```
      name:  <unnamed>
       log:  C:\Users\XuQi\Desktop\第11章.smcl
  log type:  smcl
 opened on:  16 Jul 2024, 09:46:49

. do 第11章.do, nostop

. use "C:\Users\XuQi\Desktop\so2.dta", clear

.
. tab year
```

year	Freq.	Percent	Cum.
2004	554	8.33	8.33
2005	554	8.33	16.67
2006	554	8.33	25.00
2007	554	8.33	33.33
2008	554	8.33	41.67
2009	554	8.33	50.00
2010	554	8.33	58.33
2011	554	8.33	66.67
2012	554	8.33	75.00
2013	554	8.33	83.33
2014	554	8.33	91.67
2015	554	8.33	100.00
Total	6,648	100.00	

```
.
. *生成标识政策实施的时期变量
. gen time=1 if year>2007
(2,216 missing values generated)

. replace time=0 if year<=2007
(2,216 real changes made)

.
. *一重差分
. reg lntfp treat if time==1 & so2==1, vce(cluster area)

Linear regression                               Number of obs     =      2,320
                                                F(1, 30)          =       0.58
                                                Prob > F          =     0.4525
                                                R-squared         =     0.0018
                                                Root MSE          =     1.0221

                                   (Std. err. adjusted for 31 clusters in area)
```

lntfp	Coefficient	Robust std. err.	t	P>|t|	[95% conf.	interval]
treat	.0888057	.1166604	0.76	0.452	-.1494467	.327058
_cons	6.307181	.1065014	59.22	0.000	6.089676	6.524686

```
.
. *双重差分
. *使用regress
. reg lntfp treat##time if so2==1, vce(cluster area)

Linear regression                               Number of obs     =      3,480
                                                F(3, 30)          =      34.18
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0274
                                                Root MSE          =     .97167
```

(Std. err. adjusted for **31** clusters in **area**)

lntfp	Coefficient	Robust std. err.	t	P>|t|	[95% conf.	interval]
1.treat	**-.1634398**	**.0997303**	**-1.64**	**0.112**	**-.3671161**	**.0402366**
1.time	**.2265127**	**.0537277**	**4.22**	**0.000**	**.1167861**	**.3362394**
treat#time						
1 1	**.2522454**	**.0749276**	**3.37**	**0.002**	**.0992228**	**.4052681**
_cons	**6.080668**	**.0886817**	**68.57**	**0.000**	**5.899556**	**6.26178**

. reg lntfp treat##time zcsy lf age owner sczy lnaj lnlabor lnzlb if so2==1, vce(cluster area)

Linear regression

Number of obs	= **3,479**
F(11, 30)	= **49.21**
Prob > F	= **0.0000**
R-squared	= **0.2511**
Root MSE	= **.85347**

(Std. err. adjusted for **31** clusters in **area**)

lntfp	Coefficient	Robust std. err.	t	P>|t|	[95% conf.	interval]
1.treat	**-.1989419**	**.1019939**	**-1.95**	**0.061**	**-.4072411**	**.0093573**
1.time	**.112871**	**.0446667**	**2.53**	**0.017**	**.0216494**	**.2040925**
treat#time						
1 1	**.2687978**	**.0693089**	**3.88**	**0.001**	**.1272502**	**.4103454**
zcsy	**.0140037**	**.0022578**	**6.20**	**0.000**	**.0093927**	**.0186146**
lf	**-.011272**	**.0108661**	**-1.04**	**0.308**	**-.0334636**	**.0109195**
age	**.0028508**	**.0043906**	**0.65**	**0.521**	**-.0061161**	**.0118177**
owner	**.0346404**	**.0844039**	**0.41**	**0.684**	**-.1377354**	**.2070162**
sczy	**.0209755**	**.003483**	**6.02**	**0.000**	**.0138623**	**.0280888**
lnaj	**.0768758**	**.0273546**	**2.81**	**0.009**	**.0210103**	**.1327413**
lnlabor	**.1811897**	**.0295844**	**6.12**	**0.000**	**.1207703**	**.2416091**
lnzlb	**.0886227**	**.0173527**	**5.11**	**0.000**	**.0531836**	**.1240617**
_cons	**3.896457**	**.2478425**	**15.72**	**0.000**	**3.390295**	**4.402619**

