```
-------------------------------------------------------------------------------------------------
      name:  <unnamed>
       log:  C:\henry\HGBOOKee\secondedition\webmat\iprogslog.log
  log type:  text
 opened on:  20 Jul 2015, 15:08:28

*** STEP 1. Load the programs in iprogs.do

quietly do iprogs

*** STEP 2. Load the programs in ceagraphs.do

quietly do ceagraphs

*** STEP 3. If you need help/documention for the programs in iprogs.do,
*** run the iprogsdoc program. iprogsdoc is loaded when you ''do''
*** iprogs.do

*** STEP 4. If you need help/documention for the programs in ceagraphs.do,
*** run the ceagraphsdoc program. ceaprogsdoc is loaded when you ''do''
*** ceagraphs.do

iprogsdoc
* IPROGS CONTAINS 8 ''IMMEDIATE FORM'' PROGRAMS FOR
* CALCULATING FIELLER'S METHOD CONFIDENCE INTERVALS
* FOR COST-EFFECTIVENESS RATIOS (fielleri), AN
* ACCEPTABILITY CURVE (accept1i & accepti), NMB AND
* NMB CURVES (nmb1i & nmbi), VOI CURVE (voi1i &
* voii), AND BOUNDARIES BETWEEN PATTERNS 1, 2, AND
* 3 RESULTS (ciboundi)
*
* PARAMETER VALUES MAY BE DERIVED FROM ANY NUMBER
* OF ESTIMATION METHODS, BUT THESE PROGRAMS ARE
* PARTICULARLY USEFUL IF ONE HAS USED MULTIVARIABLE
* REGRESSION TO ESTIMATE POINT ESTIMATES AND SES.
*
* WHILE THESE PROGRAMS INCLUDE A PROGRAM FOR THE
* DERIVATUION OF THE NECESSARY PARAMETERS BY USE OF
* T-TESTS (IPINPUTS), IF T-TESTS ARE SUFFICIENT,
* CONSIDER USING UPROGS.DO, WHICH CONDUCTS THE
* T-TESTS AS WELL AS ASSESSES SAMPLING UNCERTAINTY
*
* SEE CEAGRAPHS.DO FOR PROGRAMS THAT PLOT CEA, NMB,
* ACCEPTABILITY, AND VOI GRAPHS

* Glick, last revised 07/20/15


* PROGRAM:  IPINPUTS

* USES T-TESTS TO CALCULATES INPUTS USED WITH
* CIBOUNDI, FIELLERI, ACCEPTI, AND NMBI

* Calculated inputs include:
*   Difference in cost and SE
*   Difference in effect and SE
*   Correlation of difference in cost and effect

*   COMMAND LINE:  ipinputs [COST] [EFFECT] [GROUP] [if]

* The 3 arguments are all names of variables
** `1'  Name of cost variable
** `2'  Name of effect variable
** `3'  Name of 0/1 treatment variable

* Saved Results

* r(meanc)
* r(sec)
* r(meanq)
* r(seq)
```

```
* r(rho)
* r(dof)


* PROGRAM:  CIBOUNDI

* DEFINES T-STATISTICS AND CI THAT FORM
* BOUNDARIES BETWEEN PATTERNS 1, 2, AND 3

*   COMMAND LINE:  ciboundi [COST] [SEcost] [EFFECT] [SEeffect] [CORR] [DOF]

** The 6 arguments are all numbers
** `1' difference in costs
** `2' SE diff costs
** `3' difference in effects
** `4' SE diff effects
** `5' correlation of differences
** `6' degrees of freedom

   Alternative command lines (e.g., for automated calculation):
       ipinputs [cost] [effect] [group] [,if]
       local a=r(meanc)
       local b=r(sec)
       local c=r(meanq)
       local d=r(seq)
       local e=r(rho)
       local f=r(dof)
       ciboundi `a' `b' `c' `d' `e' `f'

* Saved Results
* r(tscore1_2)
* r(ci1_2)
* r(fll1_2)
* r(ful1_2)
* r(tscore2_3)
* r(widestCI)
* r(widestCL)
* r(cd)
* r(sec)
* r(qd)
* r(seq)
* r(rho)
* r(dof)


* PROGRAM:  FIELLERI

* CALCULATES FIELLER INTERVALS
* Reports the specified interval as well as the widest
* definable interval; if the specified interval isn't
* defined, reports the limit of the widest definable
* interval

*   COMMAND LINE:  fielleri [COST] [SEcost] [EFFECT] [SEeffect] [CORR] [DOF] [CI]

* The 7 arguments are all numbers
** `1' difference in costs
** `2' SE diff costs
** `3' difference in effects
** `4' SE diff effects
** `5' correlation of differences
** `6' degrees of freedom
** `7' confidence interval, as decimal (e.g., 0.95 for a 95% interval)

   Alternative command lines (e.g., for automated calculation):
       ipinputs [cost] [effect] [group] [,if]
       local a=r(meanc)
       local b=r(sec)
       local c=r(meanq)
       local d=r(seq)
       local e=r(rho)
```

```
       local f=r(dof)
       fielleri `a' `b' `c' `d' `e' `f' [CI]

* Saved Results

* r(R)
* r(CI)
* r(fll)
* r(ful)
* r(widestCI)
* r(widestCL)
* r(cd)
* r(sec)
* r(qd)
* r(seq)
* r(rho)
* r(dof)
* r(cmd)


* Program: ACCEPT1i

* CALCULATES PROPORTION ACCEPTABLE FOR A SINGLE VALUE
* OF WILLINGNESS TO PAY (E.G., 50,000)

*   COMMAND LINE:  accept1i [COST] [SEcost] [EFFECT] [SEeffect] [CORR] [WTP] [DOF]

* The 7 arguments are all numbers
