

NET Institute

Conference on

Network Economics

April 1, 2005



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NET Institute

The **Networks, Electronic Commerce and Telecommunications (“NET”) Institute** <http://www.NETinst.org> is a non-profit institution devoted to research on network industries, electronic commerce, telecommunications, the Internet, cable television, “virtual networks” comprised of computers that share the same technical standard or operating system, financial networks including credit card and ATM networks, and on network issues in general. Of particular interest is research on innovation and introduction of new technology in network industries. The NET Institute functions as a world-wide focal point for research and open exchange and dissemination of ideas in these areas. The NET Institute competitively funds cutting edge research projects in these areas of research. It organizes conferences and seminars on these issues.

The following distinguished academics sit on the NET Institute’s board of directors:

1. Professor Kenneth Arrow, Economics Department, Stanford University
2. Dr. Vinton G. Cerf, Senior Vice President, MCI
3. Professor Nicholas Economides, Stern School of Business, New York University (Executive Director)
4. Professor Ariel Pakes, Economics Department, Harvard University

The NET Institute very gratefully acknowledges the generous financial support of the AT&T Foundation and Microsoft.

The NET Institute expects to continue its summer grants program during the year 2005, and expand its support of research activities, conferences, and scientific meetings.

Activities

In 2004, its second year of operation, the NET Institute has funded through its “summer grant” program twenty research proposals in a number of network industries though a competitive process in which over eighty proposals were submitted. Similarly, during 2003, its first year of operation, the NET Institute has funded through its “summer grant” program a number of research proposals. The successful projects for summer 2004 are listed below (in alphabetical order) and at http://www.netinst.org/2004_grants.htm, followed by the 2003 successful projects and at http://www.netinst.org/2003_grants.htm. These papers include a number of very important contributions in the analysis and understanding of competition, pricing, market structure and profitability in network industries ranging from telecommunications, banking networks, software and computers, video games, and airlines, among others. The full papers are downloadable as part of the working papers series of the NET Institute at http://www.netinst.org/NET_Working_Papers.html. A number of the summer 2004 research papers are featured in this year’s NET Institute conference.

Recipients of grants from the [NET Institute](#) in Summer 2, 2004 (in alphabetical order)

1. [Patrick Bajari](#), Duke University, and [Jeremy T. Fox](#), University of Chicago, “[Should Governments Auction Nationwide Spectrum Licenses? Estimating Bidder Valuations](#).”
2. [Paris Cleanthous](#), Stern School of Business, New York University, and [Elena Krasnokutskaya](#), University of Pennsylvania, “Substitutability between Landline and Cellular Services.”
3. [Matthew T. Clements](#), University of Texas, and [Hiroshi Ohashi](#), University of Tokyo, “[Indirect Network Effects and the Product Cycle, Video Games in the U.S., 1994-2002](#).”
4. [Nataly Gantman](#) and [Yossi Spiegel](#), Tel Aviv University, “[Adware, Shareware, and Consumer Privacy](#)”
5. [Aurora García-Gallego](#), Universitat Jaume I, Castellón, [Nikolaos Georgantzís](#), Universitat Jaume I, Castellón, [Pedro Pereira](#), Autoridade da Concorrência, Lisbon, Portugal, [José C. Pernías-Cerrillo](#), Universitat Jaume I, Castellón, “[Risk Attitudes and Internet Search Engines: Theory and Experimental Evidence](#).”
6. [Mark Ginsburg](#), Eller College of Management, University of Arizona, “[Evaluating Networked Medical Information Credibility with the MEDQUAL System](#).”
7. [Austan Goolsbee](#), University of Chicago, GSB, and [Chad Syverson](#), University of Chicago, “[How Do Incumbents Respond to the Threat of Entry on Their Networks? The Case of the Major Airlines](#).”
8. [Gautam Gowrisankaran](#), John M. Olin School of Business, Washington University in St. Louis and [John Krainer](#) (Federal Reserve Bank of San Francisco) “[The Welfare Consequences of ATM Surcharges: Evidence from a Structural Entry Model](#).”
9. [John Idicula](#), Netz Informatics, “[Highly Interconnected Subsystems of the Stock Market](#).”
10. [Mark A. Jamison](#), University of Florida, “[Effects of Industry Concentration on Quality Choices for Network Connectivity](#).”
11. [Mikhail Klimenko](#) and [Kamal Saggi](#), University of California, San Diego, “[Technical Compatibility and the Mode of Foreign Entry Under Network Externalities](#).”
12. [Christopher R. Knittel](#), University of California, Davis, and [Victor Stango](#), Federal Reserve Bank of Chicago, “[Incompatibility and Consumer Demand: Evidence from ATMs](#).”

