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The Effect of Online Shopping Platform Strategies on Search, Display, and Membership Revenues☆

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Abstract

Most online shopping platform firms generate revenue from three sources: pay-per-click search advertising, pay-per-impression display advertising, and membership fees. The strategies that influence these revenue sources typically are studied individually, rather than in a holistic fashion. In response, this study uses time-series data with 18 million buyers and sellers from 2010 to 2011 and undertakes a quasi-experiment to analyze how the distinct effects of buyer- and seller-side strategies on revenues (1) vary across all three revenue sources and (2) depend differentially on a platform's upmarket repositioning strategy. The results show that buyers that purchase through direct traffic (e.g., typing in the site address) yield more display advertising and membership fee revenues than those gained through organic traffic (e.g., landing from a search engine). Engagement strategies that appeal to established sellers (i.e., value-added services) yield more search advertising and membership revenue than those that appeal to new sellers (i.e., social forums). An upmarket repositioning strategy (i.e., eliminating low quality sellers) enhances the revenue effects of buyer traffic generation and seller engagement strategies. Post hoc analyses suggest that a 1% increase in direct traffic generates an additional \$151,506 in display advertising revenue after (vs. before) the repositioning.

Keywords: Search advertising; Display advertising; Membership fee; Two-sided markets; Online shopping platforms; Upmarket repositioning

The popularity of online shopping platforms, such as eBay, Rakuten, and Alibaba, is growing exponentially. According to an industry analysis, these two-sided platform companies "receive valuations two to four times higher ... than companies with other business models" and are outperforming competitors in both their growth rates and profit margins (Libert, Wind, and Fenley 2014). Firms that participate on these shopping platforms often rely on a business model in which their services are available for free to buyers, but they extract profits from sellers. Accordingly, online platform firms collect revenues from sellers in three main ways: pay-per-click search advertising, pay-per-impression display advertising, and membership fees (Edelman 2014). To increase their revenue from these sources, the platform firms employ traffic generation strategies to bring buyers to the site, as well as seller engagement strategies to attract, enhance, and maintain sellers in the shopping journey. Yet extant research typically takes a piecemeal approach and addresses one revenue source at a time (Fang et al. 2015; Tucker and Zhang 2010). Instead, the primary objective of this article is to *determine the relative revenue effects of buyer- and seller-side strategies across all three platform revenue sources simultaneously*.

Managers are interested in the revenue effects of specific, *micro-level* (i.e., buyer- and seller-side) strategies, but platform firms also can adjust their *macro-level* strategy, which has performance implications for both buyers and sellers on those platforms. In particular, as online platform firms mature, they often implement an upmarket repositioning strategy, similar to those that are prevalent in brick-and-mortar channels (Slywotzky et al. 2000). In this transition, the platform seeks to improve the quality of the products available on its site and thereby raise the overall level of reliability of the platform. For example, in

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an anti-counterfeiting campaign, eBay "banished tens of thousands of sellers from its auction marketplace who did not meet new, elevated standards," after realizing that the loss of buyers' trust would cause severe damage to its future revenue growth and potentially provoke costly lawsuits (The New York Times 2007). Because failing to foster trustworthiness creates "negative externalities" and "threaten[s] your core value proposition to your most valuable customers" (Halaburda 2010), it is critical to understand how macro-level upmarket repositioning strategies by a platform affect existing buyer- and seller-side strategies. Thus, a second objective of this research is *to understand how a macro-level, upmarket repositioning strategy influences the effects of buyer- and seller-side strategies on all three revenue sources*.

