Data assignment 3

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Default Setting and check the data

Default Setting

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.6     v purrr   0.3.4
## v tibble  3.1.7     v dplyr   1.0.9
## v tidyr   1.2.0     v stringr 1.4.0
## v readr   2.1.2     v forcats 0.5.1
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(foreign)
library(stargazer)
```

```
##
## Please cite as:
```

```
##  Hlavac, Marek (2022). stargazer: Well-Formatted Regression and Summary Statistics Tables.
```

```
##  R package version 5.2.3. https://CRAN.R-project.org/package=stargazer
```

```
women_trade <- read.dta("Mansfield.dta", convert.factors = FALSE)
names(women_trade)
```

```
##  [1] "age"             "govtrdN"         "finvN"           "naftaN"
##  [5] "globlN"          "wtoN"            "reloN"           "iso1N"
##  [9] "iso2N"           "iso3N"           "iso4N"           "iso5N"
## [13] "com1N"           "com2N"           "com3N"           "com4N"
## [17] "com5N"           "mcon1N"          "mcon2N"          "mcon3N"
## [21] "col2I"           "col4I"           "gradI"           "incomeV3"
## [25] "unempB"          "unionBV2"        "tradescaleN"     "tookeconB"
## [29] "ln_xorient06oV2" "ln_iorient06oV2" "z_isolationN"    "z_procompN"
## [33] "econgoodB"       "z_marketconN"    "a_wage_o"        "repIV4"
## [37] "demIV4"          "minorityB"       "female"
```

Summary Statistics for Selected Variables

```
my_selection_mms <- c("tradescaleN", "female", "col2I", "col4I", "gradI",
                      "incomeV3", "unionBV2", "age")
```

```
labels_mms <- c("Trade Preferences", "Female", "Some College",
                "College Graduate", "Graduate School", "Income",
                "Union Membership", "Age")

stargazer(women_trade[my_selection_mms], type="text",
          out="MMS_Summary_Selected (Label).htm",
          covariate.labels = labels_mms)
```

```
##
## ================================================
## Statistic           N    Mean  St. Dev.  Min   Max
## ------------------------------------------------
## Trade Preferences 2,081 2.724   0.645   1.000 4.000
## Female            2,085 0.463   0.499     0     1
## Some College      2,085 0.252   0.434     0     1
## College Graduate  2,085 0.199   0.399     0     1
## Graduate School   2,085 0.121   0.326     0     1
## Income            2,085 4.388   1.829     1     8
## Union Membership  2,085 0.119   0.324     0     1
## Age               2,085 43.081  13.163   18    82
## ------------------------------------------------
```

Regression Models - female

```
model.mms.1 <- lm(tradescaleN ~ female, data = women_trade)

model.mms.2 <- lm(tradescaleN ~ female + col2I + col4I + gradI + incomeV3 +
                    unionBV2 + age, data = women_trade)

model.mms.3 <- lm(tradescaleN ~ female + col2I + col4I + gradI + incomeV3 +
                    unionBV2 + age + z_procompN + reloN, data = women_trade)
```

Q1.

```
stargazer(model.mms.1, model.mms.2, type="text",
          out="WomenTrade_Regression1.htm",
          covariate.labels = c("Female", "Some College", "College Graduate",
                               "Graduate School", "Income", "Union Membership",
                               "Age"),
          dep.var.labels = c("Trade Preferences"))
```

```
##
## ===============================================================
##                                 Dependent variable:
##                     ------------------------------------------
##                                  Trade Preferences
##                              (1)                    (2)
## ---------------------------------------------------------------
## Female                     -0.059**               -0.052*
##                            (0.028)                (0.028)
##
## Some College                                      0.135***
```

