

wooldRidge-vignette

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Effect of Job Training on Firm Scrap Rates

One approach to learning is to find an example from your textbook, and then recreate it.

From example 4.7 of the text:

“The scrap rate for a manufacturing firm is the number of defective items - products that must be discarded - out of every 100 produced. Thus, for a given number of items produced, a decrease in the scrap rate reflects higher worker productivity.”

“We can use the scrap rate to measure the effect of worker training on productivity. Using the data in `jtrain`, but only for the year 1987 and for nonunionized firms, we obtain the following estimated equation:”

First, load the `wooldRidge` package and `jtrain` data set.

```
library(wooldRidge)
data("jtrain")
```

Next, create an index identifying which observations occur in 1987 and are non-union.

```
index <- jtrain$year == 1987 & jtrain$union == 0
```

Next, subset the `jtrain` data by the new index. This returns a data.frame of `jtrain` data of non-union firms for the year 1987.

```
jtrain_1987_nonunion <- jtrain[index,]
```

Now create the linear model regressing `hrsemp`(total hours training/total employees trained), the log of annual sales, and the log of the number of the employees, against the log of the scrape rate.

$$lscrap = \alpha + \beta_1 hrsemp + \beta_2 lsales + \beta_3 lemploy$$

```
linear_model <- lm(lscrap ~ hrsemp + lsales + lemploy, data = jtrain_1987_nonunion)
```

Finally, print the coefficients of the model as well as its R^2 .

```
linear_model$coefficients
```

```
## (Intercept)      hrsemp      lsales      lemploy
## 12.45837178 -0.02926893 -0.96202693  0.76147045
```

```
summary(linear_model)$r.squared
```

```
## [1] 0.2624307
```