** `1'  difference in costs
** `2'  SE diff costs
** `3'  difference in effects
** `4'  SE diff effects
** `5'  Correlation of differences
** `6'  WTP
** `7'  degrees of freedom

   Alternative command lines (e.g., for automated calculation):
       ipinputs [cost] [effect] [group] [,if]
       local a=r(meanc)
       local b=r(sec)
       local c=r(meanq)
       local d=r(seq)
       local e=r(rho)
       local f=r(dof)
       accept1i `a' `b' `c' `d' `e' [WTP] `f '

* Saved Results
* r(WTP)
* r(accept)
* r(p)
* r(cd)"
* r(sec)
* r(qd)"
* r(seq)
* r(rho)
* r(dof)
* r(cmd)


* PROGRAM:  ACCEPTI

* CALCULATES WILLINGNESS TO PAY (WTP), % ACCEPTABLE, and P-VALUE

*   COMMAND LINE:  accepti [COST] [SEcost] [EFFECT] [SEeffect] [CORR] [DOF]

** The 6 arguments are all numbers
** `1' difference in costs
** `2' SE diff costs
** `3' difference in effects
** `4' SE diff effects
** `5' correlation of differences
```

```
** `6' degrees of freedom

   Alternative command lines (e.g., for automated calculation):
       ipinputs [cost] [effect] [group] [,if]
       local a=r(meanc)
       local b=r(sec)
       local c=r(meanq)
       local d=r(seq)
       local e=r(rho)
       local f=r(dof)
       accepti `a' `b' `c' `d' `e' `f'

* Saved Results
* r(meanc)
* r(sec)
* r(qd)
* r(seq)
* r(rho)
* r(dof)
* r(cmd)
* r(accmat)


* Program: NMB1i

* CALCULATES NMB, CI AND P-VALUE FOR A SINGLE
* VALUE OF WILLINGNESS TO PAY (E.G., 50,000)

*   COMMAND LINE:  nmb1i [COST] [SEcost] [EFFECT] [SEeffect] [CORR] [WTP] [DOF] [CI]

* The 8 arguments are all numbers
** `1'  difference in costs
** `2'  SE diff costs
** `3'  difference in effects
** `4'  SE diff effects
** `5'  Correlation of differences
** `6'  WTP
** `7'  Degrees of freedom
** `8' confidence interval, as decimal (e.g., 0.95 for a 95% interval)

   Alternative command lines (e.g., for automated calculation):
       ipinputs [cost] [effect] [group] [,if]
       local a=r(meanc)
       local b=r(sec)
       local c=r(meanq)
       local d=r(seq)
       local e=r(rho)
       local f=r(dof)
       nmb1i `a' `b' `c' `d' `e' [WTP] `f ' [CI]

* Saved Results
* r(nmb)
* r(nmbll)
* r(nmbul)
* r(CI)
* r(WTP)
* r(cd)
* r(sec)
* r(qd)
* r(seq)
* r(rho)
* r(dof)
* r(cmd)


* PROGRAM:  NMBI

* CALCULATES NMB, CI, AND P-VALUE FOR VARYING
* VALUES OF WTP

*   COMMAND LINE:  nmbi [COST] [SEcost] [EFFECT] [SEeffect] [CORR] [DOF] [CI]
```

```
* The 7 arguments are all numbers
** `1' difference in costs
** `2' SE diff costs
** `3' difference in effects
** `4' SE diff effects
** `5' correlation of differences
** `6' degrees of freedom
** `7' confidence interval, as decimal (e.g., 0.95 for a 95% interval)

   Alternative command lines (e.g., for automated calculation):
       ipinputs [cost] [effect] [group] [,if]
       local a=r(meanc)
       local b=r(sec)
       local c=r(meanq)
       local d=r(seq)
       local e=r(rho)
       local f=r(dof)
       nmbi `a' `b' `c' `d' `e' `f' [CI]

* Saved Results
* r(CI)
* r(meanc)
* r(sec)
* r(qd)
* r(seq)
* r(rho)
* r(dof)
* r(cmd)
* r(nmbmat)


* Program: VOI1i

* USES TTAIL and TDEN FUNCTIONS TO INTEGRATE UNDER THE
* NMB STUDENT'S T DISTRIBUTION AND CALCULATE THE PER-PERSON
* EXPECTED VALUE OF PERFECT INFORMATION FOR A SINGLE VALUE
* OF WILLINGNESS TO PAY (E.G., 50,000)

*   COMMAND LINE:  voi1i [COST] [SEcost] [EFFECT] [SEeffect] [CORR] [WTP] [DOF]

* The 7 arguments are all numbers
** `1'  difference in costs
** `2'  SE diff costs
** `3'  difference in effects
** `4'  SE diff effects
** `5'  Correlation of differences
** `6'  WTP
** `7'  degrees of freedom

   Alternative command lines (e.g., for automated calculation):
       ipinputs [cost] [effect] [group] [,if]
       local a=r(meanc)
       local b=r(sec)
       local c=r(meanq)
       local d=r(seq)
       local e=r(rho)
       local f=r(dof)
       voi1i `a' `b' `c' `d' `e' [WTP] `f '

* Saved Results
* r(WTP)
* r(voi)
* r(cd)
* r(sec)
* r(qd)
* r(seq)
* r(rho)
* r(dof)
```

```
* PROGRAM:  VOIi

* USES TTAIL and TDEN FUNCTIONS TO INTEGRATE UNDER THE
* NMB STUDENT'S T DISTRIBUTION AND CALCULATE THE PER-PERSON
* EXPECTED VALUE OF PERFECT INFORMATION FOR A VARYING VALUES
* OF WILLINGNESS TO PAY

*   COMMAND LINE:  voii [COST] [SEcost] [EFFECT] [SEeffect] [CORR] [DOF]

