Climate Legislation Statistics

Preprocessing

Functions

First, some libraries are imported and functions made. In addition to the functions in `functions.R`, the following are made:

- `annual_fish` - decrepit function that compares different types of legislation
- `manipulate` - preprocessing function that combines same names and removes JRP
- `com_comparison`, `com_comparison_readable` - Compares everything in a list of committees in a dataframe to everything else in dataframe.

In theory, should be the same, but has a very small and negligible difference in output

Data Import

Now, import the bill data. The following are made:

- `csvxx` - Data for the year 20xx
- `csv_total` - Combines all `csvxx` into one, combining `DiH` and `DiS` into `DiF`
- `climate` - Addition to `csv_total`, adding fate (`DIC`, `PIL`, `DIO`), and dem (whether the year is democratic trifecta)
- `df` - A separate dataframe that keeps track of how many bills passed and failed in each committee per year
- `cl` - Removes neutral bills, had `DIC`, `PIL`, `DIO`

Analysis

General Analysis

Number of bills between 2015 and 2023

```
nrow(csv_total)
```

```
## [1] 815
```

Count how many bills passed through each committee overall

```
mutate(df, total = pass + fail) %>%
    group_by(committee) %>%
    summarize(pass = sum(pass), fail = sum(fail), total = sum(total)) %>%
    print(n = 50)
```

```
## # A tibble: 25 x 4
##    committee  pass  fail total
##    <chr>     <dbl> <dbl> <dbl>
##  1 H-A          35    34    69
##  2 H-ACNR      135    57   192
##  3 H-CCT        23    16    39
##  4 H-CJ          4     1     5
```

```
##  5 H-CL         148   127   275
##  6 H-CTT          1     0     1
##  7 H-E            5     5    10
##  8 H-F           31    26    57
##  9 H-GL          21    17    38
## 10 H-HWI          1     3     4
## 11 H-MPPS         1     1     2
## 12 H-PE           0    10    10
## 13 H-R           20    22    42
## 14 H-ST           1     0     1
## 15 H-T           16     6    22
## 16 S-ACNR       119    41   160
## 17 S-CJ           4     0     4
## 18 S-CL         117    82   199
## 19 S-EH           5     0     5
## 20 S-F           85    17   102
## 21 S-GL          27     7    34
## 22 S-LG          27     6    33
## 23 S-PE           2     3     5
## 24 S-R           17    11    28
## 25 S-T           20     3    23
```

Over 100 bills?

```
mutate(df, total = pass + fail) %>%
    group_by(committee) %>%
    summarize(pass = sum(pass), fail = sum(fail), total = sum(total)) %>%
    filter(total >= 100)
```

```
## # A tibble: 5 x 4
##   committee  pass  fail total
##   <chr>     <dbl> <dbl> <dbl>
## 1 H-ACNR      135    57   192
## 2 H-CL        148   127   275
## 3 S-ACNR      119    41   160
## 4 S-CL        117    82   199
## 5 S-F          85    17   102
```

How many bills per year?

```
group_by(csv_total, Year) %>%
    summarize(n = n())
```

```
## # A tibble: 9 x 2
##    Year     n
##   <dbl> <int>
## 1  2015    86
## 2  2016    74
## 3  2017    89
## 4  2018   100
## 5  2019    91
## 6  2020    89
## 7  2021    62
## 8  2022   119
## 9  2023   105
```

How many progressive bills?

```
filter(csv_total, Pos == "Supported") %>%
    group_by(Year) %>%
    summarize(n = n())
```

```
## # A tibble: 9 x 2
##    Year     n
##   <dbl> <int>
## 1  2015    48
## 2  2016    44
## 3  2017    49
## 4  2018    84
## 5  2019    68
## 6  2020    72
## 7  2021    55
## 8  2022    86
## 9  2023    62
```

