```stata
1    // Panel Econometrics     //
2    // Assignment #5          //
3    // Author: Chuxin Liu      //
4    // Last Updated: 05082019 //
5
6    set more off
7    clear
8    capture log close
9
10   global root="C:\Users\cl3852\Documents\GitHub\PanelEconometrics\Assignments\HW5"
11   log using "$root\HW5.log",replace
12   use "$root\Cigar.dta", clear
13
14   sort state yr
15   xtset state yr
16
17   ***********************************************************************
18   *Question 1
19   *Variables in the regressions are in real term: adjusted for inflation using CPI
20
21   g c=sales*100/cpi
22   sort state yr
23   by state: gen clag = c[_n-1]
24   g lnc=ln(c)
25   g lnclag=ln(clag)
26   g y=ndi*100/cpi
27   g lny=ln(y)
28   g p=price*100/cpi
29   g lnp=ln(p)
30   g pn=pimin*100/cpi
31   g lnpn=ln(pn)
32
33   eststo clear
34   eststo sumstats: estpost summarize price pop pop16 cpi ndi sales pimin ///
35       lnc lnclag lnp lny lnpn
36   esttab sumstats using $root\Table1.rtf, replace main(mean %6.2f) aux(sd) ///
37       cell("mean sd") nomtitles title(Table 1: Summary Statistics) ///
38       addnotes("Created variables: lnc lnclag lnp lny lnpn")
39
40   ***********************************************************************
41   *Question 2
42   *(1) OLS
43   eststo clear
44   eststo OLS: reg lnc lnclag lnp lny lnpn
45   *(2) Within
46   tab yr, g(yrd)
47   eststo Within: xtreg lnc lnclag lnp lny lnpn yrd*, fe
48   *(3) 2SLS
49   eststo TSLS: xtivreg lnc lnp lny lnpn (lnclag = L.lnp L.lny L.lnpn)
50   *(4) 2SLS-KR
51   ssc install xtkr
52   eststo TSLSKR: xtkr lnc (lnclag lnp lny lnpn = d.l.lnc d.l(0/1).lnp d.l(0/1).lny d.l(0/1).lnpn yrd*)
53   *(5) Within-2SLS
```

```stata
54    eststo Within2SLS: xtivreg lnc lnp lny lnpn yrd* (lnclag = L.lnp L.lny L.lnpn), fe
55    *(6) FD-2SLS
56    eststo FD2SLS: xtivreg lnc lnp lny lnpn yrd* (lnclag = L.lnp L.lny L.lnpn), fd
57    *(7) FD-2SLS-KR
58    eststo FD2SLSKR: xtkr d.lnc (d.l.lnc d.lnp d.lny d.lnpn = l2.lnc l(1/2).lnp l(1/2).lny l(1/2).lnpn yrd*)
59    *(8) GMM-1-Step
60    ssc install xtabond2
61    eststo GMM1Step: xtabond2 lnc lnclag lnp lny lnpn yrd*, gmm(lnclag) iv(lnp lny lnpn yrd*) noleveleq robust
62    *(9) GMM-2-Step
63    eststo GMM2Step: xtabond2 lnc lnclag lnp lny lnpn yrd*, gmm(lnclag) iv(lnp lny lnpn yrd*) noleveleq twostep
64
65    esttab OLS Within TSLS TSLSKR Within2SLS ///
66        using $root\Table21.rtf, replace se noobs compress nogaps label ///
67        mtitle("OLS" "Within" "2SLS" "2SLS-KR" "Within-2SLS") ///
68        title(Table 2.1: Replication of Table 8.1 (1)) ///
69        keep(lnclag lnp lny lnpn) order(lnclag lnp lny lnpn) nonotes ///
70
71    esttab FD2SLS FD2SLSKR GMM1Step GMM2Step ///
72        using $root\Table22.rtf, replace se noobs compress nogaps label ///
73        mtitle("FD-2SLS" "FD-2SLS-KR" "GMM-1-Step" "GMM-2-Step") ///
74        title(Table 2.2: Replication of Table 8.1 (2)) ///
75        order(lnclag lnp lny lnpn D.lnclag LD.lnc D.lnp D.lny D.lnpn) nonotes ///
76        keep(lnclag lnp lny lnpn D.lnclag LD.lnc D.lnp D.lny D.lnpn)
77
78    ********************************************************************************
79    *Question 3: OLS vs. xtabond2
80    *OLS
81    eststo clear
82    eststo OLS: reg lnc lnclag lnp lny lnpn yrd*
83    *GMM-1-Step
84    eststo GMM1Step: xtabond2 lnc lnclag lnp lny lnpn yrd*, gmm(lnclag) iv(lnp lny lnpn yrd*) noleveleq robust
85    *GMM-2-Step
86    eststo GMM2Step: xtabond2 lnc lnclag lnp lny lnpn yrd*, gmm(lnclag) iv(lnp lny lnpn yrd*) noleveleq twostep
87    esttab OLS GMM1Step GMM2Step ///
88        using $root\Table3.rtf, replace se noobs compress nogaps label ///
89        mtitle("OLS" "GMM1Step" "GMM2Step") title(Table 3: OLS vs. xtabond2) ///
90        keep(lnclag lnp lny lnpn) order(lnclag lnp lny lnpn) nonotes
91
