Homework 3: Industrial Organisation

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Question 1

There are $J_t + 1$goods in each year $t = 1971, \ldots, 1990$ including the outside good. Assume utility is given by

$$u_{ij} = \alpha(y_i - p_j) + x_j\beta + \epsilon_{ij} \qquad j = 0, \ldots, J_t$$

Question 2

Question 3

Estimate the logit demand specification using the linearised version of this model from BLP. What is the implied own-price elasticity of the 1990 Honda Accord (HDACCO)? What is the implied cross-price elasticity of Honda Accord with respect to the 1990 Ford Escort (FDESC))? Pick two additional cars and report the same numbers.

Question 4

Use the instruments used in Berry-Levinsohn-Pakes. You will need the firmids and the year variables to calculate these instruments (they are product firm-year specific). Estimate the logit model using 2SLS and instrumenting for price. What is the implied own-price elasticity of the 1990 Honda Accord (HDACCO)? What is the implied cross-price elasticity of Honda Accord with respect to the 1990 Ford Escort (FDESCO)? Pick two additional cars and report the same numbers.

Table 1 Descriptive Statistics

The table reports the descriptive statistics of the data similar to Table 1 of BLP. The columns are sales weighted mean of the variables in each year.

Year	Price	HP/Wt	Size	Air	MPD
1971	7.87	0.49	1.50	0.00	1.85
1972	7.98	0.39	1.51	0.01	1.88
1973	7.54	0.36	1.53	0.02	1.82
1974	7.51	0.35	1.51	0.03	1.45
1975	7.82	0.34	1.48	0.05	1.50
1976	7.79	0.34	1.51	0.06	1.70
1977	7.65	0.34	1.47	0.03	1.83
1978	7.64	0.35	1.41	0.03	1.93
1979	7.60	0.35	1.34	0.05	1.66
1980	7.72	0.35	1.30	0.08	1.47
1981	8.35	0.35	1.29	0.09	1.56
1982	8.83	0.35	1.28	0.13	1.82
1983	8.82	0.35	1.28	0.13	2.09
1984	8.87	0.36	1.29	0.13	2.12
1985	8.94	0.37	1.26	0.14	2.02
1986	9.38	0.38	1.25	0.18	2.86
1987	9.96	0.40	1.25	0.23	2.79
1988	10.07	0.40	1.25	0.24	2.92
1989	10.32	0.41	1.26	0.29	2.81
1990	10.34	0.42	1.27	0.31	2.85

Table 2 Elasticities from Ordinary Least Squares

	Ford Escort	Honda Accord	VW Jetta	VW Passat
Ford Escort	0.50045	0.00154	0.00154	0.00154
Honda Accord	0.00364	0.82000	0.00364	0.00364
VW Jetta	0.00042	0.00042	0.67742	0.00042
VW Passat	0.00019	0.00019	0.00019	1.00147

Table 3 Elasticities from Instrument Variable Regression

	Ford Escort	Honda Accord	VW Jetta	VW Passat
Ford Escort	0.76621	0.00235	0.00235	0.00235
Honda Accord	0.00558	1.25545	0.00558	0.00558
VW Jetta	0.00064	0.00064	1.03715	0.00064
VW Passat	0.00030	0.00030	0.00030	1.53329

Table 4 Results with Logit Demand

	Dependent variable:	
	diff_shares	
	OLS	*instrumental variable*
	OLS	IV
	(1)	(2)
HP/Weight	−0.124	1.226***
	(0.277)	(0.404)
Air	−0.034	0.486***
	(0.073)	(0.133)
MPD	0.265***	0.172***
	(0.043)	(0.049)
Size	2.342***	2.292***
	(0.125)	(0.129)
Price	−0.089***	−0.136***
	(0.004)	(0.011)
Constant	−10.072***	−9.915***
	(0.253)	(0.263)
Observations	2,217	2,217
R^2	0.387	0.349
Adjusted R^2	0.386	0.348
Residual Std. Error (df = 2211)	1.083	1.116
F Statistic	279.243*** (df = 5; 2211)	
Note:		*p<0.1; **p<0.05; ***p<0.01