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HW#3

(Stata output starts at page 6)

1.

a) As shown from the Stata output:

- For performance, the difference is significant at 10% level, with the control having a higher mean than the treatment group.

- For stdv, the difference is significant at 10% level, with the treatment having a higher mean than the control group.

- For start_date, the difference is significant at 10% level, with the control having a higher mean than the treatment group.

- For log_age, the difference is significant at 10% level, with the control having a higher mean than the treatment group.

- For log_aum, the difference is significant at 10% level, with the control having a higher mean than the treatment group.

- For missing_aum, the difference is significant at 10% level, with the treatment having a higher mean than the control group.

- For year_dum_4, the difference is significant at 10% level, with the treatment having a higher mean than the control group.

- For year_dum_5, the difference is not significant at 10% level.

- For year_dum_6, the difference is significant at 10% level, with the treatment having a higher mean than the control group.

- For year_dum_7, the difference is significant at 10% level, with the treatment having a higher mean than the control group.

- For year_dum_8, the difference is significant at 10% level, with the control having a higher mean than the treatment group.

- For year_dum_9, the difference is significant at 10% level, with the control having a higher mean than the treatment group.

- For year_dum_10, the difference is significant at 10% level, with the treatment having a higher mean than the control group.

- For year_dum_11, the difference is not significant at 10% level.

- For year_dum_12, the difference is significant at 10% level, with the treatment having a higher mean than the control group.

- For year_dum_13, the difference is not significant at 10% level.

- For year_dum_14, the difference is not significant at 10% level.

- For year_dum_15, the difference is not significant at 10% level.

- For year_dum_16, the difference is significant at 10% level, with the control having a higher mean than the treatment group.

- For year_dum_17, the difference is significant at 10% level, with the control having a higher mean than the treatment group.

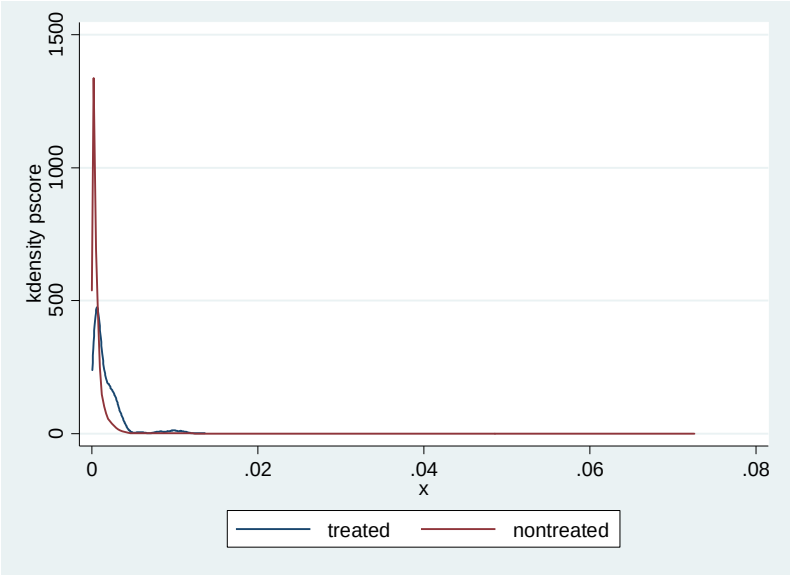
- For year_dum_18, the difference is significant at 10% level, with the control having a higher mean than the treatment group.

- For year_dum_19, the difference is significant at 10% level, with the control having a higher mean than the treatment group.

- For year_dum_20, the difference is significant at 10% level, with the control having a higher mean than the treatment group.

- For year_dum_21, the difference is significant at 10% level, with the control having a higher mean than the treatment group.

b) As shown by the Stata output below, the distributions seem to be a little bit different, with the control group’s distribution having a higher peak.



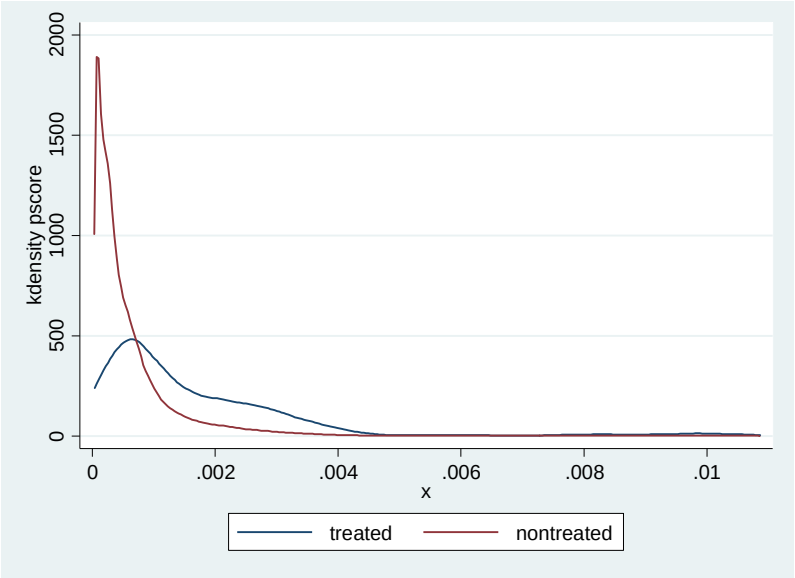
2.

a) As shown by the Stata output.

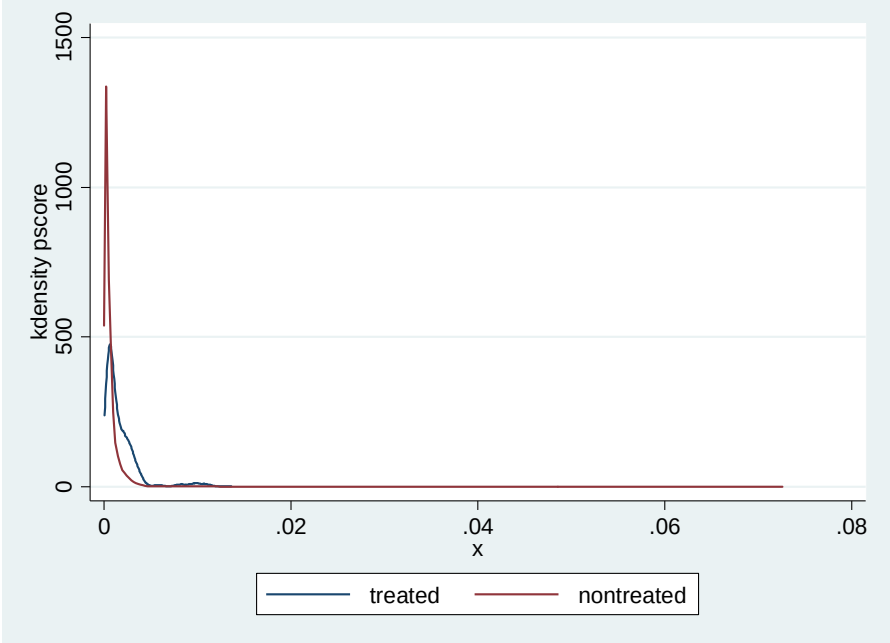
b) The baseline probability of being treated is (555/906,207), which is about 0.0612%. The Stata output indicates that while other covariates are set at their means, the marginal effect of stdv is 0.0000394, suggesting that one unit increase in stdv increases the probability of being treated by 0.00394%. Since the mean of stdv is about 1.422, doubling stdv entails an increase in stdv of 1.422 as well, which in turn increases the probability of being treated by 0.0000394*1/1.422, which is about 0.00277%.

