Pensions ESG Pilot

OVD

2023-03-16

setwd(dir = "/Users/ovd/Documents/GitHub/esg\_pensions")  
  
options(scipen=999)

library(readr)  
  
dfcj <- read\_csv("rds\_prod.experiment.392385.stacked.csv")

## Rows: 5664 Columns: 77  
## ── Column specification ────────────────────────────────────────────────────────  
## Delimiter: ","  
## chr (20): EXPECTED\_PENSION, INVESTS\_IN\_FIREARMS, INVESTS\_IN\_FOSSIL\_FUELS, I...  
## dbl (55): RESPONDENT\_ID, SURVEY\_ID, CHOICE\_SET, LABEL, CHOICE\_INDICATOR, RE...  
## dttm (2): RESPONDENT\_TIME\_OF\_OPENING\_SURVEY, RESPONDENT\_TIME\_OF\_COMPLETING\_...  
##   
## ℹ Use `spec()` to retrieve the full column specification for this data.  
## ℹ Specify the column types or set `show\_col\_types = FALSE` to quiet this message.

library(cregg)  
library(janitor)

##   
## Attaching package: 'janitor'

## The following objects are masked from 'package:stats':  
##   
## chisq.test, fisher.test

library(tidyverse)

## ── Attaching core tidyverse packages ──────────────────────── tidyverse 2.0.0 ──  
## ✔ dplyr 1.1.0 ✔ purrr 1.0.1  
## ✔ forcats 1.0.0 ✔ stringr 1.5.0  
## ✔ ggplot2 3.4.1 ✔ tibble 3.2.0  
## ✔ lubridate 1.9.2 ✔ tidyr 1.3.0

## ── Conflicts ────────────────────────────────────────── tidyverse\_conflicts() ──  
## ✖ dplyr::filter() masks stats::filter()  
## ✖ dplyr::lag() masks stats::lag()  
## ℹ Use the ]8;;http://conflicted.r-lib.org/conflicted package]8;; to force all conflicts to become errors

names(dfcj)

