

```
name: <unnamed>
log: C:\Users\XuQi\Documents\第六章.smcl
log type: smcl
opened on: 15 Jul 2024, 10:11:44
```

```
. do "C:\Users\XuQi\Desktop\第6章.do", nostop

. use "C:\Users\XuQi\Desktop\cfps2010.dta", clear

.
. *一元线性回归
. reg lninc college, vce(cluster provcd)
```

```
Linear regression               Number of obs   =      4,137
                               F(1, 24)           =      271.17
                               Prob > F             =      0.0000
                               R-squared             =      0.1095
                               Root MSE          =      1.1498
```

(Std. err. adjusted for 25 clusters in provcd)

lninc	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]	
college	.823612	.0500155	16.47	0.000	.7203851	.926839
_cons	9.353189	.1084703	86.23	0.000	9.129317	9.577061

```
.
. *有放回的1对1匹配
. teffects psmatch (lninc) (college hukou age gender race sibling i.fmedu)
```

```
Treatment-effects estimation      Number of obs   =      4,137
Estimator      : propensity-score matching  Matches: requested =      1
Outcome model  : matching                  min =      1
Treatment model: logit                    max =      50
```

lninc	Coefficient	AI robust std. err.	z	P> z	[95% conf. interval]	
ATE college (是 vs 否)	.7867998	.0411656	19.11	0.000	.7061167	.8674829

```
.
. *带卡尺的1对1匹配
. teffects psmatch (lninc) (college hukou age gender race sibling i.fmedu), caliper(0.02)
no propensity-score matches for observation 2607 within caliper 0.02; use option osample() to identify all observations with defia
r(459);
```

```
.
. teffects psmatch (lninc) (college hukou age gender race sibling i.fmedu), caliper(0.02) osample(flag)
1 observation has no propensity-score matches within caliper .02; it is identified in the osample() variable
r(459);
```

```
. tab flag
```

overlap violation indicator	Freq.	Percent	Cum.
0	4,136	99.98	99.98
1	1	0.02	100.00
Total	4,137	100.00	

```
.
. teffects psmatch (lninc) (college hukou age gender race sibling i.fmedu) if flag==0, caliper(0.02)
```

```
Treatment-effects estimation      Number of obs   =      4,136
Estimator      : propensity-score matching  Matches: requested =      1
Outcome model  : matching                  min =      1
Treatment model: logit                    max =      50
```

lninc	Coefficient	AI robust std. err.	z	P> z	[95% conf. interval]	
ATE college (是 vs 否)	.7823973	.0411119	19.03	0.000	.7018194	.8629751

```
. *带卡尺的1对4匹配
. teffects psmatch (lninc) (college hukou age gender race sibling i.fmedu) if flag==0, caliper(0.02) nneighbor(4) vce(robust, nm

Treatment-effects estimation      Number of obs      =      4,136
Estimator      : propensity-score matching      Matches: requested =      4
Outcome model  : matching                      min =      4
Treatment model: logit                      max =      50
```

lninc	Coefficient	AI robust std. err.	z	P> z	[95% conf. interval]	
ATE college (是 vs 否)	.7981312	.0398814	20.01	0.000	.7199651	.8762974

```
.
. *平衡性检验
. qui teffects psmatch (lninc) (college hukou age gender race sibling i.fmedu) if flag==0, caliper(0.02)

. tebalance summarize
(refitting the model using the generate() option)
```

Covariate balance summary

	Raw	Matched
Number of obs =	4,136	8,272
Treated obs =	1,642	4,136
Control obs =	2,494	4,136

	Standardized differences		Variance ratio	
	Raw	Matched	Raw	Matched
hukou	.2391517	-.0014774	1.082073	.9994289
age	-.7809001	-.0058524	.8161995	.9835917
gender	-.0813989	.0357897	1.025221	.9881189
race	-.0453557	-.0203342	1.199887	1.096473
sibling	.3632311	.0106027	2.008184	1.022875
fmedu	.5411217	-.0152094	2.038229	.9794947
是 缺失	-.2525403	0	.6932101	1

```
.
. qui teffects psmatch (lninc) (college hukou age gender race sibling i.fmedu) if flag==0, caliper(0.02) nneighbor(4) vce(robust, nm

. tebalance summarize
(refitting the model using the generate() option)
```

Covariate balance summary

	Raw	Matched
Number of obs =	4,136	8,272
Treated obs =	1,642	4,136
Control obs =	2,494	4,136