3.

a) As shown by the Stata output, I ended up dropping 9,501 observations in total.



b) As shown by the Stata output, I ended up dropping 5,641 observations in total this time.



4.

a)

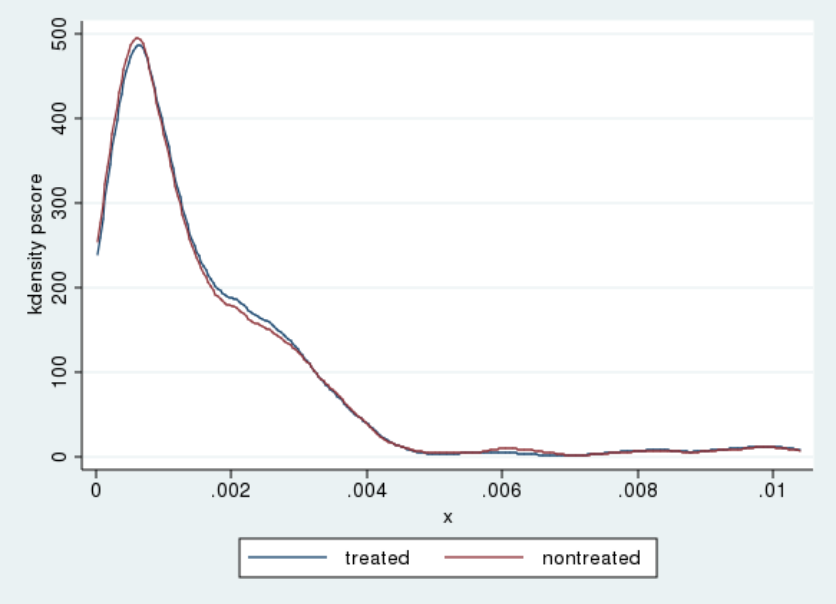
As shown from the Stata output.

b)

It took me about two hours to run the code on the research grid.

c)

The two distributions look more similar than before. They do resemble each other visually.



d)

Now fewer t-tests are significant. In fact, none of the t-tests is now significant at 10% anymore after the matching process.

Statistics/Data Analysis

```
      name:  <unnamed>
       log:  /user/user2/ShZhang17/HW3.smcl
  log type:  smcl
 opened on:  18 Apr 2017, 10:21:06

1 .
2 . // Assignment #3
3 .
4 . ssc install psmatch2, replace
  checking psmatch2 consistency and verifying not already installed...
  all files already exist and are up to date.

5 .
6 . use mf2hf_phd2016.dta

7 . describe

  Contains data from mf2hf_phd2016.dta
    obs:       906,207
   vars:            27                          22 Jan 2016 15:19
   size:    48,935,178
-------------------------------------------------------------------------------
              storage   display    value
  variable name   type    format     label      variable label
-------------------------------------------------------------------------------
  mydate2         float   %8.0g
  dyad_id         float   %9.0g
  start_date      float   %9.0g
  performance     float   %9.0g
  stdv            float   %9.0g
  missing_aum     float   %9.0g
  log_aum         float   %9.0g
  year_dum_4      byte    %8.0g                 year== 1993.0000
  year_dum_5      byte    %8.0g                 year== 1994.0000
  year_dum_6      byte    %8.0g                 year== 1995.0000
  year_dum_7      byte    %8.0g                 year== 1996.0000
  year_dum_8      byte    %8.0g                 year== 1997.0000
  year_dum_9      byte    %8.0g                 year== 1998.0000
  year_dum_10     byte    %8.0g                 year== 1999.0000
  year_dum_11     byte    %8.0g                 year== 2000.0000
  year_dum_12     byte    %8.0g                 year== 2001.0000
  year_dum_13     byte    %8.0g                 year== 2002.0000
  year_dum_14     byte    %8.0g                 year== 2003.0000
  year_dum_15     byte    %8.0g                 year== 2004.0000
  year_dum_16     byte    %8.0g                 year== 2005.0000
  year_dum_17     byte    %8.0g                 year== 2006.0000
  year_dum_18     byte    %8.0g                 year== 2007.0000
  year_dum_19     byte    %8.0g                 year== 2008.0000
  year_dum_20     byte    %8.0g                 year== 2009.0000
  year_dum_21     byte    %8.0g                 year== 2010.0000
  log_age         float   %9.0g
  treated         float   %9.0g
-------------------------------------------------------------------------------
  Sorted by:

8 .
9 . // Question 1
10.
11. // a)
```

12. ttest performance, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0100534**	**.0007196**	**.6847794**	**.0086431**	**.0114637**
1	**555**	**-.1152795**	**.0418331**	**.9855226**	**-.1974504**	**-.0331086**
combined	**906,207**	**.0099766**	**.0007196**	**.6850102**	**.0085662**	**.011387**
diff		**.1253329**	**.0290857**		**.0683259**	**.1823399**

diff = mean(**0**) - mean(**1**) t = **4.3091**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **1.0000** Pr(|T| > |t|) = **0.0000** Pr(T > t) = **0.0000**

13. ttest stdv, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**1.421733**	**.0015617**	**1.486238**	**1.418672**	**1.424794**
1	**555**	**1.766431**	**.0612274**	**1.442423**	**1.646165**	**1.886698**
combined	**906,207**	**1.421944**	**.0015613**	**1.486235**	**1.418884**	**1.425004**
diff		**-.3446984**	**.0631055**		**-.468383**	**-.2210137**

diff = mean(**0**) - mean(**1**) t = **-5.4623**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.0000** Pr(|T| > |t|) = **0.0000** Pr(T > t) = **1.0000**

