ECN 753: Industrial Organization
Homework 1
BLP Model

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1 Logit Model

1.1 OLS

Table 1: OLS Regression Results

Parameter	Estimate	Std. Err.	T-stat	P-value	Lower CI	Upper CI
constant	-2.9665	0.1086	-27.328	0.0000	-3.1794	-2.7537
prices	-10.204	0.8755	-11.654	0.0000	-11.921	-8.4866
sugar	0.0463	0.0044	10.543	0.0000	0.0377	0.0549

1.2 2SLS

Table 2: Second Stage Regression Results

Parameter	Estimate	Std. Err.	T-stat	P-value	Lower CI	Upper CI
constant	-2.8303	0.1086	-26.056	0.0000	-3.0433	-2.6173
$\mathbb{E}$[prices]	-11.385	0.8759	-12.999	0.0000	-13.103	-9.6677
sugar	0.0477	0.0044	10.951	0.0000	0.0392	0.0563

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1.3 Own Price Elasticities

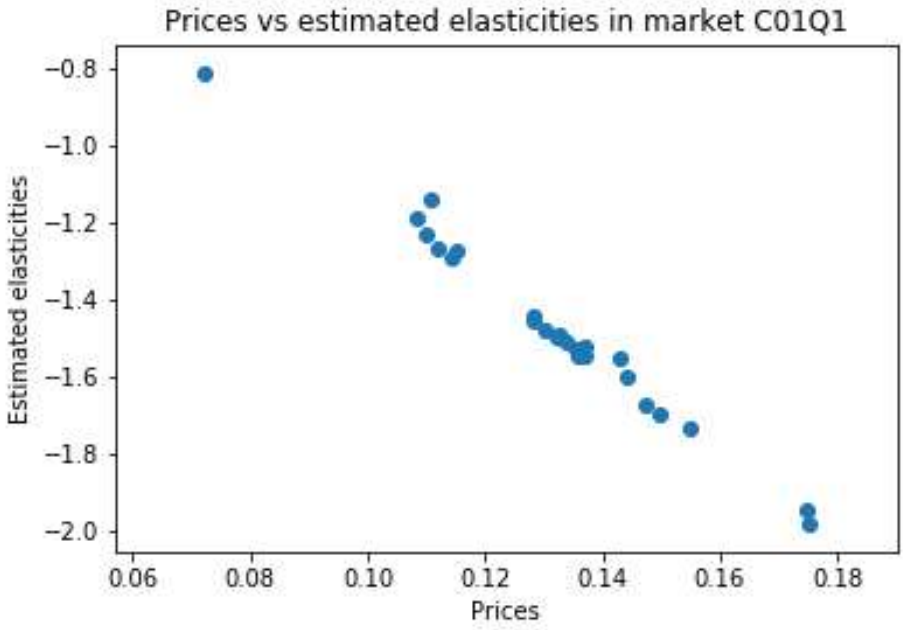


Figure 1: Estimated own price elasticities in market *C01Q1* using 2SLS

In Figure 1, we observe a clear negative relationship between price and elasticity. Moreover, the figure tells us that as consumers face higher prices they change more their demanded quantities. This implies a concave demand curve for cereal in *C01Q1*.

2 Mixed Logit / BLP Model

2.1 Estimation Results

Table 3: Coefficient estimates from BLP

Parameter	Description	Estimate
β_0^0	Constant	-3.8880
α_0	Price coefficient	-2.2348
β_{income}^0	Interaction between constant and income	4.4608
β_{income}^{sugar}	Interaction between sugar and income	0.1499
α_{income}	Interaction between price and income	-33.2619
α_ν	Interaction between price and taste shocks	1.0731

2.2 Elasticities

When using the BLP model, we observe in Figure 2 that there is no apparent relationship between prices and elasticities, or that it is positive. This would imply a straight or convex demand curve, since either the own price elasticity is constant with respect to price (straight demand curve) or it increases (convex curve). Upon further inspection we find a weak correlation coefficient between prices and elasticities

(0.2429) that makes us think the demand for cereal in *C01Q1* follows a convex demand curve.

These results differ to those observed when using a 2SLS regression. Figure 3a compares the elasticities using both methods and makes it easy to see that an important property is shared among them to some degree, namely, elasticities are negative, for the most part, in both the 2SLS and BLP estimations, implying a negative slope of the demand curve. Furthermore, Figure 3b shows that the difference between elasticities estimated with both methods is not dependent on prices given that the further a point is from the 45^o degree line, the largest the difference between 2SLS and BLP's estimation.

