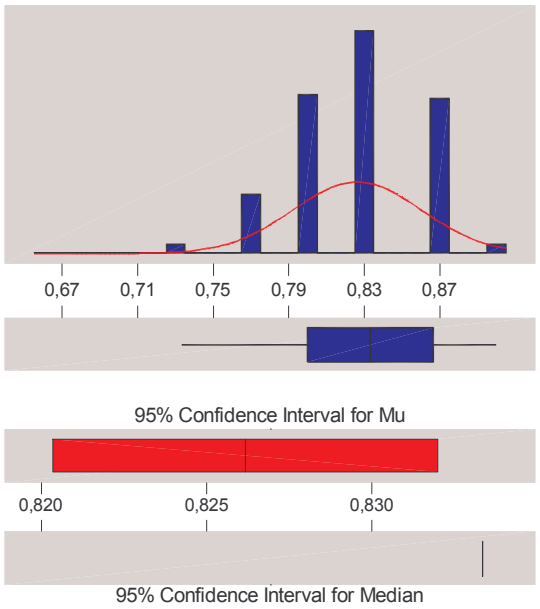
0,035913	0,045669

95% Confidence Interval for Median

0,800000	0,800000

11.2.2.2.2 GEH AS A FUNCTION OF INITIAL K-SP

Descriptive Statistics



Variable: GEH
Kinit_new: 1

Anderson-Darling Normality Test

A-Squared:	5,711
P-Value:	0,000
Mean	0,826173
StDev	0,034165
Variance	1,17E-03
Skewness	-3,6E-01
Kurtosis	-3,2E-01
N	135
Minimum	0,733333
1st Quartile	0,800000
Median	0,833333
3rd Quartile	0,866667
Maximum	0,900000

95% Confidence Interval for Mu

0,820357	0,831989

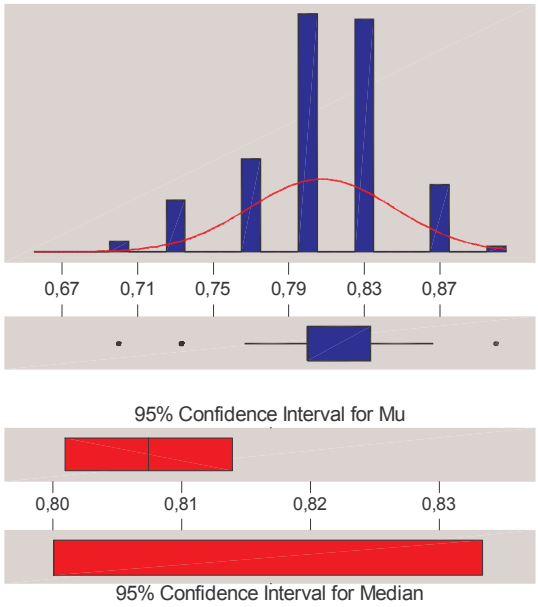
95% Confidence Interval for Sigma

0,030518	0,038809

95% Confidence Interval for Median

0,833333	0,833333

Descriptive Statistics



Variable: GEH
Kinit_new: 2

Anderson-Darling Normality Test

A-Squared:	5,138
P-Value:	0,000
Mean	0,807407
StDev	0,038129
Variance	1,45E-03
Skewness	-4,8E-01
Kurtosis	0,148155
N	135
Minimum	0,700000
1st Quartile	0,800000
Median	0,800000
3rd Quartile	0,833333
Maximum	0,900000

95% Confidence Interval for Mu

0,800917	0,813898

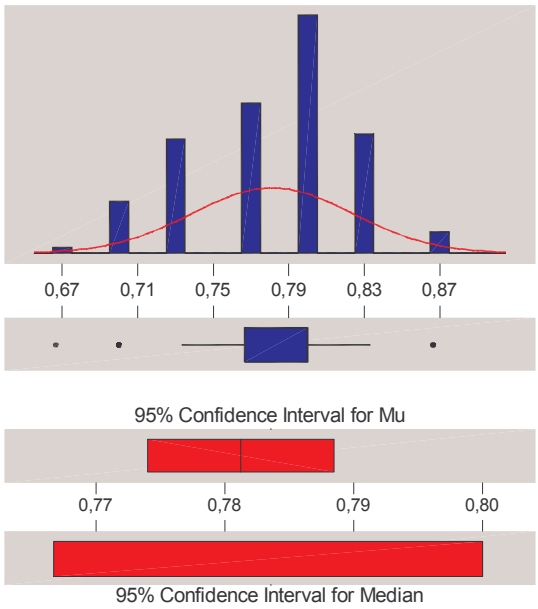
95% Confidence Interval for Sigma

0,034060	0,043312

95% Confidence Interval for Median

0,800000	0,833333

Descriptive Statistics



Variable: GEH
Kinit_new: 3

Anderson-Darling Normality Test

A-Squared:	4,166
P-Value:	0,000
Mean	0,781235
StDev	0,042635
Variance	1,82E-03
Skewness	-3,2E-01
Kurtosis	-4,4E-01
N	135
Minimum	0,666667
1st Quartile	0,766667
Median	0,800000
3rd Quartile	0,800000
Maximum	0,866667

95% Confidence Interval for Mu

0,773977	0,788492

95% Confidence Interval for Sigma

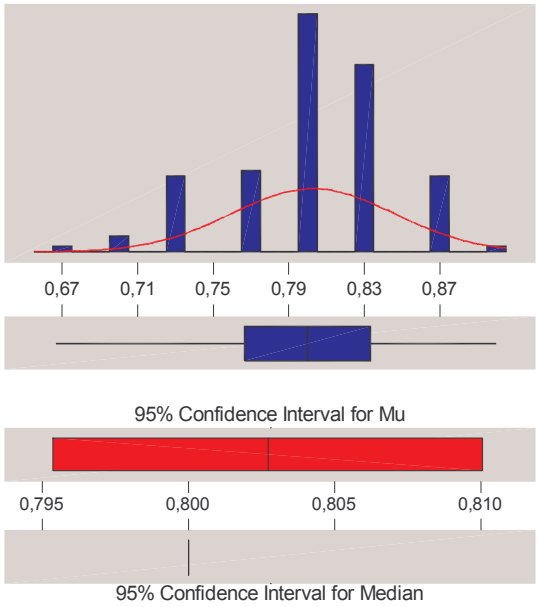
0,038084	0,048430

95% Confidence Interval for Median

0,766667	0,800000

11.2.2.2.3 GEH AS A FUNCTION OF THE NUMBER OF ALTERNATIVES

Descriptive Statistics



Variable: GEH

Alter_new: 3

Anderson-Darling Normality Test

A-Squared:	4,510
P-Value:	0,000
Mean	0,802716
StDev	0,043107
Variance	1,86E-03
Skewness	-5,3E-01
Kurtosis	0,150447
N	135
Minimum	0,666667
1st Quartile	0,766667
Median	0,800000
3rd Quartile	0,833333
Maximum	0,900000

95% Confidence Interval for Mu

0,795378	0,810054

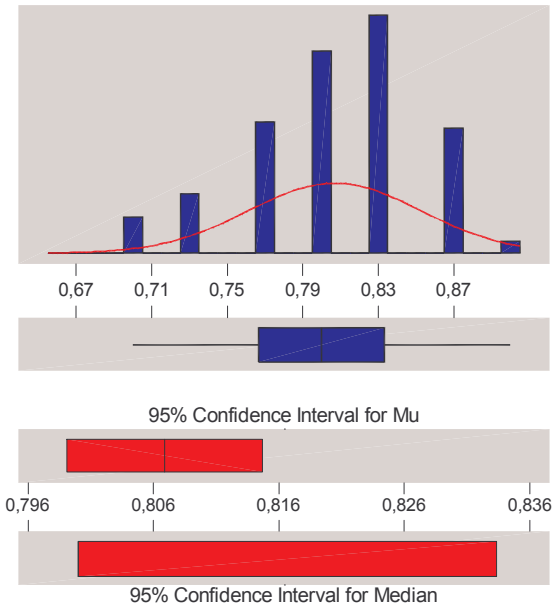
95% Confidence Interval for Sigma

0,038506	0,048967

95% Confidence Interval for Median

0,800000	0,800000

Descriptive Statistics



Variable: GEH

Alter_new: 4

Anderson-Darling Normality Test

A-Squared:	3,749
P-Value:	0,000
Mean	0,806914
StDev	0,045729
Variance	2,09E-03
Skewness	-4,7E-01
Kurtosis	-2,6E-01
N	135
Minimum	0,700000
1st Quartile	0,766667
Median	0,800000
3rd Quartile	0,833333
Maximum	0,900000

95% Confidence Interval for Mu

0,799129	0,814698

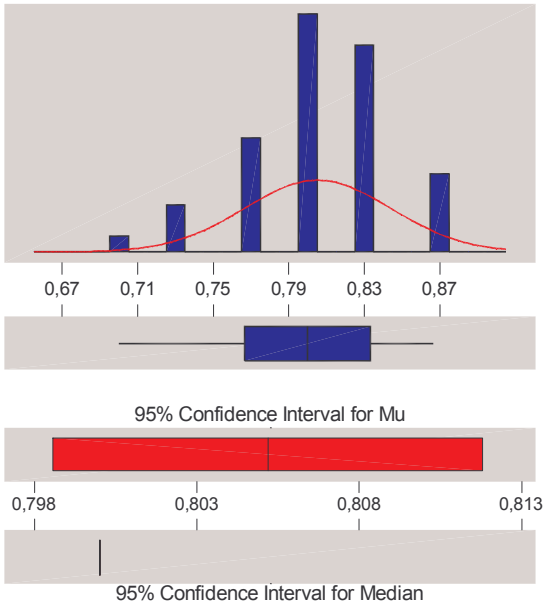
95% Confidence Interval for Sigma

0,040848	0,051945

95% Confidence Interval for Median

0,800000	0,833333

Descriptive Statistics



Variable: GEH
Alter_new: 5

Anderson-Darling Normality Test

A-Squared:	4,616
P-Value:	0,000
Mean	0,805185
StDev	0,038819
Variance	1,51E-03
Skewness	-4,8E-01
Kurtosis	7,70E-03
N	135
Minimum	0,700000
1st Quartile	0,766667
Median	0,800000
3rd Quartile	0,833333
Maximum	0,866667

95% Confidence Interval for Mu

0,798577	0,811793

95% Confidence Interval for Sigma

0,034676	0,044096

95% Confidence Interval for Median

0,800000	0,800000

11.2.2.2.4 General Linear Model: GEH versus Theta; Kinit; Alter

```
Factor      Type Levels Values
Theta_Ne    fixed      3  10  60 100
Kinit_ne    fixed      3 1 2 3
Alter_ne    fixed      3 3 4 5

Analysis of Variance for GEH, using Adjusted SS for Tests

Source                      DF     Seq SS     Adj SS     Adj MS       F      P
Theta_Ne                     2   0.052165   0.052165   0.026082   18.70  0.000
Kinit_ne                     2   0.137547   0.137547   0.068774   49.32  0.000
Alter_ne                     2   0.001202   0.001202   0.000601    0.43  0.650
Theta_Ne*Kinit_ne            4   0.007967   0.007967   0.001992    1.43  0.224
Theta_Ne*Alter_ne            4   0.001152   0.001152   0.000288    0.21  0.935
Kinit_ne*Alter_ne            4   0.001103   0.001103   0.000276    0.20  0.939
Theta_Ne*Kinit_ne*
Alter_ne                     8   0.004099   0.004099   0.000512    0.37  0.937
Error                      378   0.527111   0.527111   0.001394
Total                      404   0.732346

Unusual Observations for GEH

Obs       GEH       Fit      SE Fit  Residual   St Resid
 74  0.700000  0.806667    0.009642 -0.106667     -2.96R
 97  0.666667  0.762222    0.009642 -0.095556     -2.65R
130  0.700000  0.773333    0.009642 -0.073333     -2.03R
163  0.766667  0.840000    0.009642 -0.073333     -2.03R
179  0.766667  0.842222    0.009642 -0.075556     -2.09R
181  0.900000  0.824444    0.009642  0.075556      2.09R
185  0.733333  0.824444    0.009642 -0.091111     -2.53R
217  0.733333  0.817778    0.009642 -0.084444     -2.34R
229  0.700000  0.795556    0.009642 -0.095556     -2.65R
267  0.700000  0.797778    0.009642 -0.097778     -2.71R
275  0.733333  0.817778    0.009642 -0.084444     -2.34R
312  0.733333  0.820000    0.009642 -0.086667     -2.40R
324  0.866667  0.791111    0.009642  0.075556      2.09R
329  0.866667  0.791111    0.009642  0.075556      2.09R
344  0.866667  0.791111    0.009642  0.075556      2.09R
```

```
345  0.700000  0.791111    0.009642 -0.091111     -2.53R
359  0.866667  0.793333    0.009642  0.073333      2.03R
394  0.700000  0.780000    0.009642 -0.080000     -2.22R
395  0.866667  0.780000    0.009642  0.086667      2.40R

R denotes an observation with a large standardised residual.
```

11.2.2.2.5 COEFFICIENTS OF THE GENERAL LINEAR MODEL: GEH VERSUS THETA; KINIT; ALTER

0.804938
-0.007901
0.016049
0.021235
0.002469
-0.002222
0.001975
-0.001235
0.006420
-0.003704
0.000988
-0.000741
-0.000494
-0.000988
0.002963
-0.001728
0.002222
0.001481
0.000247
0.003210
-0.000741
-0.000000
-0.000988
-0.000247
-0.005679
0.001728
0.001481

11.2.2.2.6 GENERAL LINEAR MODEL: GEH VERSUS THETA; KINIT

```
Factor     Type Levels Values
Theta_Ne   fixed      3  10  60 100
Kinit_ne   fixed      3 1 2 3

Analysis of Variance for GEH, using Adjusted SS for Tests

Source              DF     Seq SS     Adj SS     Adj MS       F      P
Theta_Ne             2   0.052165   0.052165   0.026082   19.32  0.000
Kinit_ne             2   0.137547   0.137547   0.068774   50.94  0.000
Theta_Ne*Kinit_ne    4   0.007967   0.007967   0.001992    1.48  0.209
Error              396   0.534667   0.534667   0.001350
Total              404   0.732346

Unusual Observations for GEH

Obs       GEH       Fit      SE Fit  Residual   St Resid
 74  0.700000  0.805926    0.005478 -0.105926     -2.92R
 97  0.666667  0.768148    0.005478 -0.101481     -2.79R
```

```
181  0.900000  0.824444    0.005478  0.075556      2.08R
185  0.733333  0.824444    0.005478 -0.091111     -2.51R
217  0.733333  0.824444    0.005478 -0.091111     -2.51R
229  0.700000  0.800000    0.005478 -0.100000     -2.75R
267  0.700000  0.800000    0.005478 -0.100000     -2.75R
275  0.733333  0.822963    0.005478 -0.089630     -2.47R
312  0.733333  0.822963    0.005478 -0.089630     -2.47R
324  0.866667  0.791852    0.005478  0.074815      2.06R
329  0.866667  0.791852    0.005478  0.074815      2.06R
344  0.866667  0.791852    0.005478  0.074815      2.06R
345  0.700000  0.791852    0.005478 -0.091852     -2.53R
359  0.866667  0.791852    0.005478  0.074815      2.06R
379  0.700000  0.775556    0.005478 -0.075556     -2.08R
386  0.700000  0.775556    0.005478 -0.075556     -2.08R
394  0.700000  0.775556    0.005478 -0.075556     -2.08R
395  0.866667  0.775556    0.005478  0.091111      2.51R

R denotes an observation with a large standardised residual.
```

11.2.2.2.7 COEFFICIENTS OF THE GENERAL LINEAR MODEL: GEH VERSUS THETA; KINIT

0.804938
-0.007901
0.016049
0.021235
0.002469
-0.001235
0.006420
-0.003704
0.000988

11.2.2.3 C-LOGIT ROUTE CHOICE MODEL WITH FIXED BETA AND GAMMA

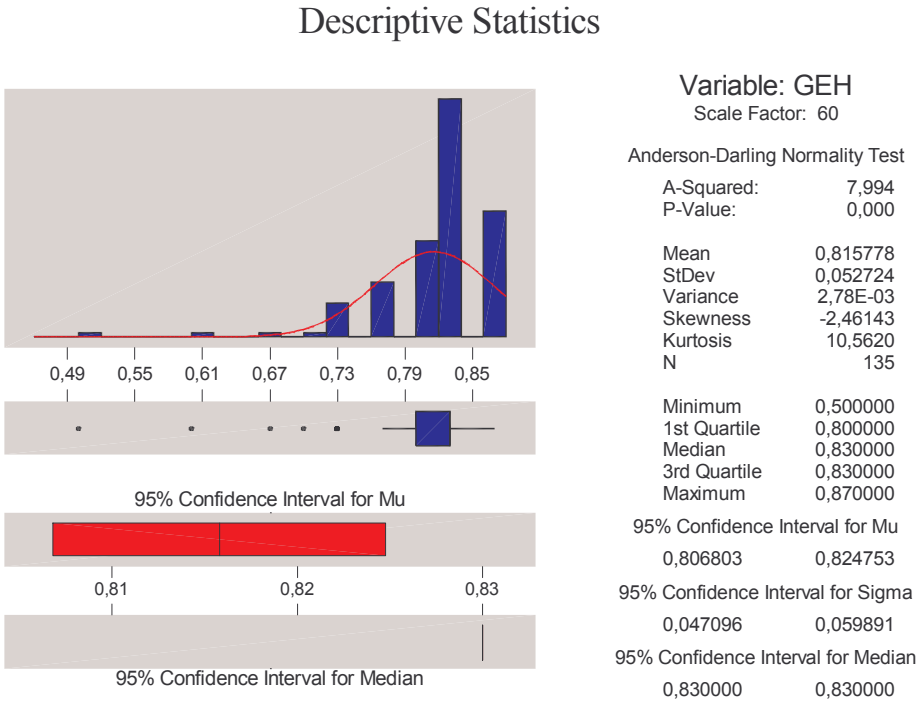
ROUTE CHOICE: CLOGIT (β=0.15 AND γ=1.0 FIXED)

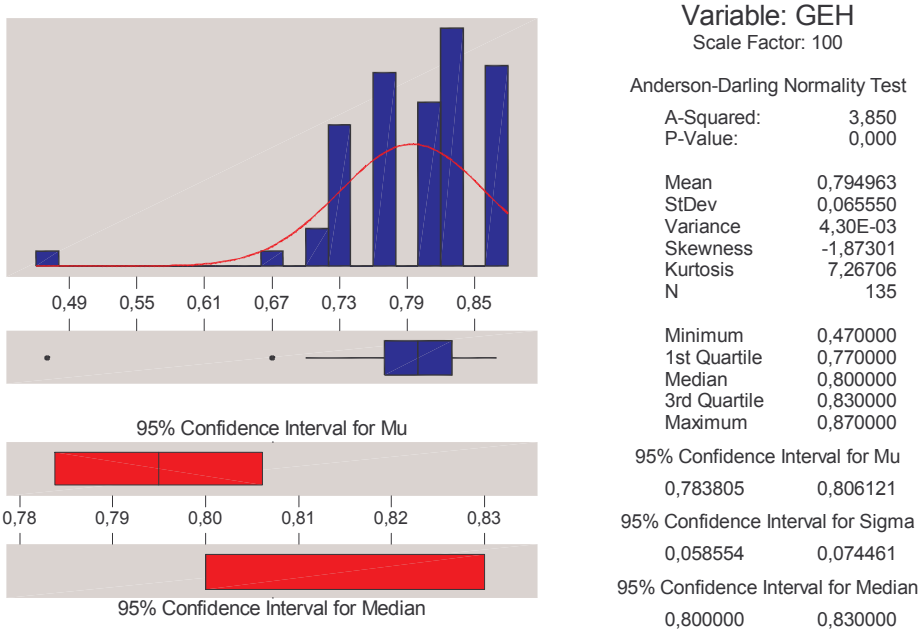
DESIGN FACTOR θ, LEVELS 10, 60, 100

DESIGN FACTOR INITIAL K-SP (KINITIAL), LEVELS 1, 2, 3

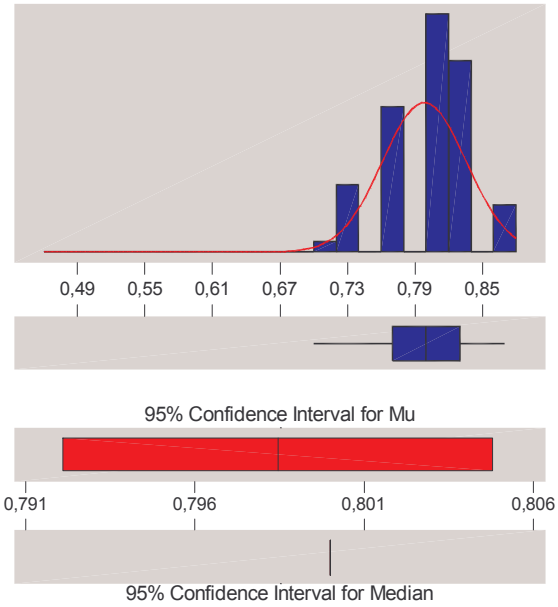
DESIGN FACTOR MAXIMUM NUMBER OF ROUTES (NUMBER OF ALTERNATIVES), LEVELS 2, 3, 4

11.2.2.3.1 GEH AS A FUNCTION OF θ





Descriptive Statistics



Variable: GEH

Scale Factor: 10

Anderson-Darling Normality Test

A-Squared:	4,667
P-Value:	0,000
Mean	0,798444
StDev	0,037254
Variance	1,39E-03
Skewness	-3,3E-01
Kurtosis	2,77E-02
N	135
Minimum	0,700000
1st Quartile	0,770000
Median	0,800000
3rd Quartile	0,830000
Maximum	0,870000

