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Replication: "Can Mobile Phones Improve Learning? Evidence from a Field Experiment in Niger." (Aker, Ksoll, and Lybbert, 2012)

Abstract:

For decades, economists questioned about why there has been gaps in the level of wealth between countries. Up to now, so many researches have shown that the level of people's education has a positive effect on a country's per-capita GDP. In addition, mobile phone usage is getting common in our daily life. Therefore, we can probe into how mobile phone usage can play an important role on improving students' educational gains. This study set a random experiment in Niger to evaluate the treatment effect of using mobile phone on improving learning. The empirical results show that an intervention that taught adult students how to practice a mobile phone can indeed help them develop their math and writing performance. The treatment effect is rather large and robust even after including age, gender, regions, villages as the controls. As a result, even using a simple technology can improve educational outcomes in a developing region in a large magnitude.

Keywords: Education outcomes; mobile phone; literacy; math; program evaluation; Niger

1. Introduction and Literature Review

Economic inequality between countries is getting wider and wider. One of the measures to judge the level of a country's economic development facts is per-capita GDP (S. Parente and E. Prescott, 1993). Meanwhile, there is a significantly positive relationship between per-capita GDP and literacy rate (M. Rahman, 2013). Thus, how to improve citizens' average knowledge level become an important issue around the world. Immersing in this world full of new technologies, one tool to influence the academic performance is by means of mobile phone. People might have incentives to boost their reading and writing skill because they'd like to use these skills in Short Message Service (or SMS), at work, and in everyday life. However, the effect of mobile phone on learning is still ambiguous. Ksoll (2014) found that without teachers' instruction, cellphone could significantly increase students' fundamental and extensive reading scores. On the contrary, students who were actively using their mobile phones during classes wrote down 38% less information in their notes and scored lower than those students who were not using their mobile phones (J. Kuznekoff and S. Titsworth, 2013). Spending time on mobile phone had the negative effect on students' academic performance (M. Hossain1, 2019). Hence, we are not sure the effect of mobile phone usage on learning will be beneficial or detrimental before we've studied it. In this paper, we estimate the influence of mobile phone usage on adult students' learning via setting a random experiment in Niger.

2. Experimental Design

Project ABC was a random experiment implemented by Catholic Relief Services (or CRS) in two agricultural areas of Niger, Dosso and Zinder. Although there were up to 140 villages be intervened by CRS, only 117 villages across the two regions were qualified for the study. Then through a random number generator, 55 villages were chosen to engage in the first year of classes in 2009, with 28 villages were selected to take part in the ABC program. This approach was executed again in 2010 for the second-year setting. In summary, for this 2-year study, 58 villages were assigned to the treatment group (or ABC group), on the other hand, 55 villages were assigned to the control group (or non-ABC group). For the both groups, all classes taught basic literacy and numeracy knowledge; but the ABC group also learned how to use a mobile phone to recognize numbers and letters and read and write

SMS, while the control group participants did not. We administered two types of tests for collecting our educational outcomes (the normalized test scores: z-scores): math and writing tests. Totally, we had five tests in this two-years program. The first one was in January 2009, testing for 2009 and 2010 cohorts' basis before the program started. The follow-up tests with the 2009 cohort in June 2009 and with both cohorts in June 2010. Seven months after finishing the classes, we tested for the 2009 cohort in January 2010 and for the 2010 cohorts in January 2011 as well.

3. Data and Sample Statistics

In this study, we primarily exploited three different data sets to analyze the effects of mobile phones usage on improving rural adult students' knowledge. First, the most important one is the "Test Score Data", which collected the numeracy and literacy tests scores, villages, and other control variables from students before and after the ABC program. In addition, the "Student Data" contained detailed information on each student's household characteristics; the "Teacher Data" provided us with valuable clues to study teachers' properties at the individual level. These data sets allowed us to examine the structure of the program rigorously.

To begin with, we considered the following model:

$$\textit{Test score} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1}\textit{Mobile phone} + \textit{controls} + \textit{u},$$

where Mobile phone is a dummy variable for whether the individual uses a mobile phone. However, the potential threats to validity of the OLS estimate of $\boldsymbol{\beta_1}$ in this model in the absence of a random experiment is omitting variable bias. Because some students might have higher ability and motivation to learn how to use mobile phone, and then their test scores will be higher as well; however, we cannot capture this effect by the model. This bias will cause consistent estimation of the effect of mobile phone use on test scores to be infeasible by OLS. Therefore, we need to design a random experiment to solve this problem. The validity of a random experiment setting is built without *"contamination of the randomization"*. Namely, we have to check the pre-program sample statistics ahead to detect if the issue raised.

As can be seen in Table 1, Panel A, Column (4), the estimated differences in the means

of pre-program household characteristics between the ABC villages and non-ABC villages are small and statistically insignificant at the 5% significance level. Therefore, our random experiment was set properly.

On the other hand, in Table 1, Panel B, Column (4), the estimated differences in the means of the education level of the teachers in the treatment and control villages in the baseline period (year 2009) is different from zero significantly at the 5% level; all other sample means for both groups seem close to each other. Moreover, as is evident from Table 1, Panel C, Column (4), for the average math and writing z-test scores, the differences in the mean between the ABC and non-ABC villages are statistically insignificant at the 5% level, that is, before the program was started, the test scores were equivalent statistically for both groups.

4. Econometric Model and Estimation Results

The econometrics strategy we used in this paper is the Difference-In-Differences (DID) estimator, which can be obtained by estimating a regression model with an interaction term as follows:

$$Test\ score = \beta_0 + \beta_1 ABC + \beta_2 Post + \beta_3 (ABC*Post) + u \quad \text{----------(1)}$$

where $Test\ score$ the learning outcome of interest (math or writing z-test score); ABC = 1 for the treatment villages, and 0 otherwise; Post = 1 if after the intervention, and 0 otherwise. In terms of the parameters of the model, the difference-in-difference estimator of the effect of the mobile phone usage is:

$$[E(Test\ score|\ ABC=1, Post=1) - E(Test\ score|\ ABC=1, Post=0)]$$
$$- [E(Test\ score|\ ABC=0, Post=1) - E(Test\ score|\ ABC=0, Post=0)]$$
$$= [(\beta_0+\beta_1+\beta_2+\beta_3) - (\beta_0+\beta_1)] - [(\beta_0+\beta_2) - (\beta_0)] = \beta_3$$

The key assumption for validity of the DID results is that there was a common trend in the test scores for both treatment and control groups; and this holds in the context of our model because we've already set a random experiment successfully.

Starting from equation (1), as shown in Table 2, Panel A and B, Column (2), the DID estimates for math and writing z-test score are 0.246 and 0.19 separately, which means on

average, the math score is increased by 0.246 z-points and writing score is increased by 0.19 z-points due to the program (mobile phone use), assuming that the average test scores of both ABC villages and non-ABC villages had the same trend, ceteris paribus. Furthermore, these estimates are also statistically significant and economically significant in magnitude. Consequently, mobile phone use indeed has a considerable effect on improving adult students' learning.

