

Household Internet Use: Implications for Online Competition and Market Structure *

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1 Abstract

While of considerable interest to the popular and trade press, fairly little reliable information is available about the Digital Economy, or Electronic Commerce (Wyckoff and Colecchia (1998), Margherio (1998)). Furthermore, despite the wealth of data available to firms engaged in online exchange, academic research on its level, growth, and impact on market structure and competition has lagged behind. In part, this reflects fundamental data privacy issues and measurement difficulties associated with E-Commerce as well as the whirlwind growth of viable digital businesses (Haltiwanger and Jarmin (1999)). This is unfortunate, however, as the digital economy has been likened to the industrial revolution in its proposed impact to the organization of economic activity and importance to economic growth (PD (1997)).

The purpose of this paper is introduce a rich new household panel dataset of online activity to establish some basic facts about household behavior in online markets. These in turn will be used to analyze important issues of organization and competition in online markets.

The primary source of data for this project comes from Foveon Corp.'s database of household Internet use. In partnership with Internet Service Providers (ISPs), Foveon collects and stores a record of all Internet activity of each subscriber to each ISP. The ISPs are chosen on an ongoing basis to provide a representative sample of household Internet use across demographic and geographic

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space.¹ Data has been collected since August, 1999, permitting an analysis of changes over time in online activity. The most recent data available for this paper provides information on over 150,000 Internet users between August and November, 1999.² As privacy is a primary concern to policymakers (e.g. DOC (1999)), Foveon collects the online data anonymously, implying individual household demographic information is not available.³ Instead, they provide census block group identifiers and supplement the online activity data with block group demographic characteristics from the Census Department.⁴

This paper will analyze patterns of household Internet activity and discuss their impact on both online product market structure and competition. The detailed research questions within these areas are briefly described below.

Fundamental to any analysis of online activity is characterizing patterns of household Internet use. Where do consumers go on the web? What do they do there? How long do they stay? Do they purchase something? How do these answers differ across geographic space? Across household groups? What role do portals play? As described earlier, public information on web use is limited (e.g. NTIA (1999)) and private information is typically proprietary and unavailable to researchers. Exploiting the rich ISP data described above, I will address these questions for a representative set of households since August, 1999.

The results can inform the nature of price competition in online markets. Recent research by Brynjolffson and Smith (1999) analyzing posted online prices for books and CDs find on average lower and less widely dispersed prices in online markets.⁵ I will focus on the nature and impact of consumer search in online markets: Do consumers search? Do they comparison-shop? How does this impact purchase decisions?⁶ The answers to these questions will inform the degree of market power merchants have in online markets.⁷

The household information described above also permits examining the market structure of online markets. What are firm market shares in online markets? How do they vary across product

¹This contrasts with most existing Internet data collection companies which describe web activity on the basis of a self-selected sample of households.

²This represents all the available users, both households and firms. As the majority of Internet use is by firms, reducing these from the sample results in 16,000 households. Ongoing development of the database will likely increase this sample by an order of magnitude.

³Households have a unique identifier, however, permitting analysis of the same household across multiple sessions.

⁴These data are provided by Claritas, Inc. from Census sources. Provided are 1995 data likely obtained from the Current Population Survey (CPS).

⁵See also the description of Dillard (1999) in Varian (1999).

⁶The dataset in this paper currently can identify online purchases but *not* the item purchased or its price. Foveon is currently engaging online merchants to trade their price information in exchange for extra-merchant online activity analysis.

⁷One impact discussed in Varian (1999) suggests that while increased access to information provided by online markets will increase the ability for consumers to comparison-shop, it also increases the ability of firms to monitor and respond to price changes by rivals. Which of these will have the greater effect is an open empirical question.

markets? How have they changed over time? The difficulties identifying products purchased and prices charged described above limit the detail of the analysis,⁸ but the available results should provide important inputs into assessing the impact of online markets on offline counterparts across product markets and analyzing entry strategies in online markets (i.e. Are their strong first-mover advantages? Are these offset by strong offline brand identities?). They also provide important datapoints to complement contemporaneous (and widely available) offline datasets to assess the direct impact of online exchange within particular product markets.

⁸For example, market shares will need to be defined in terms of purchases across broad product categories identifiable from domain names.

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