1 Getting Started

```r
#install.packages("Matching", dependencies=TRUE)
#install.packages("rgenoud")
setwd("C:/Users/Darin/Documents/sanctionsbackslide/Spectrum")
library(Matching)
library(rgenoud)
library(dplyr)
library(stargazer)
library(readr)

df <- read_csv("SanctionsFinal.csv") %>%
  mutate(pop1 = log(pop1)) %>%
  filter(!is.na(GDP_UN)) %>%

  mutate(deliniation = ifelse(polity2 >= 6, 1,
                       ifelse(polity2 >= 2 & polity2 < 6, 2,
                       ifelse(polity2 < 2 & polity2 > -2, 3,
                       ifelse(polity2 <= -2 & polity2 >= -5, 4,
                       ifelse(polity2 <= -6, 5, NA))))))

df$murban[df$murban < 0] <- 0

dsum <- as.data.frame(select(df, polity2, sanctions, GDP_UN,
                      pop1, menergy, mindustry, murban, dpolityb))

dt <-  df %>%
  group_by(sanctions) %>%
  summarise(polity2 = mean(polity2))
dt <- as.data.frame(dt)
```

2 Sources of data

Polity IV project which measures levels of political contestation Polity IV

Project by Reed Wood at ASU titled "A Hand Upon the Throat of a Nation: Economic Sanctions and State Repression, 1976-2001"

Project by Nikoly Marinov at University of Mannheim titled "Do Economic Sanctions Destabilize Country Leaders?"

Data collected by Pippa Norris used in her 1999 book Website

```
stargazer(dsum, title = "Summary Statistics")
```

Table 1: Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Max
polity2	4,043	0.153	7.555	-10	10
sanctions	4,043	0.197	0.398	0	1
GDP_UN	4,043	3,902.012	6,605.237	14	43,165
pop1	4,043	8.987	1.544	4.984	14.065
menergy	4,043	5.621	1.954	0.000	12.261
mindustry	4,043	37.808	10.452	2.000	85.000
murban	4,043	8,735.562	30,395.150	0.000	531,307.000
dpolityb	4,008	0.109	0.312	0	1

```
stargazer(dt, summary = F, title = "Average Score of Democracy:
          Sanctioned vs Non-Sanctioned", rownames = F)
```

Table 2: Average Score of Democracy: Sanctioned vs Non-Sanctioned

sanctions	polity2
0	0.518
1	-1.332

```
X <- select(df, GDP_UN, pop1, menergy, mindustry, murban)

BalanceMatrix <- cbind(df$GDP_UN, df$pop1, df$menergy,
                       df$mindustry, df$murban, I(df$GDP_UN*df$pop1),
                       I(df$GDP_UN*df$menergy), I(df$GDP_UN*df$mindustry),
                       I(df$GDP_UN*df$murban), I(df$pop1*df$murban),
                       I(df$murban*df$mindustry),I(df$pop1*df$mindustry))

#gen1 <- GenMatch(Tr = df£sanctions, X = X, BalanceMatrix = BalanceMatrix, pop.size = 1000,
                  #print.level = 0, unif.seed=3392, int.seed=8282)
load("gen1.Rdata")

mgen1 <- Match(Y = df$polity2, Tr = df$sanctions, X = X, Weight.matrix = gen1)
print(summary(mgen1))

##
## Estimate...  -1.345
## AI SE......   0.3482
## T-stat.....  -3.8628
## p.val......   0.00011208
##
## Original number of observations.............. 4043
## Original number of treated obs...............  797
## Matched number of observations...............  797
## Matched number of observations  (unweighted).  797
```

```
dfl <- df %>%
  filter(!is.na(sanctionsl1))

X <- select(dfl, GDP_UN, pop1, menergy, mindustry, murban)

BalanceMatrix <- cbind(dfl$GDP_UN, dfl$pop1, dfl$menergy, dfl$mindustry, dfl$murban,
                       I(dfl$GDP_UN*dfl$pop1), I(dfl$GDP_UN*dfl$menergy),
                       I(dfl$GDP_UN*dfl$mindustry), I(dfl$GDP_UN*dfl$murban),
                       I(dfl$pop1*dfl$murban), I(dfl$murban*dfl$mindustry),I(dfl$pop1*dfl$mindustry))
```

```
#gen1l <- GenMatch(Tr = dfl£sanctionsl1, X = X, BalanceMatrix = BalanceMatrix,
           #pop.size = 1000, print.level = 0, unif.seed=3392, int.seed=8282)
load("gen1l.Rdata")
mgen1 <- Match(Y = dfl$polity2, Tr = dfl$sanctionsl1, X = X, Weight.matrix = gen1l)
print(summary(mgen1))

##
## Estimate...  -1.0858
## AI SE......   0.36725
## T-stat.....  -2.9567
## p.val......   0.0031098
##
## Original number of observations.............  4022
## Original number of treated obs..............   769
## Matched number of observations..............   769
## Matched number of observations  (unweighted).  769
```

```r
k1 <- select(df, polity2, Pdpolity)
set.seed(2)
fit1 <- kmeans(k1, 5)
aggregate(k1,by=list(fit1$cluster),FUN=mean) %>%
  arrange(-polity2)

##   Group.1     polity2    Pdpolity
## 1       3  9.3669951 0.05869939
## 2       1  5.6035714 0.17439929
## 3       4 -0.4593023 0.27545742
## 4       5 -4.9204301 0.21363801
## 5       2 -7.8866758 0.05593759

k1 <- data.frame(k1, fit1$cluster) %>%
  mutate(fit1.cluster = plyr::mapvalues(fit1.cluster, from = c(3, 1, 4, 5, 2), to = c(1, 2, 3, 4, 5))) %>%
  select(cluster = fit1.cluster)

df <- cbind(df, k1)
```

```r
#Select on highest (cluster == 1) level in k-means
d1 <- filter(df, cluster == 1)

X <- select(d1, GDP_UN, pop1, menergy, mindustry, murban)

BalanceMatrix <- cbind(d1$GDP_UN, d1$pop1, d1$menergy, d1$mindustry, d1$murban,
                 I(d1$GDP_UN*d1$pop1), I(d1$GDP_UN*d1$menergy),
                 I(d1$GDP_UN*d1$mindustry), I(d1$GDP_UN*d1$murban),
                 I(d1$pop1*d1$murban), I(d1$murban*d1$mindustry),I(d1$pop1*d1$mindustry))

#genk1 <- GenMatch(Tr = d1£sanctions, X = X, BalanceMatrix = BalanceMatrix,
          #pop.size = 10000, print.level = 0, unif.seed=3392, int.seed=8282)
load("genk1.Rdata")

mgen1 <- Match(Y = d1$polity2, Tr = d1$sanctions, X = X, Weight.matrix = genk1)
print(summary(mgen1))

##
```

```
## Estimate...  -0.41608
## AI SE......   0.091005
## T-stat.....  -4.5721
## p.val......   4.8283e-06
##
## Original number of observations.............  1218
## Original number of treated obs..............  143
## Matched number of observations..............  143
## Matched number of observations  (unweighted).  144
```