.
. *使用diff
. diff lntfp if so2==1, t(treat) p(time) cluster(area)

DIFFERENCE-IN-DIFFERENCES ESTIMATION RESULTS

Number of observations in the DIFF-IN-DIFF: **3480**

	Before	After	
Control:	**716**	**1432**	2148
Treated:	**444**	**888**	1332
	1160	2320	

Outcome var.	**lntfp**	S. Err.	|t|	P>|t|
Before				
Control	6.081			
Treated	5.917			
Diff (T-C)	**-0.163**	**0.100**	**-1.64**	**0.112**
After				
Control	6.307			
Treated	6.396			
Diff (T-C)	**0.089**	**0.117**	**0.76**	**0.453**
Diff-in-Diff	**0.252**	**0.075**	**3.37**	**0.002*** **

R-square: **0.03**
* Means and Standard Errors are estimated by linear regression
**Clustered Std. Errors
**Inference: *** p<0.01; ** p<0.05; * p<0.1

```
. diff lntfp if so2==1, t(treat) p(time) cluster(area) cov(zcsy lf age owner sczy lnaj lnlabor lnzlb)
```

DIFFERENCE-IN-DIFFERENCES WITH COVARIATES

DIFFERENCE-IN-DIFFERENCES ESTIMATION RESULTS

Number of observations in the DIFF-IN-DIFF: **3479**

	Before	After	
Control:	**715**	**1432**	2147
Treated:	**444**	**888**	1332
	1159	2320	

Outcome var.	**lntfp**	S. Err.	|t|	P>|t|
Before				
Control	3.896			
Treated	3.698			
Diff (T-C)	**-0.199**	**0.102**	**-1.95**	**0.061***
After				
Control	4.009			
Treated	4.079			
Diff (T-C)	**0.070**	**0.094**	**0.74**	**0.464**
Diff-in-Diff	**0.269**	**0.069**	**3.88**	**0.001*****

R-square: **0.25**

* Means and Standard Errors are estimated by linear regression

**Clustered Std. Errors

**Inference: *** p<0.01; ** p<0.05; * p<0.1

```
. diff lntfp if so2==1, t(treat) p(time) cluster(area) cov(zcsy lf age owner sczy lnaj lnlabor lnzlb) test
```

TWO-SAMPLE T TEST

Number of observations (baseline): **1160**

	Before	After	
Control:	**716**	**-**	716
Treated:	**444**	**-**	444
	1160	-	

t-test at period = 0:

Variable(s)	Mean Control	Mean Treated	Diff.	|t|	Pr(|T|>|t|)
lntfp	6.081	5.917	-0.163	1.64	0.1117
zcsy	**7.229**	**7.204**	**-0.025**	**0.02**	**0.9858**
lf	**2.079**	**3.398**	**1.319**	**1.19**	**0.2416**
age	**11.511**	**11.365**	**-0.146**	**0.20**	**0.8407**
owner	**0.615**	**0.586**	**-0.029**	**0.43**	**0.6737**
sczy	**1.236**	**0.449**	**-0.788**	**2.06**	**0.0484****
lnaj	**7.552**	**8.114**	**0.562**	**1.43**	**0.1619**
lnlabor	**7.761**	**7.868**	**0.106**	**0.73**	**0.4736**
lnzlb	**0.466**	**0.517**	**0.050**	**0.46**	**0.6483**

*** p<0.01; ** p<0.05; * p<0.1

```
.
. *PSM+双重差分
. diff lntfp if so2==1, t(treat) p(time) cluster(area) cov(zcsy lf age owner sczy lnaj lnlabor lnzlb) kernel id(company) l
```

KERNEL PROPENSITY SCORE MATCHING DIFFERENCE-IN-DIFFERENCES

Estimation on common support

Matching iterations...

```
.....................................................................................................................
> .....................................................................................................................
```