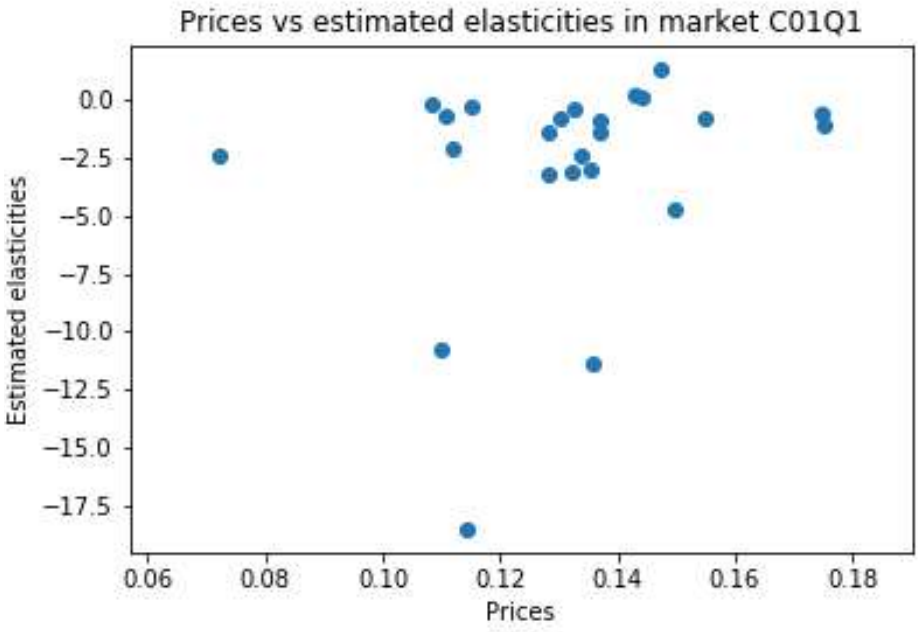
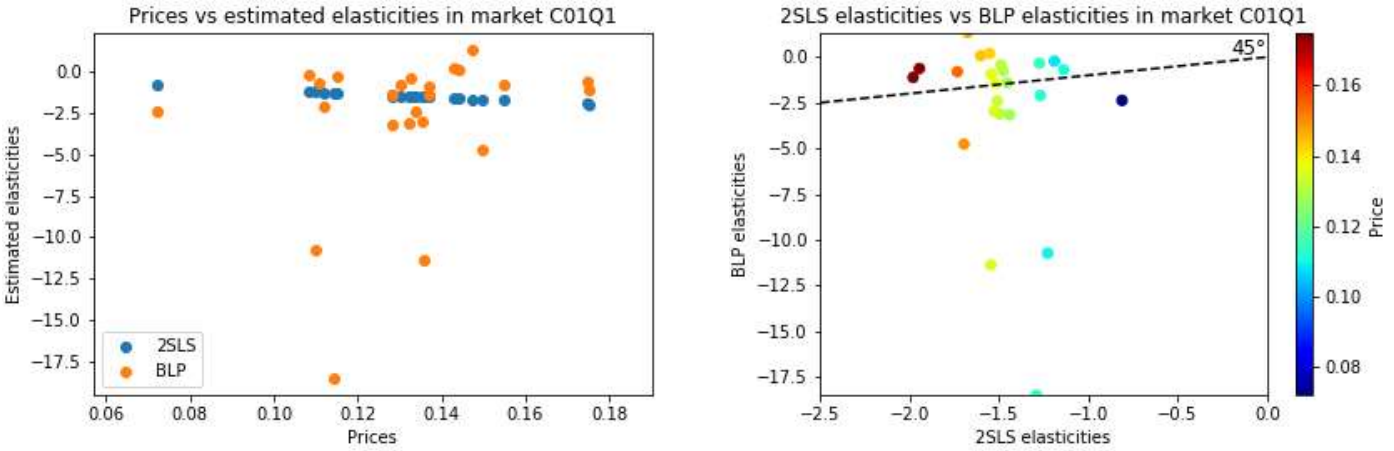


Figure 2: Estimated own price elasticities in market *C01Q1* using BLP



(a) (b)

Figure 3: Comparison between 2SLS and BLP elasticities for market *C01Q1*