```
##                                              (0.035)
##
## College Graduate                             0.312***
##                                              (0.039)
##
## Graduate School                              0.329***
##                                              (0.047)
##
## Income                                       0.019**
##                                              (0.008)
##
## Union Membership                              -0.040
##                                              (0.043)
##
## Age                                         -0.004***
##                                              (0.001)
##
## Constant                  2.751***           2.698***
##                           (0.019)            (0.060)
##
## -----------------------------------------------------------------
## Observations               2,081              2,081
## R2                         0.002              0.066
## Adjusted R2                0.002              0.063
## Residual Std. Error   0.645 (df = 2079)      0.625 (df = 2073)
## F Statistic         4.332** (df = 1; 2079) 20.830*** (df = 7; 2073)
## =================================================================
## Note:                                 *p<0.1; **p<0.05; ***p<0.01
```

```
stargazer(model.mms.1, model.mms.2, model.mms.3, type="text",
          out="WomenTrade_Regression2.htm",
          covariate.labels = c("Female", "Some College", "College Graduate",
                               "Graduate School", "Income", "Union Membership",
                               "Age", "Competitiveness",
                               "Willingness to Relocate"),
          dep.var.labels = c("Trade Preferences"))
```

```
##
## ==================================================================================================
##                                                Dependent variable:
##                           ------------------------------------------------------------------------
##                                                 Trade Preferences
##                                  (1)                     (2)                       (3)
## --------------------------------------------------------------------------------------------------
## Female                         -0.059**                -0.052*                   -0.020
##                                (0.028)                 (0.028)                   (0.029)
##
## Some College                                           0.135***                  0.129***
##                                                        (0.035)                   (0.035)
##
## College Graduate                                       0.312***                  0.299***
##                                                        (0.039)                   (0.039)
##
## Graduate School                                        0.329***                  0.323***
##                                                        (0.047)                   (0.048)
```

```
##
## Income                                                0.019**                 0.017**
##                                                       (0.008)                 (0.008)
##
## Union Membership                                      -0.040                  -0.046
##                                                       (0.043)                 (0.043)
##
## Age                                                   -0.004***               -0.003***
##                                                       (0.001)                 (0.001)
##
## Competitiveness                                                               0.053***
##                                                                               (0.014)
##
## Willingness to Relocate                                                       0.035***
##                                                                               (0.013)
##
## Constant                          2.751***            2.698***                2.585***
##                                   (0.019)             (0.060)                 (0.069)
##
## ------------------------------------------------------------------------------------------------
## Observations                       2,081               2,081                   2,063
## R2                                 0.002               0.066                   0.077
## Adjusted R2                        0.002               0.063                   0.072
## Residual Std. Error       0.645 (df = 2079)   0.625 (df = 2073)       0.623 (df = 2053)
## F Statistic             4.332** (df = 1; 2079) 20.830*** (df = 7; 2073) 18.900*** (df = 9; 2053)
## ================================================================================================
## Note:                                                          *p<0.1; **p<0.05; ***p<0.01
```

Q2.

As we can see from the table of Q1, in the first model, 'female' variable appears to be statistically significant at the p=0.05. And it does at the p=0.10 and in the second model. Also, in the third model, it has no statistically significance. We should consider not only female variable but also other variables such as competitiveness or willingness to relocate. Based on these results, we can expect that women appear to be in less favor of international trade than men because of differences in the perspective on competitiveness and the willingness to relocate.

Q3.

In the aspect of education, it seems that the higher education level affects on the more favor of international trade. In both of model 2 and model 3, three of education level variables have statistically significance and their coefficient get higher as the level of education becomes higher. Although it does not mean causal relations, we can expect the higher education level has an effect on more favor of trade. (positive direction)

And in the case of income variable, it has about -0.04 and has statistical significance in both of model 2 and model 3. It means that, as income get higher by one unit, the one's level of favor toward trade get lower with -0.04. (negative direction)

However, in the case of union membership, this variable has no statistical significance in both of model 2 and model 3.

Q4.

We can expect the effect of income difference between those with graduate degree and those with some college education.

In fact, considering income as dependent variable and the education level as independent variables, the education level has statistical significance. When considering other factors such as gender and age, those still have significance.

And then, considering attitude toward trade as dependent variable and the education level as independent variables, the differences in education level have statistically significance. When considering income and other factors such as gender and age together, those still have significance. Therefore, we can expect the income difference among those with different education level affects on the attitude toward trade.

Income and education