** The 6 arguments are all numbers
** `1' difference in costs
** `2' SE diff costs
** `3' difference in effects
** `4' SE diff effects
** `5' correlation of differences
** `6' degrees of freedom

   Alternative command lines (e.g., for automated calculation):
       ipinputs [cost] [effect] [group] [,if]
       local a=r(meanc)
       local b=r(sec)
       local c=r(meanq)
       local d=r(seq)
       local e=r(rho)
       local f=r(dof)
       voii `a' `b' `c' `d' `e' `f'

* Saved Results
* r(cd)
* r(sec)
* r(qd)
* r(seq)
* r(rho)
* r(dof)
* r(cmd)
* r(voimat)


ceagraphsdoc

 * The programs in this file graph the results of the fielleri,
 * nmbi, nmb1i, accepti, accept1i, and voii programs contained
 * in the iprogs.do file as well as the fielleru, nmbu, nmb1u,
 * acceptu, accept1u, and voiu programs contained in the
 * uprogs.do file (updated on or after 5/11/12. For each program
 * in this file, you first run one of the 6 programs in iprogs
 * (e.g., fielleri) (or one of the 6 programs in uprogs) and
 * immediately thereafter run the graphing program (e.g.,
 * fiellergraph). The following lines provide examples:
 *
 * fielleri 1000 500 .1 .05 .1 498 .95
 * fiellergraph,ellipse
 * [OR if no ellipse is desired]
 * fiellergraph
 *
 * fielleru cost qaly treat 95
 * fiellergraph,ellipse
 * [OR if no ellipse is desired]
 * fiellergraph
 *
 * nmbi 1000 500 .1 .05 .1 498 .95
 * nmbgraph
 *
 * nmbu cost qaly treat .95
 * nmbgraph
 *
 * nmb1i 1000 500 .1 .05 .1 50000 498 .95
 * nmb1graph,ellipse
 * [OR if no ellipse is desired]
 * nmb1graph
 *
```

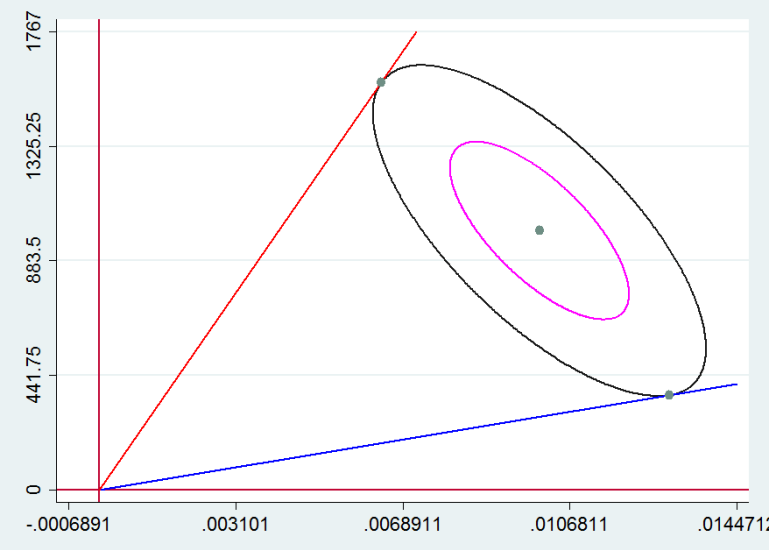
```
* nmb1u cost qaly treat 50000 .95
* nmb1graph,ellipse
* [OR if no ellipse is desired]
* nmb1graph
*
* accepti 1000 500 .1 .05 .1 498
* accgraph
* [OR, if decision lies are desired]
* accgraph 0.95
*
* acceptu cost qaly treat 50000
* accgraph
* [OR, if decision lies are desired]
* accgraph 0.95
*
* accept1i 1000 500 .1 .05 .1 50000 498
* accept1graph
*
* accept1u cost qaly treat 50000
* accept1graph
*
* voii 1000 500 .1 .05 .1 498
* voigraph
*
* voiu cost qaly treat 50000
* voigraph
*
* Glick, last revised 04/27/15
*
*
* PROGRAM: fiellergraph
*
* This program graphs the point estimate of the CER and the
* upper and lower limits of its confidence interval on the
* cost-effectiveness plane. It also reports the cost and
* effect pairs that form the tangency between the limits
* and the appropriate bivariate normal ellipse. Optionally,
* it draws 2 confidence ellipses. The program is meant to
* be run directly after running fielleri or fielleru
* because it uses elements of the return list that is
* created by both fielleri and fielleru
*
* Syntax
* fielleri [cost] [sec] [effect] [seq] [corr] [dof] [ci]
* fiellergraph,ellipse    /// [draws ellipse]
* [OR if no ellipse is desired]
* fiellergraph            /// [no ellipse drawn]
*
* fielleru [cost variable] [effect variable] [ci]
* fiellergraph,ellipse    /// [draws ellipse]
* [OR if no ellipse is desired]
* fiellergraph            /// [no ellipse drawn]
*
* Saved Results:
*
* r(cll)              /// mean cost, lower limit
* r(ell)              /// mean cost, lower limit
* r(cul)              /// mean cost, upper limit
* r(eul)              /// mean cost, upper limit
* r(R)                /// point estimate of ratio
* r(CI)               /// requested CI (e.g., 95%)
* r(fll)              /// Fieller's lower limit
* r(ful)              /// Fieller's upper limit
* r(widestCI)         /// Widest definable interval (WDI)
* r(widestCL)         /// Limit of WDI
* r(cd)               /// point estimate cost difference
* r(sec)              /// SE, cost difference
* r(qd)               /// point estimate effect difference
* rseq)               /// SE, effect difference
* r(rho)              /// correlation of the differences
* r(dof)              /// degrees of freedom
```

```
* r(cmd)              /// program identifier
* r(ellipse)          /// 721 x 4 matrix with ellipse data
*
*
* PROGRAM: nmbgraph
*
* This program draws the NMB graph. It is meant to be run
* directly after running the either the nmbi program or
* the nmbu program (or soon enough after that the r(nmbmat)
* return matrix is still resident in memory. As currently
* written, it draws the graph for values of wtp between
* 0 and 125,000. To change the upper bound wtp in the
* graph, open the program file and revise the statement
* wtp<125000.
