>> D=[ 21.89 45.1 220.4 1491 19;

22.29 50.9 259.5 1504 19.41;

19.63 53.3 256.3 1438 20.93;

22.85 53.6 249.3 1551 21.78;

33.77 54.6 352.3 1646 23.68;

39.18 61.1 329.1 1349 26.01;

30.58 61.9 219.6 1224 27.52;

26.3 57.9 234.8 1382 26.89;

30.7 64.8 237.4 1553 26.85;

32.1 66.2 245.8 1296.1 27.23;

30 66.7 229.2 1365 25.46;

30.8 72.2 233.9 1492.5 23.88;

30.8 76.5 234.2 1634.9 22.62;

32.6 81.7 347 1561 23.72;

35.4 89.8 468.1 1509.7 24.5;

36.6 97.8 555 1195.8 24.5;

38.6 100 418 1321.9 24.98;

42.2 106.3 525.2 1545.4 25.58;

47.9 111.1 620.7 1499.5 27.18;

58.2 107.8 588.6 1469 28.72;

52 109.6 444.4 2084.5 29;

51.2 119.7 427.8 2378.5 26.67;

59.5 129.8 727.1 2057.5 25.33;

77.3 129.3 877.6 1352.5 34.06;

64.2 117.8 556.6 1171.4 39.79;

69.6 129.8 780.6 1547.6 44.49;

66.8 137.1 750.7 1989.8 51.35;

66.5 145.2 709.8 2023.3 54.42;

98.3 152.5 935.7 1749.2 61.01;

101.4 147.1 940.9 1298.5 70.87]

D =

1.0e+03 \*

0.0219 0.0451 0.2204 1.4910 0.0190

0.0223 0.0509 0.2595 1.5040 0.0194

0.0196 0.0533 0.2563 1.4380 0.0209

0.0229 0.0536 0.2493 1.5510 0.0218

0.0338 0.0546 0.3523 1.6460 0.0237

0.0392 0.0611 0.3291 1.3490 0.0260

0.0306 0.0619 0.2196 1.2240 0.0275

0.0263 0.0579 0.2348 1.3820 0.0269

0.0307 0.0648 0.2374 1.5530 0.0269

0.0321 0.0662 0.2458 1.2961 0.0272

0.0300 0.0667 0.2292 1.3650 0.0255

0.0308 0.0722 0.2339 1.4925 0.0239

0.0308 0.0765 0.2342 1.6349 0.0226

0.0326 0.0817 0.3470 1.5610 0.0237

0.0354 0.0898 0.4681 1.5097 0.0245

0.0366 0.0978 0.5550 1.1958 0.0245

0.0386 0.1000 0.4180 1.3219 0.0250

0.0422 0.1063 0.5252 1.5454 0.0256

0.0479 0.1111 0.6207 1.4995 0.0272

0.0582 0.1078 0.5886 1.4690 0.0287

0.0520 0.1096 0.4444 2.0845 0.0290

0.0512 0.1197 0.4278 2.3785 0.0267

0.0595 0.1298 0.7271 2.0575 0.0253

0.0773 0.1293 0.8776 1.3525 0.0341

0.0642 0.1178 0.5566 1.1714 0.0398

0.0696 0.1298 0.7806 1.5476 0.0445

0.0668 0.1371 0.7507 1.9898 0.0514

0.0665 0.1452 0.7098 2.0233 0.0544

0.0983 0.1525 0.9357 1.7492 0.0610

0.1014 0.1471 0.9409 1.2985 0.0709

>> n=30

n =

30

>> k=5

k =

5

>> Y=log(D(:,1))

Y =

3.0860

3.1041

2.9771

3.1290

3.5196

3.6682

3.4203

3.2696

3.4243

3.4689

3.4012

3.4275

3.4275

3.4843

3.5667

3.6000

3.6533

3.7424

3.8691

4.0639

3.9512

3.9357

4.0860

4.3477

4.1620

4.2428

4.2017

4.1972

4.5880

4.6191

>> % value of "X"

>> X=[ones(n,1) log(D(:,2)) log(D(:,3)) log(D(:,4)) log(D(:,5))]

