Exercise I: Response Models
MKT 897 (Fall B)
Professor Puneet Manchanda

The research objective of this exercise is to build a model to understand the role of price – own and competitor - on sales. You can use any program (e.g., Excel, Stata, R) to carry out the exercise.

This exercise is based on two datasets– oj_all.csv and oj_14.csv. These datasets contain unit sales and prices of the 64 oz. packs of two main brands of refrigerated orange juice – Tropicana and Minute Maid. The dataset oj_all.csv is for all Dominick's stores in Chicago, while oj_14.csv is for a particular store of the same chain. In these datasets sales0 and price0 correspond to Tropicana and sales1 and price1 correspond to Minute Maid. The oj_all.csv dataset records total sales and average prices across stores.

1. Compare the means and standard deviations of prices of the two brands for store 14 vs. the chain as a whole. What does this tell you about pricing at store 14? Would you in general prefer store-level or account-level data to understand the relationship between sales and price? Why?

2. Construct time series plots of sales and prices for Tropicana and Minute Maid in both store 14 and for Dominick's (sales or price on the y-axis and week on the x-axis). What are the similarities and differences between Tropicana and Minute Maid pricing policies? What do you think the managers are doing and how are customers responding?

3. Construct scatter plots of sales vs. prices (i.e. sales on Y-axis and prices on X-axis) for Tropicana and Minute Maid at Dominick's. Construct scatter plots for log(sales) vs. log(prices) for the two brands. What do these scatter plots tell you about demand (sales) and its relationship with prices?

4. Run a regression using the data. Use log(sales) as the DV and log(own price) as the IV for both datasets (estimate the model separately for Tropicana and MM – you need to run four regressions). The regression coefficient of log(own price) is the (own) price elasticity of demand.

How does store 14 compare with the Dominick's chain in terms of price elasticities? How does Tropicana compare with Minute Maid in terms of price elasticities? Do the pricing strategies of Tropicana and Minute Maid in store 14 vs. the chain as a whole make sense in light of these elasticities?

6. Now run the same four regressions with the addition of competitive prices i.e., there are two IVs - log(own price) and log(price of competitor or cross price). What does this analysis tell you about vulnerability of each of the two brands to competitive pressure from the other brand at the Dominick's chain as a whole and at store 14?

7. Suppose you are the Tropicana brand manager and have just learnt that Minute Maid is taking a 10% price cut on average at the Dominick's chain. In light of the quantitative analysis you have conducted so far, would you consider a price cut of your own, if your objective for the year were to maintain sales at the same level as before the Minute Maid price cut? By what % would you cut Tropicana prices at Dominick's? [Hint: This is again best using pen and paper with the aid of the regression results].

8. If your conclusion to Q1 is that store 14 is somewhat different from the average store in the chain, how would you incorporate that into the regression model? In general, how would you expand the regression to allow for differences across stores (heterogeneity)? (Note – this is a "thought" question, you don't need to carry out any analysis).