95% Confidence Interval for Mu

0,792103	0,804786

95% Confidence Interval for Sigma

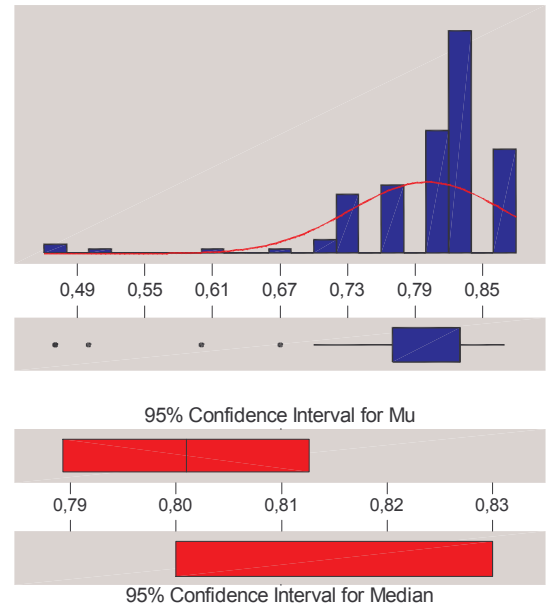
0,033278	0,042318

95% Confidence Interval for Median

0,800000	0,800000

11.2.2.3.2 GEH AS A FUNCTION OF INITIAL K-SP

Descriptive Statistics



Variable: GEH

Kinitial: 1

Anderson-Darling Normality Test

A-Squared:	8,505
P-Value:	0,000
Mean	0,800963
StDev	0,068490
Variance	4,69E-03
Skewness	-2,58266
Kurtosis	9,46560
N	135
Minimum	0,470000
1st Quartile	0,770000
Median	0,830000
3rd Quartile	0,830000
Maximum	0,870000

95% Confidence Interval for Mu

0,789304	0,812622

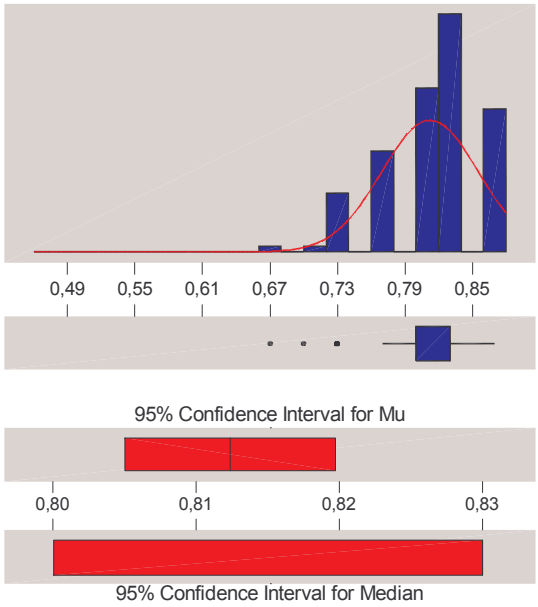
95% Confidence Interval for Sigma

0,061180	0,077800

95% Confidence Interval for Median

0,800000	0,830000

Descriptive Statistics



Variable: GEH
Kinitial: 2

Anderson-Darling Normality Test

A-Squared:	4,490
P-Value:	0,000
Mean	0,812370
StDev	0,043197
Variance	1,87E-03
Skewness	-6,1E-01
Kurtosis	0,161103
N	135
Minimum	0,670000
1st Quartile	0,800000
Median	0,830000
3rd Quartile	0,830000
Maximum	0,870000

95% Confidence Interval for Mu

0,805017	0,819724

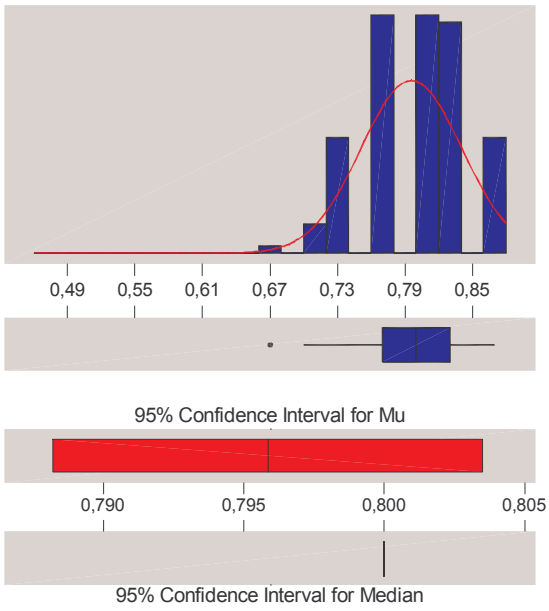
95% Confidence Interval for Sigma

0,038586	0,049069

95% Confidence Interval for Median

0,800000	0,830000

Descriptive Statistics



Variable: GEH
Kinitial: 3

Anderson-Darling Normality Test

A-Squared:	3,211
P-Value:	0,000
Mean	0,795852
StDev	0,044878
Variance	2,01E-03
Skewness	-2,4E-01
Kurtosis	-3,1E-01
N	135
Minimum	0,670000
1st Quartile	0,770000
Median	0,800000
3rd Quartile	0,830000
Maximum	0,870000

95% Confidence Interval for Mu

0,788213	0,803491

95% Confidence Interval for Sigma

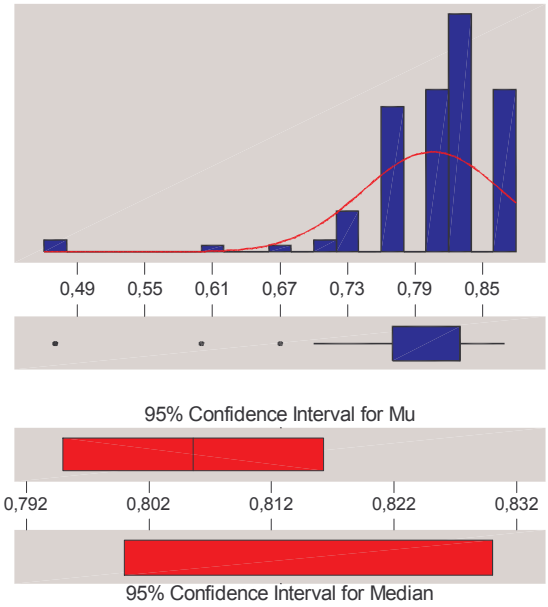
0,040088	0,050978

95% Confidence Interval for Median

0,800000	0,800000

11.2.2.3.3 GEH AS A FUNCTION OF THE NUMBER OF ALTERNATIVES

Descriptive Statistics



Variable: GEH

Numalternati: 3

Anderson-Darling Normality Test

A-Squared:	6,615
P-Value:	0,000
Mean	0,805630
StDev	0,062374
Variance	3,89E-03
Skewness	-2,66161
Kurtosis	11,6368
N	135
Minimum	0,470000
1st Quartile	0,770000
Median	0,830000
3rd Quartile	0,830000
Maximum	0,870000

95% Confidence Interval for Mu

0,795012	0,816247

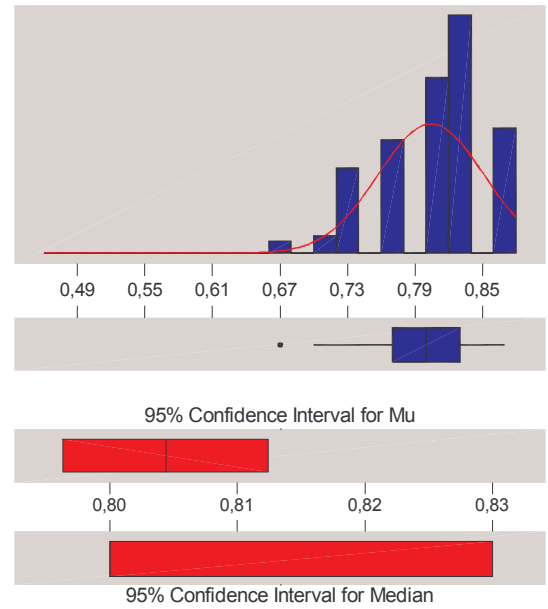
95% Confidence Interval for Sigma

0,055716	0,070852

95% Confidence Interval for Median

0,800000	0,830000

Descriptive Statistics



Variable: GEH

Numalternati: 4

Anderson-Darling Normality Test

A-Squared:	4,128
P-Value:	0,000
Mean	0,804370
StDev	0,047183
Variance	2,23E-03
Skewness	-6,0E-01
Kurtosis	-4,3E-02
N	135
Minimum	0,670000
1st Quartile	0,770000
Median	0,800000
3rd Quartile	0,830000
Maximum	0,870000

95% Confidence Interval for Mu

0,796339	0,812402

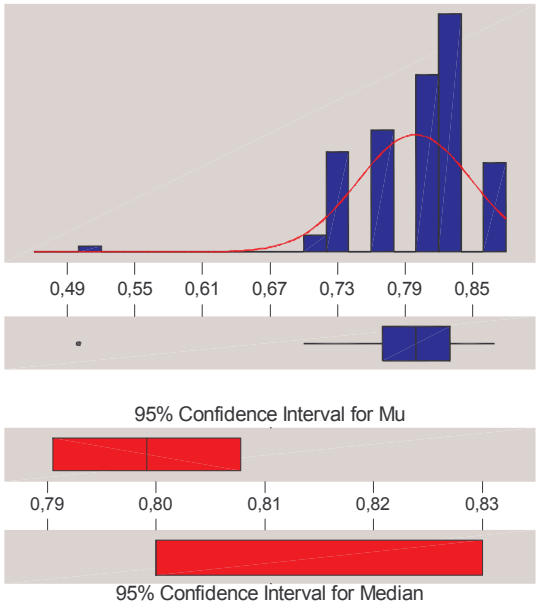
95% Confidence Interval for Sigma

0,042147	0,053597

95% Confidence Interval for Median

0,800000	0,830000

Descriptive Statistics



Variable: GEH
Numalternati: 5

Anderson-Darling Normality Test

A-Squared:	4,361
P-Value:	0,000
Mean	0,799185
StDev	0,050742
Variance	2,57E-03
Skewness	-1,69743
Kurtosis	7,73009
N	135
Minimum	0,500000
1st Quartile	0,770000
Median	0,800000
3rd Quartile	0,830000
Maximum	0,870000

95% Confidence Interval for Mu

0,790548	0,807823

95% Confidence Interval for Sigma

0,045326	0,057639

95% Confidence Interval for Median

0,800000	0,830000

11.2.2.3.4 General Linear Model: GEH versus Scale Factor; Kinitial; Numalternatives

```
Factor     Type Levels Values
Scale Fa   fixed      3  10  60 100
Kinitial   fixed      3 1 2 3
Numalter   fixed      3 3 4 5

Analysis of Variance for GEH, using Adjusted SS for Tests

Source                      DF     Seq SS     Adj SS     Adj MS       F       P
Scale Fa                     2   0.033562   0.033562   0.016781    6.16   0.002
Kinitial                     2   0.019310   0.019310   0.009655    3.55   0.030
Numalter                     2   0.003150   0.003150   0.001575    0.58   0.561
Scale Fa*Kinitial            4   0.033678   0.033678   0.008420    3.09   0.016
Scale Fa*Numalter            4   0.022531   0.022531   0.005633    2.07   0.084
Kinitial*Numalter            4   0.005041   0.005041   0.001260    0.46   0.763
Scale Fa*Kinitial*
Numalter                     8   0.021158   0.021158   0.002645    0.97   0.458
Error                      378   1.029373   1.029373   0.002723
Total                      404   1.167803

Unusual Observations for GEH

Obs       GEH       Fit      SE Fit  Residual   St Resid
136  0.600000  0.813333    0.013474 -0.213333     -4.23R
158  0.670000  0.806000    0.013474 -0.136000     -2.70R
166  0.500000  0.793333    0.013474 -0.293333     -5.82R
200  0.700000  0.821333    0.013474 -0.121333     -2.41R
271  0.470000  0.768000    0.013474 -0.298000     -5.91R
274  0.870000  0.768000    0.013474  0.102000      2.02R
276  0.870000  0.768000    0.013474  0.102000      2.02R
277  0.870000  0.768000    0.013474  0.102000      2.02R
278  0.470000  0.768000    0.013474 -0.298000     -5.91R
280  0.870000  0.768000    0.013474  0.102000      2.02R
281  0.870000  0.768000    0.013474  0.102000      2.02R
284  0.870000  0.768000    0.013474  0.102000      2.02R
312  0.700000  0.804000    0.013474 -0.104000     -2.06R
344  0.670000  0.796000    0.013474 -0.126000     -2.50R
366  0.670000  0.774000    0.013474 -0.104000     -2.06R
```

R denotes an observation with a large standardised residual.

11.2.2.3.5 COEFFICIENTS OF THE GENERAL LINEAR MODEL: GEH VERSUS SCALE FACTOR; KINITIAL; NUMALTERNATIVES

0.803062
-0.004617
0.012716
-0.002099
0.009309
0.002568
0.001309
0.016988
-0.002864
-0.009457
0.001358
0.009877
-0.002864
0.004321
-0.001531
-0.001753
-0.000049
0.002617
-0.005679
-0.000025
0.004938
-0.007284
0.009012
0.003975
0.002049
-0.003951
0.000790

11.2.2.3.6 GENERAL LINEAR MODEL: GEH VERSUS SCALE FACTOR; KINITIAL

```
Factor     Type Levels Values
Scale Fa  fixed      3  10  60 100
Kinitial  fixed      3 1 2 3

Analysis of Variance for GEH, using Adjusted SS for Tests

Source              DF     Seq SS     Adj SS     Adj MS       F      P
Scale Fa             2   0.033562   0.033562   0.016781    6.15  0.002
Kinitial             2   0.019310   0.019310   0.009655    3.54  0.030
Scale Fa*Kinitial    4   0.033678   0.033678   0.008420    3.08  0.016
Error              396   1.081253   1.081253   0.002730
Total              404   1.167803

Unusual Observations for GEH

Obs       GEH       Fit      SE Fit  Residual   St Resid
136  0.600000  0.804222    0.007790 -0.204222     -3.95R
158  0.670000  0.804222    0.007790 -0.134222     -2.60R
166  0.500000  0.804222    0.007790 -0.304222     -5.89R
```

```
200   0.700000   0.826444     0.007790 -0.126444     -2.45R
271   0.470000   0.785333     0.007790 -0.315333     -6.10R
278   0.470000   0.785333     0.007790 -0.315333     -6.10R
344   0.670000   0.805778     0.007790 -0.135778     -2.63R
366   0.670000   0.793778     0.007790 -0.123778     -2.40R

R denotes an observation with a large standardised residual.
```

11.2.2.3.7 COEFFICIENTS OF THE GENERAL LINEAR MODEL: GEH VERSUS SCALE FACTOR; KINITIAL

0.004938
-0.007284
0.009012
0.003975
0.002049
-0.003951
0.000790

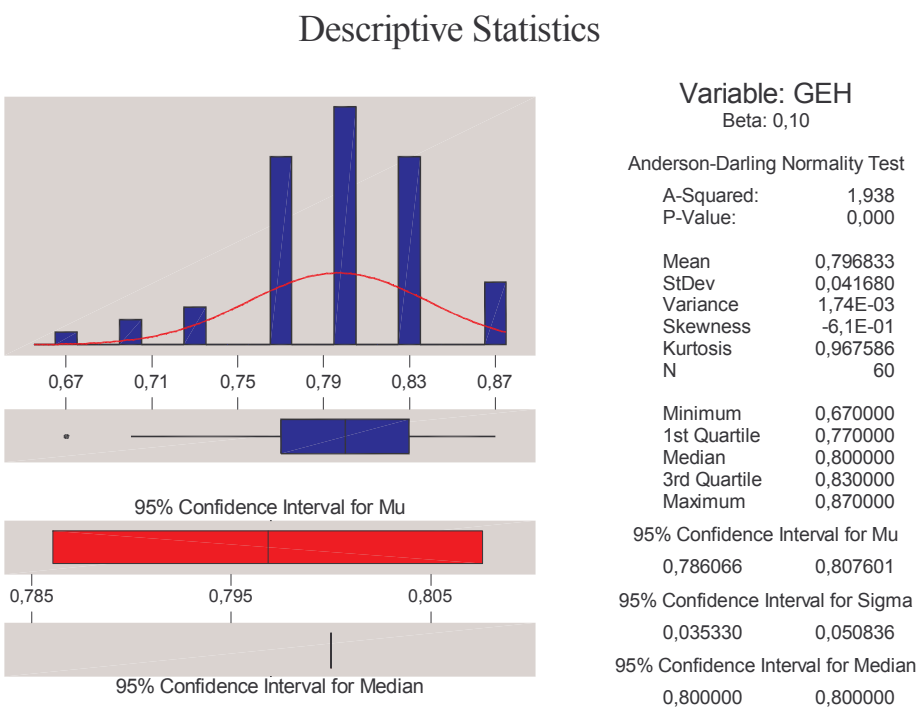
11.2.2.4 C-LOGIT ROUTE CHOICE WITH VARYING BETA AND GAMMA

ROUTE CHOICE: CLOGIT (θ=60, INITIAL K-SP=2, AND MAXIMUM NUMBER OF ROUTES =3 FIXED)

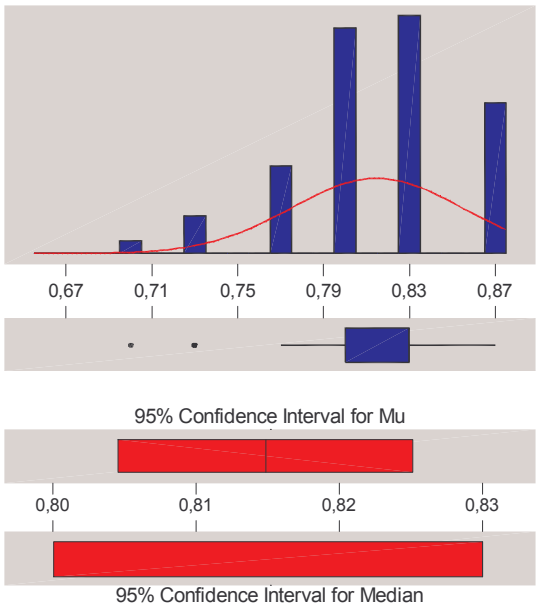
DESIGN FACTOR β, LEVELS 0.10, 0.15, 0.5, 1.0

DESIGN FACTOR γ, LEVELS 0.5, 1.0, 1.5, 2.0

11.2.2.4.1 GEH AS A FUNCTION OF β



Descriptive Statistics



Variable: GEH

Beta: 0,15

Anderson-Darling Normality Test

A-Squared:	2,097
P-Value:	0,000
Mean	0,814833
StDev	0,039851
Variance	1,59E-03
Skewness	-5,4E-01
Kurtosis	0,342179
N	60
Minimum	0,700000
1st Quartile	0,800000
Median	0,830000
3rd Quartile	0,830000
Maximum	0,870000