## [1] "RESPONDENT\_ID"   
## [2] "SURVEY\_ID"   
## [3] "CHOICE\_SET"   
## [4] "LABEL"   
## [5] "CHOICE\_INDICATOR"   
## [6] "EXPECTED\_PENSION"   
## [7] "INVESTS\_IN\_FIREARMS"   
## [8] "INVESTS\_IN\_FOSSIL\_FUELS"   
## [9] "INVESTS\_IN\_FIRMS\_THAT\_MAY\_EMPLOY\_CHILDREN"   
## [10] "ADVOCATES\_FOR\_RACIAL\_DIVERSITY\_IN\_MANAGEMENT"   
## [11] "ADVOCATES\_FOR\_EQUAL\_PAY\_FOR\_MEN\_AND\_WOMEN"   
## [12] "RESPONDENT\_IP\_ADDRESS"   
## [13] "RESPONDENT\_CITY"   
## [14] "RESPONDENT\_REGION"   
## [15] "RESPONDENT\_POSTCODE"   
## [16] "RESPONDENT\_COUNTRY"   
## [17] "RESPONDENT\_TIME\_OF\_OPENING\_SURVEY"   
## [18] "RESPONDENT\_TIME\_OF\_COMPLETING\_SURVEY"   
## [19] "RESPONDENT\_DEVICE\_USED\_IN\_SURVEY"   
## [20] "RESPONDENT\_LENGTH\_OF\_INTERVIEW\_SECONDS"   
## [21] "RESPONDENT\_TOUCH\_DEVICE\_USED\_IN\_SURVEY"   
## [22] "RESPONDENT\_UNIQUE\_CODE"   
## [23] "Q2\_DO\_YOU\_CONSENT\_TO\_PARTICIPATING\_IN\_THIS\_STUDY\_O1\_YES"   
## [24] "Q2\_DO\_YOU\_CONSENT\_TO\_PARTICIPATING\_IN\_THIS\_STUDY\_O2\_NO"   
## [25] "Q3\_SCREEN\_OUT"   
## [26] "Q5\_WHAT\_IS\_THE\_RESULT\_OF\_5\_X\_2\_TO\_MAKE\_SURE\_YOU\_ARE\_PAYING\_ATTENTION\_PLEASE\_SELECT\_THE\_OPTION\_NONE\_OF\_T\_O1\_10"   
## [27] "Q5\_WHAT\_IS\_THE\_RESULT\_OF\_5\_X\_2\_TO\_MAKE\_SURE\_YOU\_ARE\_PAYING\_ATTENTION\_PLEASE\_SELECT\_THE\_OPTION\_NONE\_OF\_T\_O2\_7"   
## [28] "Q5\_WHAT\_IS\_THE\_RESULT\_OF\_5\_X\_2\_TO\_MAKE\_SURE\_YOU\_ARE\_PAYING\_ATTENTION\_PLEASE\_SELECT\_THE\_OPTION\_NONE\_OF\_T\_O3\_12"   
## [29] "Q5\_WHAT\_IS\_THE\_RESULT\_OF\_5\_X\_2\_TO\_MAKE\_SURE\_YOU\_ARE\_PAYING\_ATTENTION\_PLEASE\_SELECT\_THE\_OPTION\_NONE\_OF\_T\_O4\_5"   
## [30] "Q5\_WHAT\_IS\_THE\_RESULT\_OF\_5\_X\_2\_TO\_MAKE\_SURE\_YOU\_ARE\_PAYING\_ATTENTION\_PLEASE\_SELECT\_THE\_OPTION\_NONE\_OF\_T\_O5\_8"   
## [31] "Q5\_WHAT\_IS\_THE\_RESULT\_OF\_5\_X\_2\_TO\_MAKE\_SURE\_YOU\_ARE\_PAYING\_ATTENTION\_PLEASE\_SELECT\_THE\_OPTION\_NONE\_OF\_T\_O6\_NONE\_OF\_THE\_ABOVE"  
## [32] "Q6\_SCREEN\_OUT"   
## [33] "Q7\_WHAT\_OF\_THE\_FOLLOWING\_WORDS\_IS\_AN\_ANIMAL\_O1\_DOG"   
## [34] "Q7\_WHAT\_OF\_THE\_FOLLOWING\_WORDS\_IS\_AN\_ANIMAL\_O2\_MOUNTAIN"   
## [35] "Q7\_WHAT\_OF\_THE\_FOLLOWING\_WORDS\_IS\_AN\_ANIMAL\_O3\_LAKE"   
## [36] "Q7\_WHAT\_OF\_THE\_FOLLOWING\_WORDS\_IS\_AN\_ANIMAL\_O4\_TREE"   
## [37] "Q7\_WHAT\_OF\_THE\_FOLLOWING\_WORDS\_IS\_AN\_ANIMAL\_O5\_CAR"   
## [38] "Q7\_WHAT\_OF\_THE\_FOLLOWING\_WORDS\_IS\_AN\_ANIMAL\_O6\_CAKE"   
## [39] "Q7\_WHAT\_OF\_THE\_FOLLOWING\_WORDS\_IS\_AN\_ANIMAL\_O7\_CANDLE"   
## [40] "Q8\_SCREEN\_OUT"   
## [41] "Q9\_WOULD\_YOU\_PREFER\_TO\_RESTRICT\_YOUR\_INVESTMENTS\_TO\_FUNDS\_THAT\_TAKE\_ENVIRONMENTAL\_SOCIAL\_AND\_GOVERNANCE\_O1\_YES"   
## [42] "Q9\_WOULD\_YOU\_PREFER\_TO\_RESTRICT\_YOUR\_INVESTMENTS\_TO\_FUNDS\_THAT\_TAKE\_ENVIRONMENTAL\_SOCIAL\_AND\_GOVERNANCE\_O2\_NO"   
## [43] "Q10\_IN\_WHAT\_YEAR\_WERE\_YOU\_BORN"   
## [44] "Q11\_WHAT\_PARTY\_DO\_YOU\_IDENTIFY\_YOURSELF\_WITH\_O1\_REPUBLICAN"   
## [45] "Q11\_WHAT\_PARTY\_DO\_YOU\_IDENTIFY\_YOURSELF\_WITH\_O2\_DEMOCRAT"   
## [46] "Q11\_WHAT\_PARTY\_DO\_YOU\_IDENTIFY\_YOURSELF\_WITH\_O3\_NONE"   
## [47] "Q12\_IF\_YOU\_DON\_T\_IDENTIFY\_WITH\_ANY\_PARTY\_DO\_YOU\_LEAN\_TOWARDS\_ONE\_OF\_THEM\_O1\_REPUBLICAN"   
## [48] "Q12\_IF\_YOU\_DON\_T\_IDENTIFY\_WITH\_ANY\_PARTY\_DO\_YOU\_LEAN\_TOWARDS\_ONE\_OF\_THEM\_O2\_DEMOCRAT"   
## [49] "Q12\_IF\_YOU\_DON\_T\_IDENTIFY\_WITH\_ANY\_PARTY\_DO\_YOU\_LEAN\_TOWARDS\_ONE\_OF\_THEM\_O3\_NONE"   
## [50] "Q13\_WHAT\_GENDER\_DO\_YOU\_IDENTIFY\_WITH\_O1\_MALE"   
## [51] "Q13\_WHAT\_GENDER\_DO\_YOU\_IDENTIFY\_WITH\_O2\_FEMALE"   
## [52] "Q13\_WHAT\_GENDER\_DO\_YOU\_IDENTIFY\_WITH\_O3\_OTHER"   
## [53] "Q14\_WHAT\_ETHNICITY\_DO\_YOU\_IDENTIFY\_WITH\_O1\_WHITE"   
## [54] "Q14\_WHAT\_ETHNICITY\_DO\_YOU\_IDENTIFY\_WITH\_O2\_ASIAN"   
## [55] "Q14\_WHAT\_ETHNICITY\_DO\_YOU\_IDENTIFY\_WITH\_O3\_HISPANIC"   
## [56] "Q14\_WHAT\_ETHNICITY\_DO\_YOU\_IDENTIFY\_WITH\_O4\_AFRICAN\_AMERICAN"   
## [57] "Q14\_WHAT\_ETHNICITY\_DO\_YOU\_IDENTIFY\_WITH\_O5\_NATIVE\_AMERICAN"   
## [58] "Q14\_WHAT\_ETHNICITY\_DO\_YOU\_IDENTIFY\_WITH\_O6\_OTHER"   
## [59] "Q15\_IN\_WHAT\_US\_STATE\_DO\_YOU\_LIVE\_O1\_FLORIDA"   
## [60] "Q15\_IN\_WHAT\_US\_STATE\_DO\_YOU\_LIVE\_O2\_TEXAS"   
## [61] "Q15\_IN\_WHAT\_US\_STATE\_DO\_YOU\_LIVE\_O3\_CALIFORNIA"   
## [62] "Q15\_IN\_WHAT\_US\_STATE\_DO\_YOU\_LIVE\_O4\_NEW\_YORK"   
## [63] "Q15\_IN\_WHAT\_US\_STATE\_DO\_YOU\_LIVE\_O5\_OTHER"   
## [64] "Q16\_WHAT\_IS\_THE\_HIGHEST\_DEGREE\_YOU\_HAVE\_EARNED\_O1\_SOME\_HIGH\_SCHOOL"   
## [65] "Q16\_WHAT\_IS\_THE\_HIGHEST\_DEGREE\_YOU\_HAVE\_EARNED\_O2\_HIGH\_SCHOOL"   
## [66] "Q16\_WHAT\_IS\_THE\_HIGHEST\_DEGREE\_YOU\_HAVE\_EARNED\_O3\_SOME\_COLLEGE"   
## [67] "Q16\_WHAT\_IS\_THE\_HIGHEST\_DEGREE\_YOU\_HAVE\_EARNED\_O4\_COLLEGE\_DEGREE"   
## [68] "Q16\_WHAT\_IS\_THE\_HIGHEST\_DEGREE\_YOU\_HAVE\_EARNED\_O5\_GRADUATE\_DEGREE"   
## [69] "Q17\_WHAT\_IS\_YOUR\_GROSS\_BEFORE\_TAX\_ANNUAL\_INCOME"   
## [70] "Q18\_HOW\_MANY\_DAYS\_A\_WEEK\_DO\_YOU\_PRAY\_OR\_MEDITATE\_O1\_0"   
## [71] "Q18\_HOW\_MANY\_DAYS\_A\_WEEK\_DO\_YOU\_PRAY\_OR\_MEDITATE\_O2\_1"   
## [72] "Q18\_HOW\_MANY\_DAYS\_A\_WEEK\_DO\_YOU\_PRAY\_OR\_MEDITATE\_O3\_2"   
## [73] "Q18\_HOW\_MANY\_DAYS\_A\_WEEK\_DO\_YOU\_PRAY\_OR\_MEDITATE\_O4\_3"   
## [74] "Q18\_HOW\_MANY\_DAYS\_A\_WEEK\_DO\_YOU\_PRAY\_OR\_MEDITATE\_O5\_4"   
## [75] "Q18\_HOW\_MANY\_DAYS\_A\_WEEK\_DO\_YOU\_PRAY\_OR\_MEDITATE\_O6\_5"   
## [76] "Q18\_HOW\_MANY\_DAYS\_A\_WEEK\_DO\_YOU\_PRAY\_OR\_MEDITATE\_O7\_6"   
## [77] "Q18\_HOW\_MANY\_DAYS\_A\_WEEK\_DO\_YOU\_PRAY\_OR\_MEDITATE\_O8\_7"