We also modeled other three specifications by controlling age, gender, regions, and villages as follows:

$$\textit{Test score} = \beta_0 + \beta_1 ABC + \beta_2 Post + \beta_3 (ABC*Post) + \beta_4 Age + \beta_5 Female + \beta_i \sum_6^8 Region_i + u \quad \text{----------(2)}$$

$$\textit{Test score} = \beta_0 + \beta_1 ABC + \beta_2 Post + \beta_3 (ABC*Post) + \beta_4 Age + \beta_5 Age^2 + \beta_6 Female + \beta_i \sum_7^9 Region_i + u \quad \text{----------(3)}$$

$$\textit{Test score} = \beta_0 + \beta_1 ABC + \beta_2 Post + \beta_3 (ABC*Post) + \beta_4 Age + \beta_5 Age^2 + \beta_6 Female + \beta_i \sum_7^{118} Village_i + u \quad \text{----------(4)}$$

Table 2, Panel A and B, Column (3) presents the results of equation (2). The DID estimates for math and writing z-test score are 0.259 and 0.2 separately after including age, gender, and regions as controls. These estimates are close to previous ones and still statistically significant, i.e., the model is rather robust.

Moreover, it is likely the relationship between age and test scores is non-linear. Table 2, Panel A and B, Column (4) reveals the results of equation (3), then we can check if there exists the relationship by the following F-test:

$$H_0: \beta_4 = \beta_5 = 0$$

$$H_1: H_0 \text{ is not true}$$

The corresponding *p-values* for both math and writing test scores are zero to the fourth decimal. Accordingly, age and age square are jointly significant at the 1% level in each model. Based on this, we should keep age square in the model.

Finally, in order to control the differences across villages, we extend our model by adding village dummies. The results of equation (4) displays in Table 2, Panel A and B, Column (5), the DID estimates for math and writing z-test score are 0.258 and 0.198

separately after including age, gender, and villages as controls. These estimates are still close to previous ones and statistically significant, i.e., our conclusions don't change a lot regarding the effect of mobile phone learning on math and writing test scores. So, the model is robust to including controls for the village fixed effects.

5. Concluding Remarks

Although there was a vague impact of mobile phone usage on improving learning, ABC program successfully demonstrates that this effect was significantly positive. The DID estimates stand for the treatment effect in our models, and it shows that an intervention that taught adult students how to practice a mobile phone can indeed help them develop their math and writing performance in Niger. The treatment effect is rather large and robust: the program increases the math scores by almost 0.25 z-points and increases the writing scores by around 0.2 z-points as well; even after we include age, gender, regions, and villages as the controls, the treatment effect doesn't change a lot. Furthermore, we also find that the relationship between age and test scores is non-linear and negative significantly, which means on average, older students have lower math and writing scores than younger students. Finally, these results suggest that even using a simple technology can improve educational outcomes in a developing region in a large magnitude.

6. References

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Table 1: Household and teacher characteristics in the treatment and control regions

Characteristic	ABC Villages Sample Mean	Non-ABC Villages Sample Mean	Estimated Difference in Means (p-value of the two-sided alternative)
Panel A: Household			
Age of respondent	37.18	37.86	0.69
			(0.37)
Respondent is a household head	0.55	0.56	0.01
			(0.68)
Number of asset categories owned	4.98	4.99	0.01
			(0.91)
Respondent owns a mobile phone	0.40	0.39	-0.01
			(0.83)
Respondent has used a mobile phone	0.57	0.54	-0.03
			(0.32)
Panel B: Teacher			
Education (number of years)	8.86	8.25	-0.61
			(0.08)*
Age	32.25	33.07	0.82
			(0.59)
Gender (female = 1)	0.34	0.25	-0.09
			(0.29)
Local (teacher from village = 1)	0.67	0.76	0.1
			(0.25)
Panel C: Test Score			
Math test score	0.01	-0.00	-0.01
			(0.79)
Writing test score	0.02	-0.00	-0.02
			(0.28)

Notes: * significant at the 10 % level; ** significant at the 5 % level; *** significant at the 1 % level.

Table 2: Impact of the ABC program on average test scores: Difference in Difference

	(1)	(2)	(3)	(4)
Panel A: Math Z-Scores				
ABC	-0.071***	-0.087***	-0.088***	0.230***
	(0.024)	(0.025)	(0.025)	(0.081)
Post	-0.000	-0.007	-0.006	-0.027
	(0.025)	(0.025)	(0.025)	(0.026)
ABC*Post	0.246***	0.259***	0.258***	0.258***
	(0.033)	(0.034)	(0.034)	(0.034)
Age	-	-0.009***	0.004	0.001
		(0.001)	(0.003)	(0.003)
Age^2	-	-	-0.000***	-0.000***
			(0.000)	(0.000)
Region Dummies	No	Yes	Yes	No
Village Dummies	No	No	No	Yes
Number of Observations	13,420	12,840	12,840	12,840
R^2	0.009	0.060	0.061	0.139

Notes: * significant at the 10 % level; ** significant at the 5 % level; *** significant at the 1 % level.

(Table 2 Continued)

	(1)	(2)	(3)	(4)
Panel B: Writing Z-Scores				
ABC	-0.027	-0.039	-0.040	0.200**
	(0.024)	(0.026)	(0.026)	(0.087)
Post	0.000	-0.004	-0.003	-0.012
	(0.025)	(0.025)	(0.025)	(0.026)
ABC*Post	0.190***	0.200***	0.199***	0.198***
	(0.034)	(0.035)	(0.035)	(0.036)
Age	-	-0.010***	0.004	0.004
		(0.001)	(0.003)	(0.003)
Age^2	-	-	-0.000***	-0.000***
			(0.000)	(0.000)
Region Dummies	No	Yes	Yes	No
Village Dummies	No	No	No	Yes
Number of Observations	13,402	12,823	12,823	12,823
R^2	0.006	0.062	0.063	0.131

Notes: * significant at the 10 % level; ** significant at the 5 % level; *** significant at the 1 % level.

Appendix (Do File and Stata Log File)