95% Confidence Interval for Mu

0,804539	0,825128

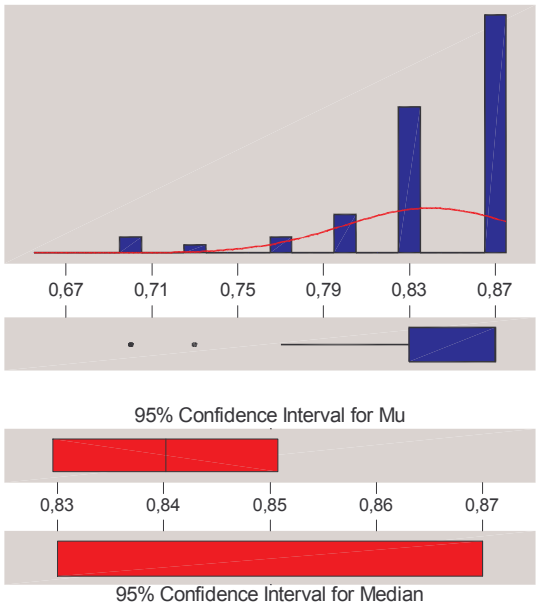
95% Confidence Interval for Sigma

0,033779	0,048605

95% Confidence Interval for Median

0,800000	0,830000

Descriptive Statistics



Variable: GEH

Beta: 0,50

Anderson-Darling Normality Test

A-Squared:	5,815
P-Value:	0,000
Mean	0,840167
StDev	0,040942
Variance	1,68E-03
Skewness	-1,80282
Kurtosis	3,55627
N	60
Minimum	0,700000
1st Quartile	0,830000
Median	0,870000
3rd Quartile	0,870000
Maximum	0,870000

95% Confidence Interval for Mu

0,829590	0,850743

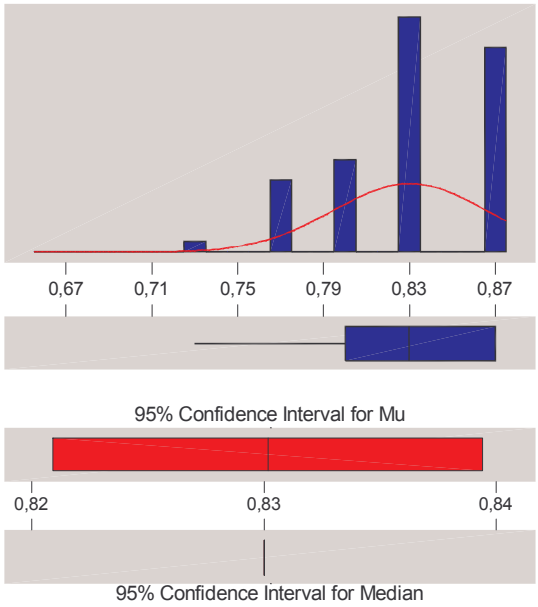
95% Confidence Interval for Sigma

0,034704	0,049935

95% Confidence Interval for Median

0,830000	0,870000

Descriptive Statistics



Variable: GEH
Beta: 1,00

Anderson-Darling Normality Test

A-Squared:	3,253
P-Value:	0,000
Mean	0,830167
StDev	0,035725
Variance	1,28E-03
Skewness	-5,8E-01
Kurtosis	-2,8E-01
N	60
Minimum	0,730000
1st Quartile	0,800000
Median	0,830000
3rd Quartile	0,870000
Maximum	0,870000

95% Confidence Interval for Mu

0,820938	0,839395

95% Confidence Interval for Sigma

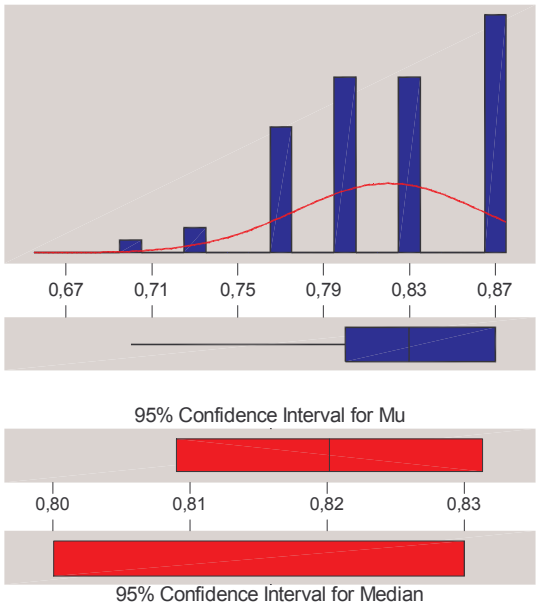
0,030281	0,043572

95% Confidence Interval for Median

0,830000	0,830000

11.2.2.4.2 GEH AS A FUNCTION OF γ

Descriptive Statistics



Variable: GEH
Gamma: 0,5

Anderson-Darling Normality Test

A-Squared:	2,385
P-Value:	0,000
Mean	0,820167
StDev	0,043198
Variance	1,87E-03
Skewness	-4,8E-01
Kurtosis	-3,4E-01
N	60
Minimum	0,700000
1st Quartile	0,800000
Median	0,830000
3rd Quartile	0,870000
Maximum	0,870000

95% Confidence Interval for Mu

0,809007	0,831326

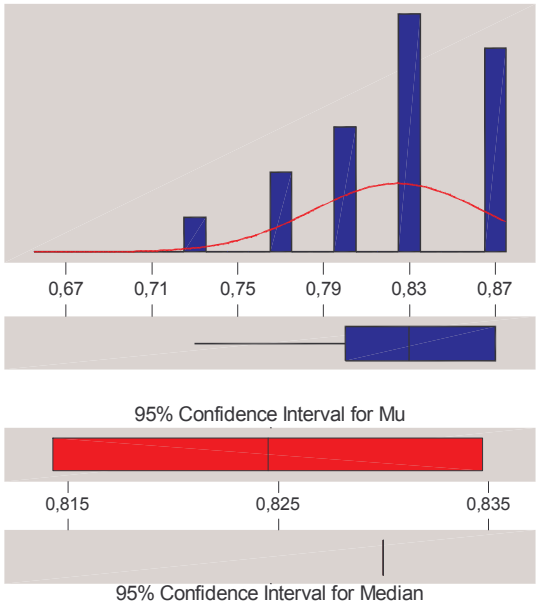
95% Confidence Interval for Sigma

0,036616	0,052687

95% Confidence Interval for Median

0,800000	0,830000

Descriptive Statistics



Variable: GEH

Gamma: 1,0

Anderson-Darling Normality Test

A-Squared:	2,648
P-Value:	0,000
Mean	0,824500
StDev	0,039506
Variance	1,56E-03
Skewness	-6,1E-01
Kurtosis	-2,2E-01
N	60
Minimum	0,730000
1st Quartile	0,800000
Median	0,830000
3rd Quartile	0,870000
Maximum	0,870000

95% Confidence Interval for Mu

0,814294	0,834706

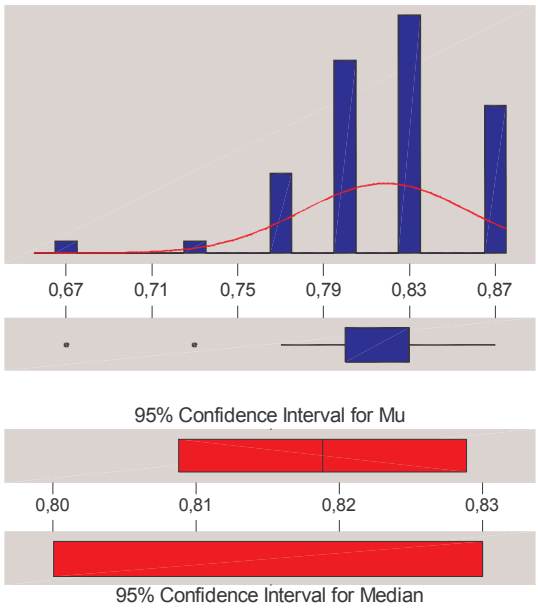
95% Confidence Interval for Sigma

0,033487	0,048185

95% Confidence Interval for Median

0,830000	0,830000

Descriptive Statistics



Variable: GEH

Gamma: 1,5

Anderson-Darling Normality Test

A-Squared:	2,341
P-Value:	0,000
Mean	0,818833
StDev	0,038930
Variance	1,52E-03
Skewness	-9,4E-01
Kurtosis	2,43161
N	60
Minimum	0,670000
1st Quartile	0,800000
Median	0,830000
3rd Quartile	0,830000
Maximum	0,870000

95% Confidence Interval for Mu

0,808777	0,828890

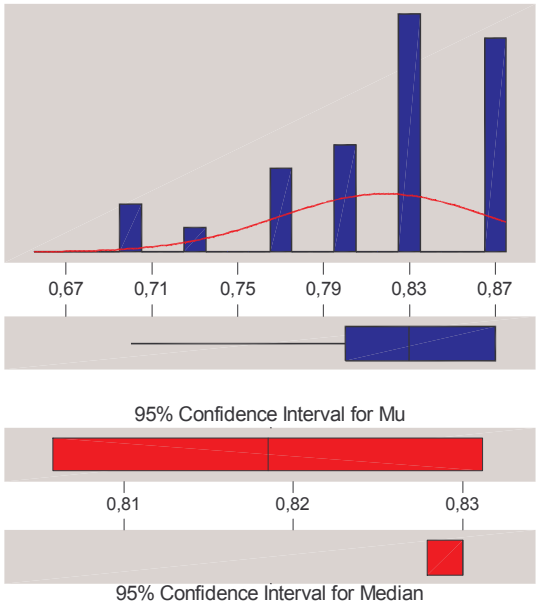
95% Confidence Interval for Sigma

0,032999	0,047482

95% Confidence Interval for Median

0,800000	0,830000

Descriptive Statistics



Variable: GEH
Gamma: 2,0

Anderson-Darling Normality Test

A-Squared:	2,879
P-Value:	0,000
Mean	0,818500
StDev	0,049018
Variance	2,40E-03
Skewness	-9,5E-01
Kurtosis	0,345363
N	60
Minimum	0,700000
1st Quartile	0,800000
Median	0,830000
3rd Quartile	0,870000
Maximum	0,870000

95% Confidence Interval for Mu

0,805837 0,831163

95% Confidence Interval for Sigma

0,041550 0,059786

95% Confidence Interval for Median

0,827920 0,830000

11.2.2.4.3 General Linear Model: GEH versus Beta; Gamma

```
Factor      Type Levels Values
Beta       fixed      4 0.10 0.15 0.50 1.00
Gamma      fixed      4 0.5 1.0 1.5 2.0

Analysis of Variance for GEH. using Adjusted SS for Tests

Source        DF     Seq SS     Adj SS     Adj MS       F      P
Beta           3   0.064347   0.064347   0.021449   13.50  0.000
Gamma          3   0.001373   0.001373   0.000458    0.29  0.834
Beta*Gamma     9   0.013033   0.013033   0.001448    0.91  0.516
Error        224   0.355987   0.355987   0.001589
Total        239   0.434740

Unusual Observations for GEH

Obs       GEH       Fit      SE Fit  Residual   St Resid
 42  0.670000  0.796000    0.010293 -0.126000     -3.27R
 52  0.700000  0.795333    0.010293 -0.095333     -2.48R
 58  0.700000  0.795333    0.010293 -0.095333     -2.48R
 62  0.730000  0.820667    0.010293 -0.090667     -2.35R
 78  0.730000  0.808000    0.010293 -0.078000     -2.03R
115  0.700000  0.804000    0.010293 -0.104000     -2.70R
132  0.700000  0.833333    0.010293 -0.133333     -3.46R
138  0.730000  0.851333    0.010293 -0.121333     -3.15R
180  0.700000  0.836667    0.010293 -0.136667     -3.55R
222  0.730000  0.813333    0.010293 -0.083333     -2.16R
```

11.2.2.5 C-Logit Route Choice Model with varying Scale Factor, Initial K-SP Beta and Gamma

ROUTE CHOICE: CLOGIT (MAXIMUM NUMBER OF ROUTES = 4 FIXED)

DESIGN FACTOR θ, LEVELS 10, 60, 100

DESIGN FACTOR INITIAL K-SP (KINITIAL), LEVELS 2, 3

DESIGN FACTOR β, LEVELS 0.10, 0.15, 0.5, 1.0

DESIGN FACTOR γ, LEVELS 0.5, 1.0, 1.5, 2.0

11.2.2.5.1 GENERAL LINEAR MODEL: GEH VERSUS SCALE; KINITIAL; BETA; GAMMA

```
Factor     Type Levels Values
Scale Fa  fixed      3  10  60 100
Kinitial  fixed      2 2 3
Beta      fixed      4 0.10 0.15 0.50 1.00
Gamma     fixed      4 0.5 1.0 1.5 2.0

Analysis of Variance for GEH. using Adjusted SS for Tests

Source     DF     Seq SS     Adj SS     Adj MS       F      P
Scale Fa    2    0.20435    0.20435    0.10217   11.19  0.000
Kinitial    1    2.30400    2.30400    2.30400  252.26  0.000
Beta        3    0.85401    0.85401    0.28467   31.17  0.000
Gamma       3    0.02386    0.02386    0.00795    0.87  0.456
Error    1430   13.06090   13.06090    0.00913
Total    1439   16.44711

Unusual Observations for GEH

 Obs       GEH       Fit      SE Fit  Residual   St Resid
  40  0.600000  0.806181    0.007964 -0.206181     -2.16R
  44  0.333333  0.767292    0.007964 -0.433958     -4.56R
  47  0.533333  0.769329    0.007964 -0.235995     -2.48R
  48  0.533333  0.758310    0.007964 -0.224977     -2.36R
  56  0.466667  0.726181    0.007964 -0.259514     -2.72R
  59  0.466667  0.698310    0.007964 -0.231644     -2.43R
  72  0.466667  0.777847    0.007964 -0.311181     -3.27R
  91  0.333333  0.669977    0.007964 -0.336644     -3.53R
  96  0.200000  0.649977    0.007964 -0.449977     -4.72R
 156  0.200000  0.687292    0.007964 -0.487292     -5.12R
 158  0.400000  0.686458    0.007964 -0.286458     -3.01R
 159  0.333333  0.689329    0.007964 -0.355995     -3.74R
 190  0.333333  0.658125    0.007964 -0.324792     -3.41R
 225  0.500000  0.822662    0.007964 -0.322662     -3.39R
 251  0.433333  0.698310    0.007964 -0.264977     -2.78R
 256  0.400000  0.678310    0.007964 -0.278310     -2.92R
 269  0.466667  0.737477    0.007964 -0.270810     -2.84R
 281  0.300000  0.666458    0.007964 -0.366458     -3.85R
 284  0.200000  0.658958    0.007964 -0.458958     -4.82R
 285  0.333333  0.657477    0.007964 -0.324144     -3.40R
 287  0.433333  0.660995    0.007964 -0.227662     -2.39R
 347  0.366667  0.698310    0.007964 -0.331644     -3.48R
 374  0.333333  0.705995    0.007964 -0.372662     -3.91R
 377  0.166667  0.666458    0.007964 -0.499792     -5.25R
 380  0.200000  0.658958    0.007964 -0.458958     -4.82R
 473  0.400000  0.666458    0.007964 -0.266458     -2.80R
 544  0.333333  0.678310    0.007964 -0.344977     -3.62R
 630  0.466667  0.734329    0.007964 -0.267662     -2.81R
 645  0.366667  0.785347    0.007964 -0.418681     -4.40R
 657  0.466667  0.714329    0.007964 -0.247662     -2.60R
 663  0.333333  0.708866    0.007964 -0.375532     -3.94R
 665  0.466667  0.666458    0.007964 -0.199792     -2.10R
 668  0.233333  0.658958    0.007964 -0.425625     -4.47R
 732  0.466667  0.687292    0.007964 -0.220625     -2.32R
 766  0.366667  0.658125    0.007964 -0.291458     -3.06R
 780  0.533333  0.747083    0.007964 -0.213750     -2.24R
 826  0.233333  0.695440    0.007964 -0.462106     -4.85R
 827  0.466667  0.698310    0.007964 -0.231644     -2.43R
 899  0.633333  0.826181    0.007964 -0.192847     -2.02R
 923  0.400000  0.698310    0.007964 -0.298310     -3.13R
```

925	0.300000	0.685810	0.007964	-0.385810	-4.05R
950	0.433333	0.705995	0.007964	-0.272662	-2.86R
951	0.500000	0.708866	0.007964	-0.208866	-2.19R
1048	0.433333	0.697847	0.007964	-0.264514	-2.78R
1117	0.366667	0.685810	0.007964	-0.319144	-3.35R
1120	0.466667	0.678310	0.007964	-0.211644	-2.22R
1146	0.266667	0.667106	0.007964	-0.400440	-4.20R
1150	0.233333	0.658125	0.007964	-0.424792	-4.46R
1191	0.566667	0.817199	0.007964	-0.250532	-2.63R
1209	0.400000	0.694792	0.007964	-0.294792	-3.10R
1219	0.600000	0.797847	0.007964	-0.197847	-2.08R
1220	0.566667	0.786829	0.007964	-0.220162	-2.31R
1233	0.466667	0.714329	0.007964	-0.247662	-2.60R
1238	0.466667	0.705995	0.007964	-0.239329	-2.51R
1245	0.300000	0.657477	0.007964	-0.357477	-3.75R
1306	0.466667	0.695440	0.007964	-0.228773	-2.40R
1342	0.266667	0.658125	0.007964	-0.391458	-4.11R
1395	0.400000	0.746181	0.007964	-0.346181	-3.63R
1438	0.400000	0.658125	0.007964	-0.258125	-2.71R
1440	0.300000	0.649977	0.007964	-0.349977	-3.67R

R denotes an observation with a large standardised residual.

11.3 BRUNNSVIKEN MODEL

11.3.1 EXPERIMENT DESCRIPTION

This section presents the validation results of dynamic traffic assignment parameters based on a standard comparison between model and system outputs for a medium-sized urban network that models a part of the city of Stockholm in Sweden.

The set of real traffic data comprises traffic counts gathered at 23 detector stations from 3 May 2001 to 4 May 2001. The level of aggregation was 30 minutes over 24 hours. From the data, we considered only the morning peak time (from 07:00 to 08:30) and calculated the average traffic count for each detector.

Depending on the route choice model employed (proportional, logit or C-logit), the experimental design factors for the simulations were as follows:

- Proportional route choice model:
  - Alpha factor (α), for which values of 2, 2.5 and 3 were considered
  - *Initial K-SP*, for which values of 1, 2 and 3 were considered
  - Maximum number of routes (*MaxNumberRoutes)*, for which values of 3, 4 and 5 were considered

  If these three factors are combined, the total number of experiments is 27 (3 * 3 * 3), each of which was simulated 15 times (replications). The following random seeds were changed: 9182, 1670, 6534, 8159, 8538, 5768, 1277, 1065, 1846, 8740, 1489, 3334, 6232, 6237 and 1870.

- Logit route choice model:
  - Scale factor (θ), for which values of 1, 10, 60 and 100 were considered
  - *Initial K-SP*, for which values of 1, 2 and 3 were considered
  - Maximum number of routes (*MaxNumberRoutes)*, for which values of 3, 4 and 5 were considered

  If these three factors are combined, the total number of experiments is 36 (4 * 3 * 3), each of which was simulated 15 times (replications). The random seeds were changed as in the proportional route choice model.

- C-logit route choice model with fixed beta and gamma:
    - Scale factor (θ), for which values of 1, 10, 60 and 100 were considered
    - *Initial K-SP*, for which values of 1, 2 and 3 were considered
    - Maximum number of routes (*MaxNumberRoutes)*, for which values of 3, 4 and 5 were considered
    - Beta (β) fixed to 0.15
    - Gamma (γ) fixed to 1

  If these factors are combined, the total number of experiments is 36 (4 * 3 * 3), each of which was simulated 15 times (replications). The random seeds were changed as in the proportional route choice model.

- C-logit route choice model with varying beta and gamma:
    - Scale factor (θ) fixed to 10
    - *Initial K-SP* fixed to 1
    - Maximum number of routes (*MaxNumberRoutes)* fixed to 3
    - Beta (β), for which values of 0.10, 0.15, 0.50 and 1 were considered
    - Gamma (γ), for which values of 0.5, 1, 1.5 and 2 were considered

  If these factors are combined, the total number of experiments is 16 (4 * 4), each of which was simulated 15 times (replications). The random seeds were changed as in the proportional route choice model.

