

Online Supplement for “Competition and Crowd-out for Brand Keywords in Sponsored Search”

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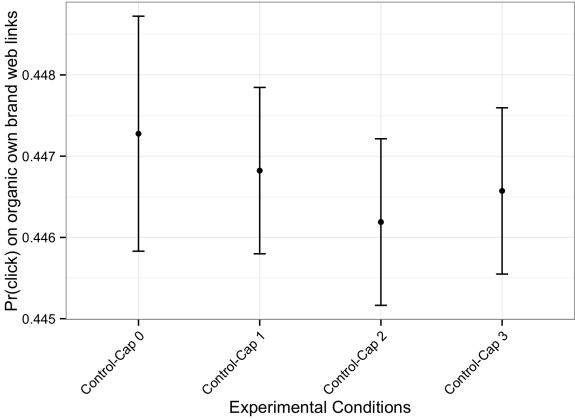
First draft: September 4, 2015

1 Appendix B: Comparison of Control Conditions

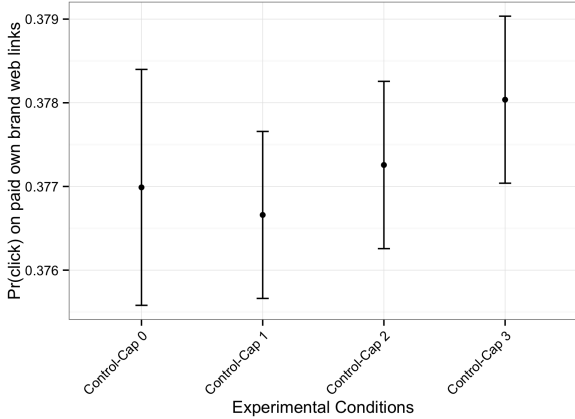
Figure S1 presents the estimates of the probabilities to click on the focal brand’s/competitors’ organic/paid web links, along with the 95% confidence intervals around these estimates, for the control conditions. Estimates are pulled for 824 brands used for the analysis. We do not find any statistically significant difference in either comparison in the controls. We conclude that treatment conditions can be compared directly.

For comparison, Figure S2 presents the estimates of the probabilities to click on focal brand’s/competitors’ organic/paid web links for all experimental conditions.

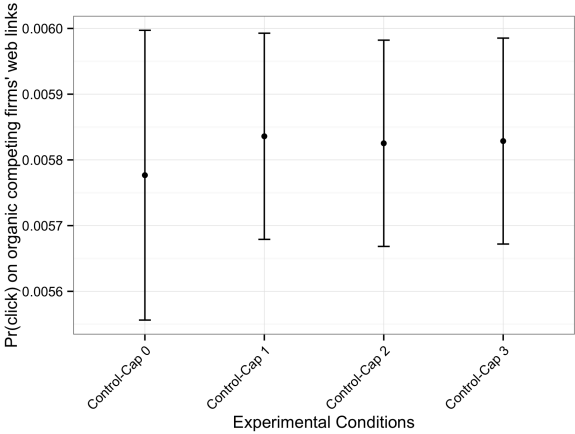
Figure S1: Estimates of probability to get a click on focal brand's/competitors' organic/paid web links, control conditions.