What percent of legislation passes into law per year?

```
group_by(csv_total, Year) %>%
    summarize(rate = mean(Disposition == "PIL"))
```

```
## # A tibble: 9 x 2
##    Year  rate
##   <dbl> <dbl>
## 1  2015 0.302
## 2  2016 0.324
## 3  2017 0.337
## 4  2018 0.24
## 5  2019 0.297
## 6  2020 0.472
## 7  2021 0.581
## 8  2022 0.319
## 9  2023 0.343
```

How does democratic trifecta affect passage rates?

```
group_by(climate, dem) %>%
    summarize(percent = mean(fate == "PIL"))
```

```
## # A tibble: 2 x 2
##   dem   percent
##   <lgl>   <dbl>
## 1 FALSE   0.309
## 2 TRUE    0.517
```

```
(tab <- table(climate$dem, climate$fate))
```

```
##
##         DIC DIO PIL
##   FALSE 412  47 205
##   TRUE   61  12  78
```

```
chisq.test(tab)
```

```
##
##  Pearson's Chi-squared test
##
```

```
## data:  tab
## X-squared = 25.366, df = 2, p-value = 3.103e-06
```

How about for just progressive legislation?

```
progressive <- filter(climate, prog == 1)
group_by(progressive, dem) %>%
    summarize(percent = mean(fate == "PIL"))
```

```
## # A tibble: 2 x 2
##   dem   percent
##   <lgl>   <dbl>
## 1 FALSE   0.272
## 2 TRUE    0.559
```

```
(tab <- table(progressive$dem, progressive$fate))
```

```
##
##         DIC DIO PIL
##   FALSE 293  28 120
##   TRUE   46  10  71
```

```
chisq.test(tab)
```

```
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 39.574, df = 2, p-value = 2.55e-09
```

How about non-progressive?

```
regressive <- filter(climate, prog != 1)
group_by(regressive, dem) %>%
    summarize(percent = mean(fate == "PIL"))
```

```
## # A tibble: 2 x 2
##   dem   percent
##   <lgl>   <dbl>
## 1 FALSE   0.381
## 2 TRUE    0.292
```

```
(tab <- table(regressive$dem, regressive$fate))
```

```
##
##         DIC DIO PIL
##   FALSE 119  19  85
##   TRUE   15   2   7
```

```
chisq.test(tab)
```

```
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 0.80029, df = 2, p-value = 0.6702
```

How does whether a bill is progressive change things?

```
group_by(climate, prog) %>%
    summarize(percent = mean(fate == "PIL"))
```

```
## # A tibble: 3 x 2
##    prog percent
##   <int>   <dbl>
## 1    -1   0.280
## 2     0   0.5
## 3     1   0.336
```

```
(tab <- table(climate$prog, climate$fate == "PIL"))
```

```
##
##      FALSE TRUE
##   -1   103   40
##   0     52   52
##   1    377  191
```

```
chisq.test(tab)
```

```
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 13.885, df = 2, p-value = 0.0009659
```

Remove neutral bills because those have high passage rate and are few

```
not_neutral <- filter(climate, prog != 0)
group_by(not_neutral, prog) %>%
    summarize(percent = mean(fate == "PIL"))
```

```
## # A tibble: 2 x 2
##    prog percent
##   <int>   <dbl>
## 1    -1   0.280
## 2     1   0.336
```

```
(tab <- table(not_neutral$prog, not_neutral$fate))
```

```
##
##      DIC DIO PIL
##   -1  87  16  40
##   1  339  38 191
```

```
chisq.test(tab)
```

```
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 4.1939, df = 2, p-value = 0.1228
```

```
(tab <- table(not_neutral$prog, not_neutral$fate == "PIL"))
```

```
##
##      FALSE TRUE
##   -1   103   40
##   1    377  191
```

```
chisq.test(tab)
```

```
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 1.4176, df = 1, p-value = 0.2338
```