13. [Tobias Kretschmer](#), and [Katrin Muehlfeld](#), London School of Economics, “[Co-opetition in Standard-Setting: The Case of the Compact Disc](#).”
14. [Mark McCabe](#), Georgia Institute of Technology, and [Christopher Snyder](#), George Washington University, “[The Economics of Open-Access Journals](#).”
15. [Eugenio J. Miravete](#), University of Pennsylvania, “[The Doubtful Profitability of Foggy Pricing](#).”
16. [Yooki Park](#) and [Suzanne Scotchmer](#), University of California, Berkeley, “[Technical Protection Measures and the Pricing of Digital Products](#).”
17. [Douglas Sicker](#) and [Tom Lookabaugh](#), University of Colorado at Boulder, “[A Model for Emergency Service of VoIP Through Certification and Labeling](#).”
18. [Michael D. Smith](#), and [Rahul Telang](#), H. John Heinz III School of Public Policy and Management, Carnegie Mellon University, “[Incentives and Protocols for Self-Organizing Interest-Based Peer-to-Peer Networks](#).”
19. [Rahul Telang](#), H. John Heinz III School of Public Policy and Management, Carnegie Mellon University, “[An Empirical Analysis of Cellular Voice and Data services](#).”
20. [Tunay I. Tunca](#), G.S.B., Stanford University, “[Information Aggregation and Liquidity in Electronic Markets for Procurement](#).”

Recipients of grants from the [NET Institute](#) in Summer 2003 (in alphabetical order)

1. [Fernando Beltran](#), Universidad de Los Andes, Colombia, “[Effects of ISP Interconnection Agreements on Internet Competition: The Case of the Network Access Point as a Cooperative Agreement for Internet Traffic Exchange.](#)”
2. [Jay Pil Choi](#), Michigan State University, “[Antitrust Analysis of Mergers with Bundling in Complementary Markets: Implications for Pricing, Innovation, and Compatibility Choice.](#)”
3. [Chris Forman](#) and [Pei-yu Chen](#), Carnegie Mellon University “[Network Effects and Switching Costs In the Market for Routers and Switches.](#)”
4. [Martha Garcia-Murillo](#), Syracuse University, “[Assessing The Impact Of Internet Telephony On The Deployment Of Telecommunications Infrastructure.](#)”
5. [David Gilo](#) and [Yossi Spiegel](#), Tel Aviv University “[Network Interconnection with Competitive Transit.](#)”
6. [Gautam Gowrisankaran](#), Washington University in St. Louis, “[Quantifying Equilibrium Network Externalities in the ACH Banking Industry.](#)”
7. [Christian Hogendorn](#), Wesleyan University, “[Excessive\(?\) Entry of National Telecom Networks.](#)”
8. [Jay P. Kesan](#), University of Illinois at Urbana-Champaign, and [Andres A. Gallo](#), University of North Florida, “[Internet Regulation: The Political Economy of ICANN and the Shaping of New Regulatory Regimes for the Internet.](#)”
9. [Carleen Maitland](#), Pennsylvania State University, “[The Delft UMTS Testbed and End-user Security features](#)” and “[End-user Security in Mobile Telecommunications: Policy Perspectives and a Research Agenda.](#)”
10. [Marc Rysman](#), Boston University “[Adoption Delay in a Standards War.](#)” and “[Differentiation Across Standards and Adoption Failure in 56K Modems.](#)”
11. [Katja Seim](#) and [V. Brian Viard](#), Stanford University “[The Effect Of Entry And Market Structure On Cellular Pricing Tactics.](#)”
12. [Ananth Srinivasan](#) and [David Sundaram](#), University of Auckland, New Zealand, “[Orchestrating Web Services For Networked Enterprise Collaboration.](#)”