Do File:

```
/*Econ504_Replication_Cheng-Yu_Ko_14559056*/
cd "D:\Studies\UMich\MAE Program\2022 Winter\ECON 504\08. Replication due Apr 11 by 8PM\02. Datasets"
log using Econ504_Replication_Cheng-Yu_Ko_14559056.log, replace

ssc install asdoc, replace
ssc install outreg2, replace

/***(ii)***/

/**Sample Statistics: Table 1**/
/*For the Households*/
use "ABChousehold.dta", clear

asdoc sum age hhhead assets cellphoneowner usecellphone if year==2009, by(abc) label stat(mean sd) dec(2) title(Table 1, Panel A: Household) replace

ttest age if year==2009, by (abc)
ttest hhhead if year==2009, by (abc)
ttest assets if year==2009, by (abc)
ttest cellphoneowner if year==2009, by (abc)
ttest usecellphone if year==2009, by (abc)
/*asdoc ttest age if year==2009, by(abc) replace*/

/*For the Teachers*/
use "ABCteacher.dta", clear

asdoc sum teacherage femaleteacher local levelno if year==2009, by(abc) label stat(mean sd) dec(2) title(Table 1, Panel B: Teacher) append

ttest levelno if year==2009, by (abc)
```

```
ttest teacherage if year==2009, by (abc)
ttest femaleteacher if year==2009, by (abc)
ttest local if year==2009, by (abc)



/*For the Testscore*/
use "ABCtestscore.dta", clear

asdoc sum mathzscore writezscore if year==2009, by(abc) label stat(mean sd) dec(2) title(Table 1, Panel C: Teat scores) append

ttest mathzscore if year==2009, by (abc)
ttest writezscore if year==2009, by (abc)



/***(iii)***/
use "ABCtestscore.dta", clear

keep if round==1|round==2|round==4

/*Model Specification 1*/
gen abcxpost = abc*post

reg mathzscore abc post abcxpost, robust
outreg2 using reg.doc, replace ctitle() dec(3)

reg writezscore abc post abcxpost, robust
outreg2 using reg.doc, append ctitle() dec(3)

/*Model Specification 2*/
reg mathzscore abc post abcxpost age female dosso zarma kanuri, robust
outreg2 using reg.doc, replace ctitle() addtext(contorls, YES) dec(3)
```

```
reg writezscore abc post abcxpost age female dosso zarma kanuri, robust
outreg2 using reg.doc, append ctitle() addtext(contorls, YES) dec(3)

/*Model Specification 3*/
gen agesq = age^2
reg mathzscore abc post abcxpost age agesq female dosso zarma kanuri, robust
outreg2 using reg.doc, replace ctitle() addtext(contorls, YES) dec(3)
test age agesq

reg writezscore abc post abcxpost age agesq female dosso zarma kanuri, robust
outreg2 using reg.doc, append ctitle() addtext(contorls, YES) dec(3)
test age agesq

/*Model Specification 4*/
Qui tab codevillage, gen(village_dum)

reg mathzscore abc post abcpost age agesq female village_dum*, robust
outreg2 using reg.doc, replace ctitle() addtext(contorls, YES) dec(3)

reg writezscore abc post abcpost age agesq female village_dum*, robust
outreg2 using reg.doc, append ctitle() addtext(contorls, YES) dec(3)

log close
exit, clear
```