*
* Command Line:  nmbgraph
*
* Saved Results
* r(CI)
* r(cmd)
* r(nmbmat)
*
* Syntax
* nmbi [cost] [sec] [effect] [seq] [corr] [dof] [ci]
* nmb1graph
*
* nmbu [cost variable] [effect variable] [ci]
* nmb1graph
*
*
* PROGRAM: nmb1graph
*
* This program graphs the point estimate of NMB and the
* upper and lower limits of its confidence interval on the
* cost-effectiveness plane. It also reports the cost and
* effect pairs that form the tangency between the limits
* and the appropriate bivariate normal ellipse. Optionally,
* it draws 2 confidence ellipses. The program is meant to
* be run directly after running nmb1i or nmb1u because it
* uses elements of the return list that is created by nmb1i.
*
* Syntax
* nmb1i [cost] [sec] [effect] [seq] [corr] [wtp] [dof] [ci]
* [ WITH ELLIPSE ]
* nmb1graph,ellipse
* [ OR if no ellipse is desired]
* nmb1graph
*
* nmb1u [cost variable] [effect variable] [wtp] [ci]
* [ WITH ELLIPSE ]
* nmb1graph,ellipse
* [ OR if no ellipse is desired]
* nmb1graph
*
* Saved Results
*
* r(elpse)            \\\ 0/1 representing whether ellipse was drawn
* r(cll)
* r(ell)
* r(cul)
* r(eul)
* r(nmb)
* r(CI)
* r(nmbll)
* r(nmbul)
* r(cd)
* r(sec)
* r(qd)
* r(seq)
* r(rho)
* r(WTP)
```

```
* r(dof)
* r(cmd)
* r(ellipse)          \\\ 721 x 4 matrix with ellipse data
*
*
* PROGRAM: accgraph
*
*    This program draws the acceptability curve. It is meant to be
* run directly after running the accepti or acceptu program (or
* soon enough after that the r(accmat) return matrix is still
* resident in memory.
*    As currently written, the program draws the curve for values of
* wtp between 0 and 125,000. To change the upper bound wtp in the
* graph, open the program file and revise the statement wtp<125000.
*    The default setting draws the acceptability curve alone.
* Optionally, you can add horizontal confidence lines by specifying
* your desired confidence level (e.g., for 2-tailed 95% confidence,
* 0.95).
*
* Command Line:       accgraph
* For optional horizontal lines (e.g., for 95% 2-tailed confidence):
*                     accgraph 0.95
*
* Saved Results
* r(accmat)
* r(cmd)
*
*
* PROGRAM: accept1graph
*
* This program graphs a line that divides the joint density
* of the difference in cost and effect that is acceptable
* from the joint density that is not for a specified value
* of willingness to pay. It also graphs a pair of bivariate
* normal ellipses. The program is meant to be run directly
* after running accept1i or accept1u because it uses
* elements of the return list that is created by these
* programs.
*
* Syntax
* accept1i [cost] [sec] [effect] [seq] [corr] [wtp] [dof]
* accept1graph
* accept1u [cost variable] [effect variable] [WTP]
* accept1graph
*
* Saved Results
*
* r(WTP)
* r(accept)
* r(cd)
* r(sec)
* r(qd)
* r(seq)
* r(rho)
* r(dof)
* r(p)
* r(cmd)
* r(ellipse)          \\\ 721 x 4 matrix with ellipse data
*
*
* PROGRAM: voigraph
*
*    This program draws the VOI curve. It is meant to be run
* directly after running the voii or voiu program (or soon enough
* after that the r(voimat) return matrix is still resident in memory.
*    As currently written, the program draws the curve for values of
* wtp between 0 and 125,000. To change the upper bound wtp in the
* graph, open the program file and revise the statement wtp<125000.