dfcj = dfcj %>%   
 clean\_names()   
  
dfcj %>%   
 filter(q3\_screen\_out == "NULL" & q6\_screen\_out == "NULL" & q8\_screen\_out == "NULL") # filter screen-outs (zero)

## # A tibble: 5,664 × 77  
## respo…¹ surve…² choic…³ label choic…⁴ expec…⁵ inves…⁶ inves…⁷ inves…⁸ advoc…⁹  
## <dbl> <dbl> <dbl> <dbl> <dbl> <chr> <chr> <chr> <chr> <chr>   
## 1 1.83e8 1.83e8 1 1 0 Expect… Invest… Invest… Invest… Does n…  
## 2 1.83e8 1.83e8 1 2 1 Expect… Does n… Does n… Invest… Advoca…  
## 3 1.83e8 1.83e8 2 1 1 Expect… Does n… Does n… Invest… Advoca…  
## 4 1.83e8 1.83e8 2 2 0 Expect… Invest… Invest… Invest… Does n…  
## 5 1.83e8 1.83e8 3 1 0 Expect… Does n… Invest… Invest… Does n…  
## 6 1.83e8 1.83e8 3 2 1 Expect… Invest… Does n… Invest… Advoca…  
## 7 1.83e8 1.83e8 4 1 1 Expect… Does n… Does n… Invest… Does n…  
## 8 1.83e8 1.83e8 4 2 0 Expect… Invest… Invest… Invest… Advoca…  
## 9 1.83e8 1.83e8 5 1 0 Expect… Invest… Does n… Invest… Does n…  
## 10 1.83e8 1.83e8 5 2 1 Expect… Does n… Invest… Invest… Advoca…  
## # … with 5,654 more rows, 67 more variables:  
## # advocates\_for\_equal\_pay\_for\_men\_and\_women <chr>,  
## # respondent\_ip\_address <chr>, respondent\_city <chr>,  
## # respondent\_region <chr>, respondent\_postcode <chr>,  
## # respondent\_country <chr>, respondent\_time\_of\_opening\_survey <dttm>,  
## # respondent\_time\_of\_completing\_survey <dttm>,  
## # respondent\_device\_used\_in\_survey <chr>, …

