```
 1
 2  set more off
 3  cd "C:\Users\derya\Dropbox\Derya\Teaching\applied
    microeconometrics\stata"
 4  log using stata_treatment, replace
 5  /*Treatmen Effects in STATA*/
 6
 7  /*I-Regression Adjustment*/
 8  webuse cattaneo2
 9  /*Estimation of ATE */
10  teffects ra (bweight prenatal1 mmarried mage fbaby) (mbsmoke)
11  estimates store m1, title(Regression)
12  /*Estimation of ATT*/
13  teffects ra (bweight prenatal1 mmarried mage fbaby) (mbsmoke),
    atet
14
15  /*Estimation of E[Y_1] and E[Y_0], and regression coefs of
    potential outcome models*/
16  teffects ra (bweight prenatal1 mmarried mage fbaby) (mbsmoke),
    pomeans aequations
17
18  /*Reporting the ATE as a percentage*/
19  teffects ra (bweight prenatal1 mmarried mage fbaby) (mbsmoke),
    coeflegend
20  nlcom _b[ATE:r1vs0.mbsmoke] / _b[POmean:r0.mbsmoke]
21
22  /*We find that smoking during pregnancy reduces birthweight by
    about 7% on average, a statistically
23  significant amount*/
24
25  /*Modeling nonnegative outcomes*/
26  teffects ra (bweight prenatal1 mmarried mage fbaby, poisson) (
    mbsmoke)
27
28  /*II-IPW*/
29
30  /*Estimation of ATE */
31  teffects ipw (bweight) (mbsmoke mmarried c.mage##c.mage fbaby
    medu, probit)
32  estimates store m2, title(IPW)
33  /*Estimation of ATT*/
34  teffects ipw (bweight) (mbsmoke mmarried c.mage##c.mage fbaby
    medu, probit), atet
35
36  /*Estimation of E[Y_1] and E[Y_0], and regression coefs of
    potential outcome models*/
37  teffects ipw  (bweight) (mbsmoke mmarried c.mage##c.mage fbaby
    medu, probit), pomeans aequations
38
39  /*Reporting the ATE as a percentage*/
```

```
teffects ipw (bweight) (mbsmoke mmarried c.mage##c.mage fbaby medu, probit), coeflegend
nlcom _b[ATE:r1vs0.mbsmoke] / _b[POmean:r0.mbsmoke]

/*We find that smoking during pregnancy reduces birthweight by about 6.7% on average, a statistically
significant amount*/
/*Estimation of ATE */
teffects ipw (bweight) (mbsmoke mmarried c.mage##c.mage fbaby medu, logit)
/*Estimation of ATT*/
teffects ipw (bweight) (mbsmoke mmarried c.mage##c.mage fbaby medu, logit), atet

/*Estimation of E[Y_1] and E[Y_0], and regression coefs of potential outcome models*/
teffects ipw  (bweight) (mbsmoke mmarried c.mage##c.mage fbaby medu, logit), pomeans aequations

/*Reporting the ATE as a percentage*/
teffects ipw (bweight) (mbsmoke mmarried c.mage##c.mage fbaby medu, logit), coeflegend
nlcom _b[ATE:r1vs0.mbsmoke] / _b[POmean:r0.mbsmoke]

/*We find that smoking during pregnancy reduces birthweight by about 6.8% on average, a statistically
significant amount*/

/*III-teffects aipw — Augmented inverse-probability weighting (DR1)*/
/*Estimation of ATE */
teffects aipw (bweight prenatal1 mmarried mage fbaby) (mbsmoke mmarried c.mage##c.mage fbaby medu, probit)
estimates store m3, title(AIPW)
/*Estimation of E[Y_1] and E[Y_0], and regression coefs of potential outcome models*/
teffects aipw (bweight prenatal1 mmarried mage fbaby) (mbsmoke mmarried c.mage##c.mage fbaby medu, probit), pomeans aequations

/*Heteroskedastic probit treatment model*/
local outx prenatal1 mmarried fbaby
local treatx mmarried c.mage##c.mage fbaby medu
teffects aipw (bweight `outx') (mbsmoke `treatx', probit), pomeans aequations

teffects aipw (bweight prenatal1 mmarried fbaby) (mbsmoke mmarried c.mage##c.mage fbaby medu, hetprobit(c.mage)), aequations