DIFFERENCE-IN-DIFFERENCES ESTIMATION RESULTS

Number of observations in the DIFF-IN-DIFF: **3192**

	Before	After	
Control:	**656**	**1288**	1944
Treated:	**424**	**824**	1248
	1080	2112	

Outcome var.	**lntfp**	S. Err.	|t|	P>|t|
Before				
Control	6.081			
Treated	5.920			
Diff (T-C)	**-0.161**	**0.083**	**-1.95**	**0.061***
After				
Control	6.274			
Treated	6.404			

Diff (T-C)	**0.129**	**0.103**	**1.25**	**0.220**
Diff-in-Diff	**0.290**	**0.078**	**3.71**	**0.001*** **

R-square: **0.03**
* Means and Standard Errors are estimated by linear regression
**Clustered Std. Errors
**Inference: *** p<0.01; ** p<0.05; * p<0.1

```
. diff lntfp if so2==1, t(treat) p(time) cluster(area) cov(zcsy lf age owner sczy lnaj lnlabor lnzlb) kernel id(company) l
    Matching iterations...
.....................................................................................................................
> .....................................................................................................................
```

TWO-SAMPLE T TEST

Test on common support

Number of observations (baseline): **1160**

	Before	After	
Control:	**716**	**-**	716
Treated:	**444**	**-**	444
	1160	-	

t-test at period = 0:

Weighted Variable(s)	Mean Control	Mean Treated	Diff.	|t|	Pr(|T|>|t|)
lntfp	6.081	5.920	-0.161	1.95	0.0605*
zcsy	**7.148**	**7.197**	**0.049**	**0.04**	**0.9720**
lf	**2.524**	**2.705**	**0.181**	**0.25**	**0.8078**
age	**11.617**	**11.333**	**-0.285**	**0.33**	**0.7409**
owner	**0.597**	**0.587**	**-0.010**	**0.16**	**0.8717**
sczy	**0.433**	**0.435**	**0.002**	**0.02**	**0.9809**
lnaj	**8.182**	**8.127**	**-0.055**	**0.17**	**0.8681**
lnlabor	**7.821**	**7.866**	**0.045**	**0.32**	**0.7507**
lnzlb	**0.547**	**0.509**	**-0.038**	**0.33**	**0.7405**

*** p<0.01; ** p<0.05; * p<0.1
Attention: option kernel weighs variables in cov(varlist)
Means and t-test are estimated by linear regression

```
.
. *三重差分
. diff lntfp, t(treat) p(time) cluster(area) cov(zcsy lf age owner sczy lnaj lnlabor lnzlb) ddd(so2)
```

TRIPLE DIFFERENCE-IN-DIFFERENCES WITH COVARIATES

TRIPLE DIFFERENCE (DDD) ESTIMATION RESULTS

Notation of DDD:

Control (A)	treat = 0 **and** so2 = 1
Control (B)	treat = 0 **and** so2 = 0
Treated (A)	treat = 1 **and** so2 = 1
Treated (B)	treat = 1 **and** so2 = 0

Number of observations in the DDD: **6645**

	Before	After	
Control (A):	**715**	**1432**	2147
Control (B):	**659**	**1319**	1978
Treated (A):	**444**	**888**	1332
Treated (B):	**396**	**792**	1188
	2214	4431	

Outcome var.	**lntfp**	S. Err.	|t|	P>|t|
Before				
Control (A)	3.987			
Control (B)	3.807			
Treated (A)	3.809			
Treated (B)	3.830			
Diff (T-C)	**-0.201**	**0.124**	**1.62**	**0.115**
After				
Control (A)	4.092			
Control (B)	4.272			
Treated (A)	4.178			
Treated (B)	4.087			
Diff (T-C)	**0.272**	**0.125**	**2.18**	**0.037** **
DDD	**0.473**	**0.105**	**4.48**	**0.000*** **