To test our overall conceptual framework, we analyze unique time series data from a global business-to-business (B2B) online platform company that serves 18 million buyers and sellers from more than 190 countries. It showcases a wide array of products, from raw materials to finished goods, in more than 40 industry categories. This data set offers unique research opportunities. First, the information about multiple revenue sources provides a comprehensive picture of the platform's business model. Second, the data describe a wide array of micro-level strategies, on both buyer and seller sides, so we can test the relative revenue effects of the strategies across revenue sources. Third, the data capture a quasi-experiment, involving upmarket repositioning, so we can observe how the revenue effects of various micro-level strategies changed, from before to after the repositioning. We use a vector autoregression model with exogenous variables (VARX), which can account for the dynamic relationship between firm strategies and revenue responses (e.g., carryover effects), as well as the endogeneity of the variables and simultaneous equation models.

With this approach, we contribute to extant literature in three ways. First, we generate a parsimonious conceptual model to synthesize the empirical findings and capture how the revenue effects of buyer- and seller-side strategies vary across different platform revenue sources, which helps advance theory in this relatively new channel context. To do so, we explicitly examine the *revenues generated by different buyer traffic generation strategies across all three platform revenue sources*. For example, buyers that access the platform as organic traffic generate more search advertising revenue than those that represent direct traffic, because they search to collect information. In contrast, buyers obtained through direct traffic generate more display advertising revenue than organic or referral traffic, because they are more receptive to advertising.

Second, we offer a concise, theoretical explanation for the revenues generated by different seller-side strategies. The duration of sellers' experience on the platform influences *the revenue effects of seller engagement strategies across all three online platform revenue sources*. For example, a marketing initiative appealing to new sellers (social forums) yields more display advertising revenue than one appealing to established sellers (value-added services), because it is more valuable for new sellers to generate awareness of their offerings through display advertisements. We also find that a marketing initiative appealing to established sellers (value-added services) leads into more search advertising and membership fee revenue than one appealing to new sellers (social forums).

Third, we use a quasi-experiment, premised on the platform's macro-level, upmarket repositioning, which was designed to raise the reliability of the entire platform. This shift had system-wide effects on both traffic generation among buyers and engagement among sellers, such that the *upmarket repositioning strategy enhances the positive effects of buyer- and seller-side strategies on revenue sources*. Attracting more buyers or enhancing sellers' engagement pays off more as the firm moves upmarket, though at the expense of a reduction in the number of buyers and sellers, at least initially.

Understanding Online Shopping Platform Firms' Business Models

Online shopping platform firms use three revenue models to capitalize on the transactions between buyers and sellers that take place through their site (Lambrecht et al. 2014; Mathmann et al. 2017; Watson et al. 2015): revenue from platform-based search advertising, revenue from platform-based display advertising, and revenue from membership fees. Because successful revenue generation depends on platforms' ability to pair buyers and sellers, they often employ both buyer- and seller-side strategies to increase the number of revenue-generating interactions.

To explain how buyer- and seller-side strategies influence revenues, we review online platform business model literature (Table 1) and identify four key limitations. First, extant studies consider platform revenue sources independently (Fang et al. 2015; Tucker and Zhang 2010) or measure revenue at an aggregate level (Grewal, Chakravarty, and Saini 2010; Zhang et al. 2012). Tucker and Zhang (2010) focus solely on display advertising; Fang et al. (2015) narrow their research scope to search advertising revenue. Second, prior research into buyer-side strategies often ignores the various sources of buyer traffic and the potentially distinct impacts of each traffic source on multiple revenue streams (Zhang et al. 2012). Third, most studies do not consider how seller-side strategies can yield more platform revenues. For example, Grewal, Chakravarty, and Saini (2010) discuss the importance of building seller social communities, to encourage other sellers to participate, but they do not address any other seller-side marketing initiatives. Fourth, extant research do not describe the actual application of an upmarket repositioning strategy in an online shopping platforms context. As we note in the last row of Table 1, our research thus *provides a more comprehensive view of online platform success by integrating both buyer- and seller-side strategies to understand their relative effects on all three revenue sources*.

Platform Revenue Sources

Revenue from search advertising

Platforms earn search advertising revenues by hosting a keyword bidding system, in which sellers list products on the platform's website, and buyers search for items they need. Search advertising relies on a pay-per-click model, so there is