6104641300

```
-------------------------------------------------------------------------------
-------------------------------------------------------
      name:  <unnamed>
       log:  C:\Users\User\Desktop\EE 426 stata\assigmnet 7.log
  log type:  text
 opened on:  17 Mar 2021, 22:55:21

. use "C:\Users\User\Desktop\EE 426 stata\assign7.dta", clear

. xtset crossid time
       panel variable:  crossid (strongly balanced)
        time variable:  time, 40 to 44
                delta:  1 year

. xtgls y x1 x2 x3 x4 x5 x6 x7, igls panels(heteroskedastic)
Iteration 1: tolerance = .08868167
Iteration 2: tolerance = .05849043
Iteration 3: tolerance = .03525359
Iteration 4: tolerance = .02040677
Iteration 5: tolerance = .01187668
Iteration 6: tolerance = .00709681
Iteration 7: tolerance = .00441169
Iteration 8: tolerance = .00291535
Iteration 9: tolerance = .00321184
Iteration 10: tolerance = .00409533
Iteration 11: tolerance = .00580092
Iteration 12: tolerance = .00908183
Iteration 13: tolerance = .01574945
Iteration 14: tolerance = .02974716
Iteration 15: tolerance = .05103653
Iteration 16: tolerance = .04401112
Iteration 17: tolerance = .00723478
Iteration 18: tolerance = .00429598
Iteration 19: tolerance = .0028681
Iteration 20: tolerance = .00195025
Iteration 21: tolerance = .00134658
Iteration 22: tolerance = .00105022
Iteration 23: tolerance = .00117237
Iteration 24: tolerance = .00122304
Iteration 25: tolerance = .00122651
Iteration 26: tolerance = .00119949
Iteration 27: tolerance = .00115339
Iteration 28: tolerance = .00109594
Iteration 29: tolerance = .00103239
Iteration 30: tolerance = .00096626
Iteration 31: tolerance = .00089991
Iteration 32: tolerance = .0008349
Iteration 33: tolerance = .00077221
Iteration 34: tolerance = .00071245
Iteration 35: tolerance = .00065597
```

```
Iteration 36: tolerance = .00060292
Iteration 37: tolerance = .00055335
Iteration 38: tolerance = .00050721
Iteration 39: tolerance = .0004644
Iteration 40: tolerance = .00042478
Iteration 41: tolerance = .0003882
Iteration 42: tolerance = .00035448
Iteration 43: tolerance = .00032344
Iteration 44: tolerance = .00029493
Iteration 45: tolerance = .00026875
Iteration 46: tolerance = .00024476
Iteration 47: tolerance = .00022279
Iteration 48: tolerance = .00020268
Iteration 49: tolerance = .0001843
Iteration 50: tolerance = .00016751
Iteration 51: tolerance = .00015219
Iteration 52: tolerance = .00013821
Iteration 53: tolerance = .00012547
Iteration 54: tolerance = .00011386
Iteration 55: tolerance = .0001033
Iteration 56: tolerance = .00009368
Iteration 57: tolerance = .00008494
Iteration 58: tolerance = .00007699
Iteration 59: tolerance = .00006977
Iteration 60: tolerance = .00006321
Iteration 61: tolerance = .00005725
Iteration 62: tolerance = .00005184
Iteration 63: tolerance = .00004694
Iteration 64: tolerance = .00004249
Iteration 65: tolerance = .00003846
Iteration 66: tolerance = .0000348
Iteration 67: tolerance = .00003149
Iteration 68: tolerance = .00002849
Iteration 69: tolerance = .00002577
Iteration 70: tolerance = .00002331
Iteration 71: tolerance = .00002108
Iteration 72: tolerance = .00001906
Iteration 73: tolerance = .00001724
Iteration 74: tolerance = .00001559
Iteration 75: tolerance = .00001409
Iteration 76: tolerance = .00001274
Iteration 77: tolerance = .00001151
Iteration 78: tolerance = .00001041
Iteration 79: tolerance = 9.406e-06
Iteration 80: tolerance = 8.501e-06
Iteration 81: tolerance = 7.683e-06
Iteration 82: tolerance = 6.943e-06
Iteration 83: tolerance = 6.274e-06
Iteration 84: tolerance = 5.669e-06
Iteration 85: tolerance = 5.122e-06
```

```
Iteration 86: tolerance = 4.628e-06
Iteration 87: tolerance = 4.182e-06
Iteration 88: tolerance = 3.778e-06
Iteration 89: tolerance = 3.413e-06
Iteration 90: tolerance = 3.084e-06
Iteration 91: tolerance = 2.786e-06
Iteration 92: tolerance = 2.517e-06
Iteration 93: tolerance = 2.274e-06
Iteration 94: tolerance = 2.054e-06
Iteration 95: tolerance = 1.855e-06
Iteration 96: tolerance = 1.676e-06
Iteration 97: tolerance = 1.514e-06
Iteration 98: tolerance = 1.368e-06
Iteration 99: tolerance = 1.235e-06
Iteration 100: tolerance = 1.116e-06
Iteration 101: tolerance = 1.008e-06
Iteration 102: tolerance = 9.105e-07
Iteration 103: tolerance = 8.224e-07
Iteration 104: tolerance = 7.428e-07
Iteration 105: tolerance = 6.710e-07
Iteration 106: tolerance = 6.060e-07
Iteration 107: tolerance = 5.474e-07
Iteration 108: tolerance = 4.944e-07
Iteration 109: tolerance = 4.466e-07
Iteration 110: tolerance = 4.034e-07
Iteration 111: tolerance = 3.643e-07
Iteration 112: tolerance = 3.291e-07
Iteration 113: tolerance = 2.972e-07
Iteration 114: tolerance = 2.684e-07
Iteration 115: tolerance = 2.425e-07
Iteration 116: tolerance = 2.190e-07
Iteration 117: tolerance = 1.978e-07
Iteration 118: tolerance = 1.786e-07
Iteration 119: tolerance = 1.613e-07
Iteration 120: tolerance = 1.457e-07
Iteration 121: tolerance = 1.316e-07
Iteration 122: tolerance = 1.189e-07
Iteration 123: tolerance = 1.074e-07
Iteration 124: tolerance = 9.697e-08
```