```
model.mms.income1 <- lm(incomeV3 ~ col2I + col4I + gradI, data = women_trade)

model.mms.income2 <- lm(incomeV3 ~ col2I + col4I + gradI + female + age,
                        data = women_trade)

stargazer(model.mms.income1, model.mms.income2, type="text",
          out="Trade_Regression1.htm",
          covariate.labels = c("Some college", "College graduate",
                               "Graduate School"),
          dep.var.labels = c("Income"))
```

```
##
## ===============================================================
##                                 Dependent variable:
##                     ------------------------------------------
##                                       Income
##                               (1)                   (2)
## ---------------------------------------------------------------
## Some college                0.535***              0.579***
##                             (0.094)               (0.094)
##
## College graduate            1.128***              1.161***
##                             (0.102)               (0.101)
##
## Graduate School             1.895***              1.891***
##                             (0.122)               (0.121)
##
## female                                           -0.373***
##                                                   (0.075)
##
## age                                               0.011***
##                                                   (0.003)
##
## Constant                    3.799***              3.493***
##                             (0.057)               (0.143)
##
## ---------------------------------------------------------------
## Observations                 2,085                 2,085
## R2                           0.124                 0.140
```

```
## Adjusted R2                  0.122                   0.138
## Residual Std. Error    1.713 (df = 2081)       1.698 (df = 2079)
## F Statistic         97.826*** (df = 3; 2081) 67.532*** (df = 5; 2079)
## ========================================================================
## Note:                                     *p<0.1; **p<0.05; ***p<0.01
```

Trade, income, and education

```
model.mms.4 <- lm(tradescaleN ~ col2I + col4I + gradI, data = women_trade)

model.mms.5 <- lm(tradescaleN ~ col2I + col4I + gradI + incomeV3,
                  data = women_trade)

model.mms.6 <- lm(tradescaleN ~ col2I + col4I + gradI + incomeV3 + female
                  + age, data = women_trade)

stargazer(model.mms.4, model.mms.5, model.mms.6, type="text",
          out="Trade_Regression2.htm",
          covariate.labels = c("Some College", "College Graduate",
                               "Graduate School", "Income", "Female", "Age"),
          dep.var.labels = c("Trade Preferences"))
```

```
##
## ===================================================================================================
##                                              Dependent variable:
##                      ------------------------------------------------------------------------------
##                                               Trade Preferences
##                                (1)                         (2)                         (3)
## ---------------------------------------------------------------------------------------------------
## Some College                0.156***                    0.146***                    0.136***
##                             (0.035)                     (0.035)                     (0.035)
##
## College Graduate            0.347***                    0.327***                    0.313***
##                             (0.037)                     (0.038)                     (0.038)
##
## Graduate School             0.365***                    0.332***                    0.332***
##                             (0.045)                     (0.047)                     (0.047)
##
## Income                                                  0.018**                     0.019**
##                                                         (0.008)                     (0.008)
##
## Female                                                                              -0.051*
##                                                                                     (0.028)
##
## Age                                                                                -0.004***
##                                                                                     (0.001)
##
## Constant                    2.572***                    2.505***                    2.700***
##                             (0.021)                     (0.037)                     (0.060)
##
## ---------------------------------------------------------------------------------------------------
## Observations                  2,081                       2,081                       2,081
## R2                            0.055                       0.057                       0.065
## Adjusted R2                   0.054                       0.056                       0.063
```

```
## Residual Std. Error    0.628 (df = 2077)        0.627 (df = 2076)        0.625 (df = 2074)
## F Statistic         40.400*** (df = 3; 2077) 31.571*** (df = 4; 2076) 24.155*** (df = 6; 2074)
## ================================================================================================
## Note:                                                                *p<0.1; **p<0.05; ***p<0.01
```

Q5.

'Unemployment' and 'the perspective on competition'. Suppose that someone is unemployed and has competitive world perspective. That person can be expected to have less favor toward international trade in that he or she can consider free trade or foreign companies as the enemies who threat his or her work.

However, the interaction variable of those two factor does not have statistical significance.

'Female' and 'Income'. The interaction variable of these factors also does not have statistical significance.

Unemployment and Competition