NET Institute Conference **on Network Economics**

Co-sponsored by the NET Institute, <http://www.NETinst.org/>

and the [NYU Center for Law and Business](#)

April 1, 2005

[Stern School of Business, NYU](#), 44 West 4th Street [[MAP](#)], Room 1-70

Preliminary Program

8:30-9:00 **Continental Breakfast**

9:00-9:10 **Introductory Remarks**

[Nicholas Economides](#), Exec. Director, NET Institute and Stern School of Business, NYU

[William Allen](#), Director, NYU Center for Law and Business

9:10-10:40 **Telecommunications Economics**

Chairman: [Nicholas Economides](#), Stern School of Business, NYU

1. [Douglas Sicker](#) and [Tom Lookabaugh](#), University of Colorado at Boulder, "[A Model for Emergency Service of VoIP Through Certification and Labeling](#)."

Discussant: Pedro Pereira, Competition Authority, Portugal

2. [Rahul Telang](#), H. John Heinz III School of Public Policy and Management, Carnegie Mellon University, "[An Empirical Analysis of Cellular Voice and Data services](#)."

Discussant: [Brian Viard](#), GSB, Stanford University

3. [Patrick Bajari](#), Duke University, and [Jeremy T. Fox](#), University of Chicago, "[Should Governments Auction Nationwide Spectrum Licenses? Estimating Bidder Valuations](#)."

Discussant: [Eugenio Miravete](#), University of Pennsylvania

10:50-12:20 **Computer Networks Economics**

Chairman: [Arun Sundararajan](#), Stern School of Business, NYU

1. [Nataly Gantman](#) and [Yossi Spiegel](#), Tel Aviv University, "[Adware, Shareware, and Consumer Privacy](#)."

Discussant: [Chris Snyder](#), George Washington University

2. [Yooki Park](#) and [Suzanne Scotchmer](#), University of California, Berkeley, “[Technical Protection Measures and the Pricing of Digital Products.](#)”

Discussant: [Cristian Dezso](#), Stern School of Business, NYU

3. [Michael D. Smith](#), and [Rahul Telang](#), H. John Heinz III School of Public Policy and Management, Carnegie Mellon University, “[Incentives and Protocols for Self-Organizing Interest-Based Peer-to-Peer Networks.](#)”

Discussant: [Mark Ginsburg](#), University of Arizona

12:20 to 1:00 **Lunch**

1:00-2:00 **Other Networks: Airlines; Video Games**

Chairman: [Tobias Kretschmer](#), London School of Economics

1. [Austan Goolsbee](#), University of Chicago, GSB, and [Chad Syverson](#), University of Chicago, “[How Do Incumbents Respond to the Threat of Entry on Their Networks? The Case of the Major Airlines.](#)”

Discussant: [Elena Krasnokutskaya](#), University of Pennsylvania

2. [Matthew T. Clements](#), University of Texas, and [Hiroshi Ohashi](#), University of Tokyo, “[Indirect Network Effects and the Product Cycle, Video Games in the U.S., 1994-2002.](#)”

Discussant: [Adam Brandenburger](#), Stern School of Business, NYU

2:10-3:10 **Banking Networks**

Chairman: [Mikhail Klimenko](#), Georgia Institute of Technology

1. [Gautam Gowrisankaran](#), John M. Olin School of Business, Washington University in St. Louis and John Krainer (Federal Reserve Bank of San Francisco) “[The Welfare Consequences of ATM Surcharges: Evidence from a Structural Entry Model.](#)”

Discussant: [John Asker](#), Stern School of Business, NYU

2. [Christopher R. Knittel](#), University of California, Davis, and [Victor Stango](#), Federal Reserve Bank of Chicago, “[Incompatibility and Consumer Demand: Evidence from ATMs.](#)”

Discussant: [Paris Cleanthous](#), School of Business, NYU

3:20-4:30 **Discussion of Open Questions**

Lead by [Nicholas Economides](#), Stern School of Business, NYU and [Bhaskar Chakravorti](#), Monitor Group

**A Model for Emergency Service of VoIP
Through Certification and Labeling**

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Paper available at <http://www.netinst.org/Sicker.pdf>