*
* Command Line:       voigraph
*
```

```
 * Saved Results
 * r(voimat)
 * r(cmd)
 *


*** STEP 5. Load the data you wish to analyze. In the first example, we load
*** the c8exper1 dataset

use c8exper1


    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
          id |       500       250.5    144.4818          1        500
       treat |       500          .5    .5005008          0          1
        cost |       500        9500    3664.302       1402      22082
        qaly |       500       1.065    .0220753   .9984848   1.114543

*** STEP 6. Use ipinputs to estimates the inputs needed to run the programs

ipinputs cost qaly treat


  Summary Statistics

    Difference in cost:              1000
    SE, difference in cost:          324.99927
    Difference in effect:            .01000001
    SE, difference in effect:        .00192499
    Correlation of differences:      -.71000917
    Degrees of freedom:              498

*** ipinputs saves its results in a set or rclass registers

return list

scalars:
              r(meanc) =  1000
                r(sec) =  324.999273
              r(meanq) =  .01
                r(seq) =  .001925
                r(rho) =  -.710009
                r(dof) =  498

*** One means of automating the analysis is to store the saved results in
*** local variables, and use them to run the programs.

local meanc=r(meanc)
local sec=r(sec)
local meanq=r(meanq)
local seq=r(seq)
local rho=r(rho)
local dof=r(dof)

*** STEP 7. Run fielleri and graph the results

fielleri `meanc' `sec' `meanq' `seq' `rho' `dof' 0.95

  Cost-Effectiveness Analysis

    Point Estimate:                  100000
    Quadrant:                        Upper right
    T-score:                         1.9647


    Fieller 95% Confidence Interval

      Lower limit :                  28184

      Upper limit:                   245218
```

```
  Confidence Statements:

     For WTP <28184, we can be 95% confident that the therapy
     with the larger point estimate for effect represents bad value;

     For WTP >=28184 and <=245218, we can't be 95% confident
     that the 2 therapies differ in value;

     For WTP > 245218, we can be 95% confident that the therapy
     with the larger point estimate for effect represents good value
     compared with the alternative


*** ALTERNATE SYNTAX
*** fielleri 1000 324.999273 .01 .001925 -.710009 498 0.95

fiellergraph,ellipse


  Fieller 95% confidence limits
     Lower limit:                28184.301
     Upper limit:                245218.33
  Tangent ellipse:               85.5%

  Ellipse estimates

     Lower limit:                28184.3
       Cost at tangency:         364.96231
       Effect at tangency:       .01294914

     Upper limit:                245218.34
       Cost at tangency:         1570.3647
       Effect at tangency:       .00640394

  Ellipse estimates are approximations. Mismatches between
  Fieller limits and ellipse limits may result because the
  program estimates approximate tangencies with the ellipse
```




```
graph export exp1fielgraph.png,replace
(file exp1fielgraph.png written in PNG format)

*** STEP 8. Use ciboundi to define the boundaries between the 3 patterns of
*** results for experiment c8exper1
```

```
ciboundi `meanc' `sec' `meanq' `seq' `rho' `dof' 0.95

T-scores and CI that define boundaries
between patterns 1, 2, and 3

  Pattern 1/2 boundary

    T-score for 1/2 boundary:         5.1948052
    Boundary CI:                      99.99997 %
    Approximate limits at boundary
       Lower limit:                   -42100
       Upper limit:                   4.397e+17

  Pattern 2/3 boundary

    T-score for widest definable CI:  10.921696
    Widest definable CI:              100 %
    Upper and lower limits, widest
       defineable CI:                 -184158


*** STEP 9. Calculate NMB and its CI for varying values of WTP

nmbi `meanc' `sec' `meanq' `seq' `rho' `dof' 0.95

  WTP, NMB, CI, and P-Values
```

WTP	NMB	95 % Lower limit	95 % Upper limit	P-value
-42079	-1421	-1958	-883	0.0000
-28588	-1286	-1853	-719	0.0000
-25652	-1257	-1830	-683	0.0000
-23852	-1239	-1817	-661	0.0000
-22537	-1225	-1806	-644	0.0000
-21495	-1215	-1799	-631	0.0001
-20629	-1206	-1792	-621	0.0001
-19886	-1199	-1786	-611	0.0001
-19234	-1192	-1781	-603	0.0001
-18653	-1187	-1777	-596	0.0001