What about year by year?

```
for (y in 2015:2023) {
    print(paste("Starting year", y))
    subset <- filter(not_neutral, year == y)
    print(tab <- table(subset$prog, subset$fate))
    print(chisq.test(tab))
}
```

```
## [1] "Starting year 2015"
##
##      DIC DIO PIL
##   -1   8   0   1
##   1   28   4  16
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 3.1253, df = 2, p-value = 0.2096
##
## [1] "Starting year 2016"
##
##      DIC DIO PIL
##   -1   7   0   4
##   1   31   4   9
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 2.0015, df = 2, p-value = 0.3676
##
## [1] "Starting year 2017"
##
##      DIC DIO PIL
##   -1  10   3   6
##   1   33   4  12
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 1.5023, df = 2, p-value = 0.4718
##
## [1] "Starting year 2018"
##
##      DIC DIO PIL
##   -1   3   2   3
##   1   62   4  18
```

```
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 6.7768, df = 2, p-value = 0.03376
##
## [1] "Starting year 2019"
##
##      DIC DIO PIL
##   -1   5   2   3
##   1   42   8  18
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 0.70176, df = 2, p-value = 0.7041
##
## [1] "Starting year 2020"
##
##      DIC DIO PIL
##   -1  11   0   0
##   1   30   5  37
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 12.99, df = 2, p-value = 0.001511
##
## [1] "Starting year 2021"
##
##      DIC DIO PIL
##   -1   4   1   1
##   1   16   5  34
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 4.5675, df = 2, p-value = 0.1019
##
## [1] "Starting year 2022"
##
##      DIC DIO PIL
##   -1  18   3  11
##   1   58   2  26
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 3.3164, df = 2, p-value = 0.1905
##
## [1] "Starting year 2023"
##
##      DIC DIO PIL
##   -1  21   5  11
```

```
##   1   39   2  21
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 3.7358, df = 2, p-value = 0.1544
```

Where do bills die?

```
dead <- filter(climate, fate != "PIL")
print(table(dead$fate))
```

```
##
## DIC DIO
## 473  59
```

```
print(table(dead$fate) / nrow(dead))
```

```
##
##       DIC       DIO
## 0.8890977 0.1109023
```

How about for different progressiveness?

```
tab <- table(dead$fate, dead$prog)
print(tab)
```

```
##
##        -1   0   1
##   DIC  87  47 339
##   DIO  16   5  38
```

```
print(sweep(tab, 2, colSums(tab), "/"))
```

```
##
##               -1          0          1
##   DIC 0.84466019 0.90384615 0.89920424
##   DIO 0.15533981 0.09615385 0.10079576
```

What part of bills that died in committee died in their first committee?

```
dead_in_committee <- filter(csv_total, Disposition == "DIC")
dead_in_first <- filter(dead_in_committee, Com.2 == "")
nrow(dead_in_first) / nrow(dead_in_committee)
```

```
## [1] 0.8625793
```

Analysis of CL and ACNR

Bills overall

```
com_comparison_readable(csv_total, "H-CL", TRUE)
```

```
##          pass_fail
## committee pass fail
##       in   148  127
##       out  717  368
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
```

```
## data:  tab
## X-squared = 13.731, df = 1, p-value = 0.0002109
```

```
## [1] 148 127
```

```
com_comparison_readable(csv_total, "S-CL", TRUE)
```

```
##          pass_fail
## committee pass fail
##       in   117   82
##       out  748  413
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 2.0918, df = 1, p-value = 0.1481
```

```
## [1] 117  82
```

```
com_comparison_readable(csv_total, "H-ACNR", TRUE)
```

```
##          pass_fail
## committee pass fail
##       in   135   57
##       out  730  438
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 4.0166, df = 1, p-value = 0.04505
```

```
## [1] 135  57
```

```
com_comparison_readable(csv_total, "S-ACNR", TRUE)
```

```
##          pass_fail
## committee pass fail
##       in   119   41
##       out  746  454
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 8.5696, df = 1, p-value = 0.003418
```

```
## [1] 119  41
```