Abstract

Voice over Internet Protocol (VoIP) will transform many aspects of traditional telephony service including technology, the business models and the regulatory constructs that govern such service. This transformation is generating a host of technical, business, social and policy problems. The Federal Communications Commission (FCC) could attempt to mandate obligations or specific solutions to the policy issues around VoIP, but is instead looking first to industry initiatives focused on key functionality that users have come to expect of telecommunications services. High among these desired functionalities is access to emergency services that allow a user to summon fire, medical or law enforcement agencies. Such services were traditionally required (and subsequently implemented) through state and federal regulations. Reproducing emergency services in the VoIP space has proven to be a considerable task, if for no other reason than the wide and diverse variety of VoIP implementations and implementers. Regardless of this difficulty, emergency service capability is a critical social concern, making it is particularly important for the industry to propose viable solutions for promoting VoIP emergency services before regulators are compelled to mandate a solution, an outcome that often suffers compromises both through demands on expertise that may be better represented in industry and through the mechanisms of political influence and regulatory capture. While technical and business communities have, in fact, made considerable progress in this area, significant uncertainty and deployment problems still exist.

The question we ask is: can an industry based certification and labeling process credibly address social and policy expectations regarding emergency services and VoIP, thus avoiding the need for government regulation at this critical time? We hypothesize that it can. To establish this, we developed just such a model for VoIP emergency service compliance through industry certification and device labeling. The intent of this model is to support a wide range of emergency service implementations while providing the user some validation that the service will operate as anticipated. To do this we first examine possible technical implementations for emergency services for VoIP. Next, we summarize the theory of certification as self-regulation and examine several relevant examples. Finally, we synthesize a specific model for certification of VoIP emergency services. We believe that the model we describe provides both short term and long-term opportunities. In the short term, an industry driven effort to solve the important current problem of emergency services in VoIP, if properly structured and overseen as we suggest, should be both effective and efficient. In the long term, such a process can serve as a model for the application of self-regulation to social policy goals in telecommunications, an attractive tool to have as telecommunications becomes increasingly diverse and heterogeneous.

We would like to thank and acknowledge the NET Institute (<http://www.NETinst.org>) for supporting this project.

An Empirical Analysis of Cellular Voice and Data services

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Paper available at <http://www.netinst.org/Telang.pdf>

Abstract

Cellular telephony and associated data services has been a major social phenomena for well over a decade now. It has changed the way – in some countries more than others – in which people communicate. In many countries in Northern Europe and Asia, its penetration rates are very high and in others less so but in all cases it has engendered change at multiple levels – socially as noted and in terms of market structure and competition with the established Incumbent Local Exchange and Inter Exchange service providers. However, there has been little work published in the academic literature on user consumption of cellular voice and data services. This has been due to the unavailability of longitudinal data at the individual user level on their consumption of voice and data services. We have such data from a large cellular service provider in Asia. Demand for voice and data services is influenced by the tariffs or “service plans” offered by firms. In our analysis we empirically estimate the drivers for cellular services how demographic and plan characteristics affect the user choices. We first provide a theoretical model and then provide insight into consumption patterns over a one year period of cellular voice and data services and relate it to service plan design.

Financial support from the NET Institute (<http://www.NETInst.org>) is gratefully acknowledged. Author would like to thank Atip Asvanund, Ramayya Krishnan, William Vogt and participants of the Austin Mobility Conference for their valuable feedback.

Estimating Continuation Values in an FCC Spectrum Auction

Patrick Bajari and Jeremy T. Fox

Duke University and NBER

University of Chicago

January 28, 2005

Paper available at <http://www.netinst.org/fox.pdf>

Abstract

The US government auctions licenses for mobile phone spectrum using a simultaneous, ascending bids auction design. While this auction design has many novel features, previous theoretical and experimental work also suggests that it could generate equilibria that are inefficient, collusive or display other undesirable properties. We empirically examine bidding in the C Block of the U.S. spectrum auctions. We propose a simulation-based estimator that recovers estimates of bidders' continuation value functions at the end of the auction. The value function estimates allow us to test for properties of the equilibrium allocation. Our estimator contributes to the econometrics of semiparametric discrete choice models by allowing agents to choose from very large, but discrete sets of alternatives which is important in other applications including housing or matching. We also estimate complementarities between the licenses in a package, an important issue when deciding the optimal geographic area size of mobile phone licenses.