-14557	-1146	-1746	-545	0.0002
-10732	-1107	-1718	-497	0.0004
-8368	-1084	-1700	-467	0.0006
-6627	-1066	-1687	-445	0.0008
-5237	-1052	-1677	-428	0.0010
-4075	-1041	-1668	-413	0.0012
-3073	-1031	-1661	-400	0.0014
-2189	-1022	-1655	-389	0.0016
-1397	-1014	-1649	-379	0.0018
-679	-1007	-1644	-370	0.0020
0	-1000	-1639	-361	0.0022
4306	-957	-1607	-307	0.0040
7458	-925	-1584	-267	0.0060
9817	-902	-1567	-236	0.0080
11724	-883	-1554	-212	0.0100
13338	-867	-1542	-191	0.0120
14744	-853	-1532	-173	0.0140
15994	-840	-1523	-157	0.0160
17124	-829	-1515	-143	0.0180
18156	-818	-1507	-129	0.0200
19109	-809	-1501	-117	0.0220
20000	-800	-1494	-106	0.0240
26111	-739	-1451	-27	0.0420
28184	-718	-1436	-0	0.0500
30000	-700	-1424	24	0.0579
30872	-691	-1417	35	0.0620
34606	-654	-1391	83	0.0820
37740	-623	-1369	124	0.1020
40476	-595	-1350	160	0.1220
42928	-571	-1333	192	0.1420

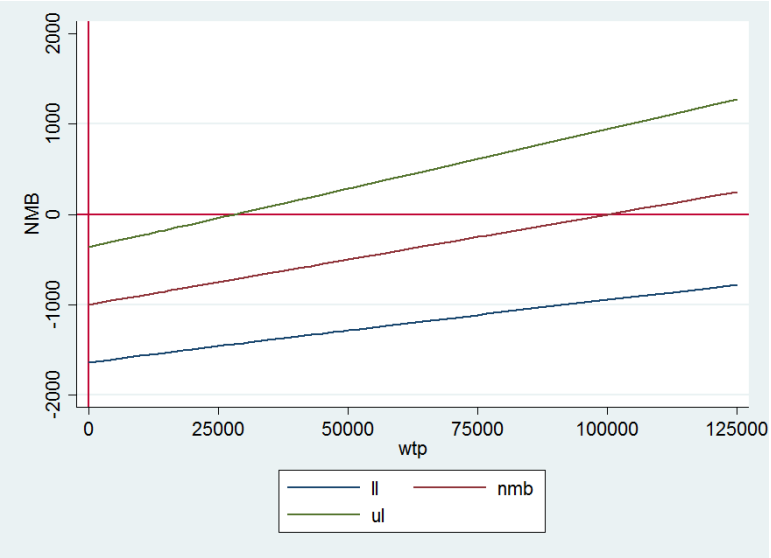
45166	-548	-1318	221	0.1620
47237	-528	-1303	248	0.1820
49174	-508	-1290	273	0.2020
50000	-500	-1284	284	0.2109
51002	-490	-1277	297	0.2220
57374	-426	-1233	381	0.3000
64436	-356	-1185	474	0.4000
70803	-292	-1142	558	0.5000
75000	-250	-1113	613	0.5697
76787	-232	-1101	637	0.6000
82576	-174	-1062	714	0.7000
88302	-117	-1024	790	0.8000
94076	-59	-985	866	0.9000
99984	-0	-945	945	0.9997
100000	0	-945	945	1.0000
106181	62	-904	1028	0.9000
112747	127	-861	1116	0.8000
119860	199	-813	1211	0.7000
125000	250	-780	1280	0.6335
127746	277	-761	1316	0.6000
136748	367	-702	1437	0.5000
147438	474	-632	1581	0.4000
150000	500	-615	1615	0.3789
160895	609	-544	1762	0.3000
174790	748	-454	1950	0.2220
179134	791	-426	2008	0.2020
179592	796	-423	2015	0.2000
183933	839	-395	2073	0.1820
189298	893	-360	2146	0.1620
195390	954	-320	2228	0.1420
202443	1024	-275	2324	0.1220
210825	1108	-221	2437	0.1020
211757	1118	-215	2450	0.1000
221160	1212	-154	2578	0.0820
234635	1346	-68	2761	0.0620
245218	1452	-0	2904	0.0500
253954	1540	56	3023	0.0420
287829	1878	272	3484	0.0220
293048	1930	305	3556	0.0200
298892	1989	343	3635	0.0180
305523	2055	385	3726	0.0160
313172	2132	433	3830	0.0140
322185	2222	491	3953	0.0120
333110	2331	560	4102	0.0100
346903	2469	647	4291	0.0080
365427	2654	765	4544	0.0060
393120	2931	940	4923	0.0040
445518	3455	1270	5640	0.0020
454128	3541	1324	5758	0.0018
463972	3640	1386	5893	0.0016
475438	3754	1458	6050	0.0014
489091	3891	1544	6238	0.0012
505840	4058	1650	6467	0.0010
527317	4273	1784	6762	0.0008
556729	4567	1969	7165	0.0006
601909	5019	2252	7786	0.0004
691380	5914	2813	9015	0.0002
819768	7198	3616	10780	0.0001
841451	7415	3751	11078	0.0001
867408	7674	3913	11435	0.0001
898933	7989	4110	11869	0.0001
938572	8386	4357	12414	0.0001
990939	8909	4684	13135	0.0000
1065609	9656	5150	14162	0.0000
1187359	10874	5909	15838	0.0000
1456387	13564	7585	19542	0.0000
32550537	324505	200941	448070	0.0000

Confidence Statements:

For WTP <28184.301, we can be 95% confident that the therapy

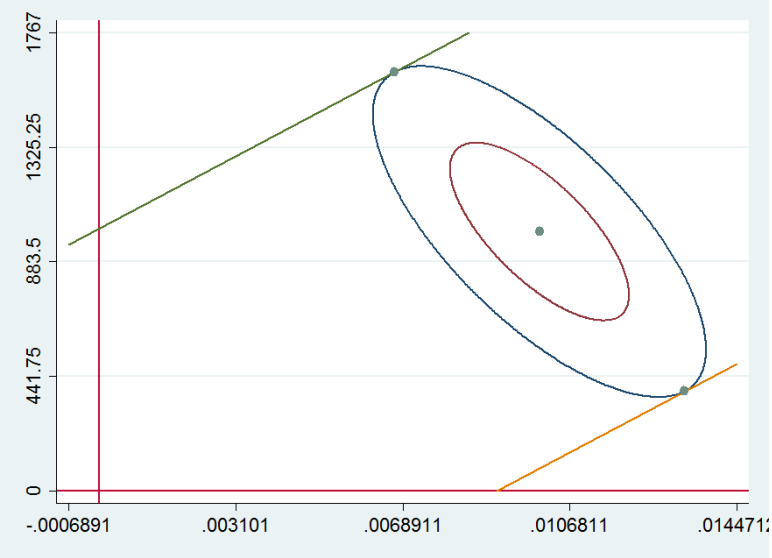
```
     with the larger point estimate for effect represents bad value;

     For WTP >=28184.301 and <=245218.33, we can't be 95% confident
     that the 2 therapies differ in value;

     For WTP > 245218.33, we can be 95% confident that the therapy
     with the larger point estimate for effect represents good value
     compared with the alternative
```

```
nmbgraph
```




```
graph export exp1nmbgraph.png,replace
(file exp1nmbgraph.png written in PNG format)

*** STEP 10. Calculate NMB and its CI for a single value of WTP

nmb1i `meanc' `sec' `meanq' `seq' `rho' 50000 `dof' 0.95

                                 95 %         95 %
                                Lower        Upper
         WTP          NMB       limit        limit     P-value

       90000         -100       -1012          812      0.8296

  Confidence Statements:

       We can't be 95% confident that the therapies differ
       in value

nmb1graph,ellipse


  NMB 95% confidence limits
     Lower limit:               -1012.27
     Upper limit:               812.27

  Ellipse estimates

     Lower limit:               -1012.2735
       Cost at tangency:        1616.1066
       Effect at tangency:      .00670926

     Upper limit:               812.27344
       Cost at tangency:        383.88687
       Effect at tangency:      .01329067
```

```
  Ellipse estimates are approximations.
  Mismatchs between CER limits and ellipse limits
  are due to the fact that the program estimates
  approximate tangencies with the ellipse
```

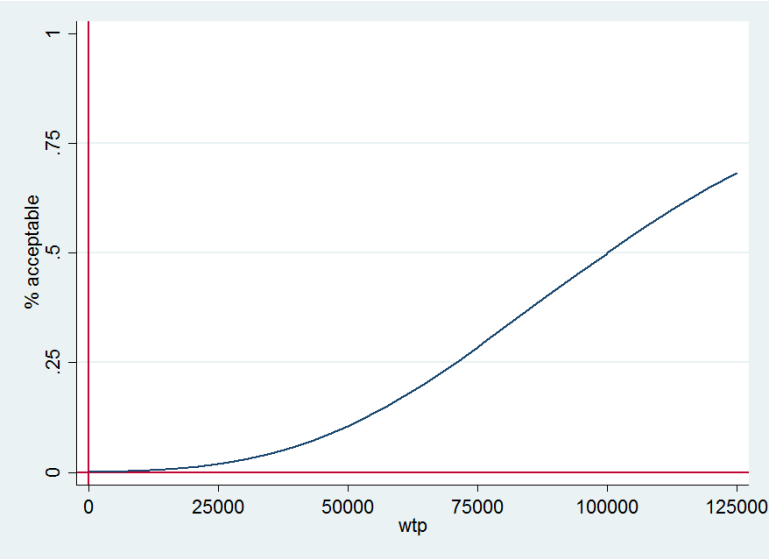



```
graph export exp1nmb1graph.png,replace
(file exp1nmb1graph.png written in PNG format)

*** STEP 11. Calculate the points defining the acceptability curve

accepti `meanc' `sec' `meanq' `seq' `rho' `dof'

  WTP, % Acceptable, and P-Value

         WTP      % Accept       P-value

      -42079       0.00000       0.0000
      -28588       0.00001       0.0000
      -25652       0.00001       0.0000
      -23852       0.00002       0.0000
      -22537       0.00002       0.0000
      -21495       0.00003       0.0001
      -20629       0.00003       0.0001
      -19886       0.00004       0.0001
      -19234       0.00004       0.0001
      -18653       0.00005       0.0001
      -14557       0.00010       0.0002
      -10732       0.00020       0.0004
       -8368       0.00030       0.0006
       -6627       0.00040       0.0008
       -5237       0.00050       0.0010
       -4075       0.00060       0.0012
       -3073       0.00070       0.0014
       -2189       0.00080       0.0016
       -1397       0.00090       0.0018
        -679       0.00100       0.0020
           0       0.00110       0.0022
        4306       0.00200       0.0040
        7458       0.00300       0.0060
        9817       0.00400       0.0080
       11724       0.00500       0.0100
       13338       0.00600       0.0120
       14744       0.00700       0.0140
       15994       0.00800       0.0160
       17124       0.00900       0.0180
```

18156	0.01000	0.0200
19109	0.01100	0.0220
20000	0.01201	0.0240
26111	0.02100	0.0420
28184	0.02500	0.0500
30000	0.02895	0.0579
30872	0.03100	0.0620
34606	0.04100	0.0820
37740	0.05100	0.1020
40476	0.06100	0.1220
42928	0.07100	0.1420
45166	0.08100	0.1620
47237	0.09100	0.1820
49174	0.10100	0.2020
50000	0.10545	0.2109
51002	0.11100	0.2220
57374	0.15000	0.3000
64436	0.20000	0.4000
70803	0.25000	0.5000
75000	0.28483	0.5697
76787	0.30000	0.6000
82576	0.35000	0.7000
88302	0.40000	0.8000
94076	0.45000	0.9000
99984	0.49987	0.9997
100000	0.50000	1.0000
106181	0.55000	0.9000
112747	0.60000	0.8000
119860	0.65000	0.7000
125000	0.68325	0.6335
127746	0.70000	0.6000
136748	0.75000	0.5000
147438	0.80000	0.4000
150000	0.81057	0.3789
160895	0.85000	0.3000
174790	0.88900	0.2220
179134	0.89900	0.2020
179592	0.90000	0.2000
183933	0.90900	0.1820
189298	0.91900	0.1620
195390	0.92900	0.1420
202443	0.93900	0.1220
210825	0.94900	0.1020
211757	0.95000	0.1000
221160	0.95900	0.0820
234635	0.96900	0.0620
245218	0.97500	0.0500
253954	0.97900	0.0420
287829	0.98900	0.0220
293048	0.99000	0.0200
298892	0.99100	0.0180
305523	0.99200	0.0160
313172	0.99300	0.0140
322184	0.99400	0.0120
333110	0.99500	0.0100
346903	0.99600	0.0080
365428	0.99700	0.0060
393119	0.99800	0.0040
445517	0.99900	0.0020
454125	0.99910	0.0018
463974	0.99920	0.0016
475438	0.99930	0.0014
489088	0.99940	0.0012
505844	0.99950	0.0010
527319	0.99960	0.0008
556725	0.99970	0.0006
601894	0.99980	0.0004
691403	0.99990	0.0002
819650	0.99995	0.0001
841565	0.99996	0.0001
867505	0.99996	0.0001

```
      899005       0.99997       0.0001
