

EDS241: Assignment 4

Wylie Hampson

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This question will ask you to estimate the price elasticity of demand for fresh sardines across 56 ports located in 4 European countries with monthly data from 2013 to 2019. The data are contained in the file EU_sardines.csv, which is available on Gauchospace.

Each row in the data file is a combination of port location (where the fish is landed and sold) in a given year and month. You can ignore the fact that the sample is not balanced (the number of monthly observations varies across ports).

For the assignment, you will need the following variables: year, month, country, port (port where sardines are landed and sold), price_euro_kg (price per kg in €), and volume_sold_kg (quantity of sardines sold in kg). In the questions below, I use $\log()$ to denote the natural logarithm.

Read in the data:

```
sardines <- read.csv(here("data", "EU_sardines.csv"))
```

Question a: Estimate a bivariate regression of $\log(\text{volume_sold_kg})$ on $\log(\text{price_euro_kg})$. What is the price elasticity of demand for sardines? Test the null hypothesis that the price elasticity is equal to -1.

Question b: Like in Lecture 8 (see the IV.R script), we will use `wind_m_s` as an instrument for $\log(\text{price_euro_kg})$. To begin, estimate the first-stage regression relating $\log(\text{price_euro_kg})$ to `wind_m_s`. Interpret the estimated coefficient on wind speed. Does it have the expected sign? Also test for the relevance of the instrument and whether it is a “weak” instrument by reporting the proper F-statistic.

Question c: Estimate the TSLS estimator of the price elasticity of demand for sardines using `wind_m_s` as an instrument for $\log(\text{price_euro_kg})$. What is the estimated price elasticity of demand for sardines?

Question d: Repeat the exercise in (c), but include fixed effects for each year, month, and country. [Hint: you can use the command “`as.factor(country) + as.factor(year) + as.factor(month)`” to the `ivreg` function in R]. Report the estimated price elasticity of demand and the F-statistic testing for relevant and non-weak instruments.