Log File:

```
-------------------------------------------------------------------------------
-------------------------------------------------------------
      name:  <unnamed>
       log:  D:\Studies\UMich\MAE Program\2022 Winter\ECON 504\08. Replication due
Apr 11 by 8PM\02. Datasets\Econ504_Replication_Cheng-Yu_Ko_1
> 4559056.log
  log type:  text
 opened on:   5 Apr 2022, 00:24:38

.
. ssc install asdoc, replace
checking asdoc consistency and verifying not already installed...
all files already exist and are up to date.

. ssc install outreg2, replace
checking outreg2 consistency and verifying not already installed...
all files already exist and are up to date.

.
end of do-file

. do "C:\Users\CHENGY~1\AppData\Local\Temp\STD1eac_000000.tmp"

. /***(ii)***/
.
. /**Sample Statistics: Table 1**/
. /*For the Households*/
. use "ABChousehold.dta", clear

.
. asdoc sum age hhhead assets cellphoneowner usecellphone if year==2009, by(abc)
label stat(mean sd) dec(2) title(Table 1, Panel A: Household)
> replace

Summary statistics: mean, sd
  by categories of: __000000 (ABC Village in 2009 or 2010)

__000000 |       age    hhhead    assets  cellph~r  usecel~e
---------+--------------------------------------------------
       0 |  37.86127  .5600775  4.990366  .3895349  .5420744
         |  13.09617  .4968593  1.608947  .4890686  .4987148
---------+--------------------------------------------------
       1 |  37.17534  .5473888  4.978805  .4011299  .5728155
         |  11.75794  .4982313  1.574879  .4915177  .4951504
---------+--------------------------------------------------
   Total |   37.5183   .553727  4.984586  .3954155  .5575049
         |  12.44378  .4973458  1.591247  .4896417  .4969244
-------------------------------------------------------------
(note: file Myfile.doc not found)
Click to Open File:  Myfile.doc

.
. ttest age if year==2009, by (abc)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
```

```
       0 |     519    37.86127    .5748581    13.09617    36.73193    38.99061
       1 |     519    37.17534    .5161162    11.75794     36.1614    38.18928
---------+--------------------------------------------------------------------
combined |   1,038     37.5183     .386237    12.44378    36.76041     38.2762
---------+--------------------------------------------------------------------
    diff |            .6859345    .7725528               -.8300121    2.201881
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   0.8879
Ho: diff = 0                                     degrees of freedom =     1036

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.8126         Pr(|T| > |t|) = 0.3748          Pr(T > t) = 0.1874

. ttest hhhead if year==2009, by (abc)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     516    .5600775     .021873    .4968593    .5171062    .6030488
       1 |     517    .5473888    .0219122    .4982313    .5043407    .5904369
---------+--------------------------------------------------------------------
combined |   1,033     .553727    .0154742    .4973458    .5233625    .5840915
---------+--------------------------------------------------------------------
    diff |            .0126887    .0309609               -.0480648    .0734423
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   0.4098
Ho: diff = 0                                     degrees of freedom =     1031

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.6590         Pr(|T| > |t|) = 0.6820          Pr(T > t) = 0.3410

. ttest assets if year==2009, by (abc)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     519    4.990366    .0706249    1.608947     4.85162    5.129113
       1 |     519    4.978805    .0691295    1.574879    4.842997    5.114614
---------+--------------------------------------------------------------------
combined |   1,038    4.984586      .04939    1.591247     4.88767    5.081501
---------+--------------------------------------------------------------------
    diff |            .0115607     .098827               -.1823632    .2054846
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   0.1170
Ho: diff = 0                                     degrees of freedom =     1036

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.5466         Pr(|T| > |t|) = 0.9069          Pr(T > t) = 0.4534

. ttest cellphoneowner if year==2009, by (abc)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     172    .3895349    .0372911    .4890686    .3159247    .4631451
       1 |     177    .4011299    .0369447    .4915177    .3282182    .4740416
```

```
---------+--------------------------------------------------------------------
combined |     349    .3954155    .0262099    .4896417    .3438657    .4469653
---------+--------------------------------------------------------------------
    diff |          -.0115951     .052497               -.1148475    .0916573
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -0.2209
Ho: diff = 0                                     degrees of freedom =      347

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.4127         Pr(|T| > |t|) = 0.8253          Pr(T > t) = 0.5873

. ttest usecellphone if year==2009, by (abc)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     511    .5420744    .0220618    .4987148    .4987311    .5854176
       1 |     515    .5728155    .0218189    .4951504    .5299503    .6156808
---------+--------------------------------------------------------------------
combined |   1,026    .5575049    .0155137    .4969244    .5270625    .5879472
---------+--------------------------------------------------------------------
    diff |          -.0307412     .031028               -.0916269    .0301446
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -0.9908
Ho: diff = 0                                     degrees of freedom =     1024

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.1610         Pr(|T| > |t|) = 0.3220          Pr(T > t) = 0.8390

.
end of do-file

. do "C:\Users\CHENGY~1\AppData\Local\Temp\STD1eac_000000.tmp"

. /*For the Teachers*/
. use "ABCteacher.dta", clear

.
. asdoc sum teacherage femaleteacher local levelno if year==2009, by(abc) label
stat(mean sd) dec(2) title(Table 1, Panel B: Teacher) append

Summary statistics: mean, sd
  by categories of: __000000 (ABC village)

__000000 |  teache~e  fema~her     local   levelno
---------+--------------------------------------
       0 |   33.0678  .2542373  .7627119  8.254237
         |  9.625513  .4391693  .4290721   2.28634
---------+--------------------------------------
       1 |  32.24561  .3448276  .6666667  8.859649
         |  6.650136  .4794633  .4753827  1.315276
---------+--------------------------------------
   Total |  32.66379  .2991453  .7142857  8.551724
         |  8.272473   .459853  .4536641  1.889766
------------------------------------------------
Click to Open File:  Myfile.doc

.
```

```
. ttest levelno if year==2009, by (abc)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |      59    8.254237    .2976562     2.28634    7.658414    8.850061
       1 |      57    8.859649    .1742125    1.315276     8.51066    9.208639
---------+--------------------------------------------------------------------