	Standardized differences		Variance ratio	
	Raw	Matched	Raw	Matched
hukou	.2391517	-.0031644	1.082073	.9986757
age	-.7809001	-.000016	.8161995	.9710056
gender	-.0813989	.0745308	1.025221	.971546
race	-.0453557	.0349928	1.199887	.8487141
sibling	.3632311	.050172	2.008184	1.1103
fmedu	.5411217	-.0048144	2.038229	.993381
是 缺失	-.2525403	.0173444	.6932101	1.025388

```
. qui teffects psmatch (lninc) (college hukou age gender race sibling i.fmedu) if flag==0, caliper(0.02)

. tebalance density age
(refitting the model using the generate() option)

.
. qui teffects psmatch (lninc) (college hukou age gender race sibling i.fmedu) if flag==0, caliper(0.02)

. tebalance box age
(refitting the model using the generate() option)

.
. *检查共同取值范围
. qui teffects psmatch (lninc) (college hukou age gender race sibling i.fmedu) if flag==0, caliper(0.02)

. teffects overlap
(refitting the model using the generate() option)

.
. *psmatch2命令的使用
. psmatch2 college hukou age gender race sibling i.fmedu if flag==0, outcome(lninc) caliper(0.02) common ate logit ties odds /
```

Logistic regression

Number of obs = 4,136

LR chi2(7) = 690.80

Prob > chi2 = 0.0000

Log likelihood = -2433.071

Pseudo R2 = 0.1243

college	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
hukou	.3691967	.0750768	4.92	0.000	.2220487	.5163446
age	-.0778884	.004612	-16.89	0.000	-.0869278	-.068849
gender	-.0052387	.0707322	-0.07	0.941	-.1438713	.1333939
race	-.178265	.155782	-1.14	0.252	-.4835921	.1270622
sibling	.1541583	.1050904	1.47	0.142	-.0518152	.3601318
fmedu 是 缺失	.8091184	.0889782	9.09	0.000	.6347243	.9835126
	.1444773	.093519	1.54	0.122	-.0388166	.3277713
_cons	2.400111	.2338113	10.27	0.000	1.941849	2.858373

There are observations with identical propensity score values.
The sort order of the data could affect your results.
Make sure that the sort order is random before calling psmatch2.

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
lninc	Unmatched	10.1775256	9.35318907	.824336518	.036540222	22.56
	ATT	10.1784556	9.47407844	.704377162	.054015335	13.04
	ATU	9.35371331	10.18839	.834676643	.	.
	ATE			.783030667	.	.

Note: S.E. does not take into account that the propensity score is estimated.

psmatch2: Treatment assignment	psmatch2: Common support		Total
	Off suppo	On suppor	
Untreated	4	2,490	2,494
Treated	7	1,635	1,642
Total	11	4,125	4,136

```
. psmatch2 college hukou age gender race sibling i.fmedu if flag==0, outcome(lninc) caliper(0.02) neighbor(4) common ate logit ti
There are observations with identical propensity score values.
The sort order of the data could affect your results.
Make sure that the sort order is random before calling psmatch2.
```

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
lninc	Unmatched	10.1775256	9.35318907	.824336518	.036540222	22.56
	ATT	10.1784556	9.47589894	.702556661	.050086699	14.03
	ATU	9.35371331	10.2115772	.857863905	.	.
	ATE			.796305761	.	.

Note: S.E. does not take into account that the propensity score is estimated.

psmatch2: Treatment assignment	psmatch2: Common support		Total
	Off suppo	On suppor	
Untreated	4	2,490	2,494
Treated	7	1,635	1,642
Total	11	4,125	4,136

. psmatch2 college hukou age gender race sibling i.fmedu if flag==0, outcome(lninc) caliper(0.02) radius common ate logit quietly

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
lninc	Unmatched	10.1775256	9.35318907	.824336518	.036540222	22.56
	ATT	10.1778062	9.48062537	.697180782	.042803897	16.29
	ATU	9.35318907	10.2249628	.8717737	.	.
	ATE			.80256189	.	.

Note: S.E. does not take into account that the propensity score is estimated.

psmatch2: Treatment assignment	psmatch2: Common support		Total
	Off suppo	On suppor	
Untreated	0	2,494	2,494
Treated	4	1,638	1,642
Total	4	4,132	4,136

. psmatch2 college hukou age gender race sibling i.fmedu if flag==0, outcome(lninc) kernel common ate logit quietly //核匹配

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
lninc	Unmatched	10.1775256	9.35318907	.824336518	.036540222	22.56
	ATT	10.1778062	9.47873591	.699070244	.042010122	16.64
	ATU	9.35318907	10.2248952	.871706092	.	.
	ATE			.8032701	.	.