median\_complet\_t = median(dfcj$respondent\_length\_of\_interview\_seconds) # calculate median completion time in secs  
  
 dfcj = dfcj %>%   
 filter(respondent\_length\_of\_interview\_seconds >= 0.5 \* median\_complet\_t,  
 respondent\_length\_of\_interview\_seconds <= 1.5 \* median\_complet\_t) # filter responded too quickly or slowly  
  
table(dfcj$invests\_in\_firearms)

##   
## Does not invest in firearms Invests in firearms   
## 2510 2506

table(dfcj$invests\_in\_firms\_that\_may\_employ\_children)

##   
## Invests in firms that ensure no children are employed   
## 2513   
## Invests in firms that may employ children   
## 2503

table(dfcj$advocates\_for\_racial\_diversity\_in\_management)

##   
## Advocates for racial diversity in management   
## 2506   
## Does not advocate for racial diversity in management   
## 2510

# create vars for AMCE  
  
typeof(dfcj$expected\_pension)

## [1] "character"

# levels(dfcj1$expected\_pension\_num) = c("$20,000", "$25,000", "$30,000", "$35,000", "$40,000", "$45,000", "$50,000")  
  
dfcj1 = dfcj %>%   
 mutate(expected\_pension\_num = factor(expected\_pension),  
 firearms = factor(invests\_in\_firearms),  
 fossil\_fuels = factor(invests\_in\_fossil\_fuels),  
 may\_employ\_children = factor(invests\_in\_firms\_that\_may\_employ\_children),  
 racial\_diversity = factor(advocates\_for\_racial\_diversity\_in\_management),  
 gender\_equal\_pay = factor(advocates\_for\_equal\_pay\_for\_men\_and\_women))  
   
  
dfcj7 = dfcj %>%  
 mutate(expected\_pension\_num = factor(expected\_pension,  
 levels = c("$20,000", "$25,000", "$30,000", "$35,000", "$40,000", "$45,000", "$50,000")),  
 firearms = factor(invests\_in\_firearms,  
 levels = c("yes", "no")),  
 fossil\_fuels = factor(invests\_in\_fossil\_fuels,  
 levels = c("yes", "no")),  
 may\_employ\_children = factor(invests\_in\_firms\_that\_may\_employ\_children,  
 levels = c("yes", "no")),  
 racial\_diversity = factor(advocates\_for\_racial\_diversity\_in\_management,  
 levels = c("no", "yes")),  
 gender\_equal\_pay = factor(advocates\_for\_equal\_pay\_for\_men\_and\_women,  
 levels = c("no", "yes")))

# Something went wrong here  
#   
# labels(dfcj1$expected\_pension\_num) <- list("$20,000" = "Expected pension: $20,000 a year",   
# "$25,000" = "Expected pension: $25,000 a year",   
# "30,000"= "Expected pension: $30,000 a year",   
# "$35,000" = "Expected pension: $35,000 a year",   
# "$40,000" = "Expected pension: $40,000 a year",   
# "$45,000" = "Expected pension: $45,000 a year",   
# "$50,000" = "Expected pension: $50,000 a year")  
#   
# labels(dfcj1$firearms) <- list("yes" = "Invests in firearms",  
# "no" = "Does not invest in firearms")  
#   
# labels(dfcj1$fossil\_fuels) <- list("yes" = "Invests in fossil fuels",  
# "no" = "Does not invest in fossil fuels")  
#   
# labels(dfcj1$may\_employ\_children) <- list("yes" = "Invests in firms that may employ children",  
# "no" = "Invests in firms that ensure no children are employed")  
#   
# labels(dfcj1$racial\_diversity) <- list("yes" = "Advocates for racial diversity in management",  
# "no" = "Does not advocate for racial diversity in management")  
#   
# labels(dfcj1$gender\_equal\_pay) <- list("yes" = "Advocates for equal pay for men and women",  
# "no" = "Does not advocate for equal pay for men and women")