Thanks to the NET Institute for financial support. Thanks to helpful comments from Lawrence Ausubel, Nicholas Economides, Philippe Février, James Heckman, Paul Milgrom, Gregory Rosston, Andrew Shepherd, Andrew Sweeting and Edward Vytlačil. Thanks to Todd Schuble for help with GIS software, to Peter Cramton for sharing his data on license characteristics, and to Chad Syverson for sharing data on airline travel. Excellent research assistance has been provided by Luis Andres, Stephanie Houghton, Dionysios Kaltis and Wai-Ping Chim.

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Adware, Shareware, and Consumer Privacy

Nataly Gantman and Yossi Spiegelz

September 30, 2004

Paper available at http://www.netinst.org/Gantman_Spiegel.pdf

Abstract

Programmers can distribute new software to online users either for a fee as shareware or bundle it with advertising banners and distribute it for free as adware. In this paper we study the programmers' choice between these two modes of distribution in the context of a model that take explicit account of the strategic interaction between programmers who develop software, firms that advertise their products through ad banners, and consumers who buy software and consumer products. Adware allows advertisers to send targeted information to specific consumers and may therefore improve their purchasing decisions. At the same time, adware also raises privacy concerns. We study the effect of programmers' choice between shareware and adware on consumers' welfare through its effect on the beneficial information that consumers receive about consumers products on the one hand and their loss of privacy on the other hand. We also examine the implications of improvements in the technology of ad banners and the desirability of bans on the use of adware.

JEL Classification: L12, L13, M37

Keywords: adware, shareware, advertising, privacy, ad banners

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Digital Rights Management and the Pricing of Digital Products

Yooki Park and Suzanne Scotchmer*

September 30, 2004

Paper available at http://www.netinst.org/Park_Scotchmer.pdf

Abstract

Digital products such as movies, music and computer software are protected both by self-help measures such as encryption and copy controls, and by the legal right to prevent copying. We explore how digital rights management and other technical protections affect the pricing of content, and consequently, why content users, content vendors, and antitrust authorities might have different views on what technical capabilities should be deployed. We discuss the potential for “collusion through technology.”

Keywords: technical protections, DRM, antitrust, trusted systems

JEL Classifications: L13, L14, L15, K21, O33

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Interest-Based Self-Organizing Peer-to-Peer Networks: A Club Economics Approach

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This Version: October 2004

Paper available at http://www.netinst.org/Smith_Telang.pdf
and <http://ssrn.com/abstract=585345>

Abstract

Improving the information retrieval (IR) performance of peer-to-peer networks is an important and challenging problem. Recently, the computer science literature has attempted to address this problem by improving IR search algorithms. However, in peer-to-peer networks, IR performance is determined by both technology and user behavior, and very little attention has been paid in the literature to improving IR performance through incentives to change user behavior. We address this gap by combining the club goods economics literature and the IR literature to propose a next generation file sharing architecture. Using the popular Gnutella 0.6 architecture as context, we conceptualize a Gnutella ultrapeer and its local network of leaf nodes as a “club” (in economic terms). We specify an information retrieval-based utility model for a peer to determine which clubs to join, for a club to manage its membership, and for a club to determine to which other clubs they should connect. We simulate the performance of our model using a unique real-world dataset collected from the Gnutella 0.6 network. These simulations show that our club model accomplishes both performance goals. First, peers are self-organized into communities of interest — in our club model peers are 85% more likely to be able to obtain content from their local club than they are in the current Gnutella 0.6 architecture. Second, peers have increased incentives to share content — our model shows that peers who share can increase their recall performance by nearly five times over the performance offered to free-riders. We also show that the benefits provided by our club model outweigh the added protocol overhead imposed on the network for the most valuable peers.

Acknowledgements: The authors thank Jamie Callan, Jie Lu, and participants at the 2003 Workshop on the Economics of Peer-to-Peer Systems, the 2003 Workshop on Information Technology and Systems, the University of Texas at Austin, the University of Maryland Institute for Advanced Computer Studies, Stern school at New York University and, Carnegie Mellon University for valuable comments on this research. Financial support was provided by the National Science Foundation through grant IIS-0118767 and by the NET Institute (www.NETinst.org).