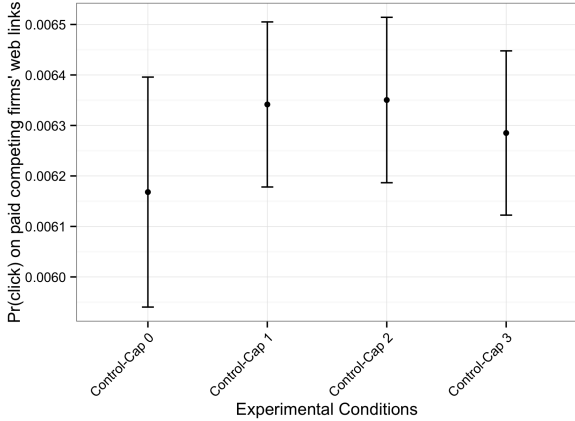
(a) Focal Brand's Organic Links



(b) Focal Brand's Paid Links



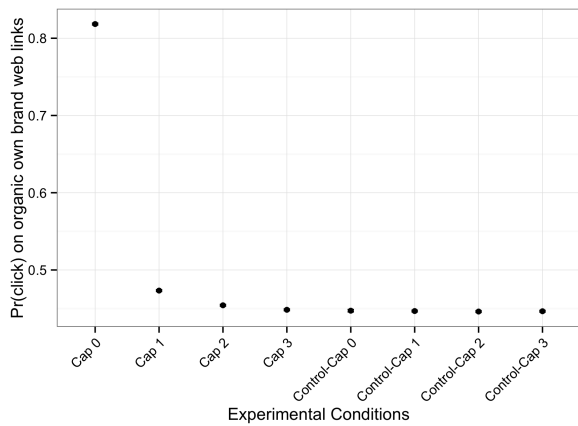
(c) Competitors' Organic Links



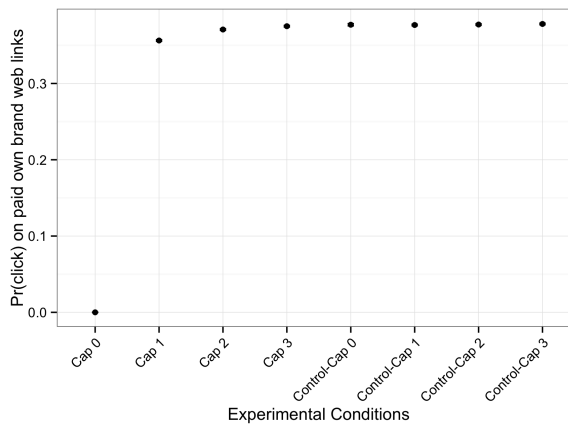
(d) Competitors' Paid Links

The bars are two standard deviations around the estimates, corresponding to the 95% confidence interval.

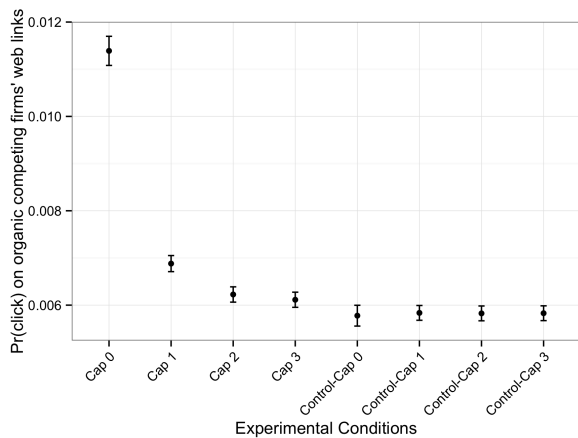
Figure S2: Estimates of probability to get a click on focal brand's/competitors' organic/paid web links, all conditions.



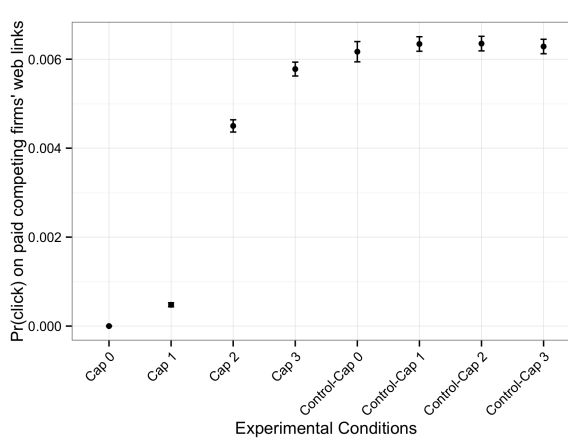
(a) Focal Brand's Organic Links



(b) Focal Brand's Paid Links



(c) Competitors' Organic Links



(d) Competitors' Paid Links

The bars are two standard deviations around the estimates, corresponding to the 95% confidence interval.

2 Appendix C: Brand Capital Measures

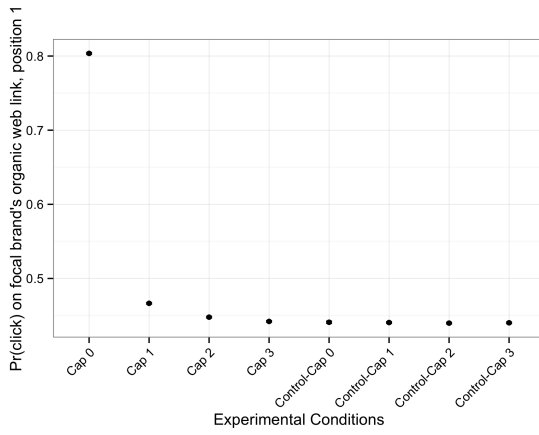
Table S1: Brand capital measures.

