Modeling Multi-Channel Advertising Attribution Across Competitors

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Abstract: The bursts of Internet advertising have made multi-channel attribution an immediate challenge for marketing practitioners. Existing attribution models predominantly focus on analyzing consumers’ converting path with respect to one focal firm while largely overlooking the impact of their interactions with competing firms, leading to biased advertising effectiveness estimates. We address this problem by developing an integrated individual-level choice model that considers consumers’ online visit and purchase decisions across all competitors within one industry. We specifically analyze the effects of multi-channel advertising on: (1) consumer choice of entry site, (2) consumer search decisions concerning the remaining websites that compete in the same industry, and (3) subsequent purchase at one of the searched websites. We quantify the impact of different digital advertising channels on consumers’ decisions at different purchase funnel stages based on an individual-level click stream data for the online air ticket booking industry. We find that information stock collected through all advertising channels contributes significantly to consumers’ visit and purchase decisions, among which search advertising is more effective in driving the choice of entry site while email advertising has a larger effect on visit decision concerning remaining websites and purchase decision. The own-and cross-marginal impacts of various ad channels on each firm vary widely across competitors, and this is true at all purchase funnel stages. We also show that neglecting competition may lead to underestimated advertising effects and worse predictions, by comparing the estimated advertising effectiveness and predictive performance of our proposed model with those of the common baseline model that only models consumers’ binary purchase decisions on a focal firm.

Bio: Zhiqiang (Eric) Zheng is a professor in Information Systems with a joint appointment in Finance at the University of Texas at Dallas. He received his Ph.D. in IS from the Wharton school. His current research interests focus on advanced business analytics, Fintech and health care analytics. He has published papers in Management Science, Information Systems Research, MIS Quarterly and Inform Journal on Computing among others. His papers have won various best paper awards in journals and conferences, including the best published paper award runner-up in Information Systems Research in 2016. He is currently a senior editor at Information Systems Research and has been on editorial board at MIS Quarterly and Inform Journal on Computing, among other top journals. He is the co-chair of the first Data Science conference in 2017. He spearheaded UTD’s successful M.S. in Business Analytics program, which has become the world largest program of this kind with more than 600 enrolling students. He developed one of the first Fintech classes in the U.S. back in Spring 2015. He was involved in founding a Fintech start-up, Momentum Analytic in 2015 for developing big data based alpha strategies.