How Do Incumbents Respond to the Threat of Entry? Evidence from the Major Airlines*

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Original Draft: May 2004

Current Draft: September 2004

Paper available at http://www.netinst.org/Goolsbee_Syverson.pdf

Abstract

This paper examines how incumbents respond to the *threat* of entry of competitors, as distinguished from their response to competitors' actual entry. It uses a case study from the passenger airline industry—specifically, the evolution of Southwest Airlines' route network—to identify particular routes where the probability of future entry rises abruptly. When Southwest begins operating in airports on both sides of a route but not the route itself, this dramatically raises the chance they will start flying that route in the near future. We examine the pricing of the incumbents on threatened routes in the period surrounding such events. We find that incumbents cut prices significantly when threatened by Southwest's entry into their routes. This is true even after controlling in several ways for airport-specific operating costs. The response of incumbents seems to be limited only to the threatened route itself, and not to routes out of nearby competitor airports where Southwest does not operate (e.g., fares drop on routes from Chicago Midway but not Chicago O'Hare). The largest responses appear to be restricted to routes that were concentrated beforehand. Incumbents do experience short-run increases in their passenger loads concurrent with these fare cuts. This is consistent with theories implying incumbents will try to generate some longer-term loyalty among current customers before the entry of a new competitor. We examine evidence relating this motive to build demand stock to frequent flyer programs and find suggestive evidence in favor of this notion. There is only weak evidence that incumbents increase capacity on the routes.

* We thank Severin Borenstein, Robert Gordon, Mara Lederman, Chris Mayer, Nancy Rose, and seminar participants at the University of Chicago and the Society for Economic Dynamics Annual Meeting for helpful comments. Luis Andres provided superior research assistance. Financial support from the NET Institute (<http://www.NETInst.org>) is gratefully acknowledged.

Indirect Network Effects and the Product Cycle: Video Games in the U.S., 1994-2002

Matthew T. Clements † Hiroshi Ohashi ‡

September 2004

Paper available at http://www.netinst.org/Clements_Ohashi.pdf

Abstract

This paper examines the importance of indirect network effects in the U.S. video game market between 1994 and 2002. The diffusion of game systems is analyzed by the interaction between console adoption decisions and software supply decisions. Estimation results suggest that introductory pricing is an effective practice at the beginning of the product cycle, and expanding software variety becomes more effective later. The paper also finds a degree of inertia in the software market that does not exist in the hardware market. This observation implies that software providers continue to exploit the installed base of hardware users after hardware demand has slowed.

Keywords: indirect network effects; penetration pricing; software variety.

JEL classifications: C23; L68; M21.

We have benefited comments from Paul Chwelos, Adam Copeland, Avi Goldfarb, and seminar and conference participants at Hitotsubashi University, the 2004 International Industrial Organization Conference, University of Tokyo and the Winter 2003 American Economic Association meetings. Financial support from the NET Institute (<http://www.NETinst.org>) is gratefully acknowledged.

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The Welfare Consequences of ATM Surcharges: Evidence from a Structural Entry Model

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Paper available at <http://www.netinst.org/Gowrisankaran2004.pdf>

Abstract

We estimate a structural model of the market for automatic teller machines (ATMs) in order to evaluate the implications of regulating ATM surcharges on ATM entry and consumer and producer surplus. We estimate the model using data on firm and consumer locations, and identify the parameters of the model by exploiting a source of local quasi-experimental variation, that the state of Iowa banned ATM surcharges during our sample period while the state of Minnesota did not. We develop new econometric methods that allow us to estimate the parameters of equilibrium models without computing equilibria. Monte Carlo evidence shows that the estimator performs well. We find that a ban on ATM surcharges reduces ATM entry by about 12 percent, increases consumer welfare by about 10 percent and lowers producer profits by about 10 percent. Total welfare remains about the same under regimes that permit or prohibit ATM surcharges and is about 17 percent lower than the surplus maximizing level. This paper can help shed light on the theoretically ambiguous implications of free entry on consumer and producer welfare for differentiated products industries in general and ATMs in particular.

