iccat-spillover-main

Julia Lawson, UCSB

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```
#Cleaning price data from NOAA
noaa.prices <- read.csv(here("data", "foss_landings.csv"),
                  stringsAsFactors = F)
noaa.prices$Dollars <- as.numeric(gsub(",","",noaa.prices$Dollars))
noaa.prices$Pounds <- as.numeric(gsub(",","",noaa.prices$Pounds))

noaa.prices_edit <- noaa.prices %>%
  mutate(SpeciesID = case_when(
    NMFS.Name == "TUNA, BLUEFIN" ~ "BFT",
    NMFS.Name == "TUNA, SKIPJACK" ~ "SKJ",
    NMFS.Name == "SHARK, MAKO, SHORTFIN" ~ "SMA",
    NMFS.Name == "MARLIN, BLUE" ~ "BUM",
    NMFS.Name == "TUNA, ALBACORE" ~ "ALB",
    NMFS.Name == "TUNA, YELLOWFIN" ~ "YFT",
    NMFS.Name == "SHARK, BLUE" ~ "BSH",
    NMFS.Name == "TUNA, BIGEYE" ~ "BET",
    NMFS.Name == "TUNA, BLACKFIN" ~ "BLF",
    NMFS.Name == "TUNA, BLACKFIN" ~ "LTA")) %>%
  na.omit(SpeciesID) %>%
  filter(Region.Name!="Gulf") %>%
  group_by(Year,SpeciesID) %>%
  mutate(Kilogram = Pounds*0.453592) %>%
  mutate(USDperkilo = Kilogram/Dollars) %>%
  summarize(avUSDperkilo = mean(USDperkilo)) %>%
  filter(avUSDperkilo <= 80) %>%
  rename(YearC=Year) %>%
  rename(Species=SpeciesID)
```

```
## `summarise()` has grouped output by 'Year'. You can override using the `.groups` argument.
```

```
#ggplot(noaa.prices_edit, aes(x=YearC, y=avUSDperkilo, color=Species)) +
#  geom_line()
```

```
#Creating a tac_any column, which shows in a given fleet year (grouped by FleetGear and YearC) if there
iccat_df_final_edit <- filter %>%
  left_join(iccat_df_final, by="FleetGear") %>%
  left_join(noaa.prices_edit, by = c("Species","YearC")) %>%
  group_by(YearC, FleetGear) %>%
  mutate(tac_any = case_when(any(tacr == 1) ~ 1, TRUE ~ 0)) %>%
  group_by(YearC, FleetGear) %>%
  mutate(totalFleetCatch = sum(Qty_t)) %>%
  mutate(propStock = Qty_t/totalFleetCatch) %>%
  group_by(FleetGear, SpeciesStock) %>%
```

```
  mutate(diff=propStock-lag(propStock,k=1)) %>%
  group_by(FleetGear) %>%
  filter(YearC >= 1970 & YearC <= 2019) %>%
  na.omit(avUSDperkilo) #here I'm removing all stocks that didn't have pricing in the NOAA database. Re

#Question. Does the proportion of the catch of stocks that never receive a TAC increase or decrease rel
#Answer. The sign is positive, suggesting that the proportion of the catch of non-TAC stocks increases

stockreg <- feols(propStock ~ tacever | YearC^SpeciesStock + FleetGear + avUSDperkilo, data = filter(ic
stockreg_coef_tab <- stockreg$coeftable

#Question. Does the value of the stocks that never receive a TAC increase or decrease relative to stock
#Answer: The sign is positive, suggesting that prices of non-TAC regulated stocks increase following TA

pricereg <- feols(avUSDperkilo ~ tacever | YearC^SpeciesStock + FleetGear + log(Qty_t), data = filter(i
pricereg_coef_tab <- pricereg$coeftable

#Question. Does the proportion of the catch of non-TAC stocks in fleets that are catching one or more T
#Answer. The treatment (being a fleet that catches one or more TAC stock) catch of non-TAC stocks in fl

fleetreg <- feols(propStock ~ tac_any | YearC^SpeciesStock + FleetGear, data = filter(iccat_df_final_ed
fleetreg_coef_tab <- fleetreg$coeftable

#Regression 1. ----
#Question: Does the catch of non-TAC stocks in fleets that are catching one or more TAC stock increase
#Answer from the regression output: Fleets that catch one or more TAC stock increase their catch by 10.

