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 * Course: Econometrics 512
 * Topic:Impact of capital accumulation and Human capital on Economic Growth


 * Let's load the data from download folder
clear
set more off
webuse auto

use "/Users/imisiaiyetan/Downloads/Table2_1.dta"

* Problem 1a: Run the multiple regression

reg lnoutput lnlabor lncapital

* problem 1b: Regress lnoutput on lncapital to predict the first residual.
*Similarly, regress  lnlabour on lncapital to predict the second residual

reg lnoutput lncapital
predict e1, residuals

reg  lnlabor lncapital
predict e2, residuals

reg e1 e2


* problem 1c: The next procedure is to regress lnoutput on the second residual

reg lnoutput e2



* problem 2: IV regression


* problem 2a: Instrumental Variable regression. lnoutlab is used as an
*instrument in this regression. In that case, we replace lncapital with
*lnoutlab and lnoutput is regressed on lnlabor lnoutlab

ivregress gmm lnoutput lnlabor (lncapital = lnoutlab)


reg lnoutput lnlabor lnoutlab
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47
48  * problem 2b: To perform two stage least squares, predict
    lncapital_hat
49  *and thereafter regress lnoutput on lnlabour and lncapital_hat
50
51  predict lncapital_hat
52
53  reg lnoutput lnlabor lncapital_hat
54
55  * problem 2c: Regress lnoutput on lnlabor and lnoutlab and
    generate the
56  *first coefficient. Similarly, Regress lncapital on lnlabor and
    lnoutlab and
57  *generate the second coefficient
58
59  reg lnoutput lnlabor lnoutlab
60  mat beta = e(b)
61  svmat beta, names(matcol)
62
63  reg lncapital lnlabor lnoutlab
64  mat gamma = e(b)
65  svmat gamma, names(matcol)
66
67  * Take the ratio of the two coefficients derived
68
69  scalar alpha_hat1 = betalnoutlab/gammalnoutlab
70  display alpha_hat1
71
72  * problem 2d: Check using another approach, if we will arrive at
    the same
73  * alpha_hat1. The procedure is as follows
74
75  * regress lnoutlab on lnlabor and predict the first residuals
76
77  reg lnoutlab lnlabor
78  predict e_z, residuals
79
80  * regress lnoutput on lnlabor and predict the second residuals
81
82  reg lnoutput lnlabor
83  predict e_y, residuals
84
85  * regress lnoutlab on lnlabor and predict the third residuals
86
87  reg lncapital lnlabor
88  predict e_t, residuals
89
90  * Estimate the first covariance using the second and the first
    residuals
91
92  corr e_y e_z, covariance
93  scalar scov1 = r(cov_12)
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94
95  * Estimate the second covariance using the third and the first
    residuals
96
97  corr e_t e_z, covariance
98  scalar scov2 = r(cov_12)
99
100 * Finally, divide the first covariance by the second covariance.
101
102 scalar alpha_hat2 = scov1/scov2
103 display alpha_hat2
104
105
106
```