We thank Fumiko Hayashi, Igal Hendel, Tom Holmes, and seminar participants at numerous institutions for helpful comments, thank Joy Lin, Yuanfang Lin, and Chishen Wei for research assistance and Anita Todd for editorial assistance. Gowrisankaran gratefully acknowledges financial support from the National Science Foundation (Grant SES-0318170), the NET Institute (<http://www.NETinst.org>), and the Federal Reserve Bank of New York. The views expressed in this paper are solely those of the authors and do not represent those of the Federal Reserve Banks of New York or San Francisco or the Federal Reserve System.

Incompatibility, Product Attributes and Consumer Welfare: Evidence from ATMs

Christopher R. Knittel and Victor Stango

Paper available at http://www.netinst.org/Knittel_Stango.pdf

Abstract

Incompatibility in markets with network effects can either benefit or harm consumers. Incompatibility reduces consumers' ability to "mix and match" components offered by different sellers, but can also be associated with changes in product attributes that might benefit consumers. In this paper, we estimate the effects of incompatibility in a classic hardware/software market: ATM cards and machines. Our empirical model allows us to measure the indirect network effect relating the value of ATM cards to ATM availability. It also allows us to measure the effects of incompatibility as measured by ATM fees. Our sample contains a relatively discrete move toward incompatibility after 1996, when banks began to impose surcharges on non-customers using their ATM machines. We provide estimates of the partial equilibrium effects of increased incompatibility on consumer welfare, finding that ATM fees *ceteris paribus* reduce the indirect network effect associated with other banks' ATMs. However, a surge in ATM deployment accompanies the shift to surcharging and in many cases completely offsets the reduction in welfare associated with higher fees. This suggests that welfare analyses should consider the interaction between incompatibility and changes in product attributes.

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Short Biographies of Speakers, Discussants, and Session Chairmen

William Allen is the Director of the New York University Center for Law & Business, which is a joint venture of the Leonard N. Stern School of Business and the NYU School of Law. Allen is also a Professor of Law on the law faculty and a Professor of Business in the Department of Finance at the Stern School. From 1985 through June 1997, Allen served as Chancellor of the Court of Chancery of the State of Delaware. The Court of Chancery has been called the leading trial court in the U.S. for questions of business and corporation law. More than 75% of the judicial work of the court falls into these categories, with cases involving the rights and duties of corporate directors forming the largest part of this work. As chief judge of the court, Allen administered the court and authored more than 500 judicial opinions treating a broad range of civil law issues. These judicial opinions often interpreted the fiduciary duties of corporate directors both in the context of corporate takeovers and in the context of regular operation of the corporations business. Allen served in 1996 as Raben Fellow at Yale Law School; in 1994 and in 1990 he served as the Phelger Visiting Professor of Law at Stanford Law School. In 1993 he served as Distinguished Lecturer in International Business & Trade on the Faculty of Law, University of Toronto. During the period 1991-95 Chancellor Allen served as Lecturer in Law and Adjunct Professor of Law at University of Pennsylvania Law School. He holds a B.S. degree from New York University (1969), a J.D. degree from the University of Texas (1972) and the honorary LL.D. degree from The Dickinson Law School. Allen also serves as the founding Chair of the Independence Standards Board, a self-regulatory body established through agreement between the Securities and Exchange Commission and the American Institute of Certified Public Accountants. The role of the ISB is to establish, through a public process, standards for the determination of auditor independence. In addition, Allen serves as counsel to the New York law firm of Wachtell, Lipton, Rosen & Katz, with whom he consults concerning questions of corporate law and governance. At Stern Professor Allen teaches courses in The Law & Business of Investment Banking, Legal Risk in Mergers & Acquisitions and Legal Foundations of Finance (which is in process). At the School of Law Allen teaches Corporation Law and the Colloquium on Law & Business. He has written more than five hundred judicial opinions and published lectures and articles on corporate law and governance and widely lectures on these topics.

John Asker joined New York University Stern School of Business as an Assistant Professor of Economics in 2004. His primary research areas include empirical industrial organization and applied microeconomics. His research focuses on the competitive effects of vertical market structure, with a particular focus on antitrust issues, and the design of auction markets. Professor Asker has a Bachelor of Economics degree from the Australian National University and Master of Arts and Doctor of Philosophy degrees, both in economics, from Harvard University.

Adam Brandenburger, the J.P. