

# Empirical Industrial Organization

Fall 2007-11-07

## Assignment 2: Market power and differentiated goods

This assignment guides you to specifying and estimating a differentiated goods demand model. You can work in groups of about 2-4, but should not cooperate between groups.

You have a dataset on the Belgian car market between 97 and 99, a yearly cross-section of car models on the following variables:

qu:	number of sold cars
princ:	price of car relative to average income
hp:	horsepower in kW
li:	fuel consumption in liters per 100 km
wi, he:	width and height in cm
cy	displacement (in cc)
pop:	population
ma:	market (Belgium)
ye:	year
frm:	firm
brd:	brand
co:	model
cla:	segment
org:	origin

The data set is available at: <http://www.econ.kuleuven.be/public/NDBAD83/>

Suppose consumer utility for cars can be expressed as a function of the underlying characteristics, and that each consumer chooses one car to maximize utility. Suppose that the potential number of consumers is equal to the number of households as proxied by  $\text{pop}/4$ .

1. Specify a logit and one-level nested logit model. The nests are segments (cla). Motivate the variables entering your specification, including the choice of segments, and interpretation of the error term.
2. Discuss endogeneity problems and how you are going to treat them. (Hint: you can use sums of characteristics of other products, and sums of characteristics of other products of the same firm. Or you could define these sums for only products of the same segment.)
3. Estimate the demand equation of the logit model and nested logit model. Compare them with OLS estimation.
4. Derive the own-and cross price elasticities and compute them based on your parameter estimates. Present summary statistics and discuss the general pattern.
5. Subsequently marginal cost parameters as a function of the product characteristics. For simplicity, assume single product price setting firms. Extra: Check if you can easily do it under the assumption of quantity setting firms, and compare your marginal cost parameters.