- C-logit route choice model with varying scale factor, *Initial K-SP*, beta and gamma:
    - Scale factor (θ), for which values of 10, 60 and 100 were considered
    - *Initial K-SP*, for which values of 2 and 3 were considered
    - Maximum number of routes (*MaxNumberRoutes)* fixed to 4
    - Beta (β), for which values of 0.10, 0.15, 0.50 and 1 were considered
    - Gamma (γ), for which values of 0.5, 1, 1.5 and 2 were considered

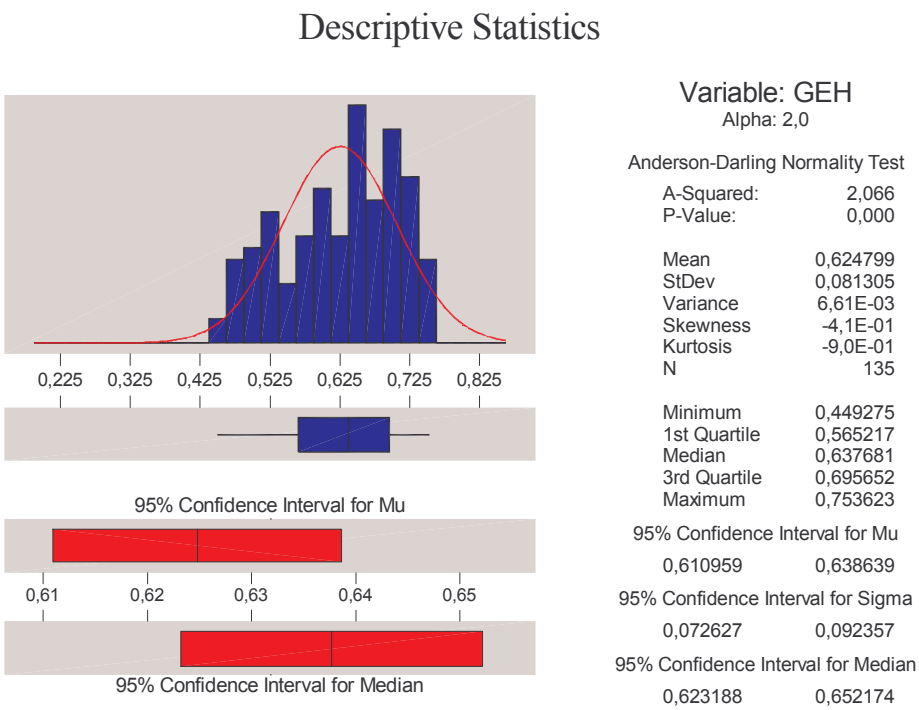
If these factors are combined, the total number of experiments is 144 (3 * 2 * 4 * 4), each of which was simulated 15 times (replications). The random seeds were changed as in the proportional route choice model.Experiment Results

In the following sections, we analyse the experiments, which have been grouped by route choice function.

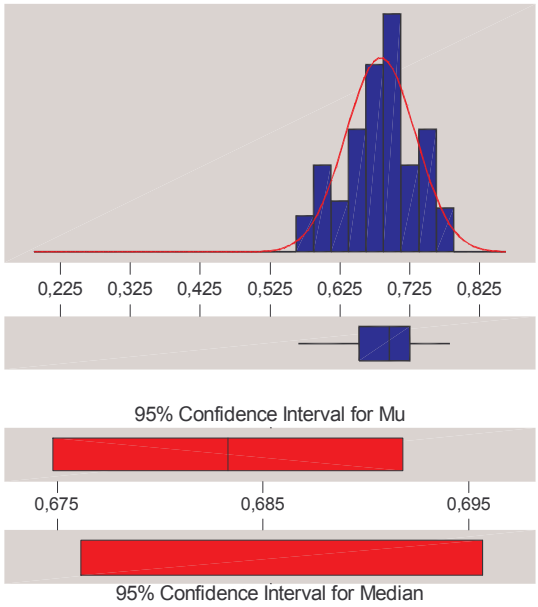
11.3.1.1 PROPORTIONAL ROUTE CHOICE

ROUTE CHOICE: PROPORTIONAL
DESIGN FACTOR α, LEVELS 2.0, 2.5, 3.0
DESIGN FACTOR INITIAL K-SP (KINITIAL), LEVELS 1, 2, 3
DESIGN FACTOR MAXIMUM NUMBER OF ROUTES (NUMBER OF ALTERNATIVES), LEVELS 3, 4, 5

11.3.1.1.1 GEH AS A FUNCTION OF α



Descriptive Statistics



Variable: GEH

Alpha: 2,5

Anderson-Darling Normality Test

A-Squared:	1,130
P-Value:	0,006
Mean	0,683306
StDev	0,049939
Variance	2,49E-03
Skewness	-2,8E-01
Kurtosis	-5,8E-01
N	135
Minimum	0,565217
1st Quartile	0,652174
Median	0,695652
3rd Quartile	0,724638
Maximum	0,782609

95% Confidence Interval for Mu

0,674806	0,691807

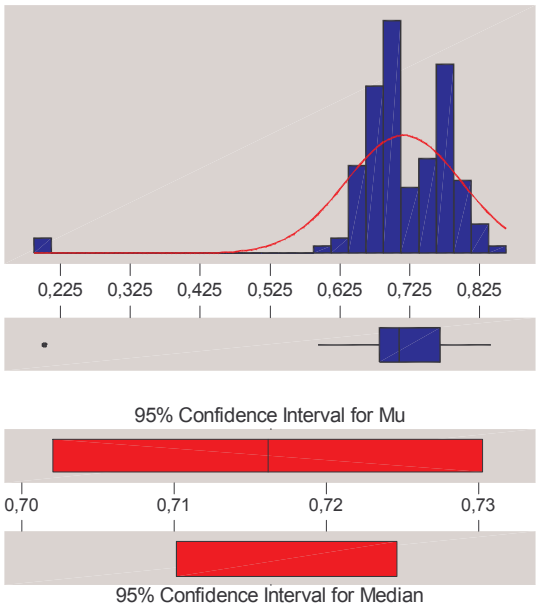
95% Confidence Interval for Sigma

0,044609	0,056727

95% Confidence Interval for Median

0,676150	0,695652

Descriptive Statistics



Variable: GEH

Alpha: 3,0

Anderson-Darling Normality Test

A-Squared:	5,251
P-Value:	0,000
Mean	0,716157
StDev	0,082733
Variance	6,84E-03
Skewness	-3,47631
Kurtosis	20,4935
N	135
Minimum	0,202899
1st Quartile	0,681159
Median	0,710145
3rd Quartile	0,768116
Maximum	0,840580

95% Confidence Interval for Mu

0,702074	0,730240

95% Confidence Interval for Sigma

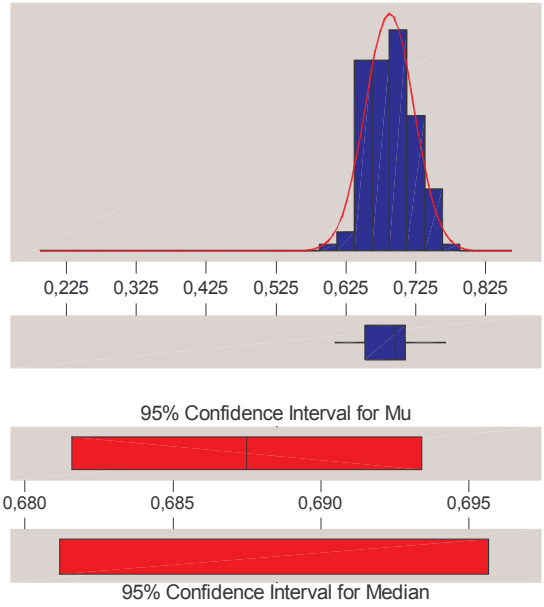
0,073902	0,093979

95% Confidence Interval for Median

0,710145	0,724638

11.3.1.1.2 GEH AS A FUNCTION OF INITIAL K-SP

Descriptive Statistics



Variable: GEH
Kinitial: 1

Anderson-Darling Normality Test

A-Squared:	2,104
P-Value:	0,000
Mean	0,687493
StDev	0,034769
Variance	1,21E-03
Skewness	-1,0E-01
Kurtosis	-9,2E-01
N	135
Minimum	0,608696
1st Quartile	0,652174
Median	0,695652
3rd Quartile	0,710145
Maximum	0,768116

95% Confidence Interval for Mu

0,681575	0,693412

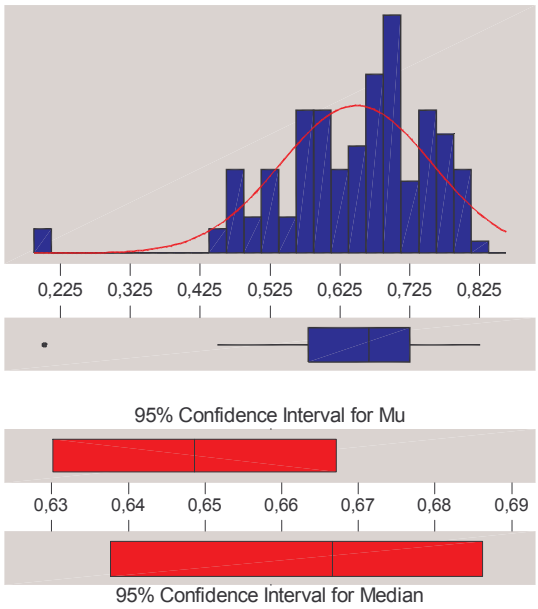
95% Confidence Interval for Sigma

0,031057	0,039495

95% Confidence Interval for Median

0,681159	0,695652

Descriptive Statistics



Variable: GEH
Kinitial: 2

Anderson-Darling Normality Test

A-Squared:	1,424
P-Value:	0,001
Mean	0,648631
StDev	0,108273
Variance	1,17E-02
Skewness	-1,13797
Kurtosis	2,70137
N	135
Minimum	0,202899
1st Quartile	0,579710
Median	0,666667
3rd Quartile	0,724638
Maximum	0,826087

95% Confidence Interval for Mu

0,630201	0,667062

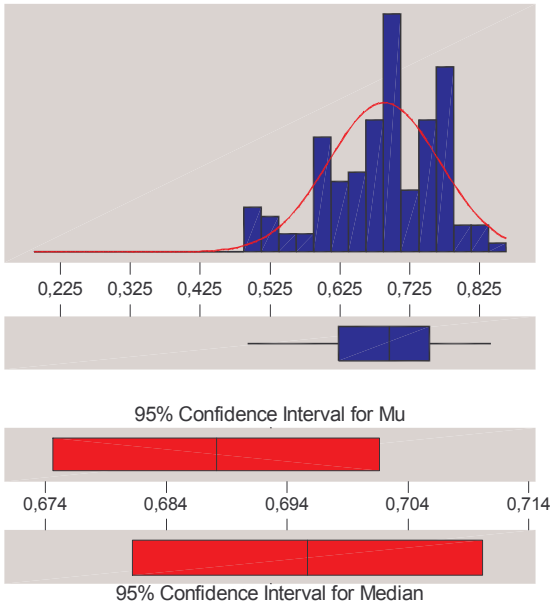
95% Confidence Interval for Sigma

0,096716	0,122990

95% Confidence Interval for Median

0,637681	0,686169

Descriptive Statistics



Variable: GEH
Kinitial: 3

Anderson-Darling Normality Test

A-Squared:	1,319
P-Value:	0,002
Mean	0,688137
StDev	0,079377
Variance	6,30E-03
Skewness	-5,3E-01
Kurtosis	-2,0E-01
N	135
Minimum	0,492754
1st Quartile	0,623188
Median	0,695652
3rd Quartile	0,753623
Maximum	0,840580

95% Confidence Interval for Mu

0,674626	0,701649

95% Confidence Interval for Sigma

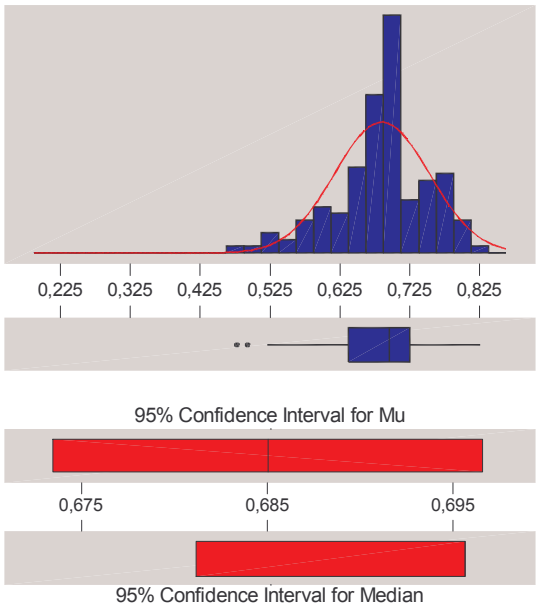
0,070905	0,090167

95% Confidence Interval for Median

0,681159	0,710145

11.3.1.1.3 GEH AS A FUNCTION OF THE NUMBER OF ALTERNATIVES

Descriptive Statistics



Variable: GEH
Numalternati: 3

Anderson-Darling Normality Test

A-Squared:	1,323
P-Value:	0,002
Mean	0,685024
StDev	0,067820
Variance	4,60E-03
Skewness	-5,3E-01
Kurtosis	0,501858
N	135
Minimum	0,478261
1st Quartile	0,637681
Median	0,695652
3rd Quartile	0,724638
Maximum	0,826087

95% Confidence Interval for Mu

0,673480	0,696569

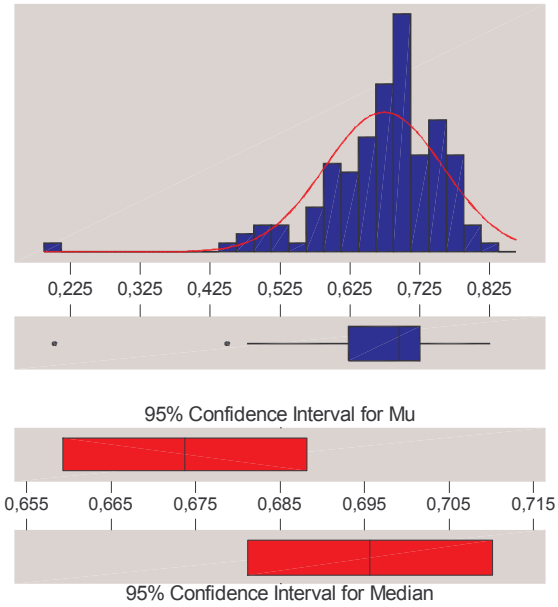
95% Confidence Interval for Sigma

0,060581	0,077039

95% Confidence Interval for Median

0,681159	0,695652

Descriptive Statistics



Variable: GEH
Numalternati: 4

Anderson-Darling Normality Test

A-Squared:	2,536
P-Value:	0,000
Mean	0,673752
StDev	0,084800
Variance	7,19E-03
Skewness	-1,71293
Kurtosis	6,41583
N	135
Minimum	0,202899
1st Quartile	0,623188
Median	0,695652
3rd Quartile	0,724638
Maximum	0,826087

95% Confidence Interval for Mu

0,659317	0,688187

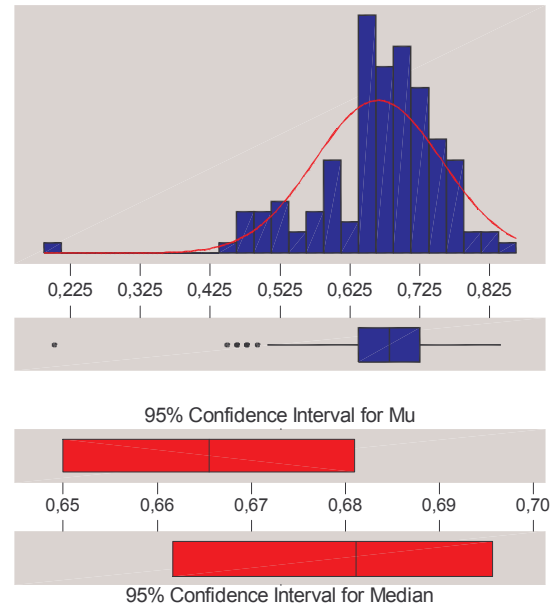
95% Confidence Interval for Sigma

0,075749	0,096328

95% Confidence Interval for Median

0,681159	0,710145

Descriptive Statistics



Variable: GEH
Numalternati: 5

Anderson-Darling Normality Test

A-Squared:	2,480
P-Value:	0,000
Mean	0,665486
StDev	0,090992
Variance	8,28E-03
Skewness	-1,37230
Kurtosis	4,21913
N	135
Minimum	0,202899
1st Quartile	0,637681
Median	0,681159
3rd Quartile	0,724638
Maximum	0,840580

95% Confidence Interval for Mu

0,649997	0,680975

95% Confidence Interval for Sigma

0,081280	0,103361

95% Confidence Interval for Median

0,661657	0,695652

11.3.1.1.4 General Linear Model: GEH versus Alpha; Kinitial; Numalternatives

```
Factor      Type Levels Values
Alpha      fixed      3 2,0 2,5 3,0
Kinitial   fixed      3 1 2 3
Numalter   fixed      3 3 4 5

Analysis of Variance for GEH, using Adjusted SS for Tests

Source                    DF     Seq SS     Adj SS     Adj MS       F       P
```

Alpha	2	0.578186	0.578186	0.289093	73.64	0.000
Kinitial	2	0.138214	0.138214	0.069107	17.60	0.000
Numalter	2	0.025971	0.025971	0.012986	3.31	0.038
Alpha*Kinitial	4	0.424354	0.424354	0.106089	27.02	0.000
Alpha*Numalter	4	0.009620	0.009620	0.002405	0.61	0.654
Kinitial*Numalter	4	0.034246	0.034246	0.008562	2.18	0.071
Alpha*Kinitial*Numalter	8	0.020834	0.020834	0.002604	0.66	0.724
Error	378	1.483946	1.483946	0.003926		
Total	404	2.715372				

Unusual Observations for GEH

Obs	GEH	Fit	SE Fit	Residual	St Resid
69	0.724638	0.569082	0.016178	0.155556	2.57R
72	0.724638	0.569082	0.016178	0.155556	2.57R
100	0.492754	0.646377	0.016178	-0.153623	-2.54R
119	0.739130	0.612560	0.016178	0.126570	2.09R
230	0.565217	0.701449	0.016178	-0.136232	-2.25R
338	0.202899	0.705314	0.016178	-0.502415	-8.30R
353	0.202899	0.698551	0.016178	-0.495652	-8.19R
354	0.826087	0.698551	0.016178	0.127536	2.11R
373	0.594203	0.744928	0.016178	-0.150725	-2.49R

11.3.1.1.5 COEFFICIENTS GENERAL LINEAR MODEL: GEH VERSUS ALPHA; KINITIAL; NUMALTERNATIVES

0.674754
-0.049955
0.008553
0.012739
-0.026123
0.010270
-0.001002
0.059080
-0.036679
-0.007801
0.006262
-0.014028
0.002398
0.014851
-0.000930