	Mean	Standard deviation
$\log(expos)$	7.59	1.41
$\log(Rank_{global})$	10.52	2.14
$\log(Rank_{US})$	9.05	1.96
bounce rate, (%)	35.1	14.3
time spent per day (minutes)	4.6	2.98
pages viewed per day	4.5	2.76
search traffic (%)	19.85	9.19

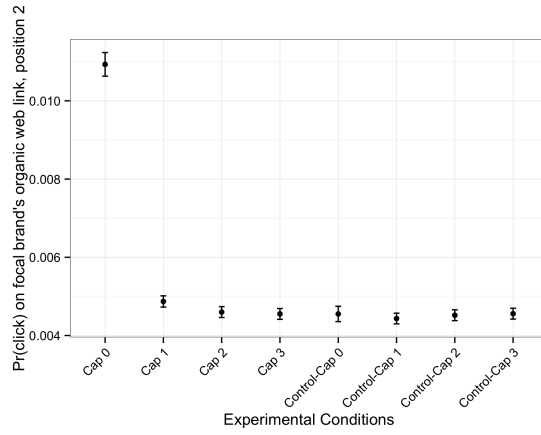
3 Appendix D: Organic Traffic by Page Position

Figure S3 presents the estimates of probabilities of a click on the focal brand's organic links by their positions. We find that multiple organic links are affected by the cannibalization: we could find a significant change in the probability to click the focal brand's organic links in the top 6 positions on the page.

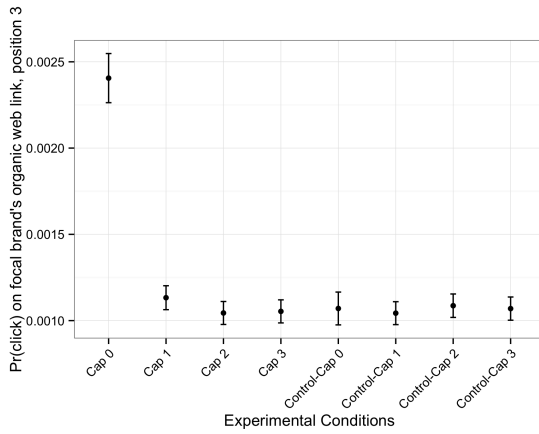
Figure S3: Crowd-out of organic clicks, by organic position.