a)

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        heteroskedastic
Correlation:   no autocorrelation

Estimated covariances      =       255          Number of obs     =      1,275
Estimated autocorrelations =         0          Number of groups  =        255
Estimated coefficients     =         8          Time periods      =          5
```

```
                                                Wald chi2(7)      =    3850.64
Log likelihood              =   519.361         Prob > chi2       =     0.0000

------------------------------------------------------------------------------
           y |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |   .0834067   .0045748    18.23   0.000     .0744403    .0923732
          x2 |   .0163976   .0032919     4.98   0.000     .0099456    .0228497
          x3 |  -.3631261   .0505673    -7.18   0.000    -.4622362    -.264016
          x4 |   .3191455   .1093883     2.92   0.004     .1047484    .5335426
          x5 |  -.1093301   .0043601   -25.07   0.000    -.1178758   -.1007844
          x6 |   .1361732   .0275038     4.95   0.000     .0822667    .1900797
          x7 |  -.2282655   .0063087   -36.18   0.000    -.2406303   -.2159007
       _cons |   -.037658   .0426502    -0.88   0.377    -.1212509    .0459349
------------------------------------------------------------------------------

. est store hetero

. xtgls y x1 x2 x3 x4 x5 x6 x7

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs     =      1,275
Estimated autocorrelations =         0          Number of groups  =        255
Estimated coefficients     =         8          Time periods      =          5
                                                Wald chi2(7)      =     899.95
Log likelihood              =  209.4322         Prob > chi2       =     0.0000

------------------------------------------------------------------------------
           y |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |   .0794732   .0093881     8.47   0.000     .0610728    .0978735
          x2 |   .0183375   .0051421     3.57   0.000     .0082592    .0284158
          x3 |   .0977707   .0526329     1.86   0.063    -.0053879    .2009293
          x4 |   .0873838   .2186064     0.40   0.689    -.3410767    .5158444
          x5 |  -.1076457   .0069214   -15.55   0.000    -.1212114   -.0940801
          x6 |  -.1432493   .0186811    -7.67   0.000    -.1798637    -.106635
          x7 |  -.2712849    .011995   -22.62   0.000    -.2947946   -.2477753
       _cons |  -.0107965   .0860341    -0.13   0.900    -.1794201    .1578272
------------------------------------------------------------------------------

. est store pgls

. local df = e(N_g) - 1

. lrtest hetero, df(`df')
```

H_0 is rejected (P-value < 0.03) , heteroskedastic exist

```
Likelihood-ratio test                                 LR chi2(254)=    619.86
(Assumption: pgls nested in hetero)                   Prob > chi2 =    0.0000

. xtgls y x1 x2 x3 x4 x5 x6 x7

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =      1,275
Estimated autocorrelations =         0          Number of groups   =        255
Estimated coefficients     =         8          Time periods       =          5
                                                Wald chi2(7)       =     899.95
Log likelihood             =  209.4322          Prob > chi2        =     0.0000