combined |     116    8.551724    .1754603    1.889766    8.204171    8.899277
---------+--------------------------------------------------------------------
    diff |           -.6054118    .3479186               -1.294636    .0838123
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -1.7401
Ho: diff = 0                                     degrees of freedom =      114

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0423         Pr(|T| > |t|) = 0.0845          Pr(T > t) = 0.9577

. ttest teacherage if year==2009, by (abc)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |      59     33.0678    1.253135    9.625513    30.55937    35.57622
       1 |      57    32.24561    .8808321    6.650136     30.4811    34.01013
---------+--------------------------------------------------------------------
combined |     116    32.66379    .7680798    8.272473    31.14237    34.18521
---------+--------------------------------------------------------------------
    diff |            .8221826    1.541189               -2.230902    3.875267
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   0.5335
Ho: diff = 0                                     degrees of freedom =      114

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.7026         Pr(|T| > |t|) = 0.5947          Pr(T > t) = 0.2974

. ttest femaleteacher if year==2009, by (abc)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |      59    .2542373     .057175    .4391693    .1397891    .3686854
       1 |      58    .3448276    .0629566    .4794633    .2187591     .470896
---------+--------------------------------------------------------------------
combined |     117    .2991453    .0425134     .459853    .2149421    .3833485
---------+--------------------------------------------------------------------
    diff |           -.0905903      .08498               -.2589193    .0777387
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -1.0660
Ho: diff = 0                                     degrees of freedom =      115

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.1443         Pr(|T| > |t|) = 0.2886          Pr(T > t) = 0.8557

. ttest local if year==2009, by (abc)
```

```
Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |      59    .7627119    .0558604    .4290721    .6508951    .8745287
       1 |      60    .6666667    .0613716    .4753827    .5438623     .789471
---------+--------------------------------------------------------------------
combined |     119    .7142857    .0415873    .4536641    .6319315    .7966399
---------+--------------------------------------------------------------------
    diff |            .0960452     .083059               -.0684488    .2605392
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   1.1563
Ho: diff = 0                                     degrees of freedom =      117

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.8751         Pr(|T| > |t|) = 0.2499          Pr(T > t) = 0.1249

.
.
. /*For the Testscore*/
. use "ABCtestscore.dta", clear

.
. asdoc sum mathzscore writezscore if year==2009, by(abc) label stat(mean sd)
dec(2) title(Table 1, Panel C: Teat scores) append

Summary statistics: mean, sd
  by categories of: __000000 (ABC or non-ABC village)

__000000 |  mathzs~e  writez~e
---------+--------------------
       0 | -1.12e-08 -1.27e-08
         |  .9996418  .9996415
---------+--------------------
       1 |  .0055217  .0224583
         |   .897886  .9254075
---------+--------------------
   Total |  .0028069  .0114125
         |  .9492283  .9626428
------------------------------
Click to Open File:  Myfile.doc

.
. ttest mathzscore if year==2009, by (abc)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |   4,190   -1.12e-08    .0154432    .9996418   -.0302769    .0302769
       1 |   4,332    .0055217     .013642     .897886   -.0212235     .032267
---------+--------------------------------------------------------------------
combined |   8,522    .0028069    .0102825    .9492283   -.0173494    .0229631
---------+--------------------------------------------------------------------
    diff |           -.0055218     .020569               -.0458421    .0347985
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -0.2685
Ho: diff = 0                                     degrees of freedom =     8520
```

```
    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.3942         Pr(|T| > |t|) = 0.7884          Pr(T > t) = 0.6058

. ttest writezscore if year==2009, by (abc)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |   4,186   -1.27e-08    .0154506    .9996415   -.0302913    .0302913
       1 |   4,325    .0224583    .0140715    .9254075   -.0051291    .0500456
---------+--------------------------------------------------------------------
combined |   8,511    .0114125    .0104346    .9626428   -.0090418    .0318668
---------+--------------------------------------------------------------------
    diff |           -.0224583    .0208717                -.063372    .0184554
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -1.0760
Ho: diff = 0                     degrees of freedom =     8509

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.1410         Pr(|T| > |t|) = 0.2820          Pr(T > t) = 0.8590

.
.
.
. /***(iii)***/
. use "ABCtestscore.dta", clear

.
. keep if round==1|round==2|round==4
(8,848 observations deleted)

.
. /*Model Specification 1*/
. gen abcxpost = abc*post

.
. reg mathzscore abc post abcxpost, robust

Linear regression                               Number of obs     =     13,420
                                                F(3, 13416)       =      43.33
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0093
                                                Root MSE          =      .9653

------------------------------------------------------------------------------
             |               Robust
  mathzscore |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         abc |  -.0712108   .0236441    -3.01   0.003    -.1175566    -.024865
        post |  -2.63e-09   .0248476    -0.00   1.000    -.0487049    .0487049
    abcxpost |   .2460714   .0332319     7.40   0.000     .1809322    .3112107
       _cons |  -6.69e-09   .0184518    -0.00   1.000    -.0361681    .0361681
------------------------------------------------------------------------------

. outreg2 using reg.doc, replace ctitle() dec(3)
reg.doc
dir : seeout
```

```
.
. reg writezscore abc post abcxpost, robust

Linear regression                               Number of obs     =     13,402
                                                F(3, 13398)       =      25.87
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0061
                                                Root MSE          =     .99479

------------------------------------------------------------------------------
             |               Robust
 writezscore |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         abc |   -.026852   .0244557    -1.10   0.272    -.0747887    .0210847
        post |   8.88e-09   .0248569     0.00   1.000    -.0487231    .0487231
    abcxpost |    .189616   .0342502     5.54   0.000     .1224807    .2567514