Note: S.E. does not take into account that the propensity score is estimated.

psmatch2: Treatment assignment	psmatch2: Common support		Total
	Off suppo	On suppor	
Untreated	0	2,494	2,494
Treated	4	1,638	1,642
Total	4	4,132	4,136

.
 . *平衡性检验
 . qui psmatch2 college hukou age gender race sibling i.fmedu if flag==0, outcome(lninc) kernel common ate logit quietly
 . pstest, both graph

Variable	Unmatched Matched	Mean		%reduct		t-test		V(T)/ V(C)
		Treated	Control	%bias	bias	t	p> t	
hukou	U	.47808	.36087	23.9		7.56	0.000	.
	M	.4768	.45253	5.0	79.3	1.39	0.164	.
age	U	35.745	42.282	-78.1		-24.32	0.000	0.82*
	M	35.769	35.67	1.2	98.5	0.35	0.725	0.94
gender	U	.55481	.59503	-8.1		-2.56	0.010	.
	M	.55617	.56359	-1.5	81.5	-0.43	0.669	.
race	U	.94214	.95229	-4.5		-1.44	0.150	.
	M	.94444	.93873	2.6	43.6	0.70	0.486	.
sibling	U	.23021	.09783	36.3		11.85	0.000	.
	M	.22955	.2036	7.1	80.4	1.80	0.071	.
1.fmedu	U	.3514	.12831	54.1		17.66	0.000	.
	M	.34982	.33667	3.2	94.1	0.79	0.428	.
2.fmedu	U	.15895	.26103	-25.3		-7.80	0.000	.
	M	.15934	.15411	1.3	94.9	0.41	0.681	.

* if variance ratio outside [0.91; 1.10] for U and [0.91; 1.10] for M

Sample	Ps R2	LR chi2	p>chi2	MeanBias	MedBias	B	R	%Var
Unmatched	0.125	692.69	0.000	32.9	25.3	88.4*	1.13	100
Matched	0.001	6.07	0.531	3.1	2.6	8.6	1.01	0

* if B>25%, R outside [0.5; 2]

```
.
. *检查共同取值范围
. qui psmatch2 college hukou age gender race sibling i.fmedu if flag==0, outcome(lninc) kernel common ate logit quietly

. psgraph, bin(5)
```

```
.
. *敏感性分析
. psmatch2 college hukou age gender race sibling i.fmedu if flag==0, outcome(lninc) caliper(0.02) common logit ties odds quietly
There are observations with identical propensity score values.
The sort order of the data could affect your results.
Make sure that the sort order is random before calling psmatch2.
```

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
lninc	Unmatched	10.1775256	9.35318907	.824336518	.036540222	22.56
	ATT	10.1784556	9.47407844	.704377162	.054015335	13.04

Note: S.E. does not take into account that the propensity score is estimated.

psmatch2: Treatment assignment	psmatch2: Common support		
	Off suppo	On suppor	Total
Untreated	0	2,494	2,494
Treated	7	1,635	1,642
Total	7	4,129	4,136

```
.
. gen diff=lninc-_lninc if _treated==1 & _support==1 & flag==0
(2,502 missing values generated)

. rbounds diff, gamma(1 (1) 5)
```

Rosenbaum bounds for **diff** (N = **1635** matched pairs)

Gamma	sig+	sig-	t-hat+	t-hat-	CI+	CI-

1	0	0	.679028	.679028	.630224	.728463
2	0	0	.380941	.985865	.329637	1.0398
3	8.1e-12	0	.210826	1.16725	.1551	1.22661
4	.001779	0	.0917	1.29513	.031636	1.35918
5	.501555	0	-3.4e-07	1.39373	-.065069	1.4644

```
* gamma - log odds of differential assignment due to unobserved factors
sig+ - upper bound significance level
sig- - lower bound significance level
t-hat+ - upper bound Hodges-Lehmann point estimate
t-hat- - lower bound Hodges-Lehmann point estimate
CI+ - upper bound confidence interval (a= .95)
CI- - lower bound confidence interval (a= .95)
```

```
. rbounds diff, gamma(4 (0.1) 5)
```

Rosenbaum bounds for **diff** (N = **1635** matched pairs)

Gamma	sig+	sig-	t-hat+	t-hat-	CI+	CI-

1	0	0	.679028	.679028	.630224	.728463
4	.001779	0	.0917	1.29513	.031636	1.35918
4.1	.004789	0	.081498	1.30569	.020604	1.37133
4.2	.011459	0	.071757	1.31663	.010318	1.38245
4.3	.024612	0	.061753	1.32688	3.4e-07	1.39327
4.4	.047872	0	.05268	1.33685	-.009798	1.40459
4.5	.085031	0	.04293	1.34712	-.019613	1.4148
4.6	.139007	0	.033641	1.35616	-.029213	1.42535
4.7	.210731	0	.025061	1.36639	-.038481	1.43508
4.8	.298408	0	.016951	1.37553	-.047947	1.44519
4.9	.397505	0	.008004	1.38522	-.056148	1.45504
5	.501555	0	-3.4e-07	1.39373	-.065069	1.4644

```
* gamma - log odds of differential assignment due to unobserved factors
sig+ - upper bound significance level
sig- - lower bound significance level
t-hat+ - upper bound Hodges-Lehmann point estimate
t-hat- - lower bound Hodges-Lehmann point estimate
CI+ - upper bound confidence interval (a= .95)
CI- - lower bound confidence interval (a= .95)

.
end of do-file

. log close
    name: <unnamed>
    log: C:\Users\XuQi\Documents\第六章.smcl
    log type: smcl
closed on: 15 Jul 2024, 10:12:59
```
