```r
1
2
3  ##' Run Statistical Analysis of Monthly Background Checks of Gun Purchase
4  ##'
5  ##' @param debug Optional boolean switch to indicate whether interim data is displayed;
6  ##' default is \sQuote{FALSE}
7  ##'
8  ##' @return A \code{data.frame} is returned, contained all different prepared columns.
9  ##'
10 ##' @author Gregor Aisch and Josh Keller wrote the R code; Dirk Eddelbuettel created
11 ##' and maintains the package.
12 ##' @seealso The NY Times article presenting this analsysi undertaken by this package is
13 ##' at \url{http://www.nytimes.com/interactive/2015/12/10/us/gun-sales-terrorism-obama-
   restrictions.html?}
14 ##'
15 ##' @examples
16 ##' \dontrun{
17 ##'   gs <- analysis()
18 ##'   plot_gunsales(gs)
19 ##'   ggplot_gunsales(gs)
20 ##' }
21 analysis <- function(debug=FALSE) {
22
23     ## estimate gun sales using formula by Jurgen Brauer, published here
24     ## http://www.smallarmssurvey.org/fileadmin/docs/F-Working-papers/SAS-WP14-US-
   Firearms-Industry.pdf
25     ##
26     ## note: the column `multiple_corrected` is a copy of `multiple` in which
27     ## we set the checks in the "multiple" category to 0 for California
28     alldata <- alldata %>% mutate(guns_sold=(handgun + longgun) * 1.1 +
   multiple_corrected * 2)
29     #alldata <- mutate(alldata, guns_sold=(handgun + longgun) * 1.1 + multiple_corrected
   * 2)
30
31     ## let's look at the total numbers; state_ts() is a helper function
32     total <- alldata %>% state_ts('Totals', 'guns_sold')
33     #total <- state_ts(all, 'Totals', 'guns_sold')
34
35     ## compute seasonally adjusted gun sales (using final() and seas() from seasonal)
36     totalSeas <- total %>% seas %>% final
37     #totalSeas <- final(seas(total))
38
39     poptotal <- poptotal %>%
40         filter(year >= 2000) %>%
41         #filter(year < 2015 | month <= 11) %>%
42         with(ts(res_pop, start=c(2000,1), frequency = 12))
43     #poptotal <- ts(select(filter(poptotal, year >= 2000), "res_pop"),
44     #               start=c(2000,1),
45     #               freqency=12)
46
47     ## normalize gun sales by population
48     totalSeasPop <- totalSeas / poptotal * 1000
49     totalSeasScaled <- totalSeas / 280726
50
51     ## create a new data frame that eventually stores all the
52     ## data we need in the final piece
```

```R
53      out_data <- ts_to_dataframe(total, 'guns_total') %>%
54          mutate(guns_total=round(guns_total, 3))
55
56      ## expand the data.frame, adding more volumns
57      out_data <- data.frame(out_data,
58                             guns_total_seas=as.matrix(totalSeas),
59                             guns_total_per_1000=round(as.matrix(totalSeasPop), digits=3),
60                             guns_total_per_1000_scaled=round(as.matrix(totalSeasScaled),
    digits=3))
61      if (debug) {
62          print(head(out_data))
63          print(tail(out_data))
64      }
65
66      ## create a temporary matrix for computing the
67      ## handgun_share and longgun_share columns
68      ## cbind works correctly here as it operates on timeseries object
69      tmp <- cbind(final(seas(state_ts(alldata, 'Totals', 'handgun'))),
70                   final(seas(state_ts(alldata, 'Totals', 'longgun'))),
71                   final(seas(state_ts(alldata, 'Totals', 'other'))),
72                   final(seas(state_ts(alldata, 'Totals', 'multiple_corrected'))))
73      colnames(tmp) <- c('handgun', 'longgun', 'other', 'multiple')
74      out_data <- data.frame(out_data, tmp)
75
76      ## convert NAs to 0 in column other
77      out_data$other[is.na(out_data$other)] <- 0
78
79      ## compute the handgun/longgun share
80      out_data <- within(out_data, {
81          handgun_share=round(handgun / (handgun+longgun+other+multiple*0.5), 4)
82          longgun_share=round(longgun / (handgun+longgun+other+multiple*0.5), 4)
83          })
84
85      ## plot percent of national for selected states
86      show_states <- c('New Jersey', 'Maryland', 'Georgia',
87                       'Louisiana', 'Mississippi', 'Missouri')
88
89      for (s in show_states) {
90          s.ts <- state_data(alldata, s, total, totalSeas)
91
92          ## merge with out_data
93          temp <- mutate(ts_to_dataframe(s.ts), value=round(value,3))
94          colnames(temp) <- c('year', 'month', gsub(' ', '_', tolower(s)))
95          out_data <- data.frame(out_data, temp[,3,drop=FALSE])
96      }
97      if (debug) {
98          print(head(out_data))
99          print(tail(out_data))
100     }
101
102     ## compute handgun sales for DC: handung * 1.1 + multiple
103     dchandgun_checks <- state_ts(alldata, 'District of Columbia', 'handgun',
    outer_zeros_to_na=F)
104     dcmultiple <- state_ts(alldata, 'District of Columbia', 'multiple',
    outer_zeros_to_na=F)
105     dchandgun <- (dchandgun_checks * 1.1 + dcmultiple + 1) %>% seas %>% final - 1
106     totalHandgun <- (state_ts(alldata, 'Totals', 'handgun') * 1.1 +
```

```r
107                    state_ts(alldata, 'Totals', 'multiple')) %>% seas %>% final
108        dchandgunPct <- dchandgun / totalHandgun * 100000
109
110        ## merge with out_data
111        temp <- ts_to_dataframe(round(dchandgunPct, 1),
     'dc_handguns_per_100k_national_sales')
112        out_data <- data.frame(out_data, temp[,3,drop=FALSE])
113
114        ## estimate how much more guns are sold missouri after law change
115        missouri <- state_data(alldata, 'Missouri', normalize = F, adj_seasonal = F)
116        missouri.avg_pre_2007 <- mean(missouri[73:84])
117        missouri.avg_post_2008 <- mean(missouri[97:108])
118        print(paste('Increase in monthly gun sales in Missouri =',
     round(missouri.avg_post_2008 - missouri.avg_pre_2007, digits=2)))
119
120        invisible(out_data)
121    }
122
123
124
125    ## R-devel CMD check still whines about these:
126    Date <- dc_handguns_per_100k_national_sales <- guns_total <- guns_total_per_1000 <- NULL
127    guns_total_per_1000_scaled <- guns_total_seas <- handgun <- handgun_share <- longgun <-
     NULL
128    longgun_share <- month.num <- multiple <- multiple_corrected <- other <- res_pop <- NULL
129    state <- value <- year <- NULL
130
```