11.3.1.2 LOGIT ROUTE CHOICE

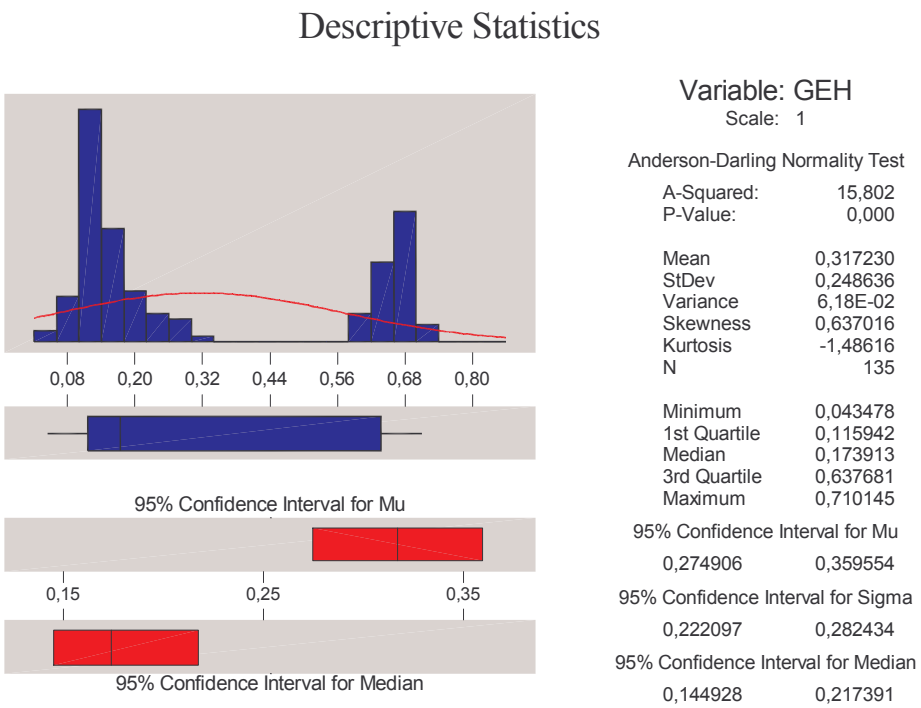
ROUTE CHOICE: CLOGIT

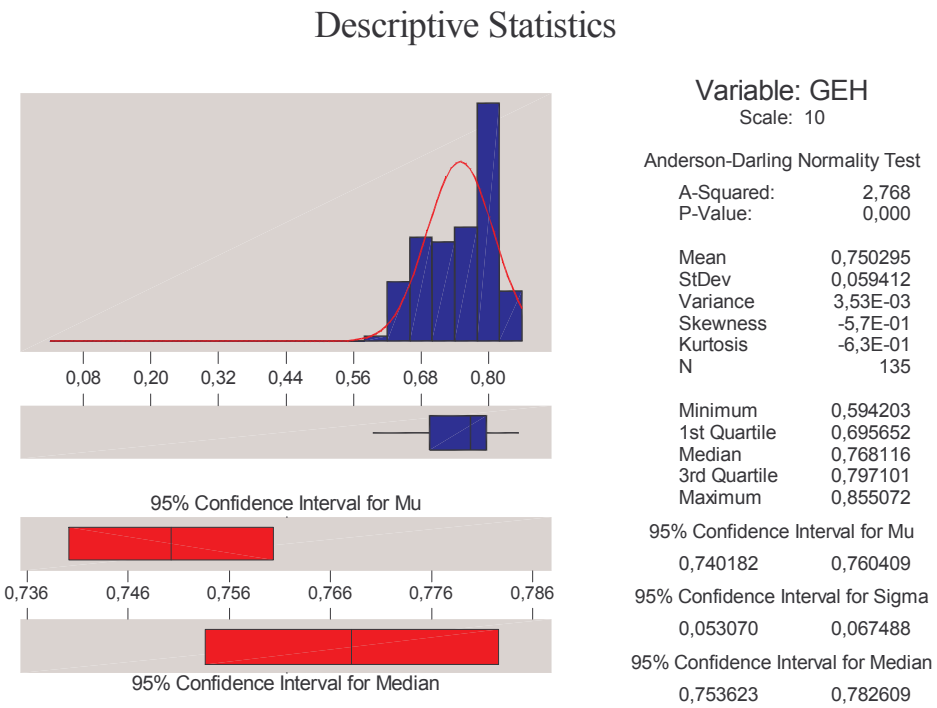
DESIGN FACTOR θ, LEVELS 1, 10, 60, 100,

DESIGN FACTOR INITIAL K-SP (KINITIAL), LEVELS 1, 2, 3

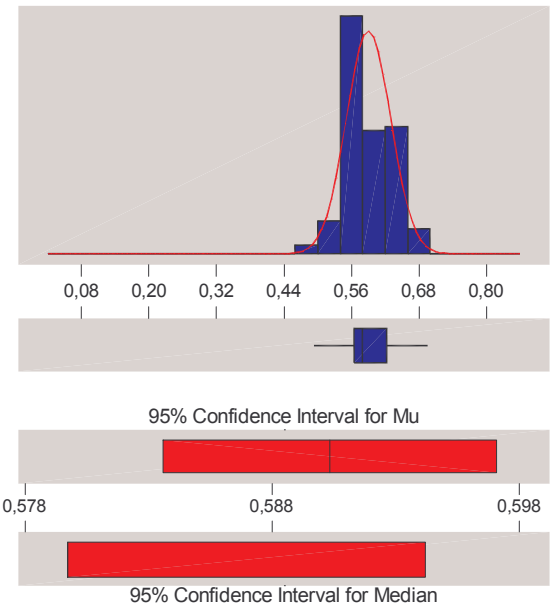
DESIGN FACTOR MAXIMUM NUMBER OF ROUTES (NUMBER OF ALTERNATIVES), LEVELS 3, 4, 5

11.3.1.2.1 GEH AS A FUNCTION OF θ





Descriptive Statistics



Variable: GEH

Scale: 60

Anderson-Darling Normality Test

A-Squared:	1,167
P-Value:	0,005
Mean	0,590338
StDev	0,039560
Variance	1,56E-03
Skewness	0,119663
Kurtosis	0,142079
N	135
Minimum	0,492754
1st Quartile	0,565217
Median	0,579710
3rd Quartile	0,623188
Maximum	0,695652

95% Confidence Interval for Mu

0,583604	0,597072

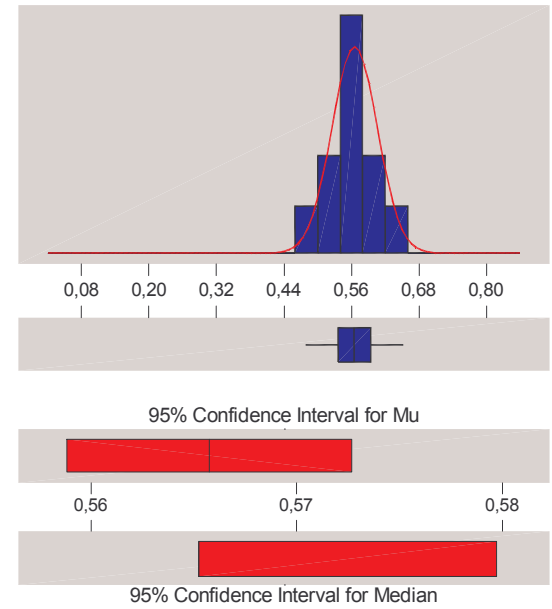
95% Confidence Interval for Sigma

0,035337	0,044937

95% Confidence Interval for Median

0,579710	0,594203

Descriptive Statistics



Variable: GEH

Scale: 100

Anderson-Darling Normality Test

A-Squared:	1,230
P-Value:	0,003
Mean	0,565754
StDev	0,040623
Variance	1,65E-03
Skewness	-8,2E-02
Kurtosis	-2,8E-01
N	135
Minimum	0,478261
1st Quartile	0,536232
Median	0,565217
3rd Quartile	0,594203
Maximum	0,652174

95% Confidence Interval for Mu

0,558839	0,572669

95% Confidence Interval for Sigma

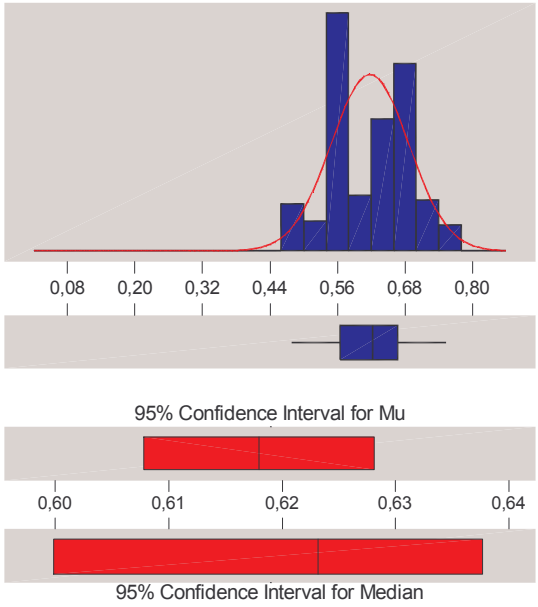
0,036287	0,046145

95% Confidence Interval for Median

0,565217	0,579710

11.3.1.2.2 GEH AS A FUNCTION OF INITIAL K-SP

Descriptive Statistics



Variable: GEH
Kinitial: 1

Anderson-Darling Normality Test

A-Squared:	2,072
P-Value:	0,000
Mean	0,617955
StDev	0,069052
Variance	4,77E-03
Skewness	-7,4E-02
Kurtosis	-8,3E-01
N	180
Minimum	0,478261
1st Quartile	0,565217
Median	0,623188
3rd Quartile	0,666667
Maximum	0,753623

95% Confidence Interval for Mu

0,607799	0,628111

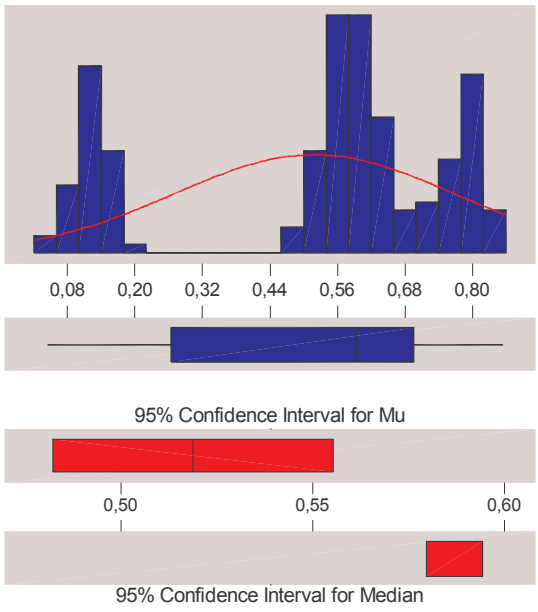
95% Confidence Interval for Sigma

0,062580	0,077029

95% Confidence Interval for Median

0,599796	0,637681

Descriptive Statistics



Variable: GEH
Kinitial: 2

Anderson-Darling Normality Test

A-Squared:	13,122
P-Value:	0,000
Mean	0,518841
StDev	0,247735
Variance	6,14E-02
Skewness	-7,6E-01
Kurtosis	-8,3E-01
N	180
Minimum	0,043478
1st Quartile	0,264493
Median	0,594203
3rd Quartile	0,695652
Maximum	0,855072

95% Confidence Interval for Mu

0,482403	0,555278

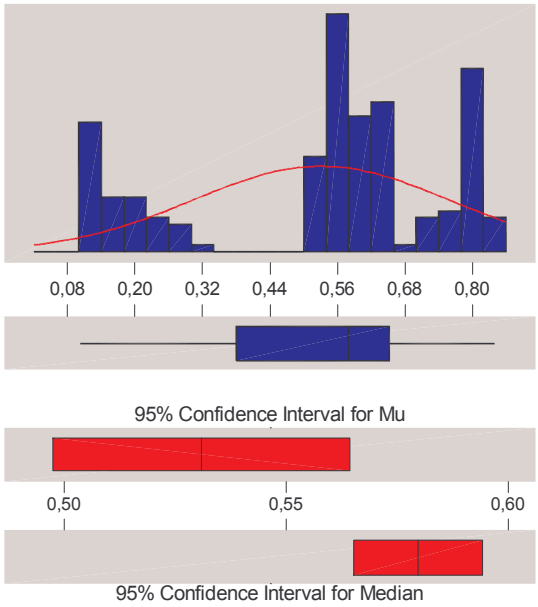
95% Confidence Interval for Sigma

0,224514	0,276354

95% Confidence Interval for Median

0,579710	0,594203

Descriptive Statistics



Variable: GEH
Kinitial: 3

Anderson-Darling Normality Test

A-Squared:	9,472
P-Value:	0,000
Mean	0,530918
StDev	0,227454
Variance	5,17E-02
Skewness	-6,7E-01
Kurtosis	-7,7E-01
N	180
Minimum	0,101449
1st Quartile	0,380435
Median	0,579710
3rd Quartile	0,652174
Maximum	0,840580

95% Confidence Interval for Mu

0,497464	0,564372

95% Confidence Interval for Sigma

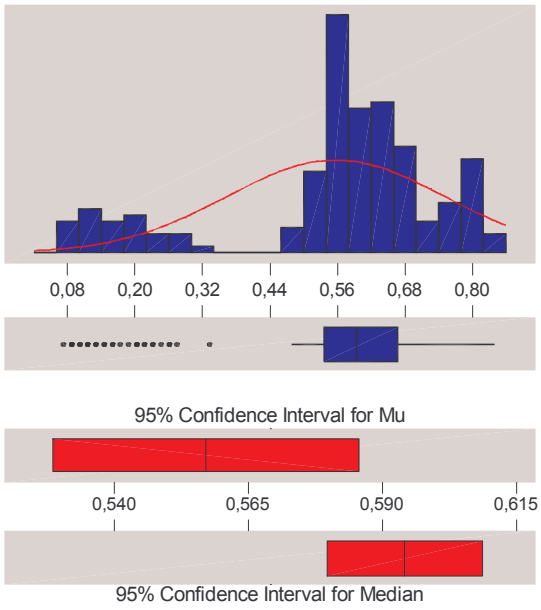
0,206135	0,253731

95% Confidence Interval for Median

0,565217	0,594203

11.3.1.2.3 GEH AS A FUNCTION OF THE NUMBER OF ALTERNATIVES

Descriptive Statistics



Variable: GEH
Numalternati: 3

Anderson-Darling Normality Test

A-Squared:	10,900
P-Value:	0,000
Mean	0,557085
StDev	0,193855
Variance	3,76E-02
Skewness	-1,15195
Kurtosis	0,576835
N	180
Minimum	0,072464
1st Quartile	0,536232
Median	0,594203
3rd Quartile	0,666667
Maximum	0,840580

95% Confidence Interval for Mu

0,528573	0,585598

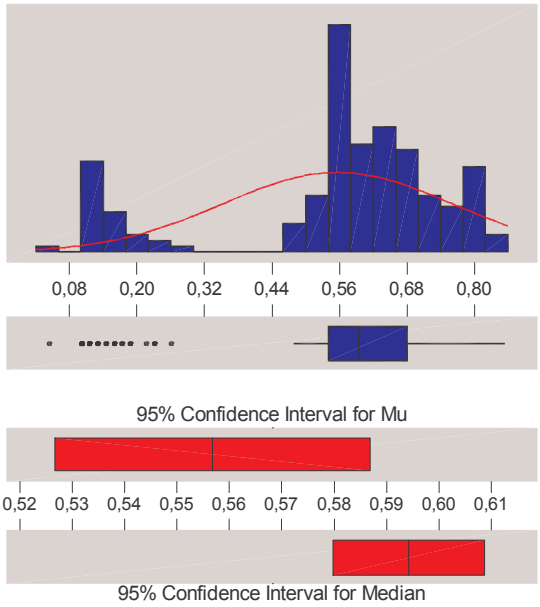
95% Confidence Interval for Sigma

0,175685	0,216251

95% Confidence Interval for Median

0,579710	0,608696

Descriptive Statistics



Variable: GEH
Numalternati: 4

Anderson-Darling Normality Test

A-Squared:	12,106
P-Value:	0,000
Mean	0,556763
StDev	0,204212
Variance	4,17E-02
Skewness	-1,17473
Kurtosis	0,437135
N	180
Minimum	0,043478
1st Quartile	0,539855
Median	0,594203
3rd Quartile	0,681159
Maximum	0,855072

95% Confidence Interval for Mu

0,526727	0,586799

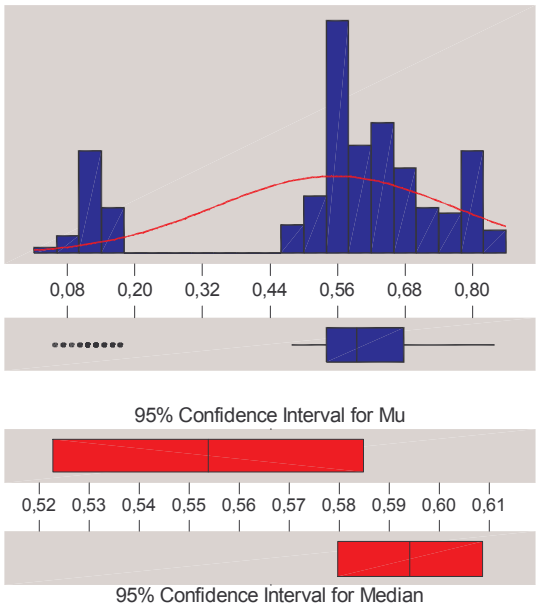
95% Confidence Interval for Sigma

0,185071	0,227804

95% Confidence Interval for Median

0,579710	0,608696

Descriptive Statistics



Variable: GEH
Numalternati: 5

Anderson-Darling Normality Test

A-Squared:	13,156
P-Value:	0,000
Mean	0,553865
StDev	0,210875
Variance	4,45E-02
Skewness	-1,16057
Kurtosis	0,355513
N	180
Minimum	0,057971
1st Quartile	0,539855
Median	0,594203
3rd Quartile	0,677536
Maximum	0,840580

95% Confidence Interval for Mu

0,522849	0,584880

95% Confidence Interval for Sigma

0,191109	0,235236

95% Confidence Interval for Median

0,579710	0,608696

11.3.1.2.4 General Linear Model: GEH versus Scale; Kinitial; Numalternatives

```
Factor      Type Levels Values
Scale      fixed      4   1  10  60 100
Kinitial   fixed      3 1 2 3
Numalter   fixed      3 3 4 5

Analysis of Variance for GEH, using Adjusted SS for Tests

Source                    DF     Seq SS     Adj SS     Adj MS       F       P
```

Scale	3	12.96484	12.96484	4.32161	2925.27	0.000
Kinitial	2	1.05270	1.05270	0.52635	356.28	0.000
Numalter	2	0.00113	0.00113	0.00057	0.38	0.682
Scale*Kinitial	6	7.30915	7.30915	1.21819	824.59	0.000
Scale*Numalter	6	0.02482	0.02482	0.00414	2.80	0.011
Kinitial*Numalter	4	0.01094	0.01094	0.00273	1.85	0.118
Scale*Kinitial*Numalter	12	0.04435	0.04435	0.00370	2.50	0.003
Error	504	0.74458	0.74458	0.00148		
Total	539	22.15249				

Unusual Observations for GEH

Obs	GEH	Fit	SE Fit	Residual	St Resid
69	0.043478	0.117874	0.009924	-0.074396	-2.00R
98	0.333333	0.224155	0.009924	0.109179	2.94R
103	0.115942	0.224155	0.009924	-0.108213	-2.91R
112	0.260870	0.167150	0.009924	0.093720	2.52R
139	0.753623	0.676329	0.009924	0.077295	2.08R
141	0.594203	0.676329	0.009924	-0.082126	-2.21R
145	0.753623	0.676329	0.009924	0.077295	2.08R
181	0.695652	0.777778	0.009924	-0.082126	-2.21R
201	0.695652	0.778744	0.009924	-0.083092	-2.24R
205	0.855072	0.778744	0.009924	0.076329	2.06R
227	0.623188	0.771981	0.009924	-0.148792	-4.01R
229	0.666667	0.771981	0.009924	-0.105314	-2.84R
258	0.710145	0.795169	0.009924	-0.085024	-2.29R
274	0.666667	0.571981	0.009924	0.094686	2.55R
289	0.666667	0.570048	0.009924	0.096618	2.60R
290	0.492754	0.570048	0.009924	-0.077295	-2.08R
304	0.666667	0.570048	0.009924	0.096618	2.60R
305	0.492754	0.570048	0.009924	-0.077295	-2.08R
326	0.681159	0.601932	0.009924	0.079227	2.13R
341	0.695652	0.607729	0.009924	0.087923	2.37R
356	0.695652	0.606763	0.009924	0.088889	2.39R
417	0.478261	0.552657	0.009924	-0.074396	-2.00R
432	0.478261	0.552657	0.009924	-0.074396	-2.00R
447	0.478261	0.552657	0.009924	-0.074396	-2.00R
457	0.492754	0.570048	0.009924	-0.077295	-2.08R
460	0.652174	0.570048	0.009924	0.082126	2.21R
472	0.492754	0.572947	0.009924	-0.080193	-2.16R
475	0.652174	0.572947	0.009924	0.079227	2.13R
487	0.492754	0.572947	0.009924	-0.080193	-2.16R
490	0.652174	0.572947	0.009924	0.079227	2.13R

11.3.1.2.5 COEFFICIENTS GENERAL LINEAR MODEL: GEH VERSUS SCALE; KINITIAL; NUMALTERNATIVES

0.062050
-0.037064
0.001181
0.000859
0.281911
-0.162292
-0.125067
0.066801
-0.081696
0.052201
0.013634
-0.000215
-0.009447
0.000859

-0.001503
-0.000537
-0.004643
0.002442
-0.003838
-0.000376
-0.014359
0.004321
-0.013875
-0.000268
0.001959
0.002281
0.009850
-0.002630
0.006253
-0.003408
0.000617
0.002308

11.3.1.3 C-LOGIT ROUTE CHOICE MODEL WITH FIXED BETA AND GAMMA

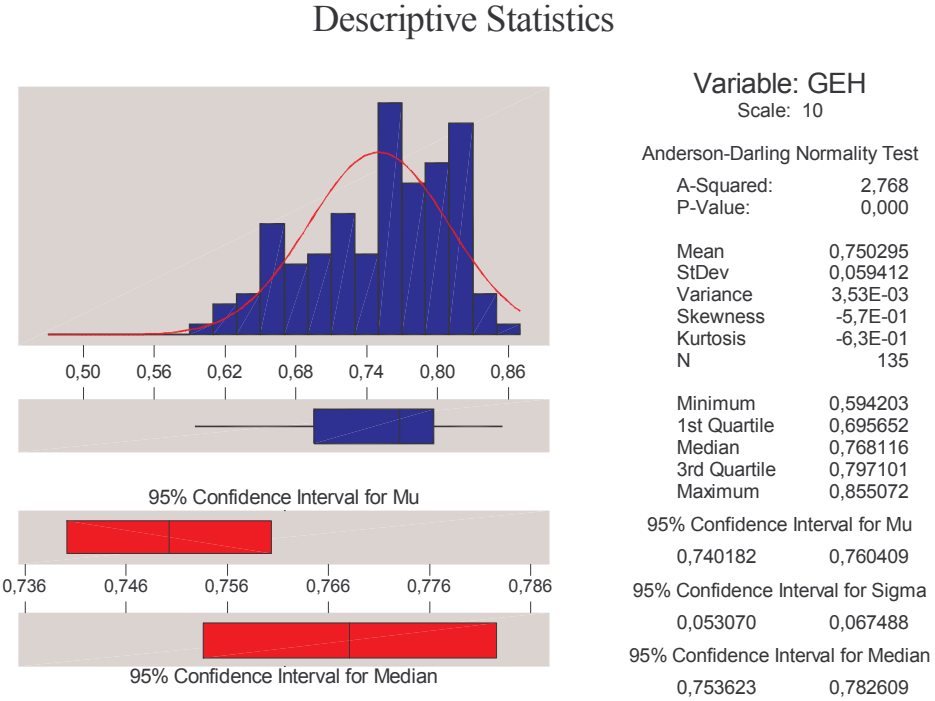
ROUTE CHOICE: CLOGIT (β=0.15 AND γ=1.0 FIXED)