14. ttest start_date, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**476.7965**	**.0583472**	**55.52655**	**476.6821**	**476.9108**
1	**555**	**447.9081**	**1.5861**	**37.36604**	**444.7926**	**451.0236**
combined	**906,207**	**476.7788**	**.0583244**	**55.52183**	**476.6645**	**476.8931**
diff		**28.88835**	**2.357299**		**24.26812**	**33.50858**

diff = mean(**0**) - mean(**1**) t = **12.2549**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **1.0000** Pr(|T| > |t|) = **0.0000** Pr(T > t) = **0.0000**

15. ttest log_age, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**3.632786**	**.0007318**	**.6963982**	**3.631352**	**3.634221**
1	**555**	**3.573286**	**.0307502**	**.7244268**	**3.512885**	**3.633688**
combined	**906,207**	**3.63275**	**.0007316**	**.6964168**	**3.631316**	**3.634184**
diff		**.0594999**	**.0295703**		**.0015432**	**.1174566**

diff = mean(**0**) - mean(**1**) t = **2.0122**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.9779** Pr(|T| > |t|) = **0.0442** Pr(T > t) = **0.0221**

16. ttest log_aum, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**4.644683**	**.0020842**	**1.98346**	**4.640598**	**4.648768**
1	**555**	**4.181499**	**.0835778**	**1.968962**	**4.017331**	**4.345667**
combined	**906,207**	**4.644399**	**.0020836**	**1.983483**	**4.640315**	**4.648483**
diff		**.4631838**	**.0842186**		**.2981182**	**.6282494**

diff = mean(**0**) - mean(**1**) t = **5.4998**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **1.0000** Pr(|T| > |t|) = **0.0000** Pr(T > t) = **0.0000**

17. ttest missing_aum, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0317661**	**.0001843**	**.1753768**	**.0314049**	**.0321273**
1	**555**	**.045045**	**.0088117**	**.2075901**	**.0277366**	**.0623535**
combined	**906,207**	**.0317742**	**.0001843**	**.1753985**	**.0314131**	**.0321353**
diff		**-.013279**	**.0074475**		**-.0278759**	**.0013179**

diff = mean(**0**) - mean(**1**) t = **-1.7830**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.0373** Pr(|T| > |t|) = **0.0746** Pr(T > t) = **0.9627**

18. ttest year_dum_4, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0026268**	**.0000538**	**.0511853**	**.0025214**	**.0027323**
1	**555**	**.0396396**	**.0082895**	**.1952871**	**.023357**	**.0559223**
combined	**906,207**	**.0026495**	**.000054**	**.0514051**	**.0025437**	**.0027553**
diff		**-.0370128**	**.0021823**		**-.0412901**	**-.0327355**

diff = mean(**0**) - mean(**1**) t = **-16.9601**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.0000** Pr(|T| > |t|) = **0.0000** Pr(T > t) = **1.0000**

19. ttest year_dum_5, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0147341**	**.0001266**	**.1204868**	**.014486**	**.0149823**
1	**555**	**.018018**	**.0056513**	**.1331364**	**.0069174**	**.0291187**
combined	**906,207**	**.0147361**	**.0001266**	**.1204949**	**.0144881**	**.0149842**
diff		**-.0032839**	**.0051163**		**-.0133116**	**.0067439**

diff = mean(**0**) - mean(**1**) t = **-0.6418**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.2605** Pr(|T| > |t|) = **0.5210** Pr(T > t) = **0.7395**

20. ttest year_dum_6, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0273681**	**.0001714**	**.1631537**	**.0270321**	**.0277041**
1	**555**	**.0648649**	**.0104637**	**.2465094**	**.0443114**	**.0854183**
combined	**906,207**	**.0273911**	**.0001715**	**.1632203**	**.027055**	**.0277271**
diff		**-.0374967**	**.0069303**		**-.0510799**	**-.0239135**

diff = mean(**0**) - mean(**1**) t = **-5.4105**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.0000** Pr(|T| > |t|) = **0.0000** Pr(T > t) = **1.0000**

21. ttest year_dum_7, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0393341**	**.0002043**	**.1943887**	**.0389337**	**.0397344**
1	**555**	**.0810811**	**.0115969**	**.2732058**	**.0583017**	**.1038604**
combined	**906,207**	**.0393597**	**.0002043**	**.1944493**	**.0389593**	**.03976**
diff		**-.041747**	**.0082563**		**-.0579291**	**-.0255649**

diff = mean(**0**) - mean(**1**) t = **-5.0564**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.0000** Pr(|T| > |t|) = **0.0000** Pr(T > t) = **1.0000**

22. ttest year_dum_8, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0404316**	**.000207**	**.1969695**	**.040026**	**.0408373**
1	**555**	**.0036036**	**.0025458**	**.0599758**	**-.0013971**	**.0086043**
combined	**906,207**	**.0404091**	**.0002069**	**.1969168**	**.0400037**	**.0408145**
diff		**.036828**	**.0083611**		**.0204405**	**.0532156**

diff = mean(**0**) - mean(**1**) t = **4.4047**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **1.0000** Pr(|T| > |t|) = **0.0000** Pr(T > t) = **0.0000**

23. ttest year_dum_9, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0548997**	**.0002394**	**.2277845**	**.0544305**	**.0553688**
1	**555**	**.009009**	**.0040144**	**.0945725**	**.0011237**	**.0168943**
combined	**906,207**	**.0548716**	**.0002392**	**.2277295**	**.0544027**	**.0553404**
diff		**.0458907**	**.0096694**		**.0269389**	**.0648424**

diff = mean(**0**) - mean(**1**) t = **4.7460**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **1.0000** Pr(|T| > |t|) = **0.0000** Pr(T > t) = **0.0000**

24. ttest year_dum_10, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0731429**	**.0002736**	**.260371**	**.0726066**	**.0736791**
1	**555**	**.2846847**	**.0191724**	**.4516712**	**.2470252**	**.3223441**
combined	**906,207**	**.0732724**	**.0002737**	**.2605833**	**.0727359**	**.073809**
diff		**-.2115418**	**.0110623**		**-.2332236**	**-.18986**

diff = mean(**0**) - mean(**1**) t = **-19.1228**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.0000** Pr(|T| > |t|) = **0.0000** Pr(T > t) = **1.0000**

25. ttest year_dum_11, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0528371**	**.0002351**	**.2237082**	**.0523763**	**.0532978**
1	**555**	**.0558559**	**.0097566**	**.2298503**	**.0366914**	**.0750203**
combined	**906,207**	**.0528389**	**.000235**	**.2237119**	**.0523783**	**.0532995**
diff		**-.0030188**	**.009499**		**-.0216364**	**.0155989**

diff = mean(**0**) - mean(**1**) t = **-0.3178**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.3753** Pr(|T| > |t|) = **0.7506** Pr(T > t) = **0.6247**