Try with case\_when instead

dfcj7 = dfcj %>%  
 mutate(expected\_pension\_num = factor(expected\_pension),  
 firearms = factor(invests\_in\_firearms),   
 fossil\_fuels = factor(invests\_in\_fossil\_fuels),  
 may\_employ\_children = factor(invests\_in\_firms\_that\_may\_employ\_children),  
 racial\_diversity = factor(advocates\_for\_racial\_diversity\_in\_management),  
 gender\_equal\_pay = factor(advocates\_for\_equal\_pay\_for\_men\_and\_women))  
  
  
dfcj7$expected\_pension\_num <- recode(dfcj7$expected\_pension\_num,  
 "Expected pension: $20,000 a year" = "20000",   
 "Expected pension: $25,000 a year" = "25000",   
 "Expected pension: $30,000 a year" = "30000",   
 "Expected pension: $35,000 a year" = "35000",   
 "Expected pension: $40,000 a year" = "40000",   
 "Expected pension: $45,000 a year" = "45000",   
 "Expected pension: $50,000 a year" = "50000")  
  
dfcj7$firearms <- recode(dfcj7$firearms,  
 "Invests in firearms" = "yes",  
 "Does not invest in firearms" = "no")  
  
dfcj7$fossil\_fuels <- recode(dfcj7$fossil\_fuels,  
 "Invests in fossil fuels" = "yes",  
 "Does not invest in fossil fuels" = "no")  
  
dfcj7$may\_employ\_children <- recode(dfcj7$may\_employ\_children,  
 "Invests in firms that may employ children" = "yes",  
 "Invests in firms that ensure no children are employed" = "no")  
  
dfcj7$racial\_diversity <- recode(dfcj7$racial\_diversity,  
 "Advocates for racial diversity in management" = "yes",  
 "Does not advocate for racial diversity in management" = "no")  
  
dfcj7$gender\_equal\_pay <- recode(dfcj7$gender\_equal\_pay,  
 "Advocates for equal pay for men and women" = "yes",  
 "Does not advocate for equal pay for men and women" = "no")

dfcj1$expected\_pension\_num <- recode(dfcj1$expected\_pension\_num,  
 "Expected pension: $20,000 a year" = "20000",   
 "Expected pension: $25,000 a year" = "25000",   
 "Expected pension: $30,000 a year" = "30000",   
 "Expected pension: $35,000 a year" = "35000",   
 "Expected pension: $40,000 a year" = "40000",   
 "Expected pension: $45,000 a year" = "45000",   
 "Expected pension: $50,000 a year" = "50000")  
  
  
dfcj1$firearms <- recode(dfcj1$firearms,  
 "Invests in firearms" = "yes",  
 "Does not invest in firearms" = "no")  
  
dfcj1$fossil\_fuels <- recode(dfcj1$fossil\_fuels,  
 "Invests in fossil fuels" = "yes",  
 "Does not invest in fossil fuels" = "no")  
  
dfcj1$may\_employ\_children <- recode(dfcj1$may\_employ\_children,  
 "Invests in firms that may employ children" = "yes",  
 "Invests in firms that ensure no children are employed" = "no")  
  
dfcj1$racial\_diversity <- recode(dfcj1$racial\_diversity,  
 "Advocates for racial diversity in management" = "yes",  
 "Does not advocate for racial diversity in management" = "no")  
  
dfcj1$gender\_equal\_pay <- recode(dfcj1$gender\_equal\_pay,  
 "Advocates for equal pay for men and women" = "yes",  
 "Does not advocate for equal pay for men and women" = "no")

# change var type   
dfcj1 = dfcj1 %>%   
 mutate(choice\_indicator = as.numeric(choice\_indicator))   
  
dfcj7 = dfcj7 %>%   
 mutate(choice\_indicator = as.numeric(choice\_indicator))   
  
#relevel factors  
# dfcj1$racial\_diversity <- relevel(dfcj1$racial\_diversity, "no")  
#   
# dfcj1$gender\_equal\_pay <- relevel(dfcj1$gender\_equal\_pay, "no")

#check sample size  
  
dfcj1 %>%   
 distinct(respondent\_id, .keep\_all = T) %>%   
 count()

## # A tibble: 1 × 1  
## n  
## <int>  
## 1 209

#trying to debug  
dfcj = dfcj %>%   
 mutate(expected\_pension\_num = factor(expected\_pension),  
 firearms = factor(invests\_in\_firearms),   
 fossil\_fuels = factor(invests\_in\_fossil\_fuels),  
 may\_employ\_children = factor(invests\_in\_firms\_that\_may\_employ\_children),   
 racial\_diversity = factor(advocates\_for\_racial\_diversity\_in\_management),  
 gender\_equal\_pay = factor(advocates\_for\_equal\_pay\_for\_men\_and\_women),  
 choice\_indicator = as.numeric(choice\_indicator))  
  
# This worked in AMCE. What did I do wrong when re-leveling the factors???

dfcj2 = dfcj1 %>%   
 select(survey\_id, choice\_indicator, expected\_pension\_num, firearms, fossil\_fuels, may\_employ\_children, racial\_diversity, gender\_equal\_pay)  
  
f1 <- choice\_indicator ~ expected\_pension\_num + firearms + fossil\_fuels + may\_employ\_children + racial\_diversity + gender\_equal\_pay  
  
# This does not work because there is an issue with the factor levels. I should check this later  
#amce2 = amce(dfcj7, f1, id = ~ survey\_id)  
   
table(dfcj1$firearms)