DESIGN FACTOR θ, LEVELS 10, 60, 100,

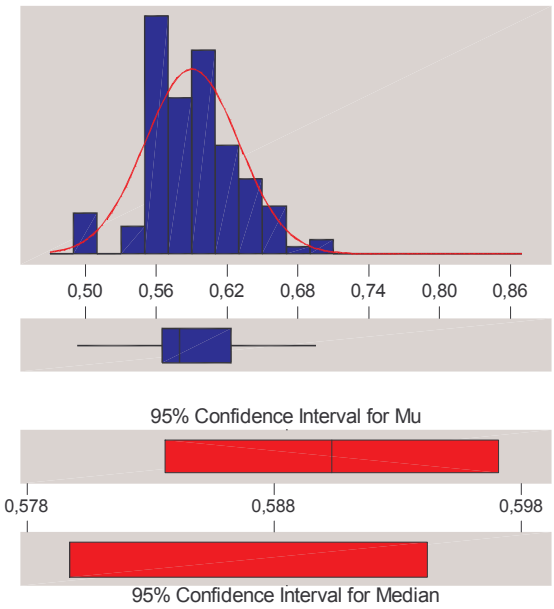
DESIGN FACTOR INITIAL K-SP (KINITIAL), LEVELS 1, 2, 3

DESIGN FACTOR MAXIMUM NUMBER OF ROUTES (NUMBER OF ALTERNATIVES), LEVELS 3, 4, 5

11.3.1.3.1 GEH AS A FUNCTION OF θ



Descriptive Statistics



Variable: GEH

Scale: 60

Anderson-Darling Normality Test

A-Squared:	1,167
P-Value:	0,005
Mean	0,590338
StDev	0,039560
Variance	1,56E-03
Skewness	0,119663
Kurtosis	0,142079
N	135
Minimum	0,492754
1st Quartile	0,565217
Median	0,579710
3rd Quartile	0,623188
Maximum	0,695652

95% Confidence Interval for Mu

0,583604	0,597072

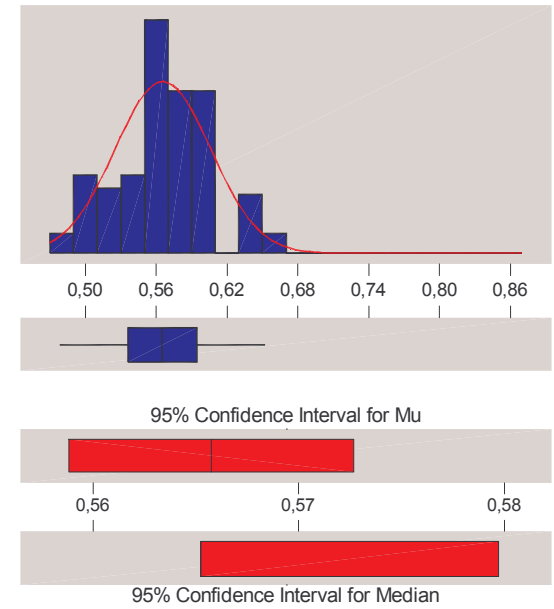
95% Confidence Interval for Sigma

0,035337	0,044937

95% Confidence Interval for Median

0,579710	0,594203

Descriptive Statistics



Variable: GEH

Scale: 100

Anderson-Darling Normality Test

A-Squared:	1,230
P-Value:	0,003
Mean	0,565754
StDev	0,040623
Variance	1,65E-03
Skewness	-8,2E-02
Kurtosis	-2,8E-01
N	135
Minimum	0,478261
1st Quartile	0,536232
Median	0,565217
3rd Quartile	0,594203
Maximum	0,652174

95% Confidence Interval for Mu

0,558839	0,572669

95% Confidence Interval for Sigma

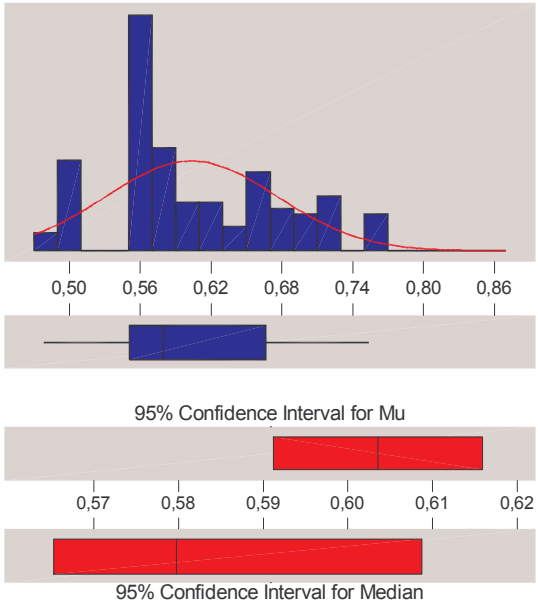
0,036287	0,046145

95% Confidence Interval for Median

0,565217	0,579710

11.3.1.3.2 GEH AS A FUNCTION OF INITIAL K-SP

Descriptive Statistics



Variable: GEH
Kinitial: 1

Anderson-Darling Normality Test

A-Squared:	2,580
P-Value:	0,000
Mean	0,603543
StDev	0,072431
Variance	5,25E-03
Skewness	0,363739
Kurtosis	-7,1E-01
N	135
Minimum	0,478261
1st Quartile	0,550725
Median	0,579710
3rd Quartile	0,666667
Maximum	0,753623

95% Confidence Interval for Mu

0,591213	0,615872

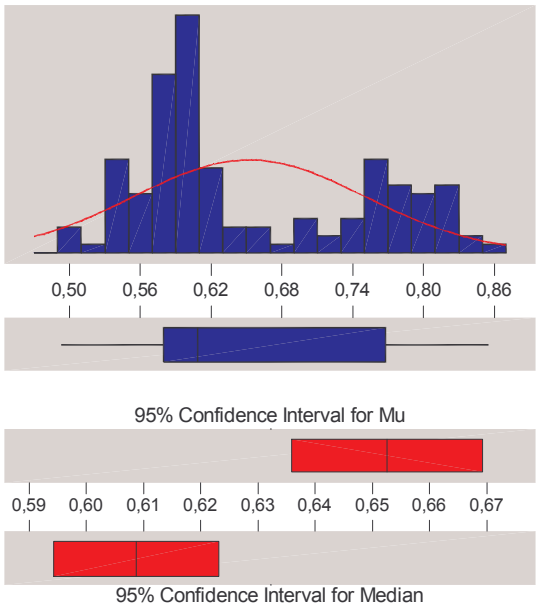
95% Confidence Interval for Sigma

0,064700	0,082276

95% Confidence Interval for Median

0,565217	0,608696

Descriptive Statistics



Variable: GEH
Kinitial: 2

Anderson-Darling Normality Test

A-Squared:	6,914
P-Value:	0,000
Mean	0,652496
StDev	0,098111
Variance	9,63E-03
Skewness	0,519378
Kurtosis	-1,14927
N	135
Minimum	0,492754
1st Quartile	0,579710
Median	0,608696
3rd Quartile	0,768116
Maximum	0,855072

95% Confidence Interval for Mu

0,635795	0,669197

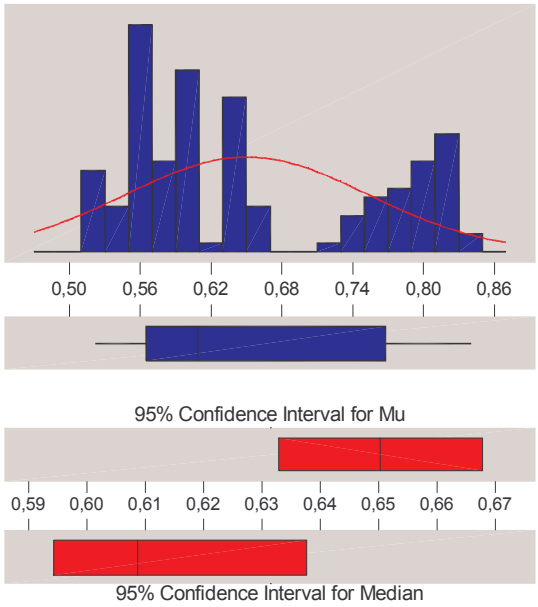
95% Confidence Interval for Sigma

0,087639	0,111447

95% Confidence Interval for Median

0,594203	0,623188

Descriptive Statistics



Variable: GEH
Kinitial: 3

Anderson-Darling Normality Test

A-Squared:	7,173
P-Value:	0,000
Mean	0,650349
StDev	0,102776
Variance	1,06E-02
Skewness	0,541940
Kurtosis	-1,25073
N	135
Minimum	0,521739
1st Quartile	0,565217
Median	0,608696
3rd Quartile	0,768116
Maximum	0,840580

95% Confidence Interval for Mu

0,632854	0,667844

95% Confidence Interval for Sigma

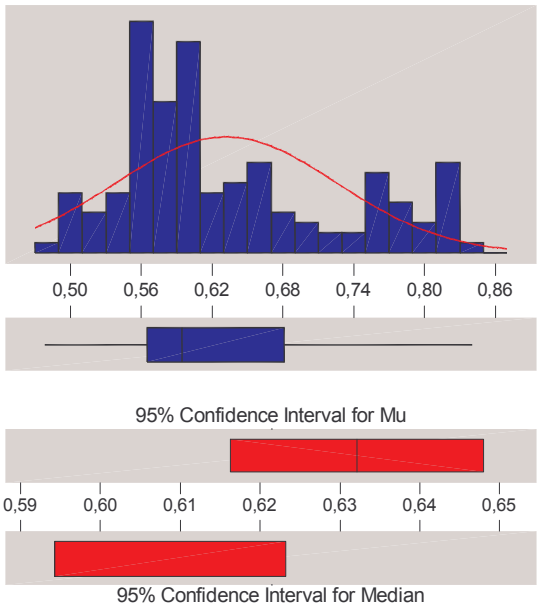
0,091806	0,116747

95% Confidence Interval for Median

0,594203	0,637681

11.3.1.3.3 GEH AS A FUNCTION OF THE NUMBER OF ALTERNATIVES

Descriptive Statistics



Variable: GEH
Numalternati: 3

Anderson-Darling Normality Test

A-Squared:	4,743
P-Value:	0,000
Mean	0,632099
StDev	0,093203
Variance	8,69E-03
Skewness	0,716832
Kurtosis	-6,0E-01
N	135
Minimum	0,478261
1st Quartile	0,565217
Median	0,594203
3rd Quartile	0,681159
Maximum	0,840580

95% Confidence Interval for Mu

0,616233	0,647964

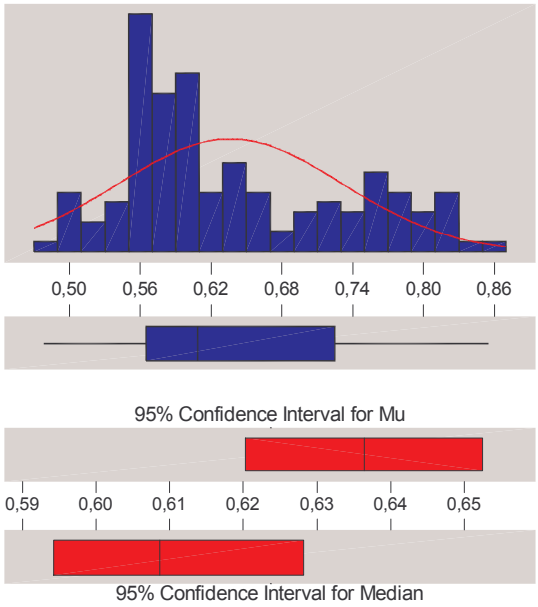
95% Confidence Interval for Sigma

0,083255	0,105873

95% Confidence Interval for Median

0,594203	0,623188

Descriptive Statistics



Variable: GEH
Numalternati: 4

Anderson-Darling Normality Test

A-Squared:	4,290
P-Value:	0,000
Mean	0,636393
StDev	0,094381
Variance	8,91E-03
Skewness	0,608808
Kurtosis	-7,7E-01
N	135
Minimum	0,478261
1st Quartile	0,565217
Median	0,608696
3rd Quartile	0,724638
Maximum	0,855072

95% Confidence Interval for Mu

0,620327	0,652459

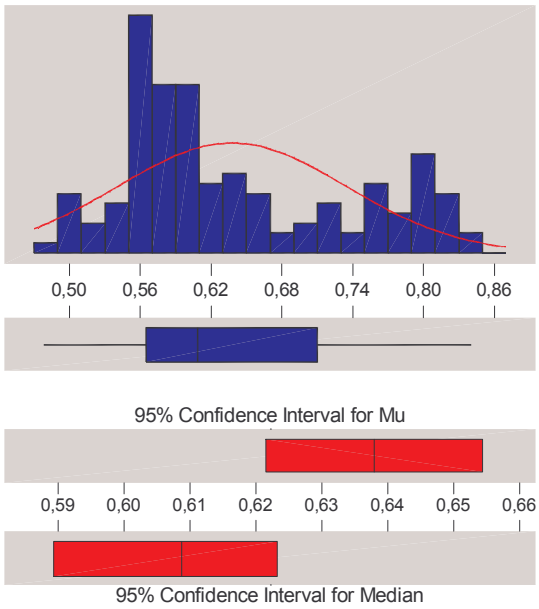
95% Confidence Interval for Sigma

0,084307	0,107211

95% Confidence Interval for Median

0,594203	0,628198

Descriptive Statistics



Variable: GEH
Numalternati: 5

Anderson-Darling Normality Test

A-Squared:	5,016
P-Value:	0,000
Mean	0,637896
StDev	0,096768
Variance	9,36E-03
Skewness	0,620822
Kurtosis	-8,4E-01
N	135
Minimum	0,478261
1st Quartile	0,565217
Median	0,608696
3rd Quartile	0,710145
Maximum	0,840580

95% Confidence Interval for Mu

0,621424	0,654368

95% Confidence Interval for Sigma

0,086439	0,109922

95% Confidence Interval for Median

0,589193	0,623188

11.3.1.3.4 General Linear Model: GEH versus Scale; Kinitial; Numalternatives

```
Factor     Type Levels Values
Scale     fixed      3  10  60 100
Kinitial  fixed      3 1 2 3
Numalter  fixed      3 3 4 5

Analysis of Variance for GEH, using Adjusted SS for Tests

Source                    DF     Seq SS     Adj SS     Adj MS       F       P
```

Scale	2	2.71107	2.71107	1.35554	871.91	0.000
Kinitial	2	0.20663	0.20663	0.10332	66.46	0.000
Numalter	2	0.00244	0.00244	0.00122	0.79	0.456
Scale*Kinitial	4	0.10188	0.10188	0.02547	16.38	0.000
Scale*Numalter	4	0.00286	0.00286	0.00071	0.46	0.766
Kinitial*Numalter	4	0.00033	0.00033	0.00008	0.05	0.995
Scale*Kinitial*Numalter	8	0.00201	0.00201	0.00025	0.16	0.996
Error	378	0.58766	0.58766	0.00155		
Total	404	3.61489				

Unusual Observations for GEH

Obs	GEH	Fit	SE Fit	Residual	St Resid
4	0.753623	0.676329	0.010181	0.077295	2.03R
6	0.594203	0.676329	0.010181	-0.082126	-2.16R
10	0.753623	0.676329	0.010181	0.077295	2.03R
46	0.695652	0.777778	0.010181	-0.082126	-2.16R
66	0.695652	0.778744	0.010181	-0.083092	-2.18R
70	0.855072	0.778744	0.010181	0.076329	2.00R
92	0.623188	0.771981	0.010181	-0.148792	-3.91R
94	0.666667	0.771981	0.010181	-0.105314	-2.76R
123	0.710145	0.795169	0.010181	-0.085024	-2.23R
139	0.666667	0.571981	0.010181	0.094686	2.49R
154	0.666667	0.570048	0.010181	0.096618	2.54R
155	0.492754	0.570048	0.010181	-0.077295	-2.03R
169	0.666667	0.570048	0.010181	0.096618	2.54R
170	0.492754	0.570048	0.010181	-0.077295	-2.03R
191	0.681159	0.601932	0.010181	0.079227	2.08R
206	0.695652	0.607729	0.010181	0.087923	2.31R
221	0.695652	0.606763	0.010181	0.088889	2.33R
322	0.492754	0.570048	0.010181	-0.077295	-2.03R
325	0.652174	0.570048	0.010181	0.082126	2.16R
337	0.492754	0.572947	0.010181	-0.080193	-2.11R
340	0.652174	0.572947	0.010181	0.079227	2.08R
352	0.492754	0.572947	0.010181	-0.080193	-2.11R
355	0.652174	0.572947	0.010181	0.079227	2.08R

11.3.1.3.5 General Linear Model: GEH versus Scale; Kinitial

Factor	Type	Levels	Values
Scale	fixed	3	10 60 100
Kinitial	fixed	3	1 2 3

Analysis of Variance for GEH, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
Scale	2	2.71107	2.71107	1.35554	901.70	0.000
Kinitial	2	0.20663	0.20663	0.10332	68.73	0.000
Scale*Kinitial	4	0.10188	0.10188	0.02547	16.94	0.000
Error	396	0.59531	0.59531	0.00150		
Total	404	3.61489				

Unusual Observations for GEH

Obs	GEH	Fit	SE Fit	Residual	St Resid
6	0.594203	0.687279	0.005780	-0.093076	-2.43R
46	0.695652	0.780032	0.005780	-0.084380	-2.20R
66	0.695652	0.780032	0.005780	-0.084380	-2.20R
92	0.623188	0.783575	0.005780	-0.160386	-4.18R
94	0.666667	0.783575	0.005780	-0.116908	-3.05R
139	0.666667	0.570692	0.005780	0.095974	2.50R
154	0.666667	0.570692	0.005780	0.095974	2.50R
155	0.492754	0.570692	0.005780	-0.077939	-2.03R
169	0.666667	0.570692	0.005780	0.095974	2.50R
170	0.492754	0.570692	0.005780	-0.077939	-2.03R
206	0.695652	0.605475	0.005780	0.090177	2.35R

221	0.695652	0.605475	0.005780	0.090177	2.35R
322	0.492754	0.571981	0.005780	-0.079227	-2.07R
325	0.652174	0.571981	0.005780	0.080193	2.09R
337	0.492754	0.571981	0.005780	-0.079227	-2.07R
340	0.652174	0.571981	0.005780	0.080193	2.09R
352	0.492754	0.571981	0.005780	-0.079227	-2.07R
355	0.652174	0.571981	0.005780	0.080193	2.09R

11.3.1.3.6 COEFFICIENTS GENERAL LINEAR MODEL: GEH VERSUS SCALE; KINITIAL

0.635463
0.114833
-0.045124
-0.031920
0.017033
-0.031097
0.012704
0.012274
-0.001897

11.3.1.4 C-LOGIT ROUTE CHOICE MODEL WITH FIXED BETA AND GAMMA

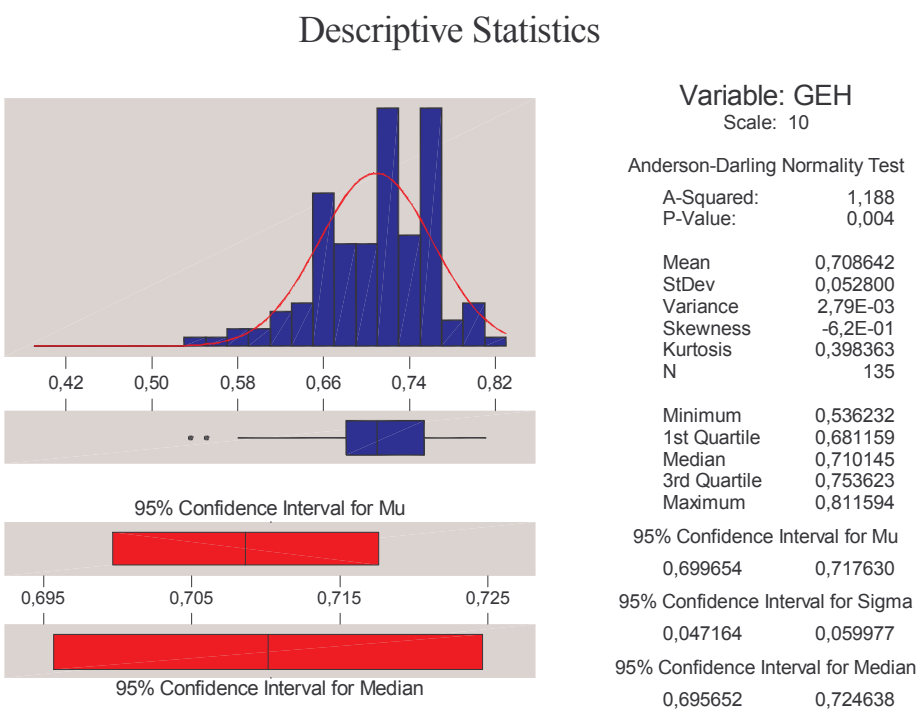
ROUTE CHOICE: CLOGIT (β=0.15 AND γ=1.0 FIXED)