26. ttest year_dum_12, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0752629**	**.0002772**	**.2638152**	**.0747196**	**.0758062**
1	**555**	**.0972973**	**.0125912**	**.2966295**	**.0725649**	**.1220297**
combined	**906,207**	**.0752764**	**.0002772**	**.263837**	**.0747332**	**.0758196**
diff		**-.0220344**	**.0112027**		**-.0439912**	**-.0000775**

diff = mean(**0**) - mean(**1**) t = **-1.9669**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.0246** Pr(|T| > |t|) = **0.0492** Pr(T > t) = **0.9754**

27. ttest year_dum_13, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0634107**	**.0002561**	**.2437003**	**.0629088**	**.0639126**
1	**555**	**.0540541**	**.0096071**	**.2263283**	**.0351833**	**.0729249**
combined	**906,207**	**.0634049**	**.000256**	**.24369**	**.0629032**	**.0639067**
diff		**.0093566**	**.0103472**		**-.0109236**	**.0296369**

diff = mean(**0**) - mean(**1**) t = **0.9043**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.8171** Pr(|T| > |t|) = **0.3659** Pr(T > t) = **0.1829**

28. ttest year_dum_14, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0537392**	**.000237**	**.2255024**	**.0532748**	**.0542036**
1	**555**	**.0540541**	**.0096071**	**.2263283**	**.0351833**	**.0729249**
combined	**906,207**	**.0537394**	**.0002369**	**.2255028**	**.0532751**	**.0542037**
diff		**-.0003149**	**.009575**		**-.0190815**	**.0184518**

diff = mean(**0**) - mean(**1**) t = **-0.0329**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.4869** Pr(|T| > |t|) = **0.9738** Pr(T > t) = **0.5131**

29. ttest year_dum_15, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.068194**	**.0002649**	**.2520786**	**.0676748**	**.0687131**
1	**555**	**.0792793**	**.0114786**	**.2704179**	**.0567324**	**.1018262**
combined	**906,207**	**.0682008**	**.0002648**	**.2520902**	**.0676817**	**.0687198**
diff		**-.0110853**	**.0107039**		**-.0320646**	**.009894**

diff = mean(**0**) - mean(**1**) t = **-1.0356**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.1502** Pr(|T| > |t|) = **0.3004** Pr(T > t) = **0.8498**

30. ttest year_dum_16, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0767811**	**.0002798**	**.266244**	**.0762328**	**.0773295**
1	**555**	**.0324324**	**.0075262**	**.1773054**	**.0176491**	**.0472158**
combined	**906,207**	**.076754**	**.0002796**	**.2662008**	**.0762059**	**.0773021**
diff		**.0443487**	**.011303**		**.0221953**	**.0665022**

diff = mean(**0**) - mean(**1**) t = **3.9236**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **1.0000** Pr(|T| > |t|) = **0.0001** Pr(T > t) = **0.0000**

31. ttest year_dum_17, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0719504**	**.0002715**	**.2584059**	**.0714182**	**.0724826**
1	**555**	**.036036**	**.0079185**	**.186548**	**.020482**	**.05159**
combined	**906,207**	**.0719284**	**.0002714**	**.2583694**	**.0713964**	**.0724603**
diff		**.0359143**	**.0109705**		**.0144126**	**.0574161**

diff = mean(**0**) - mean(**1**) t = **3.2737**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.9995** Pr(|T| > |t|) = **0.0011** Pr(T > t) = **0.0005**

32. ttest year_dum_18, by(treated)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**905,652**	**.0582442**	**.0002461**	**.2342048**	**.0577619**	**.0587266**
1	**555**	**.027027**	**.0068896**	**.1623085**	**.0134941**	**.04056**
combined	**906,207**	**.0582251**	**.000246**	**.2341688**	**.057743**	**.0587072**
diff		**.0312172**	**.0099429**		**.0117294**	**.050705**

diff = mean(**0**) - mean(**1**) t = **3.1396**
Ho: diff = 0 degrees of freedom = **906205**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.9992** Pr(|T| > |t|) = **0.0017** Pr(T > t) = **0.0008**

```
33. ttest year_dum_19, by(treated)

Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 | 905,652    .0635675    .0002564     .243981     .063065    .0640699
       1 |     555     .027027    .0068896    .1623085    .0134941       .04056
---------+--------------------------------------------------------------------
combined | 906,207    .0635451    .0002563    .2439409    .0630428    .0640473
---------+--------------------------------------------------------------------
    diff |            .0365404    .0103578                .0162395    .0568414
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   3.5278
Ho: diff = 0                     degrees of freedom =   906205

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.9998         Pr(|T| > |t|) = 0.0004          Pr(T > t) = 0.0002

34. ttest year_dum_20, by(treated)

Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 | 905,652    .0820691    .0002884      .27447    .0815038    .0826343
       1 |     555    .0234234    .0064257    .1513805    .0108016    .0360452
---------+--------------------------------------------------------------------
combined | 906,207    .0820331    .0002883    .2744153    .0814681    .0825981
---------+--------------------------------------------------------------------
    diff |            .0586456    .0116517                .0358087    .0814826
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   5.0332
Ho: diff = 0                     degrees of freedom =   906205

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000

35. ttest year_dum_21, by(treated)

Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 | 905,652    .0814065    .0002873    .2734586    .0808433    .0819697
       1 |     555    .0126126    .0047412    .1116961    .0032996    .0219256
---------+--------------------------------------------------------------------
combined | 906,207    .0813644    .0002872    .2733941    .0808015    .0819273
---------+--------------------------------------------------------------------
    diff |            .0687939    .0116083                .0460421    .0915458
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   5.9263
Ho: diff = 0                     degrees of freedom =   906205

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000

36.
37. // b)
38. probit treated performance stdv start_date log_age log_aum missing_aum year_dum*

note: year_dum_21 omitted because of collinearity
Iteration 0:   log likelihood = -4660.7505
Iteration 1:   log likelihood = -4643.5895
Iteration 2:   log likelihood = -4362.1387
Iteration 3:   log likelihood = -4356.0564
Iteration 4:   log likelihood = -4356.0215
Iteration 5:   log likelihood = -4356.0215
```