##   
## no yes   
## 2510 2506

# plot(amce)

#Did not work... wtf is going on with factors.... ask in github or stackexchange  
  
dfcjlab = dfcj   
  
  
dfcjlab$firearms = relevel(dfcjlab$firearms, "Invests in firearms")  
  
dfcjlab$fossil\_fuels = relevel(dfcjlab$fossil\_fuels, "Invests in fossil fuels")  
  
dfcjlab$may\_employ\_children = relevel(dfcjlab$may\_employ\_children, "Invests in firms that may employ children")  
  
dfcjlab$racial\_diversity = relevel(dfcjlab$racial\_diversity, "Does not advocate for racial diversity in management")  
  
dfcjlab$gender\_equal\_pay = relevel(dfcjlab$gender\_equal\_pay, "Does not advocate for equal pay for men and women")

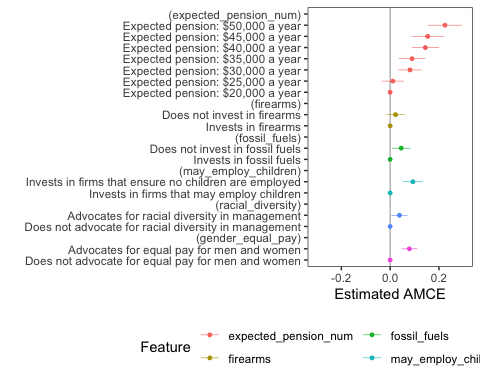
levels(dfcj$gender\_equal\_pay)

## [1] "Advocates for equal pay for men and women"   
## [2] "Does not advocate for equal pay for men and women"

#with factors re leveled  
  
amce1 = amce(dfcjlab, f1, id = ~ survey\_id)

## Warning in logLik.svyglm(x): svyglm not fitted by maximum likelihood.

plot(amce1)



WTP analysis

library(logitr)

## Version: 1.0.1  
## Author: John Paul Helveston (George Washington University)  
##   
## Consider submitting praise at  
## https://github.com/jhelvy/logitr/issues/8.  
##   
## Please cite the JSS article in your publications, see:  
## citation("logitr")

dfcjtest = dfcj %>%   
 mutate(pension = expected\_pension)  
  
# dfcjtest = dfcjtest %>%   
# mutate(pension = factor(expected\_pension,  
# levels = c("20,000",  
# "25,000",  
# "30,000",  
# "35,000",  
# "40,000",  
# "45,000",  
# "50,000")))  
  
dfcjtest$pension <- recode(dfcjtest$pension,  
 "Expected pension: $20,000 a year" = "20,000",   
 "Expected pension: $25,000 a year" = "25,000",   
 "Expected pension: $30,000 a year" = "30,000",   
 "Expected pension: $35,000 a year" = "35,000",   
 "Expected pension: $40,000 a year" = "40,000",   
 "Expected pension: $45,000 a year" = "45,000",   
 "Expected pension: $50,000 a year" = "50,000")

table(dfcjtest$pension)

##   
## 20,000 25,000 30,000 35,000 40,000 45,000 50,000   
## 716 725 715 711 713 720 716

typeof(dfcjtest$pension)

## [1] "character"

#   
#   
# dfcjtest2 = dfcjtest %>%  
# mutate(pension\_num2 = as.numeric(pension))  
#   
# table(dfcjtest2$pension\_num2)  
#   
# dfcjtest2$pension  
#   
# dfcjtest$pension\_num = as.numeric(dfcjtest$pension\_num)  
  
# ,  
# id = as.integer(survey\_id))  
  
dfcjtest = dfcjtest %>%  
 mutate(pension\_num = readr::parse\_number(pension))

library(readxl)  
nochoice <- read\_excel("~/Documents/GitHub/esg\_pensions/nochoice.xlsx")

ncl = pivot\_longer(nochoice, cols = q1:q12, names\_to = "choice")  
  
ncl = ncl %>%   
 mutate(nc = ifelse(value == 3, 1, 0),  
 choice\_set = parse\_number(choice),  
 survey\_id = ID) %>%   
 select(nc, choice\_set, survey\_id)

#ok, now I need to create new var with the option not chosen

dfnc = merge(dfcj, ncl, by = "survey\_id", "choice\_set")

dfcjtest = dfcjtest %>%   
 arrange(survey\_id, desc(choice\_set)) %>%   
 mutate(obsID = as.integer(gl(2508, 2, labels = c(1: 2508))))  
  
  
dfcjtest = dfcjtest %>%   
 select(survey\_id,   
 obsID,   
 choice\_set,   
 pension\_num,  
 choice\_indicator,   
 firearms,  
 fossil\_fuels,  
 may\_employ\_children,  
 racial\_diversity,  
 gender\_equal\_pay)  
  
dfcjtest2 = dfcjtest %>%   
 group\_by(obsID) %>% # Create ID by group  
 dplyr::mutate(ID = cur\_group\_id())

This ran, but there is something wrong. I get weird estimates with no statistics to report

#removing none  
dfcjtest3 = dfcjtest2 %>%   
 group\_by(ID) %>%   
 filter(sum(choice\_indicator) == 1)  
  
#changing price to negative  
  
dfcjtest3 = dfcjtest3 %>%   
 mutate(price = -1 \* pension\_num,  
 firearms.num = ifelse(firearms == "Invests in firearms", 1, 0),  
 fossil\_fuels.num = ifelse(fossil\_fuels == "Invests in fossil fuels", 1, 0),  
 may\_employ\_children.num = ifelse(may\_employ\_children == "Invests in firms that may employ children", 1, 0),  
 racial\_diversity.num = ifelse(racial\_diversity == "Does not advocate for racial diversity in management", 1, 0),  
 gender\_equal\_pay.num = ifelse(gender\_equal\_pay == "Does not advocate for equal pay for men and women", 1, 0))  
  
yogurt= yogurt  
  
class(yogurt$feat)