DESIGN FACTOR θ, LEVELS 10, 60, 100

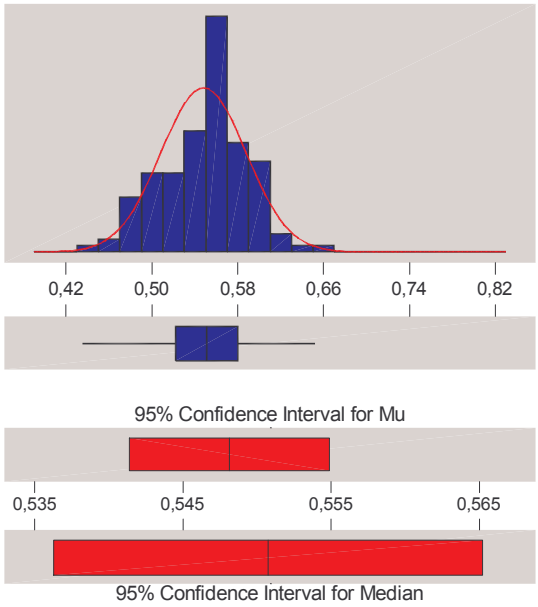
DESIGN FACTOR INITIAL K-SP (KINITIAL), LEVELS 1, 2, 3

DESIGN FACTOR MAXIMUM NUMBER OF ROUTES (NUMBER OF ALTERNATIVES), LEVELS 3, 4, 5

11.3.1.4.1 GEH AS A FUNCTION OF θ



Descriptive Statistics



Variable: GEH

Scale: 60

Anderson-Darling Normality Test

A-Squared:	1,285
P-Value:	0,002
Mean	0,548148
StDev	0,039665
Variance	1,57E-03
Skewness	-2,4E-01
Kurtosis	-3,8E-02
N	135
Minimum	0,434783
1st Quartile	0,521739
Median	0,550725
3rd Quartile	0,579710
Maximum	0,652174

95% Confidence Interval for Mu

0,541396	0,554900

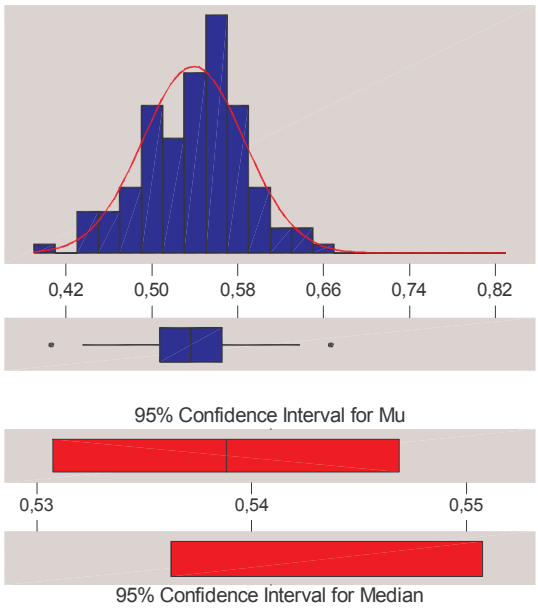
95% Confidence Interval for Sigma

0,035431	0,045057

95% Confidence Interval for Median

0,536232	0,565217

Descriptive Statistics



Variable: GEH

Scale: 100

Anderson-Darling Normality Test

A-Squared:	0,892
P-Value:	0,022
Mean	0,538808
StDev	0,047240
Variance	2,23E-03
Skewness	-1,4E-01
Kurtosis	8,23E-02
N	135
Minimum	0,405797
1st Quartile	0,507246
Median	0,536232
3rd Quartile	0,565217
Maximum	0,666667

95% Confidence Interval for Mu

0,530767	0,546850

95% Confidence Interval for Sigma

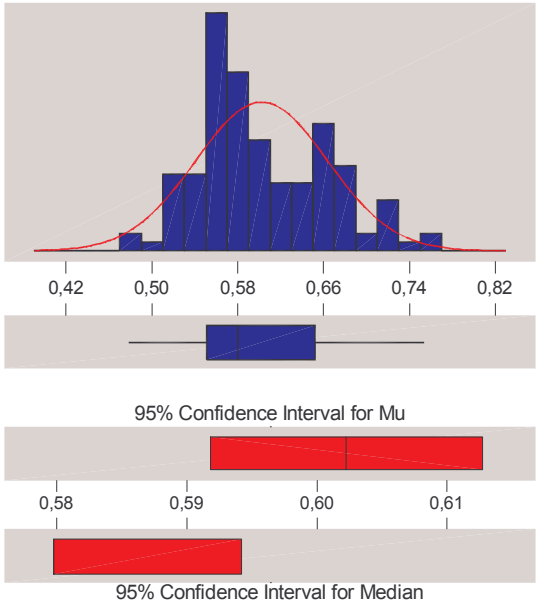
0,042198	0,053662

95% Confidence Interval for Median

0,536232	0,550725

11.3.1.4.2 GEH AS A FUNCTION OF INITIAL K-SP

Descriptive Statistics



Variable: GEH
Kinitial: 1

Anderson-Darling Normality Test

A-Squared:	2,345
P-Value:	0,000
Mean	0,602254
StDev	0,061454
Variance	3,78E-03
Skewness	0,478920
Kurtosis	-4,9E-01
N	135
Minimum	0,478261
1st Quartile	0,550725
Median	0,579710
3rd Quartile	0,652174
Maximum	0,753623

95% Confidence Interval for Mu

0,591794	0,612715

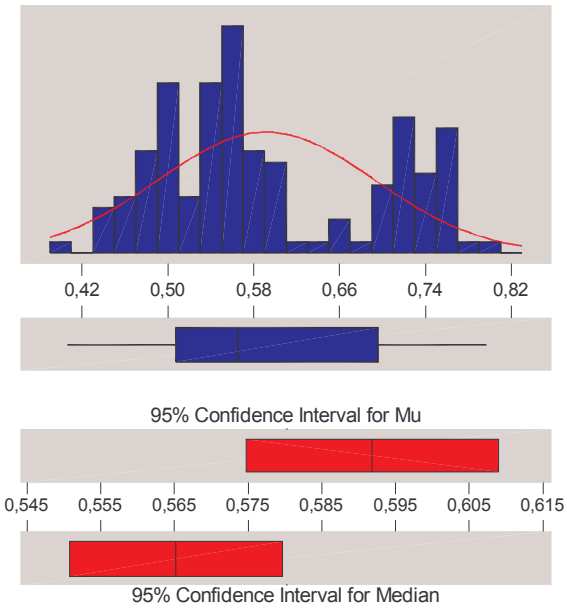
95% Confidence Interval for Sigma

0,054894	0,069807

95% Confidence Interval for Median

0,579710	0,594203

Descriptive Statistics



Variable: GEH
Kinitial: 2

Anderson-Darling Normality Test

A-Squared:	4,382
P-Value:	0,000
Mean	0,591841
StDev	0,100630
Variance	1,01E-02
Skewness	0,429002
Kurtosis	-1,09449
N	135
Minimum	0,405797
1st Quartile	0,507246
Median	0,565217
3rd Quartile	0,695652
Maximum	0,797101

95% Confidence Interval for Mu

0,574711	0,608971

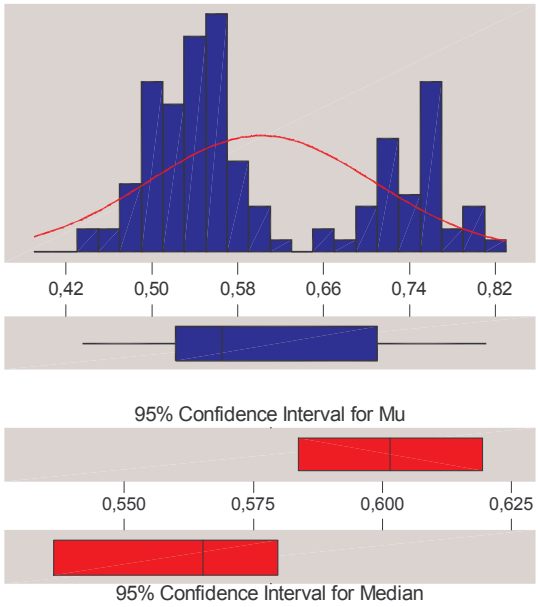
95% Confidence Interval for Sigma

0,089889	0,114309

95% Confidence Interval for Median

0,550725	0,579710

Descriptive Statistics



Variable: GEH
Kinitial: 3

Anderson-Darling Normality Test

A-Squared:	7,667
P-Value:	0,000
Mean	0,601503
StDev	0,104821
Variance	1,10E-02
Skewness	0,606274
Kurtosis	-1,11121
N	135
Minimum	0,434783
1st Quartile	0,521739
Median	0,565217
3rd Quartile	0,710145
Maximum	0,811594

95% Confidence Interval for Mu

0,583660	0,619346

95% Confidence Interval for Sigma

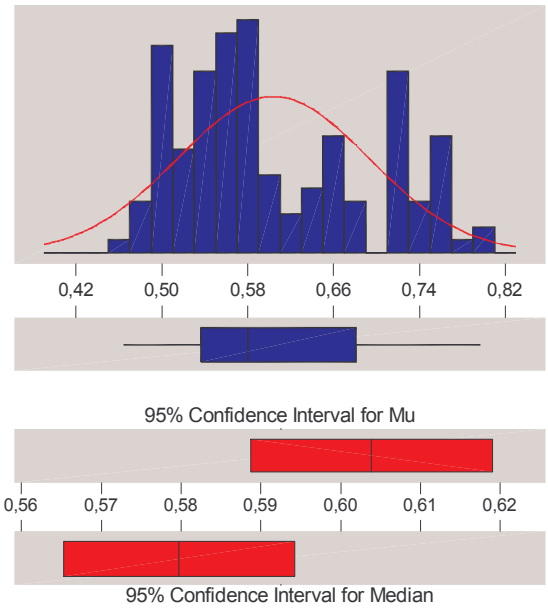
0,093633	0,119070

95% Confidence Interval for Median

0,536232	0,579710

11.3.1.4.3 GEH AS A FUNCTION OF THE NUMBER OF ALTERNATIVES

Descriptive Statistics



Variable: GEH
Numalternati: 3

Anderson-Darling Normality Test

A-Squared:	3,758
P-Value:	0,000
Mean	0,603865
StDev	0,089023
Variance	7,93E-03
Skewness	0,527702
Kurtosis	-9,3E-01
N	135
Minimum	0,463768
1st Quartile	0,536232
Median	0,579710
3rd Quartile	0,681159
Maximum	0,797101

95% Confidence Interval for Mu

0,588711	0,619019

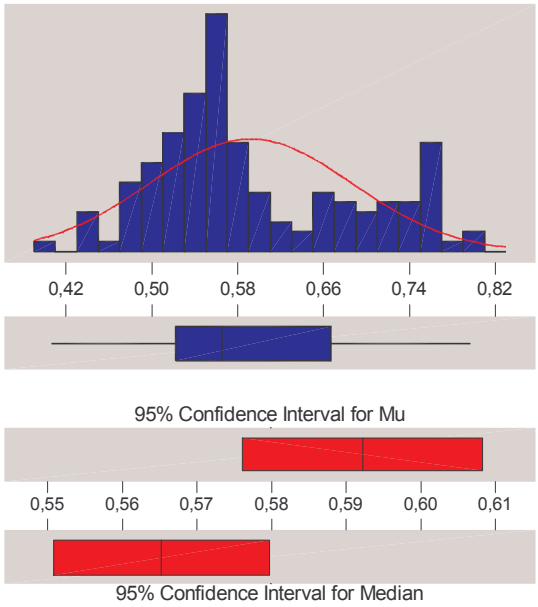
95% Confidence Interval for Sigma

0,079521	0,101124

95% Confidence Interval for Median

0,565217	0,594203

Descriptive Statistics



Variable: GEH
Numalternati: 4

Anderson-Darling Normality Test

A-Squared:	4,139
P-Value:	0,000
Mean	0,592163
StDev	0,094492
Variance	8,93E-03
Skewness	0,572252
Kurtosis	-6,7E-01
N	135
Minimum	0,405797
1st Quartile	0,521739
Median	0,565217
3rd Quartile	0,666667
Maximum	0,797101

95% Confidence Interval for Mu

0,576078	0,608248

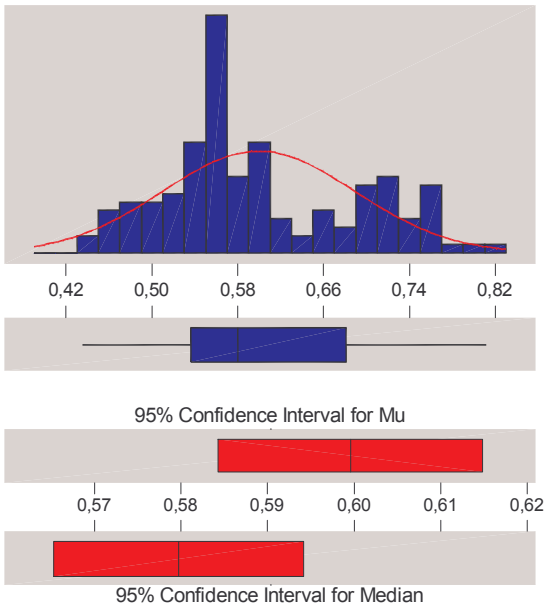
95% Confidence Interval for Sigma

0,084407	0,107337

95% Confidence Interval for Median

0,550725	0,579710

Descriptive Statistics



Variable: GEH
Numalternati: 5

Anderson-Darling Normality Test

A-Squared:	3,037
P-Value:	0,000
Mean	0,599571
StDev	0,089633
Variance	8,03E-03
Skewness	0,480894
Kurtosis	-7,2E-01
N	135
Minimum	0,434783
1st Quartile	0,536232
Median	0,579710
3rd Quartile	0,681159
Maximum	0,811594

95% Confidence Interval for Mu

0,584313	0,614828

95% Confidence Interval for Sigma

0,080066	0,101817

95% Confidence Interval for Median

0,565217	0,594203

11.3.1.4.4 General Linear Model: GEH versus Scale; Kinitial; Numalternatives

```
Factor     Type Levels Values
Scale      fixed      3  10  60 100
Kinitial   fixed      3 1 2 3
Numalter   fixed      3 3 4 5

Analysis of Variance for GEH, using Adjusted SS for Tests

Source                    DF     Seq SS     Adj SS     Adj MS       F       P
```

Scale	2	2.46100	2.46100	1.23050	691.42	0.000
Kinitial	2	0.00911	0.00911	0.00455	2.56	0.079
Numalter	2	0.00946	0.00946	0.00473	2.66	0.071
Scale*Kinitial	4	0.17505	0.17505	0.04376	24.59	0.000
Scale*Numalter	4	0.00092	0.00092	0.00023	0.13	0.972
Kinitial*Numalter	4	0.00653	0.00653	0.00163	0.92	0.454
Scale*Kinitial*Numalter	8	0.00965	0.00965	0.00121	0.68	0.711
Error	378	0.67272	0.67272	0.00178		
Total	404	3.34443				

Unusual Observations for GEH

Obs	GEH	Fit	SE Fit	Residual	St Resid
24	0.753623	0.668599	0.010892	0.085024	2.09R
27	0.579710	0.668599	0.010892	-0.088889	-2.18R
42	0.579710	0.668599	0.010892	-0.088889	-2.18R
51	0.608696	0.722705	0.010892	-0.114010	-2.80R
73	0.550725	0.714976	0.010892	-0.164251	-4.03R
79	0.608696	0.712077	0.010892	-0.103382	-2.54R
106	0.536232	0.730435	0.010892	-0.194203	-4.77R
198	0.434783	0.524638	0.010892	-0.089855	-2.20R
217	0.463768	0.551691	0.010892	-0.087923	-2.16R
219	0.652174	0.551691	0.010892	0.100483	2.47R
284	0.666667	0.578744	0.010892	0.087923	2.16R
312	0.478261	0.563285	0.010892	-0.085024	-2.09R
323	0.623188	0.528502	0.010892	0.094686	2.32R
335	0.405797	0.501449	0.010892	-0.095652	-2.35R
384	0.623188	0.535266	0.010892	0.087923	2.16R
390	0.434783	0.535266	0.010892	-0.100483	-2.47R
400	0.434783	0.532367	0.010892	-0.097585	-2.39R

11.3.1.4.5 General Linear Model: GEH versus Scale; Kinitial; Numalternatives; Scale*Kinitial

Factor	Type	Levels	Values
Scale	fixed	3	10 60 100
Kinitial	fixed	3	1 2 3
Numalter	fixed	3	3 4 5

Analysis of Variance for GEH, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
Scale	2	2.46100	2.46100	1.23050	702.82	0.000
Kinitial	2	0.00911	0.00911	0.00455	2.60	0.076
Numalter	2	0.00946	0.00946	0.00473	2.70	0.068
Scale*Kinitial	4	0.17505	0.17505	0.04376	25.00	0.000
Error	394	0.68981	0.68981	0.00175		
Total	404	3.34443				

Unusual Observations for GEH

Obs	GEH	Fit	SE Fit	Residual	St Resid
24	0.753623	0.665450	0.006896	0.088173	2.14R
27	0.579710	0.665450	0.006896	-0.085740	-2.08R
42	0.579710	0.672857	0.006896	-0.093147	-2.26R
51	0.608696	0.721918	0.006896	-0.113222	-2.74R
73	0.550725	0.710216	0.006896	-0.159492	-3.86R
79	0.608696	0.717624	0.006896	-0.108928	-2.64R
106	0.536232	0.731150	0.006896	-0.194919	-4.72R
198	0.434783	0.533083	0.006896	-0.098300	-2.38R
219	0.652174	0.540490	0.006896	0.111684	2.71R
284	0.666667	0.572482	0.006896	0.094185	2.28R
312	0.478261	0.568188	0.006896	-0.089927	-2.18R
323	0.623188	0.524817	0.006896	0.098372	2.38R
335	0.405797	0.513115	0.006896	-0.107318	-2.60R

348	0.608696	0.520522	0.006896	0.088173	2.14R
354	0.608696	0.520522	0.006896	0.088173	2.14R
384	0.623188	0.523421	0.006896	0.099767	2.42R
388	0.608696	0.523421	0.006896	0.085275	2.07R
390	0.434783	0.523421	0.006896	-0.088638	-2.15R
400	0.434783	0.530828	0.006896	-0.096046	-2.33R

11.3.1.4.6 COEFFICIENTS OF GENERAL LINEAR MODEL: GEH VERSUS SCALE; KINITIAL; NUMALTERNATIVES

0,598533
0,110109
-0,050385
0,003722
-0,006692
0,005332
-0,006370
-0,040544
0,014636
0,015924
-0,002004

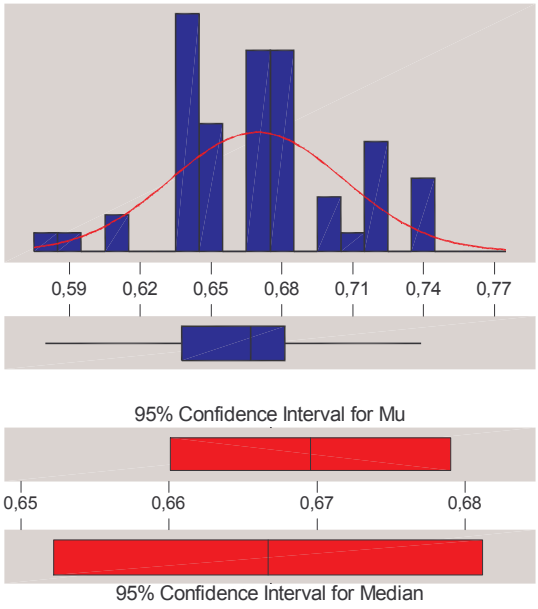
11.3.1.5 C-LOGIT ROUTE CHOICE WITH VARYING BETA AND GAMMA