Probit regression — Number of obs = **906,207**
LR chi2(**23**) = **609.46**
Prob > chi2 = **0.0000**
Log likelihood = **-4356.0215** — Pseudo R2 = **0.0654**

treated	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
performance	**-.061855**	**.0144781**	**-4.27**	**0.000**	**-.0902315**	**-.0334785**
stdv	**.0301021**	**.0047089**	**6.39**	**0.000**	**.0208728**	**.0393314**
start_date	**.0016927**	**.0011619**	**1.46**	**0.145**	**-.0005846**	**.0039699**
log_age	**.1884667**	**.0563508**	**3.34**	**0.001**	**.0780212**	**.2989122**
log_aum	**-.0335225**	**.0067388**	**-4.97**	**0.000**	**-.0467303**	**-.0203147**
missing_aum	**.1450686**	**.0628731**	**2.31**	**0.021**	**.0218396**	**.2682977**
year_dum_4	**1.899782**	**.273671**	**6.94**	**0.000**	**1.363397**	**2.436168**
year_dum_5	**.9945666**	**.2583348**	**3.85**	**0.000**	**.4882396**	**1.500893**
year_dum_6	**1.132349**	**.2303951**	**4.91**	**0.000**	**.6807829**	**1.583915**
year_dum_7	**1.045232**	**.214414**	**4.87**	**0.000**	**.624988**	**1.465475**
year_dum_8	**.105087**	**.2608017**	**0.40**	**0.687**	**-.4060749**	**.6162488**
year_dum_9	**.2226637**	**.2165285**	**1.03**	**0.304**	**-.2017244**	**.6470518**
year_dum_10	**1.138259**	**.1758352**	**6.47**	**0.000**	**.793628**	**1.482889**
year_dum_11	**.7114979**	**.1702003**	**4.18**	**0.000**	**.3779114**	**1.045084**
year_dum_12	**.7348978**	**.1563011**	**4.70**	**0.000**	**.4285532**	**1.041242**
year_dum_13	**.5922075**	**.1500789**	**3.95**	**0.000**	**.2980583**	**.8863567**
year_dum_14	**.6378365**	**.1433233**	**4.45**	**0.000**	**.3569281**	**.9187449**
year_dum_15	**.6672322**	**.131806**	**5.06**	**0.000**	**.4088973**	**.9255671**
year_dum_16	**.3603282**	**.1325194**	**2.72**	**0.007**	**.1005949**	**.6200615**
year_dum_17	**.3816843**	**.1258192**	**3.03**	**0.002**	**.1350832**	**.6282854**
year_dum_18	**.3478059**	**.1262649**	**2.75**	**0.006**	**.1003313**	**.5952805**
year_dum_19	**.293841**	**.1220266**	**2.41**	**0.016**	**.0546732**	**.5330089**
year_dum_20	**.1517177**	**.122345**	**1.24**	**0.215**	**-.0880741**	**.3915096**
year_dum_21	**0**	(omitted)				
_cons	**-5.273329**	**.8430732**	**-6.25**	**0.000**	**-6.925722**	**-3.620936**

```
39. predict pscore
  (option pr assumed; Pr(treated))

40. twoway (kdensity pscore if treated==1) || (kdensity pscore if treated==0), legend(la
  > bel(1 treated) label(2 nontreated))

41.
42.
43. // Question 2
44.
45. // a)
46.
47. // b)
48. margins, dydx(*) atmeans

  Conditional marginal effects                    Number of obs     =    906,207
  Model VCE    : OIM

  Expression   : Pr(treated), predict()
  dy/dx w.r.t. : performance stdv start_date log_age log_aum missing_aum year_dum_4
                 year_dum_5 year_dum_6 year_dum_7 year_dum_8 year_dum_9 year_dum_10
                 year_dum_11 year_dum_12 year_dum_13 year_dum_14 year_dum_15
                 year_dum_16 year_dum_17 year_dum_18 year_dum_19 year_dum_20
                 year_dum_21
  at           : performance     =    .0099766 (mean)
                 stdv            =    1.421944 (mean)
                 start_date      =    476.7788 (mean)
                 log_age         =     3.63275 (mean)
                 log_aum         =    4.644399 (mean)
                 missing_aum     =    .0317742 (mean)
                 year_dum_4      =    .0026495 (mean)
                 year_dum_5      =    .0147361 (mean)
                 year_dum_6      =    .0273911 (mean)
                 year_dum_7      =    .0393597 (mean)
                 year_dum_8      =    .0404091 (mean)
                 year_dum_9      =    .0548716 (mean)
                 year_dum_10     =    .0732724 (mean)
```

year_dum_11 = .0528389 (mean)
year_dum_12 = .0752764 (mean)
year_dum_13 = .0634049 (mean)
year_dum_14 = .0537394 (mean)
year_dum_15 = .0682008 (mean)
year_dum_16 = .076754 (mean)
year_dum_17 = .0719284 (mean)
year_dum_18 = .0582251 (mean)
year_dum_19 = .0635451 (mean)
year_dum_20 = .0820331 (mean)
year_dum_21 = .0813644 (mean)

	dy/dx	Delta-method Std. Err.	z	P>|z|	[95% Conf.	Interval]
performance	-.000081	.0000192	-4.22	0.000	-.0001186	-.0000434
stdv	.0000394	6.32e-06	6.23	0.000	.000027	.0000518
start_date	2.22e-06	1.53e-06	1.45	0.146	-7.73e-07	5.21e-06
log_age	.0002468	.0000742	3.33	0.001	.0001014	.0003921
log_aum	-.0000439	8.86e-06	-4.96	0.000	-.0000612	-.0000265
missing_aum	.0001899	.0000825	2.30	0.021	.0000283	.0003516
year_dum_4	.0024874	.0003636	6.84	0.000	.0017746	.0032001
year_dum_5	.0013022	.0003347	3.89	0.000	.0006461	.0019582
year_dum_6	.0014826	.0002983	4.97	0.000	.0008979	.0020672
year_dum_7	.0013685	.0002769	4.94	0.000	.0008259	.0019112
year_dum_8	.0001376	.0003423	0.40	0.688	-.0005334	.0008086
year_dum_9	.0002915	.0002838	1.03	0.304	-.0002647	.0008477
year_dum_10	.0014903	.0002269	6.57	0.000	.0010456	.001935
year_dum_11	.0009316	.000218	4.27	0.000	.0005043	.0013588
year_dum_12	.0009622	.0001993	4.83	0.000	.0005716	.0013527
year_dum_13	.0007754	.0001916	4.05	0.000	.0003999	.0011508
year_dum_14	.0008351	.0001822	4.58	0.000	.000478	.0011922
year_dum_15	.0008736	.0001663	5.25	0.000	.0005477	.0011995
year_dum_16	.0004718	.0001703	2.77	0.006	.000138	.0008055
year_dum_17	.0004997	.0001608	3.11	0.002	.0001845	.000815
year_dum_18	.0004554	.0001618	2.81	0.005	.0001383	.0007724
year_dum_19	.0003847	.0001567	2.46	0.014	.0000777	.0006918
year_dum_20	.0001986	.0001589	1.25	0.211	-.0001129	.0005102
year_dum_21	0	(omitted)				

```
49.
50.
51. // Question 3
52.
53. // a)
54. g outlier = 0

55. sum pscore if treated == 1, d
```

Pr(treated)

Percentiles		Smallest		
1%	.0000685	.0000363		
5%	.000195	.000038		
10%	.0002847	.0000484	Obs	555
25%	.0005591	.0000529	Sum of Wgt.	555
50%	.0010699		Mean	.0017042
		Largest	Std. Dev.	.0019645
75%	.0022556	.0111691		
90%	.0032924	.0112867	Variance	3.86e-06
95%	.0041735	.0123165	Skewness	3.062913
99%	.0108667	.0136269	Kurtosis	14.21845

```
56. g upper_bound = r(p99)

57. sum pscore if treated == 0, d

                          Pr(treated)
-------------------------------------------------------------
      Percentiles      Smallest
 1%     .0000321       .0000105
 5%     .0000535       .0000106
10%     .0000766       .0000107       Obs             905,652
25%     .0001626       .0000108       Sum of Wgt.     905,652

50%     .0003562                      Mean             .000612
                       Largest        Std. Dev.       .0008618
75%     .0007361       .0509021
90%     .0013912       .0637697       Variance        7.43e-07
95%     .0020533       .0677637       Skewness        8.478753
99%     .0035272        .072589       Kurtosis         263.708

58. g lower_bound = r(p1)

59. replace outlier = 1 if pscore > upper_bound
  (445 real changes made)

60. replace outlier = 1 if pscore < lower_bound
  (9,056 real changes made)

61. drop if outlier
  (9,501 observations deleted)

62. twoway (kdensity pscore if treated==1) || (kdensity pscore if treated==0), legend(la
  > bel(1 treated) label(2 nontreated))

63.
64. // b)
65. gen tr_score = pscore if treated==1
  (896,156 missing values generated)

66. gen ct_score = pscore if treated==0
  (550 missing values generated)

67. egen upper_control = max(ct_score)

68. egen lower_control = min(ct_score)

69. egen upper_treatment = max(tr_score)

70. egen lower_treatment = min(tr_score)

71. gen common = 0

72. replace common = 1 if treated == 1 & pscore < upper_control & pscore > lower_control
  (549 real changes made)

73. replace common = 1 if treated == 0 & pscore < upper_treatment & pscore > lower_treat
  > ment
  (890,516 real changes made)

74. drop if common == 0 & treated == 1
  (1 observation deleted)
```

```
75. drop if common == 0 & treated == 0
  (5,640 observations deleted)

76. twoway (kdensity pscore if treated==1) || (kdensity pscore if treated==0), legend(la
  > bel(1 treated) label(2 nontreated))

77.
78. // Question 4
79.
80. // a)
81. gsort -treated dyad_id mydate2

82.
83. gen counter=_n if treated==1
  (890,516 missing values generated)

84. replace counter = 0 if counter==.
  (890,516 real changes made)

85. egen maxcounter = max(counter)

86.
87. tab maxcounter
```

maxcounter	Freq.	Percent	Cum.
549	**891,065**	**100.00**	**100.00**
Total	**891,065**	**100.00**	

```
88.
89. local end = maxcounter

90.
91. gen matched = 0

92. gen matched_dyad = 0

93. gen nearest_neighbor = .
  (891,065 missing values generated)

94. gen ptreat = 0

95. gen dyad_to_match = 0

96. gen dif = 9999999

97.
98. gsort -treated -pscore dyad_id mydate2

99.
100 forvalues t = 1/`end' {
    2.         *display `t'
101         quietly:  replace ptreat = pscore if treated == 1 & counter == `t'
    3.         quietly:  egen ptomatch = max(ptreat)
    4.         quietly:  replace dif = abs(ptomatch - pscore) if matched_dyad==0 & treat
  > ed==0
    5.         quietly:  egen mindif = min(dif)
    6.         quietly:  replace matched = 1 if dif==mindif & treated==0 & matched_dyad=
  > =0
    7.         quietly:  egen maxmatched = max(matched), by(dyad_id)
    8.         quietly:  replace matched_dyad = 1 if maxmatched==1
    9.         quietly:  replace dyad_to_match = dyad_id if counter == `t'
   10.         quietly:  egen treated_dyad = max(dyad_to_match)
   11.         quietly:  replace nearest_neighbor = treated_dyad if dif==mindif & treate
  > d==0
   12.         quietly:  replace dyad_to_match = 0
   13.         quietly:  drop ptomatch mindif maxmatched treated_dyad
   14.         quietly:  replace ptreat = 0
   15.         quietly:  replace dif = 9999999
   16.         }
```

```
102
103
104 gen control = 0

105
106 replace control = 1 if matched==1
  (604 real changes made)

107
108 keep if treated==1 | control==1
  (889,912 observations deleted)

109
110 // keep dyad_id mydate2 pscore treated control nearest_neighbor
111
112 bysort dyad_id mydate: gen counter=_n
  variable counter already defined
  r(110);

  end of do-file

  r(110);

113 twoway (kdensity pscore if treated==1) || (kdensity pscore if treated==0), legend(la
  > bel(1 treated) label(2 nontreated))

114
115 ttest performance, by(treated)

  Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**604**	**-.1435793**	**.0379206**	**.9319519**	**-.2180518**	**-.0691069**
1	**549**	**-.1142205**	**.0422682**	**.9903749**	**-.197248**	**-.031193**
combined	**1,153**	**-.1296002**	**.0282692**	**.9599062**	**-.1850651**	**-.0741352**
diff		**-.0293588**	**.0566209**		**-.1404506**	**.0817329**

```
    diff = mean(0) - mean(1)                                      t =  -0.5185
Ho: diff = 0                                     degrees of freedom =     1151

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.3021         Pr(|T| > |t|) = 0.6042          Pr(T > t) = 0.6979

116 ttest stdv, by(treated)

  Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**604**	**1.677095**	**.0623043**	**1.531216**	**1.554735**	**1.799455**
1	**549**	**1.779139**	**.0616669**	**1.444902**	**1.658006**	**1.900271**
combined	**1,153**	**1.725683**	**.0439091**	**1.49097**	**1.639532**	**1.811834**
diff		**-.1020439**	**.0879049**		**-.2745158**	**.070428**

```
    diff = mean(0) - mean(1)                                      t =  -1.1608
Ho: diff = 0                                     degrees of freedom =     1151

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.1230         Pr(|T| > |t|) = 0.2459          Pr(T > t) = 0.8770
```

```
117 ttest start_date, by(treated)

Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     604    450.6606    1.849172      45.446    447.029    454.2922
       1 |     549    448.4863    1.585754     37.1554    445.3714   451.6012
---------+--------------------------------------------------------------------
combined |   1,153    449.6253    1.228091    41.70088    447.2158   452.0349
---------+--------------------------------------------------------------------
    diff |            2.174257    2.459215               -2.650789   6.999303
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   0.8841
Ho: diff = 0                                     degrees of freedom =     1151

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.8116         Pr(|T| > |t|) = 0.3768          Pr(T > t) = 0.1884

118 ttest log_age, by(treated)

Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     604    3.520939    .0274612    .6748974    3.467008    3.57487
       1 |     549    3.584307    .0307551    .7206152    3.523894   3.644719
---------+--------------------------------------------------------------------
combined |   1,153    3.551111      .02054    .6974545    3.510811   3.591411
---------+--------------------------------------------------------------------
    diff |           -.0633676    .0411023               -.1440115   .0172763
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -1.5417
Ho: diff = 0                                     degrees of freedom =     1151

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0617         Pr(|T| > |t|) = 0.1234          Pr(T > t) = 0.9383

119 ttest log_aum, by(treated)

Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     604     4.16184    .0791229    1.944558     4.00645    4.31723
       1 |     549    4.202098    .0839295    1.966531    4.037235   4.366961
---------+--------------------------------------------------------------------
combined |   1,153    4.181009    .0575543    1.954305    4.068086   4.293932
---------+--------------------------------------------------------------------
    diff |           -.0402578    .1152837               -.2664475    .185932
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -0.3492
Ho: diff = 0                                     degrees of freedom =     1151

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.3635         Pr(|T| > |t|) = 0.7270          Pr(T > t) = 0.6365

120 ttest missing_aum, by(treated)

Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     604    .0347682    .0074602     .183344    .0201172   .0494193
       1 |     549    .0455373    .0089058    .2086696    .0280437    .063031
---------+--------------------------------------------------------------------
combined |   1,153    .0398959    .0057663    .1957996    .0285823   .0512095
---------+--------------------------------------------------------------------
    diff |           -.0107691    .0115464               -.0334235   .0118852
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -0.9327
Ho: diff = 0                                     degrees of freedom =     1151
```

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.1756** Pr(|T| > |t|) = **0.3512** Pr(T > t) = **0.8244**

```
121 ttest year_dum_4, by(treated)
```

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**604**	**.0298013**	**.0069245**	**.1701798**	**.0162022**	**.0434004**
1	**549**	**.0291439**	**.0071856**	**.1683632**	**.0150293**	**.0432585**
combined	**1,153**	**.0294883**	**.0049842**	**.1692441**	**.0197091**	**.0392675**
diff		**.0006574**	**.0099842**		**-.0189318**	**.0202466**

diff = mean(**0**) - mean(**1**) t = **0.0658**
Ho: diff = 0 degrees of freedom = **1151**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.5262** Pr(|T| > |t|) = **0.9475** Pr(T > t) = **0.4738**

```
122 ttest year_dum_5, by(treated)
```

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**604**	**.0149007**	**.0049338**	**.1212558**	**.0052111**	**.0245902**
1	**549**	**.0182149**	**.0057126**	**.1338499**	**.0069937**	**.0294362**
combined	**1,153**	**.0164788**	**.0037508**	**.1273628**	**.0091195**	**.023838**
diff		**-.0033143**	**.0075128**		**-.0180547**	**.0114261**

diff = mean(**0**) - mean(**1**) t = **-0.4411**
Ho: diff = 0 degrees of freedom = **1151**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.3296** Pr(|T| > |t|) = **0.6592** Pr(T > t) = **0.6704**

```
123 ttest year_dum_6, by(treated)
```

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**604**	**.0645695**	**.0100083**	**.2459684**	**.0449141**	**.0842249**
1	**549**	**.0655738**	**.0105742**	**.2477613**	**.0448029**	**.0863447**
combined	**1,153**	**.0650477**	**.0072658**	**.246717**	**.050792**	**.0793034**
diff		**-.0010042**	**.0145545**		**-.0295605**	**.0275521**

diff = mean(**0**) - mean(**1**) t = **-0.0690**
Ho: diff = 0 degrees of freedom = **1151**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.4725** Pr(|T| > |t|) = **0.9450** Pr(T > t) = **0.5275**

```
124 ttest year_dum_7, by(treated)

   Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     604    .0745033    .0106934    .2628059    .0535024    .0955042
       1 |     549    .0819672    .0117181    .2745649    .0589492    .1049852
---------+--------------------------------------------------------------------
combined |   1,153    .0780572    .0079037    .2683781    .0625499    .0935646
---------+--------------------------------------------------------------------
    diff |           -.0074639    .0158308               -.0385244    .0235966
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -0.4715
Ho: diff = 0                                     degrees of freedom =     1151

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.3187         Pr(|T| > |t|) = 0.6374          Pr(T > t) = 0.6813

125 ttest year_dum_8, by(treated)

   Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     604    .0016556    .0016556    .0406894   -.0015959    .0049071
       1 |     549     .003643    .0025736    .0603021   -.0014124    .0086984
---------+--------------------------------------------------------------------
combined |   1,153    .0026019    .0015009    .0509646   -.0003429    .0055467
---------+--------------------------------------------------------------------
    diff |           -.0019874     .003006               -.0078852    .0039104
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -0.6611
Ho: diff = 0                                     degrees of freedom =     1151

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.2543         Pr(|T| > |t|) = 0.5087          Pr(T > t) = 0.7457

126 ttest year_dum_9, by(treated)

   Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     604    .0115894    .0043585    .1071172    .0030297    .0201492
       1 |     549    .0091075    .0040581    .0950841    .0011361    .0170788
---------+--------------------------------------------------------------------
combined |   1,153    .0104076      .00299    .1015296    .0045411    .0162742
---------+--------------------------------------------------------------------
    diff |            .0024819    .0059891               -.0092688    .0142326
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   0.4144
Ho: diff = 0                                     degrees of freedom =     1151

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.6607         Pr(|T| > |t|) = 0.6786          Pr(T > t) = 0.3393

127 ttest year_dum_10, by(treated)

   Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     604    .2980132    .0186262    .4577644    .2614332    .3345933
       1 |     549     .287796    .0193399    .4531484    .2498066    .3257854
---------+--------------------------------------------------------------------
combined |   1,153    .2931483    .0134116    .4554034    .2668343    .3194623
---------+--------------------------------------------------------------------
    diff |            .0102173    .0268638               -.0424903    .0629248
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   0.3803
Ho: diff = 0                                     degrees of freedom =     1151
```

```
    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.6481         Pr(|T| > |t|) = 0.7038          Pr(T > t) = 0.3519
```

```
128 ttest year_dum_11, by(treated)

Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	604	.0711921	.0104718	.2573585	.0506265	.0917576
1	549	.0564663	.0098601	.2310305	.037098	.0758346
combined	1,153	.0641804	.0072206	.2451804	.0500135	.0783473
diff		.0147258	.0144573		-.01364	.0430915

