import excel "C:\Users\Steffy Earnest\Documents\MSc Finance\Studies\THESIS\Testing\PSM 31.03.2020\_2009-2018 without industries 489.xlsx", sheet("Sheet1") firstrow

\***Creating Panel data**

encode COMPANYNAME, gen(COMPID)

list COMPANYNAME COMPID in 1/490, nolabel sepby (COMPANYNAME)

xtset COMPID YEAR, yearly

\* **Teffects with psmatch**

\*Teffects with psmatch ATE

teffects psmatch (ESG) (TREAT AGE SIZE TOBINSQ), gen(match)

\*predict variables

predict ps0 ps1, ps

predict y0 y1, po

predict pscore

\***Paired t-test**

\*T test for paired observations - ESG

ttest y0 == y1

\*the difference of the means is statistically significant

\*Plotting Kernel density plot for postestimation

tebalance density

\*Plotting histogram to visualize distribution of ESG scores for govt & non-govt companies with density plots included>

histogram ESG if TREAT==1, bin(10) percent fcolor(dknavy) lcolor(eltblue) lalign(inside) addlabel normal normopts(lcolor(maroon)) kdensity kdenopts(lcolor(magenta)) title(Government firms)

\*Plotting histogram to visualize distribution of ESG scores for govt & non-govt companies without density plots>

histogram ESG if TREAT==1, bin(10) percent fcolor(navy) lcolor(eltblue) lalign(inside) addlabel normal normopts(lcolor(red)) title(Government firms)

histogram ESG if TREAT==0, bin(10) percent fcolor(navy) lcolor(eltblue) lalign(inside) addlabel normal normopts(lcolor(red)) title(Non-government firms)

graph combine histogramgovt.gph histogramnongovt.gph

\***Panel Regressions**

import excel "C:\Users\Steffy Earnest\Documents\MSc Finance\Studies\THESIS\Testing\PSM 31.03.2020\_2009-2018 without industries 489.xlsx", sheet("Sheet1") firstrow

encode COMPANYNAME, gen(COMPID)

list COMPANYNAME COMPID in 1/490, nolabel sepby (COMPANYNAME)

xtset COMPID YEAR, yearly

\*Fixed effects regression for TREATMENT

xtreg TOBINSQ SIZE ESG if TREAT==1, fe

estimate store fixed

\*GRS regression for TREATMENT

xtreg TOBINSQ SIZE ESG AGE if TREAT==1, re

estimates store random

hausman fixed random

\*\*xtreg including ownership & majority dummy for impact on TOBINSQ

\*Fixed effects regression for TREATMENT

xtreg TOBINSQ ESG OWN MAJORITY if TREAT==1, fe

estimate store fixed

\*GRS regression for TREATMENT

xtreg TOBINSQ ESG OWN MAJORITY if TREAT==1, re

\*\*xtreg including ownership & majority dummy for impact on ESG

\*Fixed effects regression for TREATMENT

xtreg ESG TOBINSQ SIZE OWN MAJORITY if TREAT==1, fe

estimate store fixed

\*GRS regression for TREATMENT

xtreg ESG TOBINSQ SIZE AGE OWN MAJORITY if TREAT==1, re

\*Fixed effects regression for CONTROL

xtreg TOBINSQ SIZE ESG if TREAT==0, fe

\*GRS regression for CONTROL

xtreg TOBINSQ AGE SIZE ESG if TREAT==0, re

\***ADF test for unit root and stationarity**

xtunitroot llc TOBINSQ

xtunitroot llc ESG

\*\*The below 3 TESTS show RESULTS as mentioned in the email to BOGDAN:

\*Running vector autoregression with Impulse response to shocks

xtvar ESG TOBINSQ

**Granger Causality tests**

\*Running Granger Causality tests to test if TOBINSQ granger causes ESG

xtgcause ESG TOBINSQ, lag(1)

\*Running Granger Causality tests to test if ESG granger causes TOBINSQ

xtgcause TOBINSQ ESG, lag(1)

**\*Difference-in-difference tests**

\*2009-2013

teffects psmatch (ESG) (TREAT AGE SIZE TOBINSQ) in 1/2440, gen(match)

\*predict variables

predict ps0 ps1, ps

predict y0 y1, po

predict pscore

\*T test for paired observations - TOBINSQ

ttest y0 == y1

\*2014-2018

teffects psmatch (ESG) (TREAT AGE SIZE TOBINSQ) in 2441/4880, gen(match1)

\*predict variables

predict ps2 ps3, ps

predict y2 y3, po

predict pscore1

\*T test for paired observations - TOBINSQ

ttest y2 == y3

mean pscore

mean pscore1

\*Create a dummy variable to indicate the time when the treatment started. Lets assume that treatment started in 2014. In this case, years before 2014 and 2014 will have a value of 0 and 2014+ a 1.

gen time1 = (YEAR>=2014) & !missing(YEAR)

\*Create an interaction between time and treated. We will call this interaction ‘did’

gen did = time1\*TREAT

\* Estimating the DID estimator

diff ESG, t(TREAT) p(time1)

diff ESG, t(TREAT) p(time1) bs rep(50)

diff ESG, t(TREAT) p(time1) cov(AGE SIZE TOBINSQ)

diff ESG, t(TREAT) p(time1) cov(AGE SIZE TOBINSQ) report

diff ESG, t(TREAT) p(time1) cov(AGE SIZE TOBINSQ) report bs

stored pscore

**\*Pooled OLS tests**

generate dummyxutilities = MAJORITY\*UTILITIES

generate dummyxairport = MAJORITY\*AIRPORTOPERATOR

generate dummyxbanks = MAJORITY\*BANKS

generate dummyxairlines = MAJORITY\*AIRLINES

generate dummyxtelecomm = MAJORITY\*TELECOMM

generate dummyxoilandgas = MAJORITY\*INTEGRATEDOILANDGAS

regress ESG TOBINSQ AGE SIZE OWN UTILITIES dummyxutilities

regress ESG TOBINSQ AGE SIZE OWN AIRPORTOPERATOR dummyxairport

regress ESG TOBINSQ AGE SIZE OWN BANKS dummyxbanks

regress ESG TOBINSQ AGE SIZE OWN AIRLINES dummyxairlines

regress ESG TOBINSQ AGE SIZE OWN TELECOMM dummyxtelecomm

regress ESG TOBINSQ AGE SIZE OWN INTEGRATEDOILANDGAS dummyxoilandgas

regress ESG TOBINSQ AGE SIZE OWN MAJORITY UTILITIES dummyxutilities AIRPORTOPERATOR dummyxairport BANKS dummyxbanks AIRLINES dummyxairlines TELECOMM dummyxtelecomm INTEGRATEDOILANDGAS dummyxoilandgas