ROUTE CHOICE: CLOGIT (θ=60, INITIAL K-SP=2, AND MAXIMUM NUMBER OF ROUTES =3 FIXED)

DESIGN FACTOR β, LEVELS 0.10, 0.15, 0.5, 1.0

DESIGN FACTOR γ, LEVELS 0.5, 1.0, 1.5, 2.0

11.3.1.5.1 GEH AS A FUNCTION OF β



Variable: GEH
Beta: 0,10

Anderson-Darling Normality Test

A-Squared:	1,205
P-Value:	0,004
Mean	0,669565
StDev	0,036664
Variance	1,34E-03
Skewness	0,150484
Kurtosis	-1,3E-01
N	60
Minimum	0,579710
1st Quartile	0,637681
Median	0,666667
3rd Quartile	0,681159
Maximum	0,739130

95% Confidence Interval for Mu

0,660094	0,679037

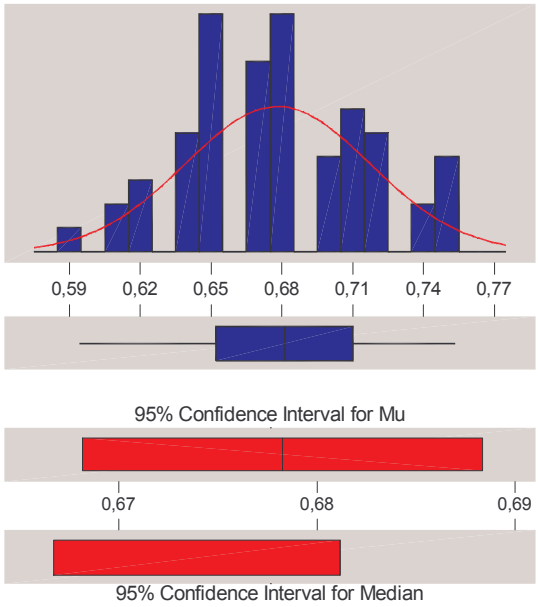
95% Confidence Interval for Sigma

0,031078	0,044718

95% Confidence Interval for Median

0,652174	0,681159

Descriptive Statistics



Variable: GEH

Beta: 0,15

Anderson-Darling Normality Test

A-Squared:	0,607
P-Value:	0,110
Mean	0,678261
StDev	0,039107
Variance	1,53E-03
Skewness	0,171552
Kurtosis	-5,2E-01
N	60
Minimum	0,594203
1st Quartile	0,652174
Median	0,681159
3rd Quartile	0,710145
Maximum	0,753623

95% Confidence Interval for Mu

0,668158	0,688363

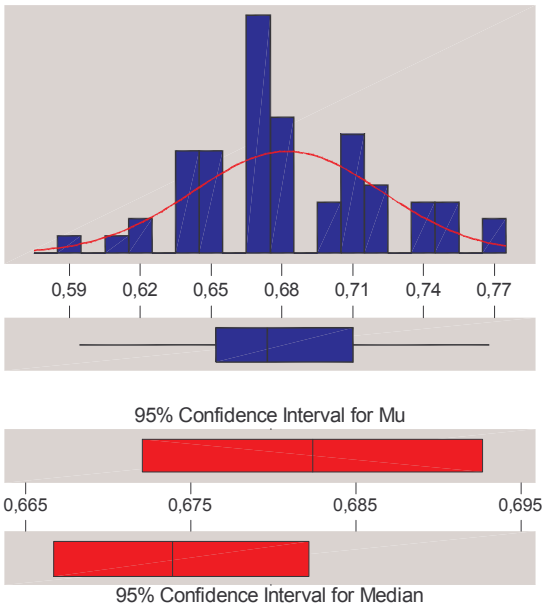
95% Confidence Interval for Sigma

0,033149	0,047698

95% Confidence Interval for Median

0,666667	0,681159

Descriptive Statistics



Variable: GEH

Beta: 0,50

Anderson-Darling Normality Test

A-Squared:	0,906
P-Value:	0,020
Mean	0,682367
StDev	0,039873
Variance	1,59E-03
Skewness	0,304219
Kurtosis	-3,5E-01
N	60
Minimum	0,594203
1st Quartile	0,652174
Median	0,673913
3rd Quartile	0,710145
Maximum	0,768116

95% Confidence Interval for Mu

0,672067	0,692667

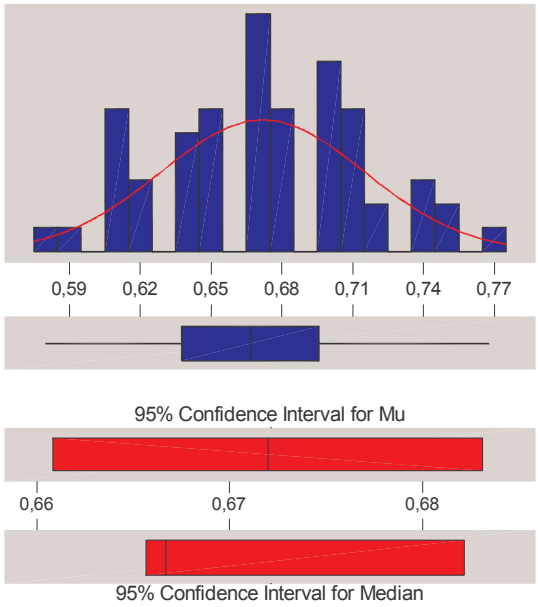
95% Confidence Interval for Sigma

0,033797	0,048631

95% Confidence Interval for Median

0,666667	0,682164

Descriptive Statistics



Variable: GEH
Beta: 1,00

Anderson-Darling Normality Test

A-Squared:	0,409
P-Value:	0,335
Mean	0,671981
StDev	0,043105
Variance	1,86E-03
Skewness	5,39E-02
Kurtosis	-4,6E-01
N	60
Minimum	0,579710
1st Quartile	0,637681
Median	0,666667
3rd Quartile	0,695652
Maximum	0,768116

95% Confidence Interval for Mu

0,660845	0,683116

95% Confidence Interval for Sigma

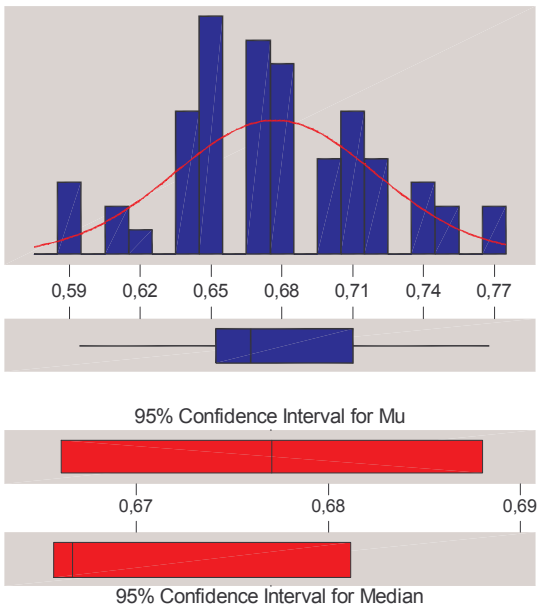
0,036538	0,052574

95% Confidence Interval for Median

0,665662	0,682164

11.3.1.5.2 GEH AS A FUNCTION OF γ

Descriptive Statistics



Variable: GEH
Gamma: 0,5

Anderson-Darling Normality Test

A-Squared:	0,586
P-Value:	0,122
Mean	0,677053
StDev	0,042450
Variance	1,80E-03
Skewness	0,176261
Kurtosis	-3,2E-01
N	60
Minimum	0,594203
1st Quartile	0,652174
Median	0,666667
3rd Quartile	0,710145
Maximum	0,768116

95% Confidence Interval for Mu

0,666087	0,688019

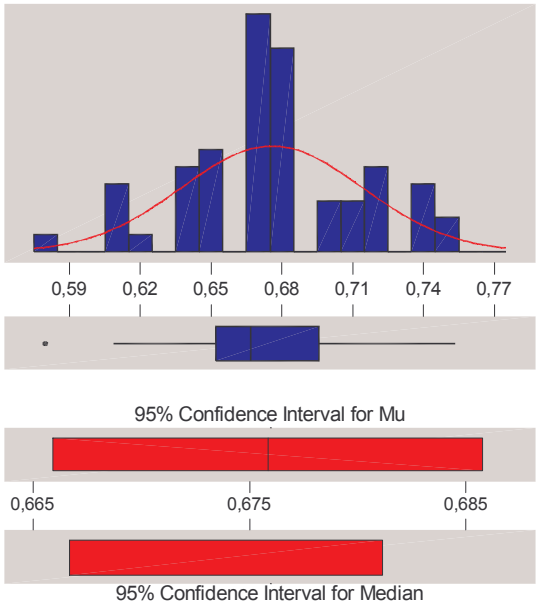
95% Confidence Interval for Sigma

0,035982	0,051775

95% Confidence Interval for Median

0,665662	0,681159

Descriptive Statistics



Variable: GEH

Gamma: 1,0

Anderson-Darling Normality Test

A-Squared:	0,987
P-Value:	0,012
Mean	0,675845
StDev	0,038388
Variance	1,47E-03
Skewness	2,10E-02
Kurtosis	-7,1E-02
N	60
Minimum	0,579710
1st Quartile	0,652174
Median	0,666667
3rd Quartile	0,695652
Maximum	0,753623

95% Confidence Interval for Mu

0,665929	0,685762

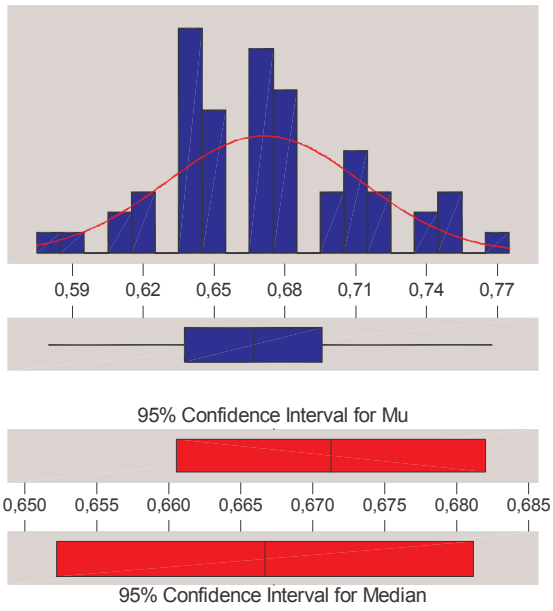
95% Confidence Interval for Sigma

0,032539	0,046820

95% Confidence Interval for Median

0,666667	0,681159

Descriptive Statistics



Variable: GEH

Gamma: 1,5

Anderson-Darling Normality Test

A-Squared:	0,808
P-Value:	0,034
Mean	0,671256
StDev	0,041552
Variance	1,73E-03
Skewness	0,366305
Kurtosis	-1,8E-01
N	60
Minimum	0,579710
1st Quartile	0,637681
Median	0,666667
3rd Quartile	0,695652
Maximum	0,768116

95% Confidence Interval for Mu

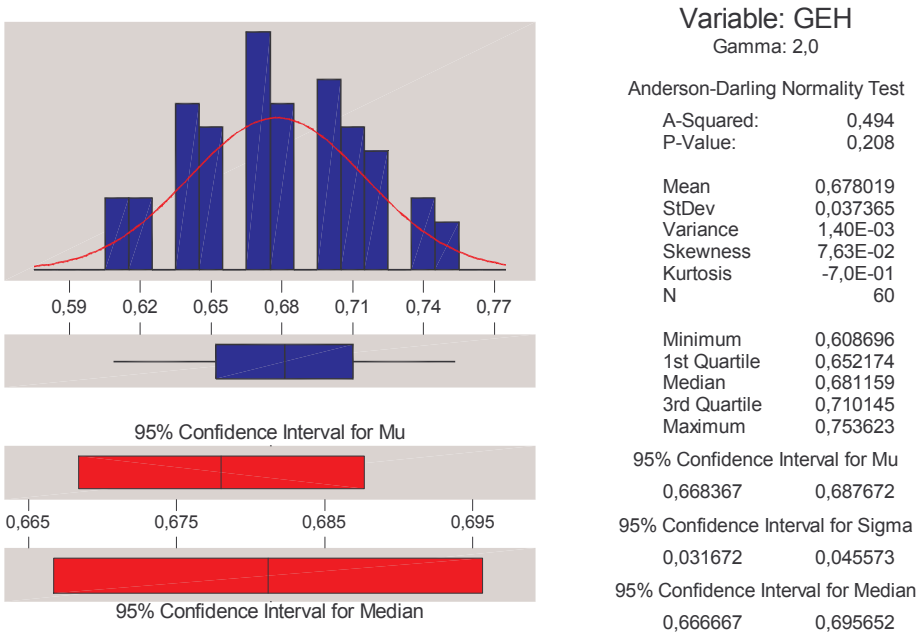
0,660522	0,681990

95% Confidence Interval for Sigma

0,035221	0,050679

95% Confidence Interval for Median

0,652174	0,681159



11.3.1.5.3 General Linear Model: GEH versus Beta; Gamma

```
Factor      Type Levels Values
Beta       fixed      4 0,10 0,15 0,50 1,00
Gamma      fixed      4 0,5 1,0 1,5 2,0

Analysis of Variance for GEH, using Adjusted SS for Tests

Source        DF     Seq SS     Adj SS     Adj MS       F      P
Beta           3   0,006143   0,006143   0,002048    1,26  0,291
Gamma          3   0,001613   0,001613   0,000538    0,33  0,804
Beta*Gamma     9   0,006001   0,006001   0,000667    0,41  0,930
Error        224   0,365357   0,365357   0,001631
Total        239   0,379114

Unusual Observations for GEH

Obs       GEH       Fit      SE Fit  Residual   St Resid
 21  0,579710  0,672464    0,010428 -0,092754     -2,38R
 72  0,594203  0,677295    0,010428 -0,083092     -2,13R
122  0,768116  0,683092    0,010428  0,085024      2,18R
127  0,594203  0,683092    0,010428 -0,088889     -2,28R
161  0,768116  0,687923    0,010428  0,080193      2,06R
184  0,768116  0,672464    0,010428  0,095652      2,45R
186  0,594203  0,672464    0,010428 -0,078261     -2,01R
199  0,753623  0,673430    0,010428  0,080193      2,06R
215  0,579710  0,658937    0,010428 -0,079227     -2,03R
220  0,739130  0,658937    0,010428  0,080193      2,06R
```

11.3.1.6 C-Logit Route Choice Model with Varying Scale Factor, Initial K-SP, Beta and Gamma

ROUTE CHOICE: CLOGIT (MAXIMUM NUMBER OF ROUTES = 4 FIXED)

DESIGN FACTOR θ, LEVELS 10, 60, 100

DESIGN FACTOR INITIAL K-SP (KINITIAL), LEVELS 2, 3

DESIGN FACTOR β, LEVELS 0.10, 0.15, 0.5, 1.0

DESIGN FACTOR γ, LEVELS 0.5, 1.0, 1.5, 2.0

11.3.1.6.1 GENERAL LINEAR MODEL: GEH VERSUS SCALE; KINITIAL; BETA; GAMMA

```
Factor     Type Levels Values
Scale Fa  fixed      3  10  60 100
Kinitial  fixed      2 2 3
Beta      fixed      4 0.10 0.15 0.50 1.00
Gamma     fixed      4 0.5 1.0 1.5 2.0

Analysis of Variance for GEH. using Adjusted SS for Tests

Source     DF     Seq SS     Adj SS     Adj MS       F      P
Scale Fa    2     3.9745     3.9745     1.9873  588.59  0.000
Kinitial    1     0.0303     0.0303     0.0303    8.98  0.003
Beta        3     9.5248     9.5248     3.1749  940.34  0.000
Gamma       3     0.0785     0.0785     0.0262    7.75  0.000
Error    1430     4.8282     4.8282     0.0034
Total    1439    18.4363

Unusual Observations for GEH

 Obs       GEH       Fit      SE Fit  Residual   St Resid
   2  0.811594  0.674849    0.004842  0.136745      2.36R
  26  0.405797  0.544334    0.004842 -0.138537     -2.39R
  28  0.405797  0.554197    0.004842 -0.148400     -2.56R
  44  0.565217  0.443871    0.004842  0.121347      2.10R
  67  0.405797  0.556180    0.004842 -0.150382     -2.60R
  70  0.405797  0.540721    0.004842 -0.134924     -2.33R
  72  0.405797  0.550584    0.004842 -0.144787     -2.50R
  84  0.434783  0.574416    0.004842 -0.139634     -2.41R
  96  0.507246  0.383112    0.004842  0.124134      2.14R
  97  0.550725  0.692925    0.004842 -0.142200     -2.46R
 100  0.811594  0.684712    0.004842  0.126882      2.19R
 120  0.811594  0.679237    0.004842  0.132357      2.29R
 192  0.550725  0.383112    0.004842  0.167613      2.89R
 197  0.478261  0.678271    0.004842 -0.200010     -3.45R
 205  0.362319  0.501620    0.004842 -0.139302     -2.41R
 207  0.362319  0.484350    0.004842 -0.122031     -2.11R
 216  0.521739  0.679237    0.004842 -0.157498     -2.72R
 217  0.420290  0.562409    0.004842 -0.142120     -2.45R
 218  0.376812  0.544334    0.004842 -0.167522     -2.89R
 221  0.391304  0.510799    0.004842 -0.119495     -2.06R
 222  0.347826  0.492723    0.004842 -0.144897     -2.50R
 224  0.362319  0.502587    0.004842 -0.140268     -2.42R
 286  0.507246  0.373249    0.004842  0.133998      2.31R
 288  0.521739  0.383112    0.004842  0.138627      2.39R
 315  0.405797  0.545139    0.004842 -0.139342     -2.41R
 317  0.376812  0.510799    0.004842 -0.133988     -2.31R
 346  0.565217  0.443186    0.004842  0.122031      2.11R
 383  0.507246  0.374054    0.004842  0.133192      2.30R
 399  0.347826  0.484350    0.004842 -0.136524     -2.36R
 401  0.840580  0.702103    0.004842  0.138476      2.39R
 449  0.434783  0.573450    0.004842 -0.138667     -2.39R
 496  0.362319  0.493408    0.004842 -0.131089     -2.26R
 522  0.565217  0.434008    0.004842  0.131210      2.27R
 542  0.536232  0.391576    0.004842  0.144656      2.50R
 554  0.550725  0.415680    0.004842  0.135044      2.33R
 556  0.565217  0.425543    0.004842  0.139674      2.41R
 586  0.376812  0.535155    0.004842 -0.158343     -2.73R
 590  0.333333  0.483545    0.004842 -0.150211     -2.59R
 607  0.362319  0.493529    0.004842 -0.131210     -2.27R
 669  0.521739  0.391324    0.004842  0.130415      2.25R
 671  0.521739  0.374054    0.004842  0.147685      2.55R
 673  0.826087  0.692925    0.004842  0.133162      2.30R
```

691	0.811594	0.684833	0.004842	0.126761	2.19R
696	0.797101	0.679237	0.004842	0.117864	2.04R
714	0.550725	0.434008	0.004842	0.116717	2.02R
767	0.507246	0.374054	0.004842	0.133192	2.30R
768	0.507246	0.383112	0.004842	0.124134	2.14R
775	0.782609	0.661000	0.004842	0.121608	2.10R
843	0.565217	0.416486	0.004842	0.148732	2.57R
844	0.565217	0.425543	0.004842	0.139674	2.41R
893	0.376812	0.510799	0.004842	-0.133988	-2.31R
895	0.347826	0.493529	0.004842	-0.145702	-2.52R
960	0.521739	0.383112	0.004842	0.138627	2.39R
991	0.362319	0.493529	0.004842	-0.131210	-2.27R
1030	0.420290	0.540721	0.004842	-0.120431	-2.08R
1062	0.782609	0.660195	0.004842	0.122413	2.11R
1087	0.362319	0.493529	0.004842	-0.131210	-2.27R
1117	0.550725	0.409652	0.004842	0.141073	2.44R
1180	0.434783	0.554197	0.004842	-0.119414	-2.06R
1209	0.579710	0.461262	0.004842	0.118448	2.05R
1210	0.565217	0.443186	0.004842	0.122031	2.11R
1246	0.536232	0.373249	0.004842	0.162983	2.81R
1259	0.405797	0.535960	0.004842	-0.130163	-2.25R
1274	0.376812	0.544334	0.004842	-0.167522	-2.89R
1331	0.420290	0.565358	0.004842	-0.145068	-2.51R
1437	0.507246	0.391324	0.004842	0.115922	2.00R
1438	0.492754	0.373249	0.004842	0.119505	2.06R

R denotes an observation with a large standardised residual