```
    diff = mean(0) - mean(1)                                      t =   1.0186
Ho: diff = 0                     degrees of freedom =     1151

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.8457         Pr(|T| > |t|) = 0.3086          Pr(T > t) = 0.1543
```

```
129 ttest year_dum_12, by(treated)

Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	604	.0976821	.0120901	.2971304	.0739384	.1214259
1	549	.0983607	.0127215	.2980733	.0733719	.1233494
combined	1,153	.0980052	.0087599	.2974507	.080818	.1151924
diff		-.0006785	.0175474		-.0351071	.03375

```
    diff = mean(0) - mean(1)                                      t =  -0.0387
Ho: diff = 0                     degrees of freedom =     1151

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.4846         Pr(|T| > |t|) = 0.9692          Pr(T > t) = 0.5154
```

```
130 ttest year_dum_13, by(treated)

Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	604	.0546358	.0092551	.2274563	.0364597	.0728118
1	549	.0546448	.0097092	.2274929	.0355731	.0737165
combined	1,153	.0546401	.0066962	.227375	.041502	.0677782
diff		-9.05e-06	.0134135		-.0263266	.0263086

```
    diff = mean(0) - mean(1)                                      t =  -0.0007
Ho: diff = 0                     degrees of freedom =     1151

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.4997         Pr(|T| > |t|) = 0.9995          Pr(T > t) = 0.5003
```

```
131 ttest year_dum_14, by(treated)

   Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     604    .0480132    .0087064    .2139714    .0309147    .0651117
       1 |     549    .0546448    .0097092    .2274929    .0355731    .0737165
---------+--------------------------------------------------------------------
combined |   1,153    .0511709     .006492    .2204417    .0384334    .0639083
---------+--------------------------------------------------------------------
    diff |           -.0066316     .013003               -.0321438    .0188807
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -0.5100
Ho: diff = 0                                     degrees of freedom =     1151

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.3051         Pr(|T| > |t|) = 0.6101          Pr(T > t) = 0.6949

132 ttest year_dum_15, by(treated)

   Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     604    .0711921    .0104718    .2573585    .0506265    .0917576
       1 |     549    .0801457    .0115987    .2717663    .0573624    .1029291
---------+--------------------------------------------------------------------
combined |   1,153    .0754553    .0077818    .2642393    .0601872    .0907235
---------+--------------------------------------------------------------------
    diff |           -.0089537     .015586               -.0395338    .0216264
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -0.5745
Ho: diff = 0                                     degrees of freedom =     1151

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.2829         Pr(|T| > |t|) = 0.5658          Pr(T > t) = 0.7171

133 ttest year_dum_16, by(treated)

   Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     604    .0347682    .0074602     .183344    .0201172    .0494193
       1 |     549    .0327869    .0076071    .1782408    .0178442    .0477296
---------+--------------------------------------------------------------------
combined |   1,153    .0338248    .0053262    .1808565    .0233746     .044275
---------+--------------------------------------------------------------------
    diff |            .0019813    .0106691               -.0189517    .0229143
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   0.1857
Ho: diff = 0                                     degrees of freedom =     1151

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.5736         Pr(|T| > |t|) = 0.8527          Pr(T > t) = 0.4264

134 ttest year_dum_17, by(treated)

   Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     604    .0248344    .0063373    .1557493    .0123885    .0372804
       1 |     549    .0364299    .0080035    .1875281    .0207086    .0521512
---------+--------------------------------------------------------------------
combined |   1,153    .0303556    .0050547    .1716382    .0204381    .0402731
---------+--------------------------------------------------------------------
    diff |           -.0115954    .0101196               -.0314504    .0082596
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -1.1458
Ho: diff = 0                                     degrees of freedom =     1151
```

```
   Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.1261         Pr(|T| > |t|) = 0.2521          Pr(T > t) = 0.8739
```

```
135 ttest year_dum_18, by(treated)

Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	604	.0331126	.0072866	.1790788	.0188024	.0474228
1	549	.0273224	.0069639	.1631698	.0136432	.0410016
combined	1,153	.0303556	.0050547	.1716382	.0204381	.0402731
diff		.0057902	.010124		-.0140733	.0256537

```
   diff = mean(0) - mean(1)                                      t =   0.5719
Ho: diff = 0                     degrees of freedom =     1151

   Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.7163         Pr(|T| > |t|) = 0.5675          Pr(T > t) = 0.2837
```

```
136 ttest year_dum_19, by(treated)

Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	604	.0331126	.0072866	.1790788	.0188024	.0474228
1	549	.0273224	.0069639	.1631698	.0136432	.0410016
combined	1,153	.0303556	.0050547	.1716382	.0204381	.0402731
diff		.0057902	.010124		-.0140733	.0256537

```
   diff = mean(0) - mean(1)                                      t =   0.5719
Ho: diff = 0                     degrees of freedom =     1151

   Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.7163         Pr(|T| > |t|) = 0.5675          Pr(T > t) = 0.2837
```

```
137 ttest year_dum_20, by(treated)

Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	604	.0231788	.0061277	.1505958	.0111447	.0352129
1	549	.0236794	.0064952	.152187	.0109209	.0364379
combined	1,153	.0234172	.0044555	.15129	.0146754	.032159
diff		-.0005006	.008925		-.0180117	.0170105

```
   diff = mean(0) - mean(1)                                      t =  -0.0561
Ho: diff = 0                     degrees of freedom =     1151

   Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.4776         Pr(|T| > |t|) = 0.9553          Pr(T > t) = 0.5224
```

```
138 ttest year_dum_21, by(treated)
```

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	**604**	**.013245**	**.0046556**	**.1144171**	**.0041019**	**.0223881**
1	**549**	**.0127505**	**.0047928**	**.112298**	**.003336**	**.0221649**
combined	**1,153**	**.0130095**	**.0033386**	**.1133642**	**.0064592**	**.0195599**
diff		**.0004946**	**.0066876**		**-.0126268**	**.0136159**

diff = mean(**0**) - mean(**1**) t = **0.0740**
Ho: diff = 0 degrees of freedom = **1151**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.5295** Pr(|T| > |t|) = **0.9411** Pr(T > t) = **0.4705**

```
139 translate HW3.smcl HW3.pdf
```