```

```
/*Using the WNLS estimator*/
teffects aipw (bweight prenatal1 mmarried mage fbaby) (mbsmoke
mmarried c.mage##c.mage fbaby medu, probit), wnls


/*IV-Inverse probability weighted regression adjustment*/
/*Estimation of ATE */
teffects ipwra (bweight prenatal1 mmarried mage fbaby) (mbsmoke
 mmarried c.mage##c.mage fbaby medu, probit)
estimates store m4, title(IPW-REG)

/*Estimation of E[Y_1] and E[Y_0], and regression coefs of
potential outcome models*/
teffects ipwra (bweight prenatal1 mmarried mage fbaby) (mbsmoke
 mmarried c.mage##c.mage fbaby medu, probit), pomeans aequations

/*Heteroskedastic probit treatment model*/
teffects ipwra (bweight prenatal1 mmarried fbaby c.mage) (
mbsmoke mmarried c.mage##c.mage fbaby medu, hetprobit(c.mage##c
.mage)), aequations

/*Estimation of E[Y_1] and E[Y_0], and regression coefs of
potential outcome models*/
teffects ipwra (bweight prenatal1 mmarried mage fbaby, poisson)
 (mbsmoke mmarried c.mage##c.mage fbaby medu, probit)

estout * using example.tex, replace cells(b(star fmt(%9.2f)
label(Coef.))  se(par fmt(%9.2f) label(Std. Err.))) label
legend varlabels(_cons Constant c.mage#c.mage "Age Squared")
style(tex)


/*V-Matching Methods*/
/*Estimating the ATE*/
/*Matching on covariates, nearest neighbor based on
Mahalanobis distance*/
teffects nnmatch (bweight mage prenatal1 mmarried fbaby) (
mbsmoke)
/*Matching on covariates, nearest neighbor based on Euclidean
distance*/
teffects nnmatch (bweight mage prenatal1 mmarried fbaby) (
mbsmoke), metric(euclidean)
/*Exact matching*/
teffects nnmatch (bweight mage) (mbsmoke), ematch(prenatal1
mmarried fbaby)

/*Bias Adjustment (Abadie & Imbens)*/
teffects nnmatch (bweight mage fage) (mbsmoke), ematch(
prenatal1 mmarried fbaby) biasadj(mage fage)

```

```
/*m-th nn matching*/
teffects nnmatch (bweight mage fage) (mbsmoke), nneighbor(3)



/*Propensity Score Matching*/
teffects psmatch (bweight) (mbsmoke mmarried c.mage##c.mage
fbaby medu)

/*Specifying the caliper*/
//teffects psmatch (bweight) (mbsmoke mmarried c.mage##c.mage
fbaby medu), caliper(0.03)

teffects psmatch (bweight) (mbsmoke mmarried c.mage##c.mage
fbaby medu), caliper(0.13)

teffects psmatch (bweight) (mbsmoke mmarried c.mage##c.mage
fbaby medu), caliper(0.13) nneighbor(3)


/*Estimation of ATT requires only matches for treated group*/
teffects psmatch (bweight) (mbsmoke mmarried c.mage##c.mage
fbaby medu), atet vce(iid) caliper(0.03)


/*teffects overlap – Overlap plots*/
teffects ipw (bweight) (mbsmoke mmarried c.mage##c.mage fbaby
medu, probit)
teffects overlap

probit mbsmoke mmarried c.mage##c.mage fbaby medu
predict pshat

twoway (histogram pshat if mbsmoke==1,  color(green)
fintensity(40)) ///
       (histogram pshat if mbsmoke==0, ///
       fcolor(none) lcolor(black)), legend(order(1 "Smoker" 2
"Non-smoker" ))



/*Overlap assumption Violated*/
use http://www.stata-press.com/data/r13/systolic2, replace
twoway (scatter systolic weight if xy1==1, mcolor(red)) ///
 (scatter systolic weight if xy1==0, mcolor(blue)), ///
 legend(label(1 "Treated") label(2 "Untreated"))

 teffects ipw (systolic) (xy1 weight), pstolerance(1e-8)
 teffects overlap

```

```
150   probit xy1 weight
151   predict pshat2
152
153   twoway (histogram pshat2 if xy1==1,  color(green)  fintensity(
      40)) ///
154          (histogram pshat2 if xy1==0, ///
155          fcolor(none) lcolor(black)), legend(order(1 "Treated" 2
      "control" ))
156
157          log close
158
```