BMI-Randomization-Feb_12.R

danny

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```
#*** MSBA 6440 ***#
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#*** Code for Lecture 2 ***#

## Set working dir - for this example only
setwd("~/MSBA 2020 All Files/Spring 2020/MSBA 6440 - Inference via Ecnmtrcs Exprmnt/Week 2 - Design of E

# BMI example with randomization

library("stargazer")
```

```
##
## Please cite as:

##  Hlavac, Marek (2018). stargazer: Well-Formatted Regression and Summary Statistics Tables.

##  R package version 5.2.2. https://CRAN.R-project.org/package=stargazer
```

```
BMI = read.csv("BMI_pill.csv")

#check balance of some observable covariates between treated and control groups.

t.test(data=BMI, height~magicpill)
```

```
##
##  Welch Two Sample t-test
##
## data:  height by magicpill
## t = -0.30601, df = 376.88, p-value = 0.7598
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -0.7333199  0.5358093
## sample estimates:
## mean in group 0 mean in group 1
##        56.93160        57.03036
```

```
t.test(data=BMI, gender~magicpill)
```

```
##
##  Welch Two Sample t-test
##
## data:  gender by magicpill
## t = 0.60068, df = 387.92, p-value = 0.5484
## alternative hypothesis: true difference in means is not equal to 0
```

```
## 95 percent confidence interval:
##  -0.06863251  0.12901898
## sample estimates:
## mean in group 0 mean in group 1
##       0.5138889       0.4836957
```

```
t.test(data=BMI, weight~magicpill)
```

```
##
##  Welch Two Sample t-test
##
## data:  weight by magicpill
## t = 0.38354, df = 374.55, p-value = 0.7015
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -6.524866  9.687110
## sample estimates:
## mean in group 0 mean in group 1
##        175.5419        173.9607
```

```
#Let's see if BMI changes with receipt of the randomly assigned pill.
mp<-lm(log(bmi)~magicpill, data = BMI)
summary (mp)
```

```
##
## Call:
## lm(formula = log(bmi) ~ magicpill, data = BMI)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.3251 -0.1616  0.0419  0.2416  0.7935
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  3.55643    0.02514 141.447  < 2e-16 ***
## magicpill   -0.15842    0.03707  -4.273 2.41e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3695 on 398 degrees of freedom
## Multiple R-squared:  0.04387,    Adjusted R-squared:  0.04147
## F-statistic: 18.26 on 1 and 398 DF,  p-value: 2.413e-05
```

```
#Let's see if this changes when we control for some observables (if its randomly assigned then this won
mphw<-lm(log(bmi)~magicpill+log(height) + log(weight), data = BMI)
summary(mphw)
```

```
##
## Call:
## lm(formula = log(bmi) ~ magicpill + log(height) + log(weight),
##     data = BMI)
##
```

```
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.3903 -0.1578  0.0616  0.2290  0.6635
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  7.94100    1.32834   5.978 5.04e-09 ***
## magicpill   -0.15550    0.03654  -4.255 2.61e-05 ***
## log(height) -1.19644    0.32677  -3.661 0.000285 ***
## log(weight)  0.08745    0.07290   1.200 0.230977
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3641 on 396 degrees of freedom
## Multiple R-squared:  0.07649,    Adjusted R-squared:  0.06949
## F-statistic: 10.93 on 3 and 396 DF,  p-value: 6.509e-07
```

```
mphwg<-lm(log(bmi)~magicpill+log(height) + log(weight) + gender, data = BMI)
summary(mphwg)
```

```
##
## Call:
## lm(formula = log(bmi) ~ magicpill + log(height) + log(weight) +
##     gender, data = BMI)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.3299 -0.1681  0.0498  0.2275  0.7130
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 15.96344    4.23651   3.768  0.00019 ***
## magicpill   -0.15977    0.03647  -4.381 1.52e-05 ***
## log(height) -3.13220    1.02420  -3.058  0.00238 **
## log(weight)  0.07132    0.07307   0.976  0.32966
## gender      -0.23017    0.11547  -1.993  0.04691 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3627 on 395 degrees of freedom
## Multiple R-squared:  0.08569,    Adjusted R-squared:  0.07643
## F-statistic: 9.255 on 4 and 395 DF,  p-value: 3.712e-07
```

```
stargazer(mp,mphw,mphwg, type="text",column.labels=c("magic pill","magic pill with controls", "magic pi
```

```
##
## ===============================================================================================
##                                              Dependent variable:
##                     -----------------------------------------------------------------------
##                                                     log(bmi)
##                            magic pill        magic pill with controls magic pill with more controls
##                               (1)                      (2)                          (3)
## -----------------------------------------------------------------------------------------------
```

```
## magicpill                -0.158***           -0.155***           -0.160***
##                           (0.037)             (0.037)             (0.036)
##
## log(height)                                   -1.196***           -3.132***
##                                               (0.327)             (1.024)
##
## log(weight)                                    0.087               0.071
##                                               (0.073)             (0.073)
##
## gender                                                            -0.230**
##                                                                    (0.115)
##
## Constant                 3.556***            7.941***           15.963***
##                           (0.025)             (1.328)             (4.237)
##
## ---------------------------------------------------------------------------------------------
## Observations                400                 400                 400
## R2                         0.044               0.076               0.086
## Adjusted R2                0.041               0.069               0.076
## Residual Std. Error  0.370 (df = 398)   0.364 (df = 396)    0.363 (df = 395)
## F Statistic         18.260*** (df = 1; 398) 10.933*** (df = 3; 396)  9.255*** (df = 4; 395)
## =============================================================================================
## Note:                                                  *p<0.1; **p<0.05; ***p<0.01
```