R-square: **0.28**
* Means and Standard Errors are estimated by linear regression
**Clustered Std. Errors
**Inference: *** p<0.01; ** p<0.05; * p<0.1

```
. reg lntfp treat##time##so2 zcsy lf age owner sczy lnaj lnlabor lnzlb, vce(cluster area)

Linear regression                               Number of obs     =      6,645
                                                F(15, 30)         =     100.09
                                                Prob > F          =     0.0000
                                                R-squared         =     0.2836
                                                Root MSE          =     .85096

                                   (Std. err. adjusted for 31 clusters in area)
------------------------------------------------------------------------------
             |               Robust
       lntfp | Coefficient  std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
    1.treat  |   .0227465   .1024759     0.22   0.826    -.1865372    .2320303
     1.time  |   .4652871   .0566712     8.21   0.000     .3495491    .5810252
             |
  treat#time |
        1 1  |  -.2082028    .076687    -2.71   0.011    -.3648187    -.051587
             |
     1.so2   |   .1803518   .0950319     1.90   0.067    -.0137293    .3744329
             |
   treat#so2 |
        1 1  |  -.2010362   .1237354    -1.62   0.115    -.4537376    .0516651
             |
    time#so2 |
        1 1  |   -.360426    .061117    -5.90   0.000    -.4852436   -.2356084
             |
treat#time#so2 |
      1 1 1  |      .4726   .1054661     4.48   0.000     .2572095    .6879905
             |
        zcsy |   .0152224   .0018709     8.14   0.000     .0114015    .0190433
          lf |  -.0095792   .0085473    -1.12   0.271     -.027035    .0078767
         age |   .0060498   .0037545     1.61   0.118    -.0016179    .0137174
       owner |  -.0121611   .0502389    -0.24   0.810    -.1147627    .0904404
        sczy |   .0287401   .0051478     5.58   0.000     .0182269    .0392534
        lnaj |   .0433441   .0220366     1.97   0.059    -.0016606    .0883488
     lnlabor |   .1989679   .0210119     9.47   0.000     .1560559    .2418799
       lnzlb |   .0764826   .0125055     6.12   0.000      .050943    .1020222
       _cons |   3.806953   .1991366    19.12   0.000     3.400262    4.213644
------------------------------------------------------------------------------

.
. *多期双重差分
. reg lntfp treat##i.year if so2==1, vce(cluster area)

Linear regression                               Number of obs     =      3,480
                                                F(21, 30)         =          .
                                                Prob > F          =          .
                                                R-squared         =     0.0493
                                                Root MSE          =     .96342

                                   (Std. err. adjusted for 31 clusters in area)
------------------------------------------------------------------------------
             |               Robust
       lntfp | Coefficient  std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
    1.treat  |  -.1840304   .1127734    -1.63   0.113    -.4143443    .0462835
             |
        year |
       2005  |   .0090056    .046054     0.20   0.846    -.0850492    .1030604
       2006  |   .0954318   .0521879     1.83   0.077    -.0111502    .2020137
       2007  |   .3337292   .0633192     5.27   0.000     .2044142    .4630443
       2008  |   .0808051   .1140292     0.71   0.484    -.1520735    .3136838
       2009  |   .2589026   .0939196     2.76   0.010     .0670933     .450712
       2010  |   .3172287   .0699272     4.54   0.000     .1744183     .460039
       2011  |   .3409849   .1061847     3.21   0.003     .1241268    .5578429
       2012  |   .3716956   .0671542     5.53   0.000     .2345484    .5088428
       2013  |    .425858    .077219     5.51   0.000     .2681557    .5835602
       2014  |   .4943078   .0723734     6.83   0.000     .3465016    .6421141
       2015  |   .3986523   .0917391     4.35   0.000     .2112961    .5860084
             |
  treat#year |
     1 2005  |  -.0104657   .0604552    -0.17   0.864    -.1339317    .1130003
```

