Facebook Ads as a Predictor of Election Outcomes

Tanvi Modi, Professor Pavel Oleinikov
Quantitative Analysis Center, Wesleyan University

Andrew Yang

Eric Adams

Kathryn Garcia

Maya Wiley

INTRODUCTION

This project tests the hypothesis that Facebook(FB) ad impressions and their prices are a predictor of winners of political elections in the US. FB ads are priced on the basis of real-time online bid auctions and the more relevant ads can reach a user at a lower price. We believe that controlled comparisons of ad prices are an indicator of a politician's popularity because the relevance of an ad is a reflection of the user's political preferences, known to FB through machine learning models of user behavior.

We utilize a dataset that includes the Democratic primaries for the New York City Mayoral elections on June 22nd, 2021. We explore factors that can influence the cost of impressions, such as dependency of the marginal cost of impressions on the previously accumulated number of impressions. We do so for Eric Adams, Kathryn Garcia, Andrew Yang, and Maya Wiley who were the top competitors in the election. We conclude that Eric Adams - the winner of the election, was charged less for ad impressions than his opponents, meaning that he was more popular/relevant among FB users than his opponents.

METHODOLOGY AND DISCUSSION

- We limit the analysis to the top Democratic candidates for the NYC mayor election and ad ids that ran after 06/14/2021.
- We group the observations based on ad ids and keep only the rows when the new spend range appears for the first time.
- We then calculate the delta for the price as well as impression values.
- Our first level of analysis is shown in Figure 1 which is the CPM(cost per mill) where we plot the price as a function of the number of impressions. This indicates whether a control is necessary for our analysis as the CPM values are evaluated at different levels of impressions. Our chart suggests that when we are past 100K impressions, the price curves remain relatively flat and the CPM values can be pooled for comparison.
- Figure 2 shows the marginal cost of each additional impression that the candidate received. We calculated this with the formula: marginal_price = 1000 * spend_delta/v_delta)
- Finally, Figure 3 explores the hypothesis that more popular candidates will have to pay less. We see that Eric Adams(winner of the mayoral election) has a more narrow distribution with a smaller mean than his competitor Kathryn Garcia. Although Eric Adams and Andrew Yang share the same peak, Yang's distribution is more spread out which results in a higher mean.

LIMITATIONS

Although our findings suggest that more popular candidates pay less than their competitors and hence are more relevant among FB users, we must bear in mind that this is a very simple analysis that does not control for factors such as:

- amount of overall FB ad spending in New York state: the more ads were run, the tougher the competition and the higher the CPM
- type of ad: video ads require different level of engagement than image ads
- Dynamic creative ads: FB has the functionality where the advertiser provides several creatives (images or videos) and FB itself figures out which ones to show. These ads cost more.
- Targeting: when an ad was targeted at a specific audience, FB charges more - the CPM is higher.
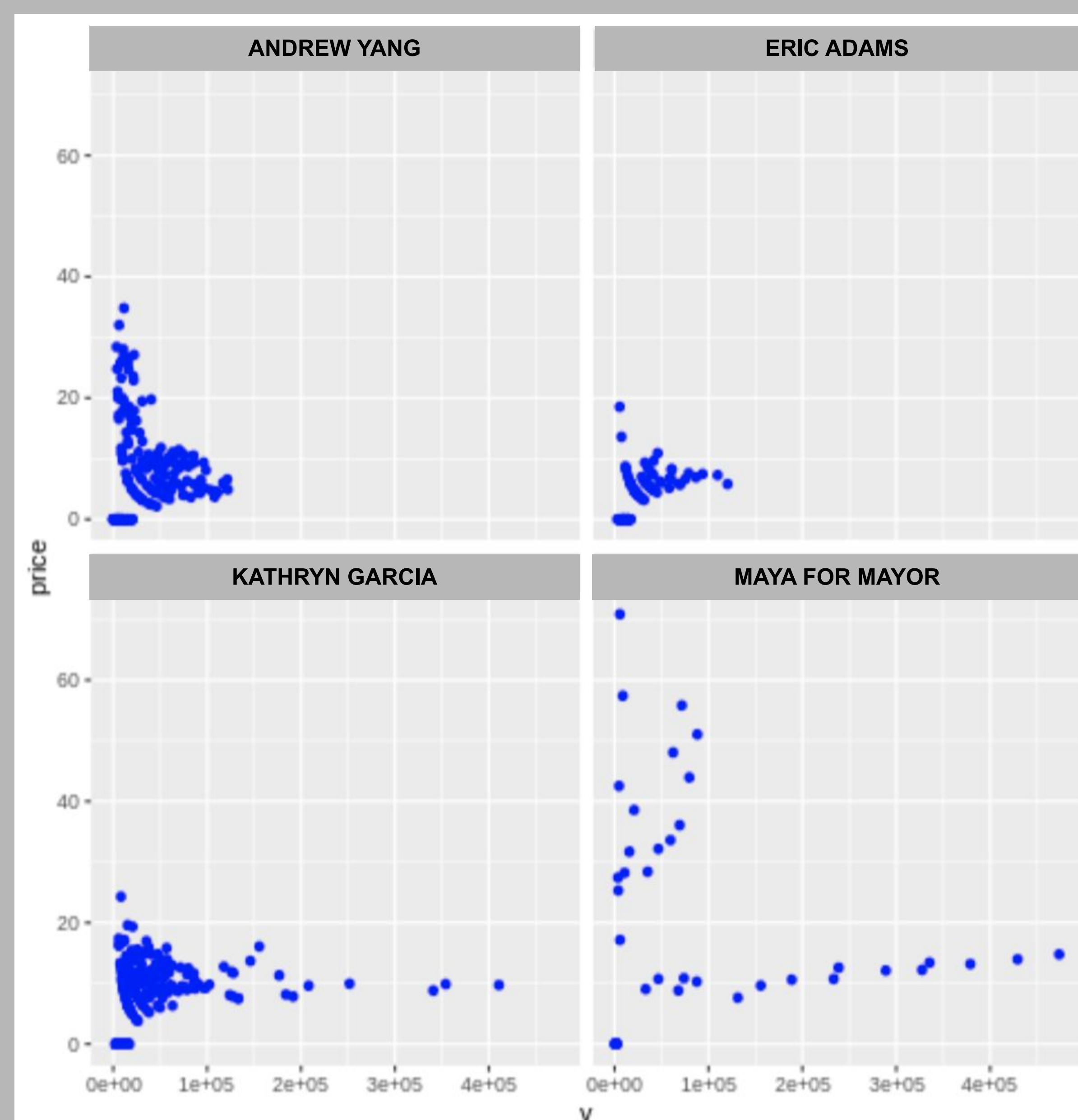

