

```

1  cls;
2
3  /* ***** */
4  /* Monte Carlo Experiment to Estimate Sampling Distribution of Multipliers */
5  /* ***** */
6
7  //load path = Documents\;
8  //load x[36,2] = ConsumptionData.txt;
9  x = 700 + 1500*randu(100,1);
10 n = rows(x);
11 y = x[:,1];
12 x = ones(n,1)~y;
13 mpc = 0.8;
14 ac = 500;
15 sig = 10;
16 loops = 5000;
17 mults = zeros(loops,1);
18 for i(1,loops,1);
19 c = ac + 0.8*y + sig*randn(n,1);
20 //c = ac + 0.8*y + sig*randu(n,1)-sig/2;
21 b = inv(x'*x)*x'*c;
22 mults[i] = 1/(1-b[2]);
23 endfor;
24 multdist = sortc(mults,1);
25 mult025 = multdist[125];
26 mult975 = multdist[4875];
27 library pgraph;
28 graphset;
29 Title("Estimated Sampling Distribution for the Multiplier from Monte Cristo");
30 {k,m,f} = hist(mults,20);
31 print;
32 print"The 95% confidence interval for the multiplier from the Monte Cristo
33 experimant is [" mult025 "," mult975 "];
34 print;
35 /* ***** */
36 /* Bootstrap to Estimate Sampling Distribution of Multipliers */
37 /* ***** */
38
39 loops1 = 5000;
40 e = c - x*b;
41 multbs = zeros(loops1,1);
42 for j (1,loops1,1);
43 edraws = zeros(n,1);
44 for t(1,n,1);
45 rint = ceil(n*randu(n,1));
46 edraws[t] = e[rint[t]];
47 endfor;
48 cb = x*b + sqrt(n/(n-2))*edraws;
49 bb = inv(x'*x)*x'*cb;
50 multbs[j] = 1/(1-bb[2]);
51 endfor;
52 multbdist = sortc(multbs,1);
53 multb025 = multbdist[125];
54 multb975 = multbdist[4875];
55 library pgraph;
56 graphset;
57 Title("Estimated Sampling Distribution for the Multiplier from Bootstrap");
58 {k,m,f} = hist(multbs,20);
59 print;
60 print"The 95% confidence interval for the multiplier from the bootstrap is ["
61 multb025 "," multb975 "];
62 print;

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63 /* ***** */
64 /* Delta Method to Estimate Confidence Interval */
65 /* ***** */
66
67 s2 = e'*e/(n-1);
68 invxx = inv(x'*x);
69 varb = s2*invxx[2,2];
70 varmult = 1/((1-b[2])^4)*varb;
71 multlo = 1/(1-b[2])-1.96*sqrt(varmult);
72 multhi = 1/(1-b[2])+1.96*sqrt(varmult);
73 print;
74 print"The 95% confidence interval for the multiplier from the delta method is
75 [" multlo "," multhi "];
76 print;
```