```
      name:  <unnamed>
       log:  /user/user2/ShZhang17/HW2.smcl
  log type:  smcl
 opened on:   4 Apr 2017, 21:01:27

.
. // Assignment #2
.
. use taxi_phd2.dta

.
.
. // Question 1
.
. g d_taxis = taxis2 - taxis1

. g d_cmptr = evercmptr2 - evercmptr1

. g d_down = downrt2 - downrt1

.
. reg d_down d_cmptr d_taxis, cluster(msa)

Linear regression                               Number of obs     =        574
                                                F(2, 168)         =      62.29
                                                Prob > F          =     0.0000
                                                R-squared         =     0.2456
                                                Root MSE          =     20.495

                                   (Std. Err. adjusted for 169 clusters in msa)
------------------------------------------------------------------------------
             |               Robust
     d_down |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     d_cmptr |  -15.78749   2.083842    -7.58   0.000    -19.90138    -11.6736
     d_taxis |   -.210539   .0281999    -7.47   0.000    -.2662108   -.1548672
       _cons |   23.58529   1.410612    16.72   0.000     20.80048     26.3701
------------------------------------------------------------------------------
```

The results suggest that changes in computer adoption is negatively associated with changes in driver ownership and that changes in firm size is also negatively associated with changes in driver ownership. In the cross-sectional model, we also included a quadratic term in addition to the terms we included in this first difference model, and we found that the level of computer adotion is negatively associated with the level of driver adoption in the cross-sectional model.

```
.
.
. // Question 2
.
. ivreg d_down (d_cmptr = south northeast worktransit) d_taxis, robust first

First-stage regressions
```

```
----------------------
```

Source	SS	df	MS	Number of obs	=	575
				F(4, 570)	=	11.14
Model	9.29837865	4	2.32459466	Prob > F	=	0.0000
Residual	118.920752	570	.208632898	R-squared	=	0.0725
				Adj R-squared	=	0.0660
Total	128.21913	574	.223378276	Root MSE	=	.45676

d_cmptr	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
d_taxis	-.0005183	.0004418	-1.17	0.241	-.001386	.0003495
southdum	.0044605	.0518929	0.09	0.932	-.0974642	.1063851
northeast	.2011303	.046333	4.34	0.000	.110126	.2921345
worktransit	.0078621	.0025712	3.06	0.002	.0028118	.0129123
_cons	.2433904	.0284309	8.56	0.000	.1875483	.2992325

Instrumental variables (2SLS) regression

				Number of obs	=	575
				F(2, 572)	=	33.69
				Prob > F	=	0.0000
				R-squared	=	0.1159
				Root MSE	=	22.228

d_down	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
d_cmptr	2.072527	7.256232	0.29	0.775	-12.17958	16.32464
d_taxis	-.202822	.0247576	-8.19	0.000	-.2514488	-.1541952
_cons	17.42475	2.663409	6.54	0.000	12.19349	22.656

```
Instrumented:  d_cmptr
Instruments:   d_taxis southdum northeast worktransit
--------------------------------------------------------------------------------
```

The first stage regression suggests that being in the northeast region is associated with a 20.11% increase in computer adoption and that a one unit increase in worktransit is associated with a 0.7% increase in computer adoption.

The second stage regression suggests that an increase in firm size is associated with a decrease in driver ownership, while changes in computer adoption does not help explain changes in driver ownership, after we include instrumental variables into our model.

```
.
.
. // Question 3
.
. reshape long downrt taxis evercmptr, i(id)
(note: j = 1 2)

Data                               wide   ->   long
```

HW2.log

```
-----------------------------------------------------------------------------
Number of obs.                      575   ->    1150
Number of variables                  20   ->      18
j variable (2 values)                     ->   _j
xij variables:
                        downrt1 downrt2   ->   downrt
                          taxis1 taxis2   ->   taxis
                  evercmptr1 evercmptr2   ->   evercmptr
-----------------------------------------------------------------------------


.
. rename _j year_count

.
. g year_dum1 = 0

. replace year_dum1=1 if year_count==1
(575 real changes made)

. g year2_dum = 0

. replace year2_dum=1 if year_count==2
(575 real changes made)

.
. xtreg downrt evercmptr taxis year_dum*, fe i(id) cluster(msa)

Fixed-effects (within) regression               Number of obs      =      1148
Group variable: id                              Number of groups   =       574

R-sq:  within  = 0.4712                         Obs per group: min =         2
       between = 0.0016                                        avg =       2.0
       overall = 0.0037                                        max =         2

                                                F(3,168)           =     94.05
corr(u_i, Xb)  = -0.6436                        Prob > F           =    0.0000

                                    (Std. Err. adjusted for 169 clusters in msa)
------------------------------------------------------------------------------
             |               Robust
      downrt |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   evercmptr |  -15.78749   2.082928    -7.58   0.000    -19.89958    -11.6754
       taxis |   -.210539   .0281875    -7.47   0.000    -.2661864   -.1548917
   year_dum1 |  -23.58529   1.409993   -16.73   0.000    -26.36888    -20.8017
       _cons |   59.81082    2.47262    24.19   0.000     54.92941    64.69223
-------------+----------------------------------------------------------------
     sigma_u |  42.067178
     sigma_e |  14.492386
         rho |   .8939073   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Compared with the coefficients in Q1, the coefficients of computer adoption and firm size in Q3 stayed the same. Moreover, the coefficient of year_dum1 in Q3 is the same as the intercept in Q1.