The Costco Effect and Pet Pharmaceuticals

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PERSONAL

- PhD candidate in economics at Northwestern University

I am in the process of finishing a PhD in Economics at Northwestern University and decided to come to Galvanize and get some additional data skills. I am working on this project with ALLYDVM, a consultancy which advises veterinary and pharmaceutical companies throughout the United States, and we plan on working together on this and a few additional projects in the future.

MOTIVATION

- Choice and its discontents: the Costco effect

Allydvm is interested, in the context of veterinary clinics, in something called the Costco effect. Essentially, if you go to Costco to buy peanut butter, how many different brands can you buy? One or two. And the containers are huge and in packages of two. They do this because profits for them are higher.

HYPOTHESIS TO TEST

- Does the number of brands offered effect the number of doses of heartworm/flea medications sold?

Similarly, ALLYDVM is interested in understanding whether sales would be higher if veterinary clinics offered only one or two brands of heartworm and flea medications as opposed to the ten or so brands of each on the market. In this project I test this hypothesis twice: once for each of these two types of pet pharmaceuticals.

Methodology

The data I use for this project come from ALLYDVM's database, which consists of clinic specific data from hundreds of clinics across the United States. The two tables which I used primarily in the analysis were the "transactions" and "clients" tables, from which I construct my two main variables of interest: the two outcome variables (the number of doses of heartworm and flea medications sold) and the key explanatory variable for each regression (the number of brands of each type a clinic offers). These are clinic level variables.
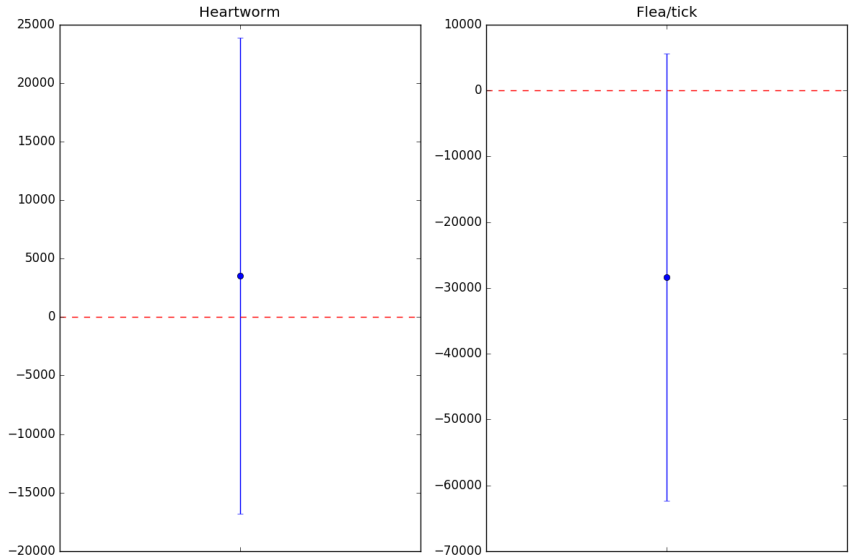
DATA

- ALLYDVM's database: information from hundreds of clinics
- Transactions and clients tables

MODELING

- Linear regression

The model I use to conduct the hypothesis test is a multivariable linear regression. This allows me to condition on various clinic specific features in the data.

Effect of number of brands offered on doses purchased

This diagram summarizes the results of the two regressions. Here, the point estimate is the blue dot, and the bars represent the 95% confidence interval (each of which encompasses zero).

CONCLUSION

- No significant effect of the number of brands on amount of heartworm or flea medication purchased

Based on these results, I conclude the number of brands offered of either type of medication does not influence its total sales.

NEXT STEPS

- Condition on price points
- Disaggregating data

Going forward, there are a number of things I will expand on. First, I will look into conditioning on a price point. There is significant variation in price of a dose of these medications across brands, and there may be profit benefits to offering brands at different price points. But conditional on a price point, how does varying the number of brands affect sales? Second, I mentioned that the data used were clinic level data. I could potentially disaggregate the data and use a hierarchical model for the analysis which would allow for client and clinic effects.

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