```
women_trade$unem_comp <- women_trade$unempB * women_trade$z_procompN

model.mms.unem1 <- lm(tradescaleN ~ unempB, data = women_trade)
model.mms.unem2 <- lm(tradescaleN ~ unempB + z_procompN, data = women_trade)
model.mms.unem3 <- lm(tradescaleN ~ unempB + z_procompN + unem_comp,
                      data = women_trade)

stargazer(model.mms.unem1, model.mms.unem2, model.mms.unem3, type="text",
          out="Trade_Regression.htm",
          covariate.labels = c("Unemployment", "Competitiveness",
                               "Interaction"),
          dep.var.labels = c("Trade Preferences"))
```

```
##
## ================================================================================================
##                                              Dependent variable:
##                     ---------------------------------------------------------------------------
##                                              Trade Preferences
##                                (1)                    (2)                    (3)
## ------------------------------------------------------------------------------------------------
## Unemployment               -0.231***              -0.241***              -0.231***
##                             (0.069)                (0.069)                (0.069)
##
## Competitiveness                                    0.066***               0.069***
##                                                    (0.014)                (0.014)
##
## Interaction                                                               -0.076
##                                                                           (0.067)
##
## Constant                    2.734***               2.735***               2.735***
##                             (0.014)                (0.014)                (0.014)
##
## ------------------------------------------------------------------------------------------------
## Observations                 2,081                  2,065                  2,065
## R2                           0.005                  0.016                  0.016
## Adjusted R2                  0.005                  0.015                  0.015
## Residual Std. Error    0.644 (df = 2079)      0.642 (df = 2062)      0.642 (df = 2061)
```

```
## F Statistic         11.361*** (df = 1; 2079) 16.498*** (df = 2; 2062) 11.423*** (df = 3; 2061)
## ================================================================================================
## Note:                                                                *p<0.1; **p<0.05; ***p<0.01
```

Female and income

```
women_trade$female_income <- women_trade$female * women_trade$incomeV3

model.mms.income1 <- lm(tradescaleN ~ female, data = women_trade)
model.mms.income2 <- lm(tradescaleN ~ female + incomeV3, data = women_trade)
model.mms.income3 <- lm(tradescaleN ~ female + incomeV3 + female_income, data = women_trade)

stargazer(model.mms.income1, model.mms.income2, model.mms.income3, type="text",
          out="Trade_Regression.htm",
          covariate.labels = c("Female", "Income",
                               "Interaction"),
          dep.var.labels = c("Trade Preferences"))
```

```
##
## ================================================================================================
##                                              Dependent variable:
##                     ---------------------------------------------------------------------------
##                                              Trade Preferences
##                               (1)                    (2)                    (3)
## ------------------------------------------------------------------------------------------------
## Female                     -0.059**               -0.043                  0.033
##                            (0.028)                (0.028)                (0.073)
##
## Income                                            0.042***               0.050***
##                                                   (0.008)                (0.010)
##
## Interaction                                                              -0.018
##                                                                          (0.015)
##
## Constant                   2.751***               2.559***               2.523***
##                            (0.019)                (0.040)                (0.051)
##
## ------------------------------------------------------------------------------------------------
## Observations                2,081                  2,081                  2,081
## R2                          0.002                  0.016                  0.017
## Adjusted R2                 0.002                  0.015                  0.015
## Residual Std. Error   0.645 (df = 2079)      0.640 (df = 2078)      0.640 (df = 2077)
## F Statistic         4.332** (df = 1; 2079) 17.082*** (df = 2; 2078) 11.818*** (df = 3; 2077)
## ================================================================================================
## Note:                                                                *p<0.1; **p<0.05; ***p<0.01
```