# tac_reg1 <- lm(Qty_t ~ tac_any + as.factor(YearC) + FleetGear + SpeciesStock, data = filter(iccat_df_
# summary(tac_reg1) #matches feols output
#mb, 5.3.21: commenting out for speed, made YearC into a categorical FE

tac_reg1b <- feols(Qty_t ~ tac_any | YearC + FleetGear + SpeciesStock, data = filter(iccat_df_final_edi
coef_tab <- tac_reg1b$coeftable
#This regression assumes that all stocks change in the same way over time (this is the YearC fixed effe

tac_reg1c <- feols(Qty_t ~ tac_any | YearC^SpeciesStock + FleetGear, data = filter(iccat_df_final_edit,
coef_tab <- tac_reg1c$coeftable
#result: positive, significant spillover when adding FEs that account for variations in stock-by-year
#JML: Answer from regression output: The total catch of non-TAC regulated stocks (SpeciesStock) increas

#Regression 2. ----
#Creating a column that is proportion of TAC-treated stocks in total catch (prop_tacC).
#iccat_df_final_test2 <- iccat_df_final_edit %>%
#  group_by(YearC, FleetGear) %>%
#  mutate(totalCatch = sum(Qty_t),
#         tac_catch = sum(Qty_t[tacr==1])) %>% #Total catch grouped by FleetGear and YearC
#  mutate(prop_tacC = tac_catch/totalCatch) #mb: notice this is different

#hist(iccat_df_final_test2$prop_tacC)
#JML: commented out Mark's code (above) to try new code (below)

#Creating a column that is the proportion of TAC-treated stocks in total catch in years prior to when t
#Proportion of TAC catch (tacever=1) in the years before the TAC went into effect (tacr=0) for each sto
iccat_df_final_reg <- iccat_df_final_edit %>%
  group_by(YearC, FleetGear) %>%
```

```
  mutate(totalCatch = sum(Qty_t),
         pretac_catch = sum(Qty_t[tacever==1 & tacr==0])) %>%
  mutate(prop_pretac_catch = pretac_catch/totalCatch)

#Question. Does the proportion of TAC-treated stocks in a given fleet's total catch increase or decreas
#Answer from the regression:  The proportion of stocks that would be subject to TAC restrictions (tacev

# tac_reg2 <- lm(Qty_t ~ tac_any*prop_tacC + as.factor(YearC) + FleetGear + SpeciesStock, data = filter
# summary(tac_reg2)
#
# tac_reg2b <- feols(Qty_t ~ tac_any*prop_tacC | YearC + FleetGear + SpeciesStock, data = filter(iccat_
# # print(tac_reg2b)

tac_reg2c <- feols(Qty_t ~ prop_pretac_catch | YearC^SpeciesStock + FleetGear, data = filter(iccat_df_f
coef_tab <- tac_reg2c$coeftable

#note: this isn't strictly right, because we probably want the dosage based on the pre-treatment period
```

```
#Comparing average prices pre and post-TAC implementation

iccat_df_final_summ1 <- iccat_df_final_edit %>%
  group_by(Species) %>%
  filter(YearC < 1997) %>%
  summarize(SSaverageUSD = mean(avUSDperkilo)) %>%
  add_column(Era = "Pre")

iccat_df_final_summ2 <- iccat_df_final_edit %>%
  group_by(Species) %>%
  filter(YearC >= 1997) %>%
  summarize(SSaverageUSD = mean(avUSDperkilo)) %>%
  add_column(Era = "Post")

#Comparing average total volumes landed pre and post-TAC implementation

iccat_df_final_summ3 <- iccat_df_final_edit %>%
  filter(YearC < 1997) %>%
  group_by(Species, YearC) %>%
  summarize(sumQty = sum(Qty_t)) %>%
  group_by(Species) %>%
  summarize(SSaverageQty = mean(sumQty)) %>%
  add_column(Era = "Pre")
```

```
## `summarise()` has grouped output by 'Species'. You can override using the `.groups` argument.
```

```
iccat_df_final_summ4 <- iccat_df_final_edit %>%
  filter(YearC >= 1997) %>%
  group_by(Species, YearC) %>%
  summarize(sumQty = sum(Qty_t)) %>%
  group_by(Species) %>%
  summarize(SSaverageQty = mean(sumQty)) %>%
  add_column(Era = "Post")
```

```
## `summarise()` has grouped output by 'Species'. You can override using the `.groups` argument.
```

```r
combined_summarya <- iccat_df_final_summ1 %>%
  full_join(iccat_df_final_summ2, by=c("Species","Era", "SSaverageUSD"))

combined_summaryb <- iccat_df_final_summ3 %>%
  full_join(iccat_df_final_summ4, by=c("Species","Era", "SSaverageQty"))

combined_summaryc <- left_join(combined_summarya, combined_summaryb, by=c("Species","Era"))

stargazer(combined_summaryc)
```

```
##
## % Table created by stargazer v.5.2.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harva
## % Date and time: Tue, Jun 15, 2021 - 10:38:18
## \begin{table}[!htbp] \centering
##   \caption{}
##   \label{}
## \begin{tabular}{@{\extracolsep{5pt}}lccccccc}
## \\[-1.8ex]\hline
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## Statistic & \multicolumn{1}{c}{N} & \multicolumn{1}{c}{Mean} & \multicolumn{1}{c}{St. Dev.} & \multi
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## \end{tabular}
## \end{table}
```