Examples

```
data("EuroEnergy")
energy_lm <- lm(log(energy) ~ log(gdp), data = EuroEnergy)
influence.measures(energy_lm)
```

`Fatalities` *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
```

`Fertility` *Fertility and Women's Labor Supply*

Description

Cross-section data from the 1980 US Census on married women aged 21–35 with two or more children.

Usage

```
data("Fertility")
data("Fertility2")
```

Format

A data frame containing 254,654 (and 30,000, respectively) observations on 8 variables.