      938604       0.99997       0.0001
      990899       0.99998       0.0000
     1065425       0.99998       0.0000
     1186807       0.99999       0.0000
     1454224       0.99999       0.0000
```

accgraph

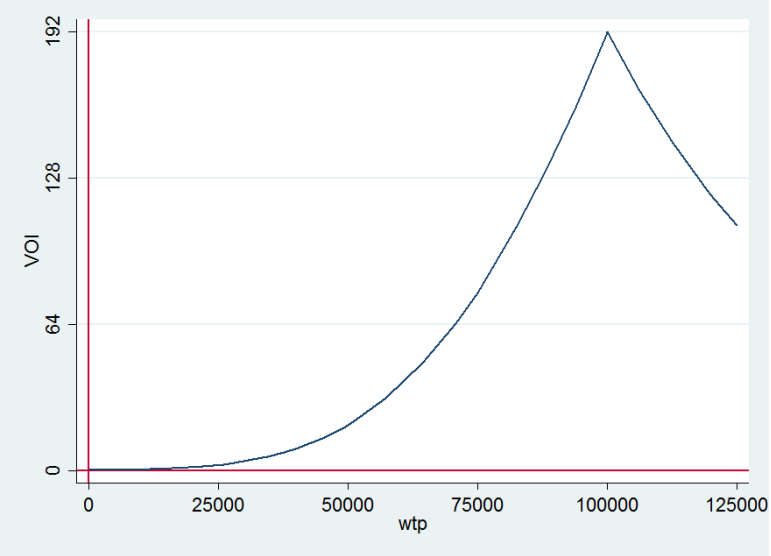



```
graph export exp1accgraph.png,replace
(file exp1accgraph.png written in PNG format)

*** STEP 12. Calculate the % acceptable for a single value of WTP

accept1i `meanc' `sec' `meanq' `seq' `rho' 50000 `dof'

         WTP     % Accept       P-value

       90000       0.41478       0.8296


*** STEP 13. Calculate the points defining the per-person VOI curve

voii `meanc' `sec' `meanq' `seq' `rho' `dof'

  WTP and VOI

                    Value of
         WTP        Information

    -1000000        0.00
     -750000        0.00
     -500000        0.00
     -250000        0.00
     -100000        0.00
      -42079        0.00
      -28588        0.00
      -25652        0.00
      -23852        0.00
      -22537        0.00
      -21495        0.00
      -20629        0.00
      -19886        0.00
      -19234        0.00
      -18653        0.00
```

-14557	0.00
-10732	0.01
-8368	0.02
-6627	0.02
-5237	0.03
-4075	0.04
-3073	0.04
-2189	0.05
-1397	0.06
-679	0.07
0	0.08
4306	0.16
7458	0.26
9817	0.36
11724	0.47
13338	0.59
14744	0.70
15994	0.83
17124	0.95
18156	1.08
19109	1.21
20000	1.35
26111	2.65
28184	3.28
30000	3.92
30872	4.26
34606	6.01
37740	7.89
40476	9.87
42928	11.96
45166	14.14
47237	16.42
49174	18.79
50000	19.87
51002	21.24
57374	31.65
64436	46.89
70803	64.30
75000	77.79
76787	84.03
82576	106.29
88302	131.39
94076	159.73
99984	191.77
100000	191.86
106181	166.69
112747	143.18
119860	121.15
125000	107.24
127746	100.44
136748	80.93
147438	62.54
150000	58.79
160895	45.22
174790	32.43
179134	29.25
179592	28.93
183933	26.12
189298	23.03
195390	19.98
202443	16.99
210825	14.04
211757	13.75
221160	11.14
234635	8.30
245218	6.62
253954	5.52
287829	2.82
293048	2.55
298892	2.29
305523	2.02

```
      313172         1.76
      322184         1.50
      333110         1.24
      346903         0.99
      365428         0.73
      393119         0.48
      445517         0.23
      454125         0.21
      463974         0.19
      475438         0.16
      489088         0.14
      505844         0.11
      527319         0.09
      556725         0.07
      601894         0.04
      691403         0.02
      819650         0.01
      841565         0.01
      867505         0.01
      899005         0.01
      938604         0.00
      990899         0.00
     1065425         0.00
     1186807         0.00
     1454224         0.00
 2.30552e+13         641.38
```

```
voigraph
```




```
graph export exp1voigraph.png,replace
(file exp1voigraph.png written in PNG format)


*** STEP 14. Calculate the per-person VOI for a single value of WTP

voi1i `meanc' `sec' `meanq' `seq' `rho' 90000 `dof'

                    Value of
        WTP         Information

      90000         139.41


.
. log close
      name:  <unnamed>
```

```
      log:  C:\henry\HGBOOKee\secondedition\webmat\iprogslog.log
 log type:  text
closed on:  20 Jul 2015, 15:08:31
-------------------------------------------------------------------------------------------------
```