1 2006	.0563132	.0814006	0.69	0.494	-.109929	.2225553
1 2007	.0365152	.0811367	0.45	0.656	-.129188	.2022184
1 2008	.1327992	.1455011	0.91	0.369	-.1643537	.429952
1 2009	.1604434	.1288306	1.25	0.223	-.1026637	.4235506
1 2010	.2613511	.1296397	2.02	0.053	-.0034085	.5261107
1 2011	.3565759	.1398286	2.55	0.016	.0710079	.6421439
1 2012	.2988896	.1183659	2.53	0.017	.0571542	.540625
1 2013	.3188529	.1341609	2.38	0.024	.0448598	.5928459
1 2014	.3198456	.1130307	2.83	0.008	.089006	.5506851
1 2015	.333931	.131772	2.53	0.017	.0648167	.6030454
_cons	5.971126	.0935335	63.84	0.000	5.780106	6.162147

```
. reg lntfp treat##i.year zcsy lf age owner sczy lnaj lnlabor lnzlb if so2==1, vce(cluster area)

Linear regression                               Number of obs     =      3,479
                                                F(29, 30)         =          .
                                                Prob > F          =          .
                                                R-squared         =     0.2657
                                                Root MSE          =     .84755

                                   (Std. err. adjusted for 31 clusters in area)
```

lntfp	Coefficient	Robust std. err.	t	P>|t|	[95% conf.	interval]
1.treat	-.2282414	.1150343	-1.98	0.056	-.4631729	.0066901
year						
2005	.0891487	.0572108	1.56	0.130	-.0276912	.2059887
2006	.0992199	.0591842	1.68	0.104	-.0216504	.2200901
2007	.2416198	.0655007	3.69	0.001	.1078495	.3753901
2008	.0506266	.0950662	0.53	0.598	-.1435245	.2447777
2009	.2488978	.0919622	2.71	0.011	.061086	.4367097
2010	.1908061	.0755103	2.53	0.017	.0365934	.3450188
2011	.2501845	.0871373	2.87	0.007	.0722264	.4281426
2012	.3104828	.0611604	5.08	0.000	.1855765	.4353891
2013	.3174777	.0693984	4.57	0.000	.1757473	.4592082
2014	.4230261	.0745342	5.68	0.000	.270807	.5752452
2015	.3615054	.0815603	4.43	0.000	.1949371	.5280738
treat#year						
1 2005	-.007383	.0703811	-0.10	0.917	-.1511205	.1363544
1 2006	.0697575	.0800641	0.87	0.391	-.0937553	.2332703
1 2007	.0636727	.0875883	0.73	0.473	-.1152065	.242552
1 2008	.1466794	.1257514	1.17	0.253	-.1101392	.403498
1 2009	.1424666	.1212662	1.17	0.249	-.105192	.3901252
1 2010	.3531054	.1043513	3.38	0.002	.1399917	.5662191
1 2011	.3358427	.1217471	2.76	0.010	.0872019	.5844835
1 2012	.3117943	.0975774	3.20	0.003	.1125146	.511074
1 2013	.4075408	.122991	3.31	0.002	.1563597	.6587219
1 2014	.3032603	.0994332	3.05	0.005	.1001906	.50633
1 2015	.3873069	.125767	3.08	0.004	.1304565	.6441573
zcsy	.0141708	.0023013	6.16	0.000	.0094709	.0188707
lf	-.0129489	.0110561	-1.17	0.251	-.0355284	.0096305
age	-.0038743	.0049712	-0.78	0.442	-.0140269	.0062782
owner	.0340992	.0840435	0.41	0.688	-.1375406	.205739
sczy	.0218173	.0038772	5.63	0.000	.0138989	.0297356
lnaj	.0783234	.0275275	2.85	0.008	.0221049	.134542
lnlabor	.1761974	.0293381	6.01	0.000	.1162809	.2361139
lnzlb	.0794305	.0180055	4.41	0.000	.0426584	.1162027
_cons	3.899891	.2711109	14.38	0.000	3.346208	4.453573

```
.
.
end of do-file

. log close
      name:  <unnamed>
       log:  C:\Users\XuQi\Desktop\第11章.smcl
  log type:  smcl
 closed on:  16 Jul 2024, 09:47:01
```