Connecting Consumer Expenditures with Edmund's Data

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Justification

Targeted marketing certainly is one of Edmund's core principles. The scope of their own data provides rich opportunities for examining what predicts or promotes traffic through links on their site to the advertising pages of their partners. This of course is economically beneficent for Edmond's, and high volume, high velocity data availability make it feasible to turn much of this optimization of targetting Edmond's visitors into a science.

Data & EDA

We aim to extend Edmund's knowledge about their consumer base by pairing their web data with 2013 wave of the Consumer Experience Survey (CEX). These are rich, granular data on household expenditures, and employing the CEX will allow us to pair vehicle search histories and zip codes of Edmund's visitors, with a plethora of data on consumers interested in those vehicles, living in those geographic areas. While the predictions of consumer interest in products produced by this aggregate match-and-merge strategy lack the appeal of following the same individuals, the CEX more than makes up for it with it's detailed consumption data (more detail on vehicles purchase than the Edmund's data) and a robust, nationally representative survey design.
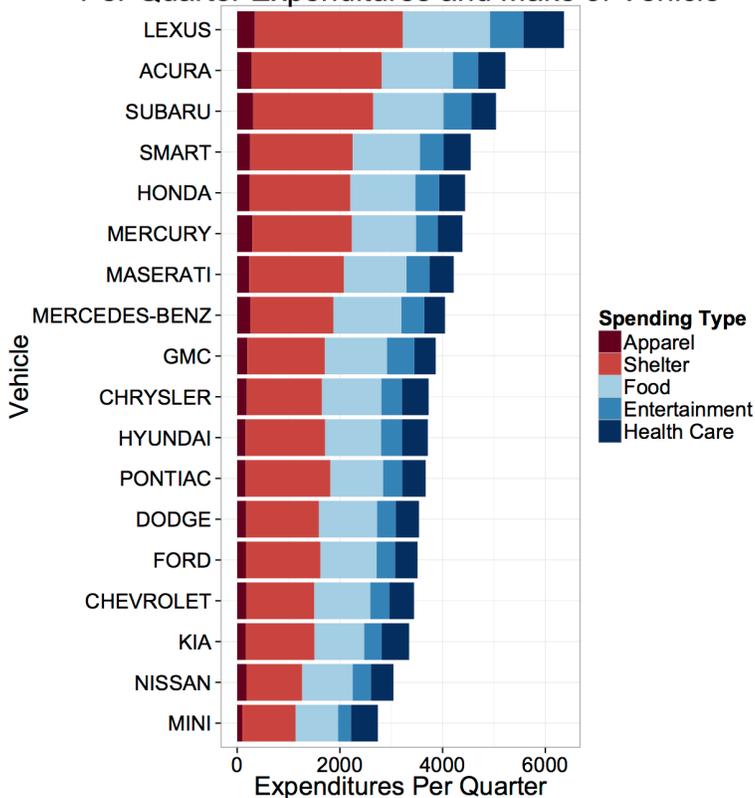
We can take the data input by Edmund's users and predict their interest in products beyond the scope of what they currently advertise. This tactic would essentially broaden as well as strengthen Edmund's marketing strategy. It would encompass diverse and intricate patterns in customer purchasing habits that could potentially be very useful for successful marketing. It might also lead to better customer satisfaction. As is demonstrated in figure, consumer spending patterns are related to large patterns in more broad consumer behavior. This gave us the idea that Edmund's could use what cars their visitors are looking for not just as information to th suggest other automotive based services, but also other products that are not intuitively related to the customer's search or even Edmund's professional field.

Models & Results

The statistical models we estimated are fairly simple–given the complexity of these search prediction algorithms that actually work, we use these models primarily as support for the relationship between basic vehicle searches and purchases and broader consumer processes.

We estimate two hierarchical Gaussian regression models, predicting the amount of households expedniture in US

dollars per quarter. Specifically, we predict insurance and healthcare expenditures (model 1) and food expenditures (model 2). We use random effects for geographic region of the respondent, and condition on the ... between vehicle ownership and the amount of consumer expenditure, but car choices are related to proportional ... as well.

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MCMC Gaussian Regression of Expenditures on Vehicle Categories

Food Expenditures w/ Random Effects for U.S. region, conditioning on overall expenditure

95% HPD Intervals	lower	upper
Luxury Vehicle	−107.820	−37.448
American Vehicle	−116.190	−52.207
Total Expend	0.940	0.943

Food Expenditures w/ Random Effects for U.S. region, conditioning on overall expenditure

95% HPD Intervals	lower	upper
Luxury Vehicle	8598.660	13556.544
Value Vehicle	2814.866	7552.374
American Vehicle	−3059.119	1307.565
Total Expend	3.931	4.165

Discussion

The data contained in these tables are crucial in targeting specific customer groups. It would indicate which customer may be attracted to a particular advertisement based on their search or patterns of searches for a particular type of car.