## [1] "numeric"

#Rerun after reseting R  
  
mnl\_pref <- logitr(  
 data = dfcjtest3,  
 outcome = "choice\_indicator",  
 obsID = "ID",  
 pars = c("pension\_num",  
 "firearms.num",   
 "fossil\_fuels.num",  
 "may\_employ\_children.num",  
 "racial\_diversity.num",  
 "gender\_equal\_pay.num")  
)

## Running model...

## Done!

mnl\_wtp <- logitr(  
 data = dfcjtest3,  
 outcome = "choice\_indicator",  
 obsID = "ID",  
 pars = c("firearms.num",   
 "fossil\_fuels.num",  
 "may\_employ\_children.num",  
 "racial\_diversity.num",  
 "gender\_equal\_pay.num"),  
 scalePar = "pension\_num"  
)

## Running model...  
## Done!

summary(mnl\_pref)

## =================================================  
##   
## Model estimated on: Thu Mar 23 09:13:53 2023   
##   
## Using logitr version: 1.0.1   
##   
## Call:  
## logitr(data = dfcjtest3, outcome = "choice\_indicator", obsID = "ID",   
## pars = c("pension\_num", "firearms.num", "fossil\_fuels.num",   
## "may\_employ\_children.num", "racial\_diversity.num", "gender\_equal\_pay.num"))  
##   
## Frequencies of alternatives:  
## 1 2   
## 0.48983 0.51017   
##   
## Exit Status: 3, Optimization stopped because ftol\_rel or ftol\_abs was reached.  
##   
## Model Type: Multinomial Logit  
## Model Space: Preference  
## Model Run: 1 of 1  
## Iterations: 12  
## Elapsed Time: 0h:0m:0.01s  
## Algorithm: NLOPT\_LD\_LBFGS  
## Weights Used?: FALSE  
## Robust? FALSE  
##   
## Model Coefficients:   
## Estimate Std. Error z-value  
## pension\_num 0.0000304616 0.0000030611 9.9513  
## firearms.num -0.0604094767 0.0474657204 -1.2727  
## fossil\_fuels.num -0.1256507865 0.0476614344 -2.6363  
## may\_employ\_children.num -0.2585418095 0.0478058763 -5.4082  
## racial\_diversity.num -0.1022787640 0.0478052494 -2.1395  
## gender\_equal\_pay.num -0.2119722964 0.0478167226 -4.4330  
## Pr(>|z|)   
## pension\_num < 0.00000000000000022 \*\*\*  
## firearms.num 0.203126   
## fossil\_fuels.num 0.008381 \*\*   
## may\_employ\_children.num 0.00000006368 \*\*\*  
## racial\_diversity.num 0.032396 \*   
## gender\_equal\_pay.num 0.00000929240 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Log-Likelihood: -1383.50257696  
## Null Log-Likelihood: -1466.00628688  
## AIC: 2779.00515392  
## BIC: 2812.94600000  
## McFadden R2: 0.05627787  
## Adj McFadden R2: 0.05218512  
## Number of Observations: 2115.00000000

summary(mnl\_wtp)

## =================================================  
##   
## Model estimated on: Thu Mar 23 09:13:53 2023   
##   
## Using logitr version: 1.0.1   
##   
## Call:  
## logitr(data = dfcjtest3, outcome = "choice\_indicator", obsID = "ID",   
## pars = c("firearms.num", "fossil\_fuels.num", "may\_employ\_children.num",   
## "racial\_diversity.num", "gender\_equal\_pay.num"), scalePar = "pension\_num")  
##   
## Frequencies of alternatives:  
## 1 2   
## 0.48983 0.51017   
##   
## Exit Status: 3, Optimization stopped because ftol\_rel or ftol\_abs was reached.  
##   
## Model Type: Multinomial Logit  
## Model Space: Willingness-to-Pay  
## Model Run: 1 of 1  
## Iterations: 23  
## Elapsed Time: 0h:0m:0.02s  
## Algorithm: NLOPT\_LD\_LBFGS  
## Weights Used?: FALSE  
## Robust? FALSE  
##   
## Model Coefficients:   
## Estimate Std. Error z-value Pr(>|z|)  
## scalePar -0.000030462 NA NA NA  
## firearms.num 1983.149979751 NA NA NA  
## fossil\_fuels.num 4124.893293820 NA NA NA  
## may\_employ\_children.num 8487.457784044 NA NA NA  
## racial\_diversity.num 3357.612506218 NA NA NA  
## gender\_equal\_pay.num 6958.674852078 NA NA NA  
##   
## Log-Likelihood: -1383.50257696  
## Null Log-Likelihood: -1466.00628688  
## AIC: 2779.00515392  
## BIC: 2812.94600000  
## McFadden R2: 0.05627787  
## Adj McFadden R2: 0.05218512  
## Number of Observations: 2115.00000000

yogurt = yogurt  
  
class(yogurt$obsID)