       _cons |  -1.03e-08   .0184518    -0.00   1.000    -.0361681    .0361681
------------------------------------------------------------------------------

. outreg2 using reg.doc, append ctitle() dec(3)
reg.doc
dir : seeout

.
. /*Model Specification 2*/
. reg mathzscore abc post abcxpost age female dosso zarma kanuri, robust

Linear regression                               Number of obs     =     12,840
                                                F(8, 12831)       =     118.92
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0601
                                                Root MSE          =     .94646

------------------------------------------------------------------------------
             |               Robust
  mathzscore |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         abc |  -.0873711   .0247903    -3.52   0.000    -.1359637   -.0387785
        post |  -.0065534   .0253652    -0.26   0.796    -.0562729    .0431661
    abcxpost |   .2585009   .0336371     7.68   0.000     .1925671    .3244347
         age |  -.0087212   .0006662   -13.09   0.000    -.0100271   -.0074154
      female |   -.378397   .0168863   -22.41   0.000    -.4114966   -.3452974
       dosso |   .0386797   .0186407     2.08   0.038     .0021411    .0752182
       zarma |   .2105714   .0273079     7.71   0.000      .157044    .2640989
      kanuri |  -.1795499    .040687    -4.41   0.000    -.2593024   -.0997974
       _cons |   .4691126   .0358576    13.08   0.000     .3988263    .5393988
------------------------------------------------------------------------------

. outreg2 using reg.doc, replace ctitle() addtext(contorls, YES) dec(3)
reg.doc
dir : seeout

.
. reg writezscore abc post abcxpost age female dosso zarma kanuri, robust

Linear regression                               Number of obs     =     12,823
                                                F(8, 12814)       =     116.27
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0618
```

```
                                                Root MSE          =     .97208

------------------------------------------------------------------------------
             |               Robust
 writezscore |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         abc |  -.0394064   .0258027    -1.53   0.127    -.0899834    .0111707
        post |   -.004071   .0254422    -0.16   0.873    -.0539415    .0457995
    abcxpost |   .1998582   .0346355     5.77   0.000     .1319674    .2677489
         age |  -.0102791   .0006629   -15.51   0.000    -.0115784   -.0089798
      female |   -.424654   .0173548   -24.47   0.000     -.458672   -.3906361
       dosso |    .060129    .019228     3.13   0.002     .0224392    .0978188
       zarma |   .1005961   .0292668     3.44   0.001     .0432289    .1579633
      kanuri |  -.1912844   .0421069    -4.54   0.000    -.2738203   -.1087485
       _cons |   .5485915   .0355641    15.43   0.000     .4788805    .6183025
------------------------------------------------------------------------------

. outreg2 using reg.doc, append ctitle() addtext(contorls, YES) dec(3)
reg.doc
dir : seeout

.
. /*Model Specification 3*/
. gen agesq = age^2
(758 missing values generated)

. reg mathzscore abc post abcxpost age agesq female dosso zarma kanuri, robust

Linear regression                               Number of obs     =     12,840
                                                F(9, 12830)       =     107.00
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0611
                                                Root MSE          =     .94598

------------------------------------------------------------------------------
             |               Robust
  mathzscore |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         abc |  -.0883306   .0247704    -3.57   0.000    -.1368843   -.0397769
        post |  -.0056958   .0253719    -0.22   0.822    -.0554285    .0440368
    abcxpost |   .2580804   .0336302     7.67   0.000     .1921602    .3240006
         age |   .0036988   .0032173     1.15   0.250    -.0026075    .0100051
       agesq |  -.0001614   .0000408    -3.96   0.000    -.0002414   -.0000814
      female |   -.375825   .0168488   -22.31   0.000     -.408851   -.3427989
       dosso |   .0369043    .018658     1.98   0.048     .0003318    .0734768
       zarma |   .2125624   .0272939     7.79   0.000     .1590622    .2660626
      kanuri |  -.1791699   .0406804    -4.40   0.000    -.2589096   -.0994303
       _cons |   .2558466   .0647635     3.95   0.000     .1289006    .3827927
------------------------------------------------------------------------------

. outreg2 using reg.doc, replace ctitle() addtext(contorls, YES) dec(3)
reg.doc
dir : seeout

. test age agesq

 ( 1)  age = 0
 ( 2)  agesq = 0
```

```
       F(  2, 12830) =   94.46
            Prob > F =    0.0000

.
. reg writezscore abc post abcxpost age agesq female dosso zarma kanuri, robust

Linear regression                               Number of obs     =     12,823
                                                F(9, 12813)       =     106.02
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0630
                                                Root MSE          =      .9715

------------------------------------------------------------------------------
             |               Robust
 writezscore |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         abc |  -.0404734    .025787    -1.57   0.117    -.0910198    .0100731
        post |  -.0031243   .0254494    -0.12   0.902    -.0530089    .0467604
    abcxpost |   .1993582   .0346272     5.76   0.000     .1314837    .2672328
         age |   .0035019   .0031763     1.10   0.270    -.0027242     .009728
       agesq |  -.0001792   .0000389    -4.61   0.000    -.0002554   -.0001029
      female |  -.4217833   .0172952   -24.39   0.000    -.4556844   -.3878822
       dosso |   .0581445   .0192515     3.02   0.003     .0204087    .0958803
       zarma |   .1027392   .0292778     3.51   0.000     .0453504     .160128
      kanuri |  -.1908826   .0421005    -4.53   0.000    -.2734059   -.1083593
       _cons |   .3120353   .0650626     4.80   0.000     .1845029    .4395677
------------------------------------------------------------------------------

. outreg2 using reg.doc, append ctitle() addtext(contorls, YES) dec(3)
reg.doc
dir : seeout

. test age agesq

 ( 1)  age = 0
 ( 2)  agesq = 0

       F(  2, 12813) =  148.47
            Prob > F =    0.0000

.
. /*Model Specification 4*/
. qui tab codevillage, gen(village_dum)

.
. reg mathzscore abc post abcpost age agesq female village_dum*, robust
note: village_dum23 omitted because of collinearity
note: village_dum71 omitted because of collinearity

Linear regression                               Number of obs     =     12,840
                                                F(117, 12722)     =      20.56
                                                Prob > F          =     0.0000
                                                R-squared         =     0.1393
                                                Root MSE          =     .90959

------------------------------------------------------------------------------
             |               Robust