92    ********************************************************************************
93    *Question 4: FE vs. RE
94    *FE
95    eststo FE: xtreg lnc lnclag lnp lny lnpn yrd*, fe
96    eststo RE: xtreg lnc lnclag lnp lny lnpn yrd*, re
97    esttab FE RE ///
98        using $root\Table4.rtf, replace se noobs compress nogaps label ///
99        mtitle("FE" "RE") title(Table 4: FE vs. RE) ///
100       keep(lnclag lnp lny lnpn) order(lnclag lnp lny lnpn) nonotes
101
102   ********************************************************************************
103   *Question 5: 2SLS (ivregress), FE-2SLS and RE-2SLS (xtivreg) vs. Q3 and Q4
104   *2SLS (ivregress)
105   eststo TSLS: ivregress 2sls lnc lnp lny lnpn yrd* (lnclag = L.lnp L.lny L.lnpn)
106   *FE-2SLS (xtivreg)
```

```
107    eststo FE2SLS: xtivreg lnc lnp lny lnpn yrd* (lnclag = L.lnp L.lny L.lnpn), fe
108    *RE-2SLS (xtivreg)
109    eststo RE2SLS: xtivreg lnc lnp lny lnpn yrd* (lnclag = L.lnp L.lny L.lnpn), re
110    esttab TSLS FE2SLS RE2SLS ///
111        using $root\Table5.rtf, replace se noobs compress nogaps label ///
112        mtitle("2SLS" "FE-2SLS" "RE-2SLS") ///
113        title(Table 5: 2SLS (ivregress), FE-2SLS and RE-2SLS (xtivreg)) ///
114        keep(lnclag lnp lny lnpn) order(lnclag lnp lny lnpn) nonotes
115
116    ********************************************************************************
117    *Question 6: xtdpdsys vs. xtabond, comparing to FE and RE?
118    * Part 6.
119    eststo xtdpdsys: xtdpdsys lnc lnp lny lnpn yrd*, lags(1) twostep vce(robust)
120    esttab xtdpdsys GMM1Step GMM2Step FE RE ///
121        using $root\Table6.rtf, replace se noobs compress nogaps label ///
122        mtitle("xtdpdsys" "GMM-1-Step" "GMM-2-Step" "FE" "RE") ///
123        title(Table 6: xtdpdsys vs. xtabond, comparing to FE and RE) ///
124        keep(lnclag L.lnc lnp lny lnpn) order(lnclag L.lnc lnp lny lnpn) nonotes
125
126    ********************************************************************************
127    *Question 7: use xtdpd to replicate xtabond
128    eststo xtdpd: xtdpd l(0/1).lnc lnp lny lnpn yrd*, dgmmiv(lnc) div(lnp lny lnpn yrd*) twostep vce(robust)
129    esttab xtdpd GMM2Step ///
130        using $root\Table7.rtf, replace se noobs compress nogaps label ///
131        mtitle("xtdpd" "GMM2Step") title(Table 7: Use xtdpd to replicate xtabond) ///
132        keep(lnclag L.lnc lnp lny lnpn) order(lnclag L.lnc lnp lny lnpn) nonotes
133
134    ********************************************************************************
135    *Question 8: dgmmiv(lnp lny lnpn, lag(1.)) and dgmmiv(lnp lny lnpn, lag(1.1))
136    eststo ABOption1: xtdpd l(0/1).lnc lnp lny lnpn yrd*, dgmmiv(lnp lny lnpn,lag(1 .)) div(yrd*) twostep vce(robust)
137    eststo ABOption2: xtdpd l(0/1).lnc lnp lny lnpn yrd*, dgmmiv(lnp lny lnpn,lag(1 1)) div(yrd*) twostep vce(robust)
138    esttab ABOption1 ABOption2 ///
139        using $root\Table8.rtf, replace se noobs compress nogaps label ///
140        mtitle("AB-Option1" "AB-Option2") ///
141        title(Table 8: dgmmiv(lnp lny lnpn,lag(1 .)) and dgmmiv(lnp lny lnpn,lag(1 1))) ///
142        keep(L.lnc lnp lny lnpn) order(L.lnc lnp lny lnpn) nonotes
143
144    ********************************************************************************
145    *Question 9: lgmmiv(lnc) and lgmmiv(lnc lnp lny lnpn)
146    eststo ABOption3:  xtdpd l(0/1).lnc lnp lny lnpn yrd*, dgmmiv(lnc lnp lny lnpn,lag(1 .)) div(yrd*) twostep vce(robust)
147    eststo ABOption4:  xtdpd l(0/1).lnc lnp lny lnpn yrd*, dgmmiv(lnc lnp lny lnpn,lag(1 1)) div(yrd*) twostep vce(robust)
148    esttab ABOption3 ABOption4 ///
149        using $root\Table9.rtf, replace se noobs compress nogaps label ///
150        mtitle("AB-Option3" "AB-Option4") ///
151        title(Table 9: lgmmiv(lnc) and lgmmiv(lnc lnp lny lnpn)) ///
152        keep(L.lnc lnp lny lnpn) order(L.lnc lnp lny lnpn) nonotes
153
```