Fatalities R Documentation

US Traffic Fatalities

Description

US traffic fatalities panel data for the “lower 48” US states (i.e., excluding Alaska and Hawaii), annually for 1982 through 1988.

Usage

```
data("Fatalities")
```

Format

A data frame containing 336 observations on 34 variables.

state

factor indicating state.

year

factor indicating year.

spirits

numeric. Spirits consumption.

unemp

numeric. Unemployment rate.

income

numeric. Per capita personal income in 1987 dollars.

emppop

numeric. Employment/population ratio.

beertax

numeric. Tax on case of beer.

baptist

numeric. Percent of southern baptist.

mormon

numeric. Percent of mormon.

drinkage

numeric. Minimum legal drinking age.

dry

numeric. Percent residing in “dry” countries.

youngdrivers

numeric. Percent of drivers aged 15–24.

miles

numeric. Average miles per driver.

breath

factor. Preliminary breath test law?

jail

factor. Mandatory jail sentence?

service

factor. Mandatory community service?

fatal

numeric. Number of vehicle fatalities.

nfatal

numeric. Number of night-time vehicle fatalities.

sfatal

numeric. Number of single vehicle fatalities.

fatal1517

numeric. Number of vehicle fatalities, 15–17 year olds.

nfatal1517

numeric. Number of night-time vehicle fatalities, 15–17 year olds.

fatal1820

numeric. Number of vehicle fatalities, 18–20 year olds.

nfatal1820

numeric. Number of night-time vehicle fatalities, 18–20 year olds.

fatal2124

numeric. Number of vehicle fatalities, 21–24 year olds.

nfatal2124

numeric. Number of night-time vehicle fatalities, 21–24 year olds.

afatal

numeric. Number of alcohol-involved vehicle fatalities.

pop

numeric. Population.

pop1517

numeric. Population, 15–17 year olds.

pop1820

numeric. Population, 18–20 year olds.

pop2124

numeric. Population, 21–24 year olds.

milestot

numeric. Total vehicle miles (millions).

unempus

numeric. US unemployment rate.

emppopus

numeric. US employment/population ratio.

gsp

numeric. GSP rate of change.

Details

Traffic fatalities are from the US Department of Transportation Fatal Accident Reporting System. The beer tax is the tax on a case of beer, which is an available measure of state alcohol taxes more generally. The drinking age variable is a factor indicating whether the legal drinking age is 18, 19, or 20. The two binary punishment variables describe the state's minimum sentencing requirements for an initial drunk driving conviction.

Total vehicle miles traveled annually by state was obtained from the Department of Transportation. Personal income was obtained from the US Bureau of Economic Analysis, and the unemployment rate was obtained from the US Bureau of Labor Statistics.

Source

Online complements to Stock and Watson (2007).

References

Ruhm, C. J. (1996). Alcohol Policies and Highway Vehicle Fatalities. *Journal of Health Economics*, **15**, 435–454.

Stock, J. H. and Watson, M. W. (2007). *Introduction to Econometrics*, 2nd ed. Boston: Addison Wesley.

See Also

`StockWatson2007`

Examples

```
## data from Stock and Watson (2007)
data("Fatalities", package = "AER")
## add fatality rate (number of traffic deaths
## per 10,000 people living in that state in that year)
Fatalities$frate <- with(Fatalities, fatal/pop * 10000)
## add discretized version of minimum legal drinking age
Fatalities$drinkagec <- cut(Fatalities$drinkage,
  breaks = 18:22, include.lowest = TRUE, right = FALSE)
Fatalities$drinkagec <- relevel(Fatalities$drinkagec, ref = 4)
## any punishment?
Fatalities$punish <- with(Fatalities,
  factor(jail == "yes" | service == "yes", labels = c("no", "yes")))
## plm package
library("plm")

## for comparability with Stata we use HC1 below
## p. 351, Eq. (10.2)
f1982 <- subset(Fatalities, year == "1982")
fm_1982 <- lm(frate ~ beertax, data = f1982)
coeftest(fm_1982, vcov = vcovHC(fm_1982, type = "HC1"))

## p. 353, Eq. (10.3)
f1988 <- subset(Fatalities, year == "1988")
fm_1988 <- lm(frate ~ beertax, data = f1988)
coeftest(fm_1988, vcov = vcovHC(fm_1988, type = "HC1"))

## pp. 355, Eq. (10.8)
fm_diff <- lm(I(f1988$frate - f1982$frate) ~ I(f1988$beertax - f1982$beertax))
coeftest(fm_diff, vcov = vcovHC(fm_diff, type = "HC1"))

## pp. 360, Eq. (10.15)
##   (1) via formula
fm_sfe <- lm(frate ~ beertax + state - 1, data = Fatalities)
##   (2) by hand
fat <- with(Fatalities,
  data.frame(frates = frate - ave(frate, state),
  beertaxs = beertax - ave(beertax, state)))
fm_sfe2 <- lm(frates ~ beertaxs - 1, data = fat)
##   (3) via plm()
fm_sfe3 <- plm(frate ~ beertax, data = Fatalities,
  index = c("state", "year"), model = "within")

coeftest(fm_sfe, vcov = vcovHC(fm_sfe, type = "HC1"))[1,]
## uses different df in sd and p-value
coeftest(fm_sfe2, vcov = vcovHC(fm_sfe2, type = "HC1"))[1,]
## uses different df in p-value
coeftest(fm_sfe3, vcov = vcovHC(fm_sfe3, type = "HC1", method = "white1"))[1,]
```

```
## pp. 363, Eq. (10.21)
## via lm()
fm_stfe <- lm(frate ~ beertax + state + year - 1, data = Fatalities)
coeftest(fm_stfe, vcov = vcovHC(fm_stfe, type = "HC1"))[1,]
## via plm()
fm_stfe2 <- plm(frate ~ beertax, data = Fatalities,
  index = c("state", "year"), model = "within", effect = "twoways")
coeftest(fm_stfe2, vcov = vcovHC) ## different


## p. 368, Table 10.1, numbers refer to cols.
fm1 <- plm(frate ~ beertax, data = Fatalities, index = c("state", "year"), model = "pooling")
fm2 <- plm(frate ~ beertax, data = Fatalities, index = c("state", "year"), model = "within")
fm3 <- plm(frate ~ beertax, data = Fatalities, index = c("state", "year"), model = "within",
  effect = "twoways")
fm4 <- plm(frate ~ beertax + drinkagec + jail + service + miles + unemp + log(income),
  data = Fatalities, index = c("state", "year"), model = "within", effect = "twoways")
fm5 <- plm(frate ~ beertax + drinkagec + jail + service + miles,
  data = Fatalities, index = c("state", "year"), model = "within", effect = "twoways")
fm6 <- plm(frate ~ beertax + drinkage + punish + miles + unemp + log(income),
  data = Fatalities, index = c("state", "year"), model = "within", effect = "twoways")
fm7 <- plm(frate ~ beertax + drinkagec + jail + service + miles + unemp + log(income),
  data = Fatalities, index = c("state", "year"), model = "within", effect = "twoways")
## summaries not too close, s.e.s generally too small
coeftest(fm1, vcov = vcovHC)
coeftest(fm2, vcov = vcovHC)
coeftest(fm3, vcov = vcovHC)
coeftest(fm4, vcov = vcovHC)
coeftest(fm5, vcov = vcovHC)
coeftest(fm6, vcov = vcovHC)
coeftest(fm7, vcov = vcovHC)

## TODO: Testing exclusion restrictions
```