 mathzscore |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

abc	.2304088	.0813177	2.83	0.005	.0710138	.3898038
post	-.0269673	.0255822	-1.05	0.292	-.0771123	.0231777
abcpost	.2581796	.0340972	7.57	0.000	.191344	.3250152
age	.0014676	.0032552	0.45	0.652	-.0049131	.0078483
agesq	-.0001277	.0000412	-3.10	0.002	-.0002085	-.000047
female	-.3739415	.0163357	-22.89	0.000	-.405962	-.341921
village_dum1	.1340469	.0710456	1.89	0.059	-.0052133	.273307
village_dum2	.6172878	.1168446	5.28	0.000	.3882548	.8463208
village_dum3	.1121939	.0772259	1.45	0.146	-.0391805	.2635682
village_dum4	.0476657	.0673104	0.71	0.479	-.0842728	.1796042
village_dum5	-.2245481	.0898843	-2.50	0.012	-.4007349	-.0483613
village_dum6	.57214	.0740602	7.73	0.000	.4269709	.7173092
village_dum7	.1769142	.0663088	2.67	0.008	.046939	.3068894
village_dum8	.5647013	.1116596	5.06	0.000	.3458318	.7835709
village_dum9	.5767816	.1032283	5.59	0.000	.3744385	.7791246
village_dum10	-.0268811	.0681453	-0.39	0.693	-.160456	.1066939
village_dum11	.7422923	.10109	7.34	0.000	.5441407	.9404438
village_dum12	.2898047	.0734113	3.95	0.000	.1459075	.4337018
village_dum13	.3964721	.0804705	4.93	0.000	.2387378	.5542065
village_dum14	1.437935	.1747941	8.23	0.000	1.095313	1.780558
village_dum15	-.080201	.0818523	-0.98	0.327	-.2406439	.0802418
village_dum16	.0220621	.0767953	0.29	0.774	-.1284682	.1725924
village_dum17	.3294287	.1081969	3.04	0.002	.1173466	.5415109
village_dum18	.0143654	.0996927	0.14	0.885	-.1810474	.2097781
village_dum19	.4050257	.0769585	5.26	0.000	.2541754	.555876
village_dum20	.1595526	.1208564	1.32	0.187	-.0773442	.3964494
village_dum21	.0388279	.0947637	0.41	0.682	-.1469232	.2245789
village_dum22	.6583834	.1130433	5.82	0.000	.4368015	.8799653
village_dum23	0	(omitted)				
village_dum24	-.2701003	.0793065	-3.41	0.001	-.425553	-.1146476
village_dum25	.4073737	.1334134	3.05	0.002	.1458633	.6688842
village_dum26	.0945878	.1284449	0.74	0.461	-.1571835	.3463591
village_dum27	.2911824	.0746046	3.90	0.000	.1449463	.4374186
village_dum28	.7692604	.1157419	6.65	0.000	.5423887	.996132
village_dum29	-.0933571	.0789397	-1.18	0.237	-.2480908	.0613767
village_dum30	.5304775	.0729598	7.27	0.000	.3874652	.6734898
village_dum31	.3664185	.0732405	5.00	0.000	.2228561	.5099809
village_dum32	.5243534	.0978561	5.36	0.000	.3325407	.716166
village_dum33	-.0941615	.0747069	-1.26	0.208	-.2405982	.0522752
village_dum34	.6177983	.1019634	6.06	0.000	.4179348	.8176618
village_dum35	.3967689	.0921127	4.31	0.000	.2162141	.5773236
village_dum36	.2593729	.070619	3.67	0.000	.120949	.3977967
village_dum37	.1308264	.0716439	1.83	0.068	-.0096063	.2712592
village_dum38	.5692132	.1093315	5.21	0.000	.354907	.7835194
village_dum39	.6312953	.0869282	7.26	0.000	.460903	.8016876
village_dum40	.2490621	.0768911	3.24	0.001	.0983439	.3997802
village_dum41	.1946032	.0885027	2.20	0.028	.0211245	.3680819
village_dum42	.7854782	.1291714	6.08	0.000	.5322828	1.038673
village_dum43	.291605	.0815974	3.57	0.000	.1316618	.4515483
village_dum44	.6651024	.1206123	5.51	0.000	.4286842	.9015207
village_dum45	-.3652751	.0853033	-4.28	0.000	-.5324823	-.1980678
village_dum46	-.0590672	.0843311	-0.70	0.484	-.2243689	.1062344
village_dum47	-.0989499	.1057288	-0.94	0.349	-.3061942	.1082944
village_dum48	-.0538021	.0855349	-0.63	0.529	-.2214634	.1138592
village_dum49	.1233083	.0939929	1.31	0.190	-.0609318	.3075485
village_dum50	-.1059587	.1070976	-0.99	0.323	-.315886	.1039686
village_dum51	.1040803	.0966099	1.08	0.281	-.0852896	.2934501
village_dum52	-.1020964	.0918645	-1.11	0.266	-.2821647	.0779719
village_dum53	-.2980892	.091448	-3.26	0.001	-.477341	-.1188374

village_dum54	.879559	.1067691	8.24	0.000	.6702755	1.088842
village_dum55	.0227232	.092223	0.25	0.805	-.1580477	.2034941
village_dum56	.4625065	.1184167	3.91	0.000	.2303919	.6946211
village_dum57	.7876855	.1225306	6.43	0.000	.5475071	1.027864
village_dum58	.3254212	.1059603	3.07	0.002	.1177231	.5331193
village_dum59	-.0691536	.0957998	-0.72	0.470	-.2569356	.1186283
village_dum60	.6435241	.1106959	5.81	0.000	.4265435	.8605047
village_dum61	.7981737	.121147	6.59	0.000	.5607073	1.03564
village_dum62	.5254195	.1267587	4.15	0.000	.2769533	.7738856
village_dum63	.4912544	.1089687	4.51	0.000	.2776594	.7048493
village_dum64	.2971935	.0897565	3.31	0.001	.1212573	.4731297
village_dum65	.0620621	.1046445	0.59	0.553	-.1430569	.2671811
village_dum66	.7914963	.108939	7.27	0.000	.5779595	1.005033
village_dum67	.3461106	.0879083	3.94	0.000	.173797	.5184242
village_dum68	.3548055	.0992186	3.58	0.000	.1603221	.5492888
village_dum69	.144745	.0940854	1.54	0.124	-.0396766	.3291666
village_dum70	-.1462085	.0840187	-1.74	0.082	-.3108977	.0184808
village_dum71	0	(omitted)				
village_dum72	.4309493	.1625722	2.65	0.008	.1122833	.7496153
village_dum73	.0986976	.1056517	0.93	0.350	-.1083955	.3057908
village_dum74	.4232973	.1057572	4.00	0.000	.2159972	.6305974
village_dum75	.1901039	.1065578	1.78	0.074	-.0187654	.3989732
village_dum76	.1680752	.1246954	1.35	0.178	-.0763465	.4124968
village_dum77	.2816224	.1200256	2.35	0.019	.0463543	.5168906
village_dum78	-.2342353	.1237919	-1.89	0.058	-.476886	.0084154
village_dum79	.1845568	.1141096	1.62	0.106	-.0391152	.4082288
village_dum80	.6649395	.1032207	6.44	0.000	.4626114	.8672677
village_dum81	-.1650774	.0894755	-1.84	0.065	-.3404628	.010308
village_dum82	-.1862645	.0957405	-1.95	0.052	-.3739302	.0014013
village_dum83	-.0190238	.0714618	-0.27	0.790	-.1590997	.1210521
village_dum84	.3361813	.1117022	3.01	0.003	.1172283	.5551343
village_dum85	.5654703	.1067755	5.30	0.000	.3561743	.7747663
village_dum86	.377591	.1062633	3.55	0.000	.1692989	.5858832
village_dum87	.1150872	.1135497	1.01	0.311	-.1074873	.3376618
village_dum88	.4554562	.0841352	5.41	0.000	.2905385	.620374
village_dum89	-.0764105	.0709795	-1.08	0.282	-.2155409	.06272
village_dum90	.5886127	.1612017	3.65	0.000	.272633	.9045923
village_dum91	-.0286019	.0925004	-0.31	0.757	-.2099166	.1527127
village_dum92	-.1631718	.0894413	-1.82	0.068	-.3384902	.0121466
village_dum93	.2248553	.0905292	2.48	0.013	.0474044	.4023062
village_dum94	.5213362	.0829566	6.28	0.000	.3587288	.6839436
village_dum95	.0025262	.0910728	0.03	0.978	-.1759902	.1810426
village_dum96	-.0152691	.0978648	-0.16	0.876	-.2070989	.1765607
village_dum97	.6015611	.1040088	5.78	0.000	.3976882	.805434
village_dum98	.4379961	.1088906	4.02	0.000	.2245541	.6514382
village_dum99	-.2128962	.0840814	-2.53	0.011	-.3777083	-.0480841
village_dum100	.0261496	.1166377	0.22	0.823	-.2024777	.254777
village_dum101	.5731722	.1285731	4.46	0.000	.3211496	.8251947
village_dum102	-.0715143	.0765946	-0.93	0.350	-.2216512	.0786226
village_dum103	.1229107	.0902467	1.36	0.173	-.0539865	.2998079
village_dum104	.2589786	.0788054	3.29	0.001	.1045082	.413449
village_dum105	-.0897122	.1016492	-0.88	0.377	-.2889599	.1095354
village_dum106	.4165499	.1054168	3.95	0.000	.209917	.6231827
village_dum107	.6256733	.114945	5.44	0.000	.4003639	.8509827
village_dum108	.6600402	.1207811	5.46	0.000	.4232911	.8967894
village_dum109	.1066969	.0946074	1.13	0.259	-.0787478	.2921416
village_dum110	.3307869	.0814755	4.06	0.000	.1710826	.4904913
village_dum111	-.4362401	.1010852	-4.32	0.000	-.6343822	-.238098
village_dum112	.0973619	.0827287	1.18	0.239	-.0647987	.2595226