Figure 3: Distribution of Price Values

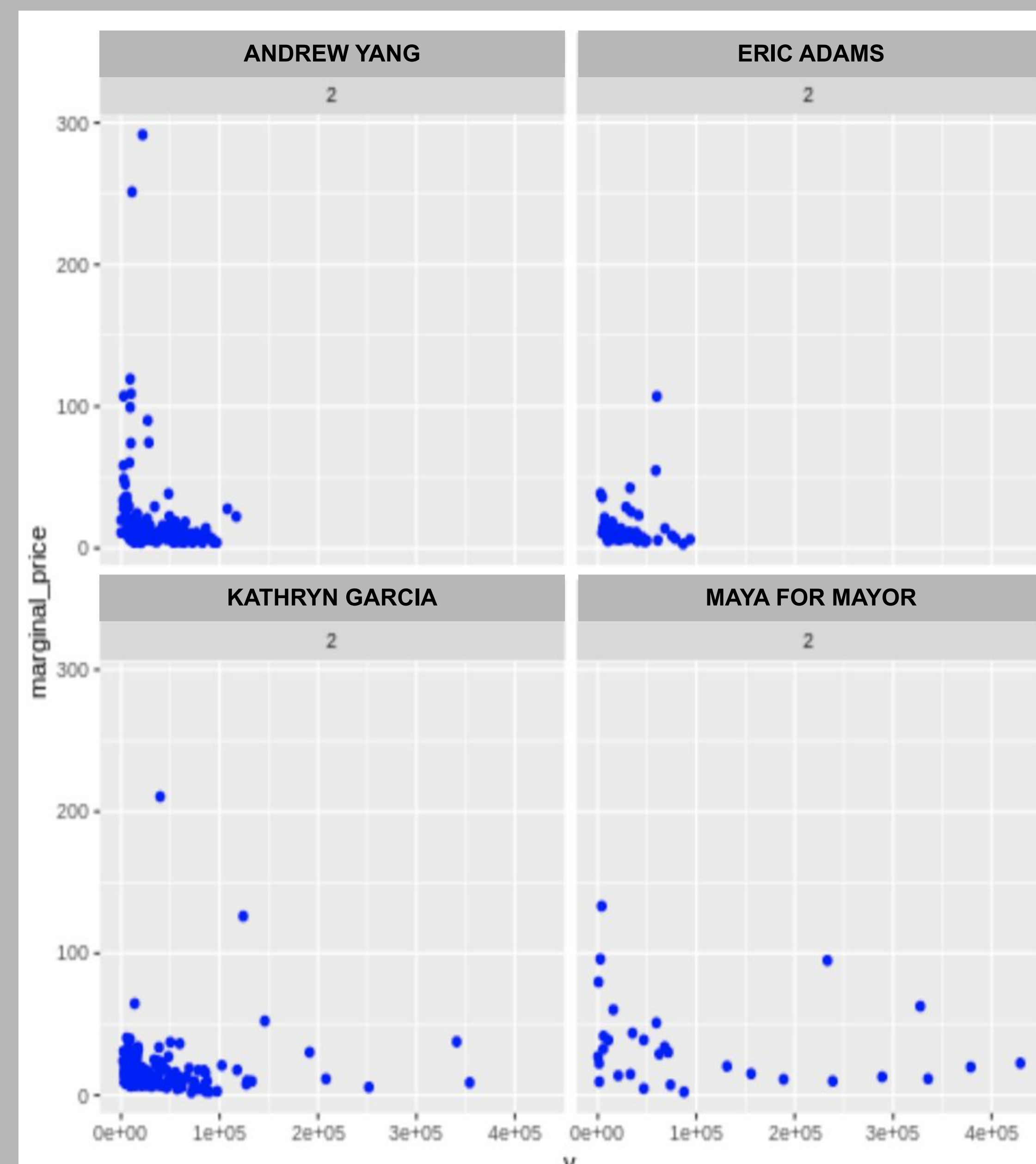## ACKNOWLEDGEMENTS

Figure 1: Cost as a function of impressions

Figure 2: Marginal cost of impressions