------------------------------------------------------------------------------
           y |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |   .0794732   .0093881     8.47   0.000     .0610728    .0978735
          x2 |   .0183375   .0051421     3.57   0.000     .0082592    .0284158
          x3 |   .0977707   .0526329     1.86   0.063    -.0053879    .2009293
          x4 |   .0873838   .2186064     0.40   0.689    -.3410767    .5158444
          x5 |  -.1076457   .0069214   -15.55   0.000    -.1212114   -.0940801
          x6 |  -.1432493   .0186811    -7.67   0.000    -.1798637    -.106635
          x7 |  -.2712849    .011995   -22.62   0.000    -.2947946   -.2477753
       _cons |  -.0107965   .0860341    -0.13   0.900    -.1794201    .1578272
------------------------------------------------------------------------------

. xtreg y x1 x2 x3 x4 x5 x6 x7, fe

Fixed-effects (within) regression               Number of obs      =      1,275
Group variable: crossid                         Number of groups   =        255

R-sq:                                           Obs per group:
     within  = 0.3772                                         min =          5
     between = 0.1103                                         avg =        5.0
     overall = 0.1644                                         max =          5

                                                F(7,1013)          =      87.64
corr(u_i, Xb)  = -0.2003                        Prob > F           =     0.0000

------------------------------------------------------------------------------
           y |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |  -.1256447   .0180942    -6.94   0.000     -.161151   -.0901384
          x2 |   .0123739    .008023     1.54   0.123    -.0033697    .0281176
          x3 |   .0747825    .039773     1.88   0.060    -.0032643    .1528293
```

```
          x4 |   .6493144   .2855092     2.27   0.023     .0890573    1.209572
          x5 |  -.1104883   .0061097   -18.08   0.000    -.1224773   -.0984992
          x6 |  -.1461423   .0141035   -10.36   0.000    -.1738178   -.1184669
          x7 |  -.0951497   .0121853    -7.81   0.000    -.1190611   -.0712383
       _cons |   1.756067   .1658407    10.59   0.000     1.430636    2.081497
-------------+----------------------------------------------------------------
     sigma_u |  .22676694
     sigma_e |  .11725953
         rho |  .78902632   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(254, 1013) = 11.40                     Prob > F = 0.0000

. est store fixed

. xtreg y x1 x2 x3 x4 x5 x6 x7, re

Random-effects GLS regression                   Number of obs     =      1,275
Group variable: crossid                         Number of groups  =        255

R-sq:                                           Obs per group:
     within  = 0.3492                                         min =          5
     between = 0.3404                                         avg =        5.0
     overall = 0.3377                                         max =          5

                                                Wald chi2(7)      =     663.43
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000

------------------------------------------------------------------------------
           y |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |  -.0145018   .0133366    -1.09   0.277     -.040641    .0116375
          x2 |   .0146948   .0064463     2.28   0.023     .0020604    .0273292
          x3 |   .0985565   .0399464     2.47   0.014      .020263    .1768501
          x4 |   .4693539   .2493856     1.88   0.060    -.0194329    .9581407
          x5 |  -.1117985    .005959   -18.76   0.000    -.1234779    -.100119
          x6 |  -.1541318    .014125   -10.91   0.000    -.1818163   -.1264472
          x7 |  -.1494529   .0115006   -13.00   0.000    -.1719937   -.1269122
       _cons |   .7714573   .1226841     6.29   0.000     .5310009    1.011914
-------------+----------------------------------------------------------------
     sigma_u |  .15944933
     sigma_e |  .11725953
         rho |  .64900604   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. est store re

. hausman fixed re

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
```

Reject H_0

```
             |     fixed          re         Difference          S.E.
-------------+----------------------------------------------------------------
          x1 |   -.1256447    -.0145018       -.1111429        .0122284
          x2 |    .0123739     .0146948       -.0023208        .0047765
          x3 |    .0747825     .0985565       -.0237741               .
          x4 |    .6493144     .4693539        .1799605        .1390048
          x5 |   -.1104883    -.1117985        .0013102        .0013484
          x6 |   -.1461423    -.1541318        .0079894               .
          x7 |   -.0951497    -.1494529        .0543033        .0040273
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =      190.39
                Prob>chi2 =      0.0000
                (V_b-V_B is not positive definite)
```

reject H_0

```
. log close
      name:  <unnamed>
       log:  C:\Users\User\Desktop\EE 426 stata\assigmnet 7.log
  log type:  text
 closed on:  17 Mar 2021, 22:57:24
-------------------------------------------------------------------------------
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```

there is fixed effect exist according to fixed effect test and for hausman test which H_0 is rejected. So, the fixed effect is the most appropriate one.