```
village_dum113 |   .3751599   .1030743     3.64   0.000     .1731187     .577201
         _cons |  -.0898277    .083626    -1.07   0.283    -.2537472    .0740917
------------------------------------------------------------------------------

. outreg2 using reg.doc, replace ctitle() addtext(contorls, YES) dec(3)
reg.doc
dir : seeout

.
. reg writezscore abc post abcpost age agesq female village_dum*, robust
note: village_dum23 omitted because of collinearity
note: village_dum71 omitted because of collinearity

Linear regression                               Number of obs     =     12,823
                                                F(117, 12705)     =      18.73
                                                Prob > F          =     0.0000
                                                R-squared         =     0.1310
                                                Root MSE          =     .93953

------------------------------------------------------------------------------
             |               Robust
  writezscore |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         abc |   .2000127   .0867997     2.30   0.021     .0298723    .3701532
        post |  -.0121467   .0258221    -0.47   0.638    -.0627619    .0384684
     abcpost |   .1981458   .0355653     5.57   0.000     .1284325    .2678592
         age |   .0035513   .0032671     1.09   0.277    -.0028527    .0099552
       agesq |  -.0001729   .0000399    -4.33   0.000    -.0002512   -.0000946
      female |    -.42022   .0168153   -24.99   0.000    -.4531804   -.3872595
 village_dum1 |   .2463838   .0946266     2.60   0.009     .0609014    .4318662
 village_dum2 |   .3594132   .1274489     2.82   0.005     .1095942    .6092323
 village_dum3 |  -.0304211   .0980938    -0.31   0.756    -.2226997    .1618575
 village_dum4 |   .3483127   .1176378     2.96   0.003     .1177249    .5789004
 village_dum5 |  -.2166004     .10157    -2.13   0.033     -.415693   -.0175078
 village_dum6 |   .3707893   .0789908     4.69   0.000     .2159554    .5256232
 village_dum7 |   .0085449   .1123267     0.08   0.939    -.2116323    .2287222
 village_dum8 |   .2758065   .1113878     2.48   0.013     .0574696    .4941435
 village_dum9 |   .2509161   .0801529     3.13   0.002     .0938044    .4080277
village_dum10 |  -.0493719   .1012847    -0.49   0.626    -.2479051    .1491613
village_dum11 |   .4104497   .0748646     5.48   0.000     .2637037    .5571956
village_dum12 |   .2046092   .0725305     2.82   0.005     .0624384      .34678
village_dum13 |   .3452605   .0815647     4.23   0.000     .1853814    .5051396
village_dum14 |   1.049788   .2073155     5.06   0.000     .6434181    1.456157
village_dum15 |   .0268117   .0910566     0.29   0.768    -.1516729    .2052963
village_dum16 |   .0829354   .0872892     0.95   0.342    -.0881646    .2540354
village_dum17 |  -.0787306    .103536    -0.76   0.447    -.2816769    .1242156
village_dum18 |   .0301431   .0913343     0.33   0.741    -.1488858    .2091721
village_dum19 |   .2509395   .0615225     4.08   0.000     .1303461     .371533
village_dum20 |   .1350521   .0893174     1.51   0.131    -.0400234    .3101277
village_dum21 |    .292485   .1418795     2.06   0.039     .0143798    .5705901
village_dum22 |   .3646007   .0903703     4.03   0.000     .1874614    .5417401
village_dum23 |          0  (omitted)
village_dum24 |   -.122782   .0949209    -1.29   0.196    -.3088411    .0632772
village_dum25 |   .2294518   .0927109     2.47   0.013     .0477244    .4111791
village_dum26 |   -.043829   .0904314    -0.48   0.628    -.2210881    .1334301
village_dum27 |   .4659355   .1026572     4.54   0.000      .264712    .6671591
village_dum28 |   .3299478   .0912793     3.61   0.000     .1510266     .508869
village_dum29 |  -.0959563   .1010638    -0.95   0.342    -.2940565    .1021439
village_dum30 |   .4381723   .0667501     6.56   0.000     .3073321    .5690126
```

village_dum31	.3144499	.0713403	4.41	0.000	.1746121	.4542878
village_dum32	.4706423	.0939581	5.01	0.000	.2864703	.6548143
village_dum33	-.1921805	.093801	-2.05	0.041	-.3760446	-.0083164
village_dum34	.2782096	.0825388	3.37	0.001	.1164212	.439998
village_dum35	.4653453	.1136233	4.10	0.000	.2426265	.688064
village_dum36	.1857377	.0743803	2.50	0.013	.0399411	.3315343
village_dum37	-.1328043	.0874507	-1.52	0.129	-.3042209	.0386123
village_dum38	.3033545	.1211302	2.50	0.012	.0659211	.540788
village_dum39	.6047206	.0929718	6.50	0.000	.4224819	.7869592
village_dum40	.7469455	.0915578	8.16	0.000	.5674785	.9264126
village_dum41	.0820559	.1060023	0.77	0.439	-.1257246	.2898363
village_dum42	.8363101	.1651271	5.06	0.000	.5126361	1.159984
village_dum43	.3680188	.0964951	3.81	0.000	.1788738	.5571637
village_dum44	.6109077	.1341514	4.55	0.000	.3479506	.8738647
village_dum45	-.3060901	.0632705	-4.84	0.000	-.4301098	-.1820705
village_dum46	-.1230971	.0618696	-1.99	0.047	-.2443707	-.0018234
village_dum47	-.4282263	.0897446	-4.77	0.000	-.6041392	-.2523133
village_dum48	-.0446813	.0749074	-0.60	0.551	-.1915112	.1021486
village_dum49	.1746349	.0999243	1.75	0.081	-.0212317	.3705016
village_dum50	.1084691	.1368913	0.79	0.428	-.1598585	.3767967
village_dum51	.0750311	.1123309	0.67	0.504	-.1451544	.2952166
village_dum52	.0917464	.0869489	1.06	0.291	-.0786865	.2621793
village_dum53	-.1370117	.1018072	-1.35	0.178	-.3365692	.0625458
village_dum54	.6250278	.1130939	5.53	0.000	.4033467	.846709
village_dum55	-.0005771	.1257461	-0.00	0.996	-.2470584	.2459041
village_dum56	.5881901	.1291832	4.55	0.000	.3349716	.8414087
village_dum57	.5582569	.1513685	3.69	0.000	.2615518	.854962
village_dum58	.0658919	.1172297	0.56	0.574	-.163896	.2956797
village_dum59	-.0551618	.1042597	-0.53	0.597	-.2595266	.149203
village_dum60	.5489568	.0912552	6.02	0.000	.3700829	.7278308
village_dum61	.2446412	.1193877	2.05	0.040	.0106232	.4786591
village_dum62	.3517421	.1348584	2.61	0.009	.0873994	.6160848
village_dum63	.0262433	.0688378	0.38	0.703	-.1086892	.1611757
village_dum64	-.1307429	.0926824	-1.41	0.158	-.3124144	.0509286
village_dum65	.1924216	.1243878	1.55	0.122	-.0513972	.4362403
village_dum66	.413397	.1248842	3.31	0.001	.168605	.6581889
village_dum67	.1047458	.0849802	1.23	0.218	-.0618282	.2713198
village_dum68	.3082862	.1312689	2.35	0.019	.0509793	.5655931
village_dum69	-.0362231	.1107291	-0.33	0.744	-.2532689	.1808226
village_dum70	-.2047813	.0944808	-2.17	0.030	-.3899778	-.0195848
village_dum71	0	(omitted)				
village_dum72	.5147862	.1479741	3.48	0.001	.2247347	.8048377
village_dum73	.0333197	.1124122	0.30	0.767	-.1870252	.2536646
village_dum74	.0101105	.0694151	0.15	0.884	-.1259535	.1461746
village_dum75	.1320347	.1088031	1.21	0.225	-.0812357	.3453052
village_dum76	-.0916407	.1122428	-0.82	0.414	-.3116536	.1283722
village_dum77	.2873811	.1185282	2.42	0.015	.055048	.5197142
village_dum78	-.3089412	.1223541	-2.52	0.012	-.5487737	-.0691087
village_dum79	.2622445	.1379618	1.90	0.057	-.0081814	.5326704
village_dum80	.4049001	.085044	4.76	0.000	.2382011	.571599
village_dum81	-.1971048	.1025066	-1.92	0.055	-.3980333	.0038236
village_dum82	.0200442	.1120517	0.18	0.858	-.1995941	.2396824
village_dum83	-.095612	.057314	-1.67	0.095	-.2079561	.0167321
village_dum84	.2209478	.1134831	1.95	0.052	-.0014961	.4433917
village_dum85	.4659644	.0927846	5.02	0.000	.2840925	.6478362
village_dum86	.3321916	.1129319	2.94	0.003	.1108279	.5535552
village_dum87	.1503892	.1325261	1.13	0.256	-.1093819	.4101604
village_dum88	.2690468	.0689088	3.90	0.000	.1339752	.4041184
village_dum89	-.1688341	.0938728	-1.80	0.072	-.3528391	.0151708

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 village_dum90 |   .6203053    .171823     3.61   0.000     .2835064    .9571042
 village_dum91 |  -.0884095   .1019451    -0.87   0.386    -.2882372    .1114182
 village_dum92 |  -.2753335   .1065381    -2.58   0.010    -.4841641   -.0665028
 village_dum93 |   .0915902   .0820758     1.12   0.264    -.0692906    .2524711
 village_dum94 |   .5520984    .077498     7.12   0.000     .4001905    .7040062
 village_dum95 |  -.1543976   .0995411    -1.55   0.121    -.3495133     .040718
 village_dum96 |   .0108074   .0985027     0.11   0.913    -.1822729    .2038876
 village_dum97 |   1.172814   .1578696     7.43   0.000      .863366    1.482262
 village_dum98 |    .285212   .1004242     2.84   0.005     .0883654    .4820585
 village_dum99 |   -.342363   .0985617    -3.47   0.001    -.5355589   -.1491671
village_dum100 |  -.1649565   .1165296    -1.42   0.157    -.3933722    .0634591
village_dum101 |   .5504485   .1456853     3.78   0.000     .2648834    .8360137
village_dum102 |  -.0800508   .1041936    -0.77   0.442    -.2842859    .1241844
village_dum103 |   .1635836    .089861     1.82   0.069    -.0125575    .3397247
village_dum104 |   .0386099   .0561967     0.69   0.492    -.0715441    .1487639
village_dum105 |  -.0427333    .103912    -0.41   0.681    -.2464164    .1609499
village_dum106 |   .0958824   .0785572     1.22   0.222    -.0581016    .2498664
village_dum107 |   .3970639   .1018403     3.90   0.000     .1974415    .5966863
village_dum108 |   .2835363   .0937357     3.02   0.002     .0998002    .4672724
village_dum109 |   .0000214   .1102769     0.00   1.000    -.2161378    .2161807
village_dum110 |   .1243371   .0718761     1.73   0.084    -.0165509    .2652251
village_dum111 |  -.5558233   .1096093    -5.07   0.000    -.7706739   -.3409726
village_dum112 |  -.0863275   .0993986    -0.87   0.385    -.2811639    .1085088
village_dum113 |   .2710067    .118143     2.29   0.022     .0394287    .5025848
         _cons |   .0503767   .0745938     0.68   0.499    -.0958384    .1965918
------------------------------------------------------------------------------

. outreg2 using reg.doc, append ctitle() addtext(contorls, YES) dec(3)
reg.doc
dir : seeout

.
.
. log close
      name:  <unnamed>
       log:  D:\Studies\UMich\MAE Program\2022 Winter\ECON 504\08. Replication due
Apr 11 by 8PM\02. Datasets\Econ504_Replication_Cheng-Yu_Ko_1
> 4559056.log
  log type:  text
 closed on:   5 Apr 2022, 00:25:00
-------------------------------------------------------------------------------
-------------------------------------------------------------
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