

JooHee Oh

Management Science
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ACADEMIC POSITION

Postdoctoral Associate 2011-Present
MIT Sloan School of Management and Center for Digital Business

EDUCATION

Marshall School of Business 2006-2011
University of Southern California, Los Angeles, CA
PhD in Business Administration
Advisors: Prof. Il-Horn Hann and Prof. Omar El-Sawy
Dissertation title: Piracy Propagation of Information Goods: Theory, Measurement, and Application

Seoul National University, Graduate School of Economics 2004
MA in Economics

Seoul National University, Seoul, Korea 2002
BA in Economics, Business Administration, and Consumer Studies
Summa cum laude

RESEARCH AND TEACHING INTERESTS

Digital Products Market; Technology enabled Strategy and Policy; Economics of Information Technology

WORKING PAPERS

- *The Attention Economy: Measuring the Value of Free Goods on the Internet*, 2012. With Erik Brynjolfsson.
- *Demand and Supply- side Dynamics of Piracy Propagation in P2P Networks*, 2010. With Il-Horn Hann.
- *From Piracy to Business Intelligence: A Functional Data Analysis of P2P Traffic*, 2010. With Il-Horn Hann and Gareth James.
- *The Interplay between Seeders and Pirates in P2P networks: An Empirical Analysis*, 2010. With Il-Horn Hann.

PUBLICATION

Erik Brynjolfsson and JooHee Oh, “The Attention Economy: Measuring the Value of Free goods and Services on the Internet”, *Proceedings of the 34th International Conference on Information Systems*, Orlando, Florida, US (*forthcoming*).

Jae-Young Kim and Joo Hee Oh (2003), "A Scenario Analysis of Korean Pension Portfolio using Vector Auto Regression (VAR) Model", *The Korean Economic Journal*, Vol. 42.

CONFERENCE PRESENTATIONS

- The Attention Economy: Measuring the Value of Free goods on the Internet, *ICIS Annual Meeting*, Dec.16th, 2012, Orlando, FL.
- The Attention Economy: Measuring the Value of Free goods on the Internet, *INFORMS Annual Meeting*, Oct.17th, 2012, Phoenix, AZ.
- From Piracy to Business Intelligence: Forecasting the Sales of Music Albums, *INFORMS Marketing Science Conference, Boston University*, June 9th, 2012, Boston, MA.
- The Attention Economy: Measuring the Value of Free goods on the Internet, *INFORMS Marketing Science Conference, Boston University*, June 7th, 2012, Boston, MA.
- The Attention Economy: Measuring the Value of Free goods on the Internet, *NBER Workshop on Economics of Digitization, Stanford University*, February 24th, 2012, Palo Alto, CA.
- Piracy Propagation of Information goods in P2P networks, *NBER Workshop on Economics of Digitization, Stanford University*, February 24th, 2012, Palo Alto, CA.
- Measuring the Value of Free goods on the Internet, *Workshop on Information Systems and Economics (WISE)*, December 8th, 2011, Shanghai, China.
- The Interplay between Seeders and Pirates in P2P networks: An Empirical analysis, *Workshop on Information Systems and Economics (WISE)*, December 11th, 2010, St. Louis, MO.
- Demand- and supply-side Dynamics of Piracy Diffusion in P2P networks, *Workshop on Information Systems and Economics (WISE)*, December 15th, 2009, Phoenix, AZ.
- Forecasting the Sales of Music Albums: A Functional Data Analysis of P2P Traffic, *Southern California Workshop on Information System Research and Development (WISRDR)*, University of California at Irvine, June 5th, 2009, Irvine, CA.
- Forecasting the Sales of Music Albums: A Functional Data Analysis of P2P Traffic, *The Fifth Symposium on Statistical Challenges in E-Commerce Research (SCECR)*, The Heinz College, Carnegie Mellon University, May 31th, 2009, Pittsburg, PA.
- Forecasting the Sales of Music Albums: A Functional Data Analysis of P2P Traffic, *Internal Seminar, University of Southern California*, May 28th, 2009, Los Angeles, CA.
- Predicting Music Sales Through Online Word-of-Mouth: A Functional Data Analysis of P2P Traffic, *Schmooze session at R.H. Smith School of Business, University of Maryland*, Dec. 3rd, 2008, College Park, MD.
- Forecasting the Sales of Music Albums: A Functional Data Analysis of P2P Traffic, *Workshop on Information Systems and Economics (WISE)*, December 8th, 2007, Montreal, Canada.
- Theorizing around the boundaries of strategy and emerging technologies: A Levels of mindfulness framework, Omar A. El Sawy, Joseph Clark, Jeremiah Johnson, Joo Hee Oh, Youngki Park, *JSIS Workshop*, Dec. 9th, 2007, Montreal, Canada.

TEACHING EXPERIENCES

Instructor

IOM402- Business Information Systems: Database Applications, USC, Summer 2010
(Instructor Rating: 4.57/5, Course Rating: 4.43/5)

Teaching Assistant

Graduate Level Course (MBA):

Global Businesses and Markets: Strategies Enabled by Technology, USC, Spring 2009

Undergraduate Level Courses:

Technology enabled Global Businesses, Markets & Sourcing, USC, Spring 2009

Macroeconomic Principles, UT Austin, Spring 2006

Statistics for Economists, SNU, Fall, 2004

Econometric Methods, SNU, Fall, Spring 2003

HONORS AND AWARDS

Doctoral Consortium Fellow, International Conference on Information Systems (ICIS), 2010

Full tuition and stipend, Marshall School of Business, USC, 2006-2010

Graduated Top in the Department, Seoul National University, 2002

Full Tuition Fellowship, Seoul National University, 1997-2002

REFERENCES

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WORKING PAPER ABSTRACTS

The Attention Economy: Measuring the Value of Free Goods on the Internet

The Internet has given rise to an explosion of free information goods, from Wikipedia articles and Facebook photos to Google maps and YouTube videos. What is their value? Traditional approaches based on measuring prices and quantities do not work well for such goods. In this study, we explore a framework to quantify the value of online applications that have very low prices using the insight that even when people do not pay cash, they must still pay “attention,” or time, when consuming information goods. Accordingly, we contrast the value of consumer surplus using two different methods, one based on the value of direct market expenditure, and one based on the value of time spent consuming free goods. We provide a generalized model of household consumption and time use and estimate the value of consuming information goods on the Internet that is not measured in the traditional money-based measure of GDP. Our model of the “attention economy” yields an estimate of annual consumer surplus gain around \$21 billion between 2003 and 2010 created by free sites on the Internet. This corresponds to about 0.17% of average annual GDP during the relating period. Our data imply that less than 7% of total welfare gain would be measured by approaches that rely solely on the variation in direct dollar expenditures. To identify the remaining 93% of value, one must consider time spent on consumption, as we do in this paper.

Demand and supply-side Dynamics of Piracy Propagation in P2P network

We study the propagation dynamics of demand and supply-side piracy in a file sharing network. This interplay between the demand and supply-side of piracy directly governs the propagation rate. In this paper, we develop a fluid model that explains piracy propagation in P2P networks for individual songs. We incorporate characteristics of individuals' participation behavior and topological properties of P2P systems in the propagation process. This fluid model leads to a system of non-linear differential equation. We obtain a unique closed-form solution for the differential equation and derive key features of determinants. In the empirical analysis, we perform scenario analyses using estimated parameter values and quantify the impact of demand and supply shock prior to the release on piracy level over time. This model accounts for the supply-side impact of availability on the demand-side of file propagation process that has been spotlighted in current anti-piracy efforts. Our results show that the removal of a 1% file supply about 6 weeks prior to the release reduce about 0.06% of cumulative file demand and 0.05% of cumulative file supply on release date. The impact of supply on demand level increases over time, however, we found that the effect of demand shock is more significant than supply shock; decrease of a 1% file demand about 6 weeks prior to the release will cut about 1.52% of file demand and 0.24% of file supply on cumulative level afterwards before release date. This result provides anti-piracy policy implications with respect to the effective timing and the importance of demand-control in P2P networks.

From Piracy to Business Intelligence: A Functional Data Analysis of P2P traffic

Much attention has been given by the business press and academic work on the relationship between P2P downloading activities and sales of sound recordings (Bhattacharjee et al. 2007; Oberholzer-Gee and Strumpf 2007; Liebowitz 2006). What has garnered less attention is that information on digital piracy offers an opportunity to assess customer preferences to improve business decisions and market forecasting. In this paper, we focus on generating and comparing sales forecasts of music albums utilizing demand and supply side P2P data using a functional data analysis (FDA) approach. Specifically, we relate downloading behavior prior to the official launch date to predict music sales of albums. We find that the characteristics of the functional form of downloading behavior explain first-week sales by 60% after controlling for album characteristics. By updating our forecasts weekly prior to the album release date, we examine the dynamic influences of piracy behavior on sales across heterogeneous albums. The results significantly improve pre-release forecasts of first week sales where the business contribution and embedded uncertainty is the highest. We find that piracy propagation rate convey critical information for pre-release sales prediction.