X =

1.0000 3.8089 5.3954 7.3072 2.9444

1.0000 3.9299 5.5588 7.3159 2.9658

1.0000 3.9759 5.5463 7.2710 3.0412

1.0000 3.9815 5.5187 7.3467 3.0810

1.0000 4.0000 5.8645 7.4061 3.1646

1.0000 4.1125 5.7964 7.2071 3.2585

1.0000 4.1255 5.3918 7.1099 3.3149

1.0000 4.0587 5.4587 7.2313 3.2918

1.0000 4.1713 5.4697 7.3479 3.2903

1.0000 4.1927 5.5045 7.1671 3.3043

1.0000 4.2002 5.4346 7.2189 3.2371

1.0000 4.2794 5.4549 7.3082 3.1730

1.0000 4.3373 5.4562 7.3993 3.1188

1.0000 4.4031 5.8493 7.3531 3.1663

1.0000 4.4976 6.1487 7.3197 3.1987

1.0000 4.5829 6.3190 7.0866 3.1987

1.0000 4.6052 6.0355 7.1868 3.2181

1.0000 4.6663 6.2638 7.3430 3.2418

1.0000 4.7104 6.4308 7.3129 3.3025

1.0000 4.6803 6.3777 7.2923 3.3576

1.0000 4.6968 6.0967 7.6423 3.3673

1.0000 4.7850 6.0587 7.7742 3.2835

1.0000 4.8660 6.5891 7.6292 3.2320

1.0000 4.8621 6.7772 7.2097 3.5281

1.0000 4.7690 6.3218 7.0660 3.6836

1.0000 4.8660 6.6601 7.3445 3.7953

1.0000 4.9207 6.6210 7.5958 3.9387

1.0000 4.9781 6.5650 7.6125 3.9967

1.0000 5.0272 6.8413 7.4669 4.1110

1.0000 4.9911 6.8468 7.1690 4.2608

>> % now the value of beta

>> B=inv(X'\*X)\*X'\*Y

B =

-1.4971

0.4678

0.2794

-0.0056

0.4409

>> % now the value of "YP"

>> YP=X\*B

YP =

3.0501

3.1617

3.2133

3.2253

3.3672

3.4432

3.3617

3.3383

3.3927

3.4196

3.3737

3.3877

3.3907

3.5525

3.6948

3.7836

3.7228

3.8248

3.9191

3.9145

3.8461

3.8390

4.0032

4.1869

4.0854

4.2730

4.3495

4.3862

4.5376

4.5900

>> % now the residual value "E"

>> E=Y-YP

E =

0.0359

-0.0576

-0.2363

-0.0964

0.1524

0.2249

0.0586

-0.0687

0.0316

0.0492

0.0275

0.0398

0.0368

-0.0682

-0.1281

-0.1836

-0.0696

-0.0824

-0.0499

0.1494

0.1052

0.0967

0.0828

0.1608

0.0766

-0.0302

-0.1478

-0.1890

0.0504

0.0291

>> % Dermin Watson Formula "d"

>> e1=E(2:n,1)

e1 =

-0.0576

-0.2363

-0.0964

0.1524

0.2249

0.0586

-0.0687

0.0316

0.0492

0.0275

0.0398

0.0368

-0.0682

-0.1281

-0.1836

-0.0696

-0.0824

-0.0499

0.1494

0.1052

0.0967

0.0828

0.1608

0.0766

-0.0302

-0.1478

-0.1890

0.0504

0.0291

>> e2=E(1:n-1,1)

e2 =

0.0359

-0.0576

-0.2363

-0.0964

0.1524

0.2249

0.0586

-0.0687

0.0316

0.0492

0.0275

0.0398

0.0368

-0.0682

-0.1281

-0.1836

-0.0696

-0.0824

-0.0499

0.1494

0.1052

0.0967

0.0828

0.1608

0.0766

-0.0302

-0.1478

-0.1890

0.0504

>> d=(e1'\*e1+e2'\*e2-2\*e1'\*e2)/(E'\*E) % d statistics

d =

0.9545

>> % Theil - Nagar ro estimate based on "d" statistics

>> ro=(n^2\*(1-(d/2)+k^2))/(n^2-k^2)

ro =

26.2520

>> % large n, this estimate of ro is equal to one obtained by the simpler formula (1-d/2).

>>

>>