Only progressive bills

```
progressive <- filter(csv_total, Pos == "Supported")
com_comparison_readable(progressive, "H-CL", TRUE)
```

```
##          pass_fail
## committee pass fail
##       in    76  100
##       out  513  255
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
```

```
## data:  tab
## X-squared = 33.032, df = 1, p-value = 9.063e-09
```

```
## [1]  76 100
```

```
com_comparison_readable(progressive, "S-CL", TRUE)
```

```
##          pass_fail
## committee pass fail
##       in    61   55
##       out  528  300
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 4.9558, df = 1, p-value = 0.026
```

```
## [1] 61 55
```

```
com_comparison_readable(progressive, "H-ACNR", TRUE)
```

```
##          pass_fail
## committee pass fail
##       in    98   37
##       out  491  318
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 6.4849, df = 1, p-value = 0.01088
```

```
## [1] 98 37
```

```
com_comparison_readable(progressive, "S-ACNR", TRUE)
```

```
##          pass_fail
## committee pass fail
##       in    86   18
##       out  503  337
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 19.562, df = 1, p-value = 9.737e-06
```

```
## [1] 86 18
```

Only regressive bills

```
regressive <- filter(csv_total, Pos == "Opposed")
com_comparison_readable(regressive, "H-CL", TRUE)
```

```
##          pass_fail
## committee pass fail
##       in    39   17
##       out  110   75
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
```

```
## data:  tab
## X-squared = 1.482, df = 1, p-value = 0.2235
```

```
## [1] 39 17
```

```
com_comparison_readable(regressive, "S-CL", TRUE)
```

```
##          pass_fail
## committee pass fail
##       in    29   15
##       out  120   77
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 0.19807, df = 1, p-value = 0.6563
```

```
## [1] 29 15
```

```
com_comparison_readable(regressive, "H-ACNR", TRUE)
```

```
##          pass_fail
## committee pass fail
##       in    21   14
##       out  128   78
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 0.0027365, df = 1, p-value = 0.9583
```

```
## [1] 21 14
```

```
com_comparison_readable(regressive, "S-ACNR", TRUE)
```

```
##          pass_fail
## committee pass fail
##       in    19   16
##       out  130   76
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 0.64799, df = 1, p-value = 0.4208
```

```
## [1] 19 16
```

Let's look at how party affects everything

```
party_comparison(csv_total, TRUE)
```

```
##      pass_fail
## party pass fail
##     D  280  115
##     R  403  393
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
```

```
## X-squared = 43.468, df = 1, p-value = 4.31e-11
```

```
##      pass_fail
## party pass fail
##     D  280  115
##     R  403  393
```

And progressive bills

```
t <- party_comparison(progressive, TRUE)
```

```
##      pass_fail
## party pass fail
##     D  233   64
##     R  214  299
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 101.16, df = 1, p-value < 2.2e-16
```

And finally regressive bills

```
t <- party_comparison(regressive, TRUE)
```

```
##      pass_fail
## party pass fail
##     D   28   50
##     R   90   46
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 17.169, df = 1, p-value = 3.419e-05
```

What about when there is a split house?

```
filter(csv_total, Year %in% c(2022, 2023)) %>%
    party_comparison(TRUE)
```

```
##      pass_fail
## party pass fail
##     D   96   48
##     R   96   98
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 9.2565, df = 1, p-value = 0.002347
```

```
##      pass_fail
## party pass fail
##     D   96   48
##     R   96   98
```

```
filter(progressive, Year %in% c(2022, 2023)) %>%
    party_comparison(TRUE)
```

```
##      pass_fail
```

```
## party pass fail
##     D   67   13
##     R   51   85
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 41.625, df = 1, p-value = 1.106e-10
```

```
##      pass_fail
## party pass fail
##     D   67   13
##     R   51   85
```

```
t <- filter(regressive, Year %in% c(2022, 2023)) %>%
    party_comparison(TRUE)
```

```
##      pass_fail
## party pass fail
##     D   22   35
##     R   39   12
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  tab
## X-squared = 14.205, df = 1, p-value = 0.0001639
```