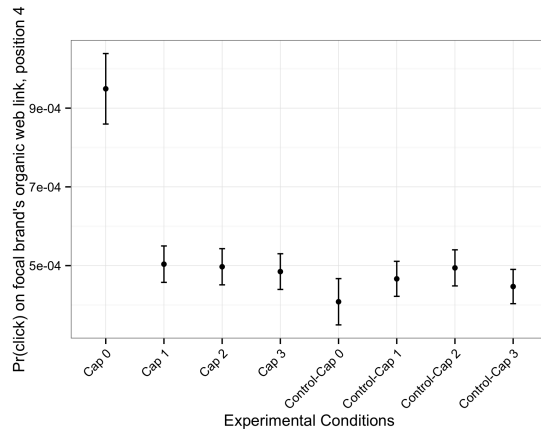
(a) Organic Position 1



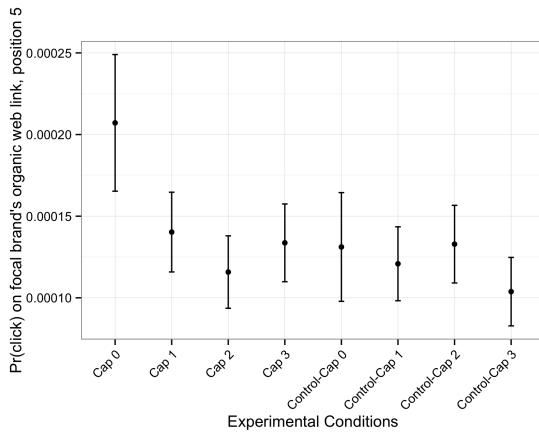
(b) Organic Position 2



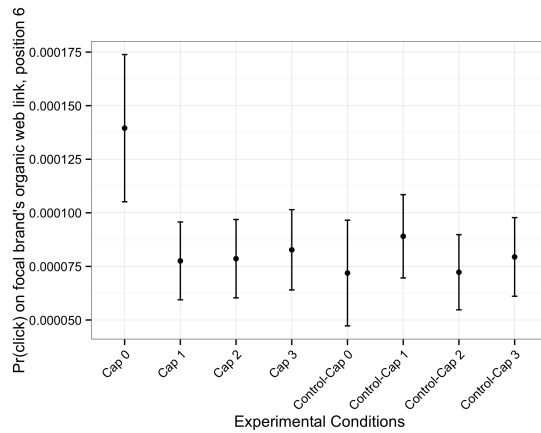
(c) Organic Position 3



(d) Organic Position 4



(e) Organic Position 5

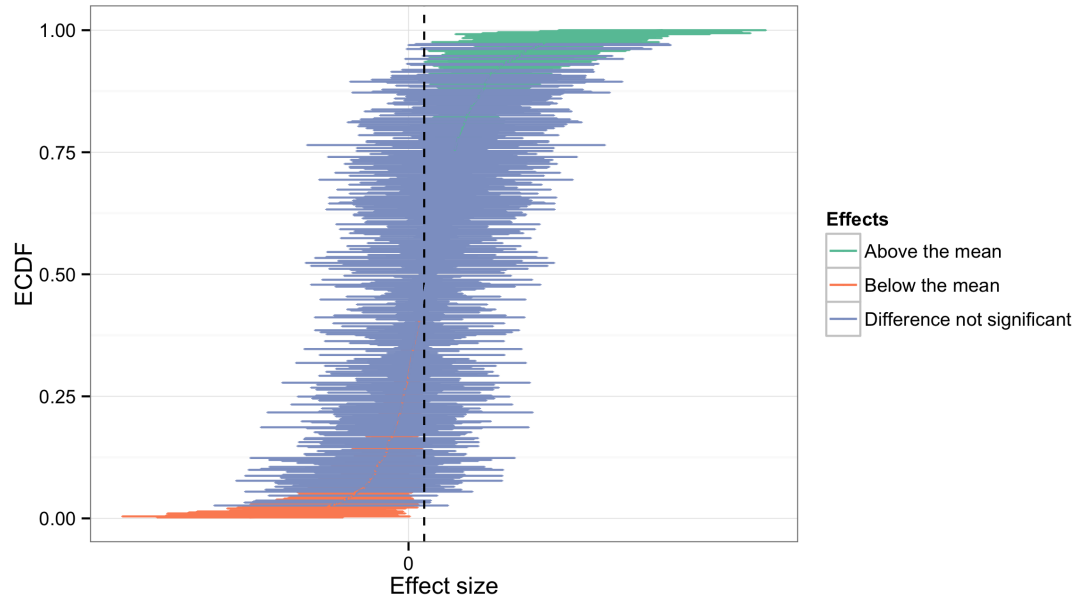


(f) Organic Position 6

The bars are two standard deviations around the estimates, corresponding to the 95% confidence interval.

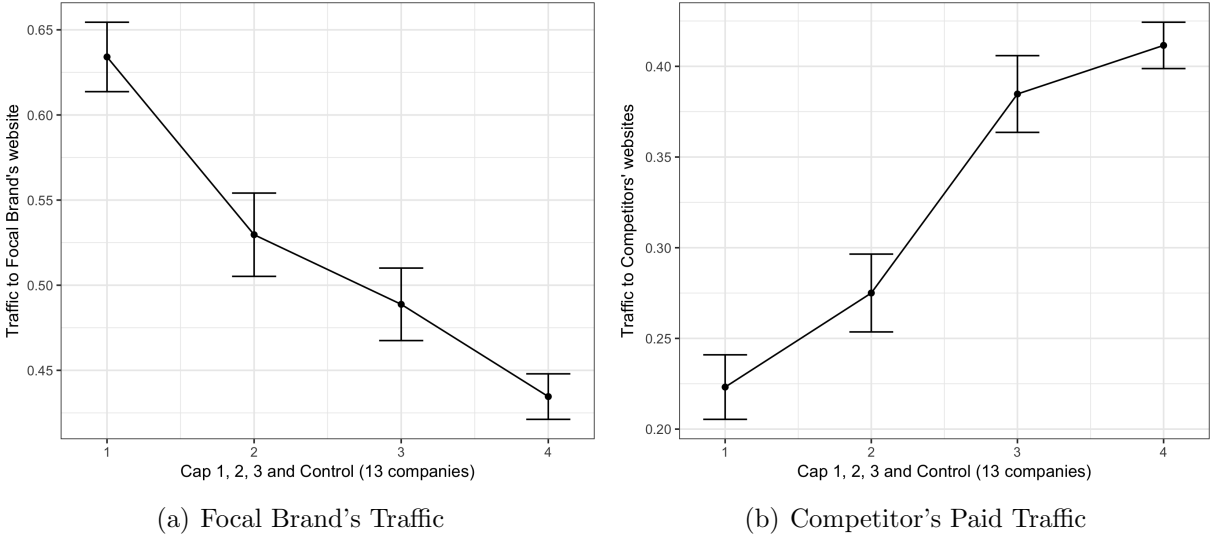
4 Appendix E: Additional Figures

Figure S4: Heterogeneity in the effectiveness of brand search advertising.



Black line corresponds to the implied average brand search ad effect estimate; red, green and blue lines correspond to the 95% confidence interval of the estimates of focal brand's ad effect.

Figure S5: Effect of second, third and fourth competing firms advertising in top paid position on the page for companies with high CTR and high brand capital level.



Point estimates are computed for each brand using the frequency estimator defined in Section 3.4. Results are averaged across brands. Error bars give +/- two standard errors.