## [1] "integer"

class(dfcjtest$survey\_id)

## [1] "numeric"

dfcjtest %>%   
 select(survey\_id, obsID, choice\_indicator)

## # A tibble: 5,016 × 3  
## survey\_id obsID choice\_indicator  
## <dbl> <int> <dbl>  
## 1 182570538 1 0  
## 2 182570538 1 1  
## 3 182570538 2 0  
## 4 182570538 2 1  
## 5 182570538 3 1  
## 6 182570538 3 0  
## 7 182570538 4 1  
## 8 182570538 4 0  
## 9 182570538 5 0  
## 10 182570538 5 1  
## # … with 5,006 more rows

yogurt %>%   
 select(id, obsID, choice)

## # A tibble: 9,648 × 3  
## id obsID choice  
## <dbl> <int> <dbl>  
## 1 1 1 0  
## 2 1 1 0  
## 3 1 1 1  
## 4 1 1 0  
## 5 1 2 1  
## 6 1 2 0  
## 7 1 2 0  
## 8 1 2 0  
## 9 1 3 1  
## 10 1 3 0  
## # … with 9,638 more rows

mnl\_pref <- logitr(  
 data = yogurt,  
 outcome = "choice",  
 obsID = "obsID",  
 pars = c("price", "feat", "brand")  
)

## Running model...

## Done!

summary(mnl\_pref)

## =================================================  
##   
## Model estimated on: Thu Mar 23 09:13:53 2023   
##   
## Using logitr version: 1.0.1   
##   
## Call:  
## logitr(data = yogurt, outcome = "choice", obsID = "obsID", pars = c("price",   
## "feat", "brand"))  
##   
## Frequencies of alternatives:  
## 1 2 3 4   
## 0.402156 0.029436 0.229270 0.339138   
##   
## Exit Status: 3, Optimization stopped because ftol\_rel or ftol\_abs was reached.  
##   
## Model Type: Multinomial Logit  
## Model Space: Preference  
## Model Run: 1 of 1  
## Iterations: 21  
## Elapsed Time: 0h:0m:0.02s  
## Algorithm: NLOPT\_LD\_LBFGS  
## Weights Used?: FALSE  
## Robust? FALSE  
##   
## Model Coefficients:   
## Estimate Std. Error z-value Pr(>|z|)   
## price -0.366555 0.024365 -15.0441 < 0.00000000000000022 \*\*\*  
## feat 0.491439 0.120062 4.0932 0.00004254 \*\*\*  
## brandhiland -3.715477 0.145417 -25.5506 < 0.00000000000000022 \*\*\*  
## brandweight -0.641138 0.054498 -11.7645 < 0.00000000000000022 \*\*\*  
## brandyoplait 0.734519 0.080642 9.1084 < 0.00000000000000022 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Log-Likelihood: -2656.8878790  
## Null Log-Likelihood: -3343.7419990  
## AIC: 5323.7757580  
## BIC: 5352.7168000  
## McFadden R2: 0.2054148  
## Adj McFadden R2: 0.2039195  
## Number of Observations: 2412.0000000

mnl\_wtp <- logitr(  
 data = yogurt,  
 outcome = "choice",  
 obsID = "obsID",  
 pars = c("feat",   
 "brand"),  
 scalePar = "price"  
)

## Running model...

## Done!

summary(mnl\_wtp)

## =================================================  
##   
## Model estimated on: Thu Mar 23 09:13:53 2023   
##   
## Using logitr version: 1.0.1   
##   
## Call:  
## logitr(data = yogurt, outcome = "choice", obsID = "obsID", pars = c("feat",   
## "brand"), scalePar = "price")  
##   
## Frequencies of alternatives:  
## 1 2 3 4   
## 0.402156 0.029436 0.229270 0.339138   
##   
## Exit Status: 3, Optimization stopped because ftol\_rel or ftol\_abs was reached.  
##   
## Model Type: Multinomial Logit  
## Model Space: Willingness-to-Pay  
## Model Run: 1 of 1  
## Iterations: 38  
## Elapsed Time: 0h:0m:0.06s  
## Algorithm: NLOPT\_LD\_LBFGS  
## Weights Used?: FALSE  
## Robust? FALSE  
##   
## Model Coefficients:   
## Estimate Std. Error z-value Pr(>|z|)   
## scalePar 0.366583 0.024366 15.0448 < 0.00000000000000022 \*\*\*  
## feat 1.340593 0.355867 3.7671 0.0001651 \*\*\*  
## brandhiland -10.135764 0.576089 -17.5941 < 0.00000000000000022 \*\*\*  
## brandweight -1.749083 0.179898 -9.7226 < 0.00000000000000022 \*\*\*  
## brandyoplait 2.003821 0.142377 14.0740 < 0.00000000000000022 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Log-Likelihood: -2656.8878779  
## Null Log-Likelihood: -3343.7419990  
## AIC: 5323.7757559  
## BIC: 5352.7168000  
## McFadden R2: 0.2054148  
## Adj McFadden R2: 0.2039195  
## Number of Observations: 2412.0000000