

## Association for Information Systems AIS Electronic Library (AISeL)

---

ICIS 2001 Proceedings

International Conference on Information Systems  
(ICIS)

---

December 2001

# Assessing Promotion Performance of Pure Online Players: A Two-Stage Model with Sample Selection

Jianan Wu  
*Tulane University*

Victor Cook  
*Tulane University*

Imad Samarah  
*Tulane University*

Follow this and additional works at: <http://aisel.aisnet.org/icis2001>

---

### Recommended Citation

Wu, Jianan; Cook, Victor; and Samarah, Imad, "Assessing Promotion Performance of Pure Online Players: A Two-Stage Model with Sample Selection" (2001). *ICIS 2001 Proceedings*. 27.  
<http://aisel.aisnet.org/icis2001/27>

This material is brought to you by the International Conference on Information Systems (ICIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ICIS 2001 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# ASSESSING PROMOTION PERFORMANCE OF PURE ONLINE PLAYERS: A TWO-STAGE MODEL WITH SAMPLE SELECTION

**Jianan Wu**

A. B. Freeman School of Business  
Tulane University  
[jianan.wu@tulane.edu](mailto:jianan.wu@tulane.edu)

**Victor J. Cook, Jr.**

A. B. Freeman School of Business  
Tulane University

**Edward C. Strong**

A. B. Freeman School of Business  
Tulane University

## Extended Abstract<sup>1</sup>

Firms may be motivated to establish an online presence to achieve many objectives, including image-building, awareness creation, sales lead generation, or direct sales. These ends cannot be fulfilled unless customers know of and visit the firm's website. Firms with an established offline presence (mixed online players) can generate website traffic by word-of-mouth or may be reached by a consumer guessing a Web address (e.g., [www.ford.com](http://www.ford.com)). However, pure online players must promote their websites to their targeted audience in various advertising vehicles in online and/or offline media (e.g., [www.monster.com](http://www.monster.com)). According to *Advertising Age*, in 1999, the golden year for advertising-revenue-driven firms, dot-coms spent \$7.4 billion in various advertising vehicles to promote their websites.

Regardless of their line of business, pure online players in e-commerce follow essentially the same two-stage model of advertising strategy. In the first stage, firms attract customers to their online websites through advertising either in traditional media such as print, radio, and television or online media such as banners, search engines, e-mails, and affiliate programs (Hoffman and Novak 2000). In the second stage, when potential customers visit the websites, firms provide customers with carefully selected website contents and friendly navigation environments to create an environment conducive to the generation of desired outcomes. These outcomes can be sales transactions, sales leads, or other expressions of interest (e.g., registration, membership, etc). For instance, business-to-consumer (B2C) online retailer Amazon.com ([www.amazon.com](http://www.amazon.com)) heavily advertises in both online and offline media to build website traffic and expects customers make purchases at its websites once customers visit the sites. On the other hand, business-to-business (B2B) e-marketplace Ariba.com ([www.ariba.com](http://www.ariba.com)) also heavily advertises in both online and offline media to build website traffic, but only expects visitors (both buyers and suppliers) to register at its website and join the network. In either situation, the more financially desirable outcome goes beyond merely inducing website visits (e.g., number of visits or number of hits). Going beyond traffic generation is critical to online players in the post-dot-com crash era.

The need for pure online players to monitor and analyze website traffic has created a brand new software industry. However, most of the website traffic tracking software currently available in the market suffers from several limitations. First, they provide only a static snapshot of website traffic. Second, they cannot be used for relational analysis. Third, they focus on the website activities per se (e.g., number of hits and type of browser) rather than managerially relevant issues such as the drivers of website activities and the consequences of these activities.

---

<sup>1</sup>**Keywords:** Promotion, E-commerce, two-stage model, sample selection.

Measuring and understanding the behavior of website visitors also has attracted the attention of scholars. Published studies contribute significantly to the understanding of customer online behavior. However, to the best of our knowledge, most of these studies cover only one stage of the two-stage model. They focus on either website traffic generation (Hoffman and Novak 2000) or consumer purchase behavior within electronic stores (Degeratu et al. 2000; Hoque and Lohse 1999). Hence, published studies lack an integrated assessment of advertising effectiveness and online customer behavior.

In this paper, we seek to understand and assess the promotional effectiveness of pure online players by studying the two stages *jointly*. Specifically, we intend to offer insights on three important questions concerning assessment of promotion effectiveness for pure online players:

- (1) How do advertising characteristics affect the pattern of website visits (e.g., number of visits, recency of visits)?
- (2) How do advertising characteristics and website characteristics jointly affect the achievement of the desired outcomes of the promotion?
- (3) How should the advertising campaign and the website characteristics be combined and coordinated to produce better promotion effectiveness?

Because we only observe the website activities and outcomes for those individuals who actually visited the firms' websites, analyzing typical log file based data for pure online players in our two-stage model faces a sample selection problem (Bloom and Killingsworth 1985). We propose a general solution to address the sample selection problem in our two-stage model.

In the context of our application, an online retailer promoting its website through print advertising to generate sales leads, we find that some advertising characteristics (e.g., magazine shelf life) significantly affect the website visit pattern and some website characteristics (e.g., average time spent per file at the website) also significantly affect the sales leads generation. Interestingly, these two types of effects (i.e., website visit effects and sales lead generation effects) do not necessarily go hand-in-hand.

This paper contributes to the e-commerce literature in three ways. Theoretically, a dynamic two-stage model is conceptualized as a natural and necessary generalization of current single-stage models. Methodologically, a general solution is developed to jointly assess promotional performance that incorporates the sample selection problem faced by pure online players in stage-one. This solution does not require costly survey research data. Instead, it utilizes available secondary data like website log files, ad characteristics, and website design. Managerially, an application is presented that offers insights on how to create more effective promotional programs by changing the characteristics of the advertising campaign and/or modifying the design of websites.

## References

- Bloom, D. E., and Killingsworth, M. R. "Correcting for Truncation Bias Caused by Latent Truncation Variables," *Journal of Econometrics* (27), 1985, pp. 131-135.
- Degeratu, A., Rangaswamy, A., and Wu, J. "Consumer Choice Behavior in Online and Traditional Supermarkets: The Effects of Brand Name, Price, and other Search Attributes," *International Journal of Research in Marketing* (17:1), 2000, pp. 55-78.
- Hoffman, D. L., and Novak, T. P. "How to Acquire Customers on the Web," *Harvard Business Review* (78:3), 2000, pp. 179-185.
- Hoque, A. Y., and Lohse, G. L. "An Information Search Cost Perspective for Designing Interfaces for Electronic Commerce," *Journal of Marketing Research* (36:August), 1999, pp. 387-394.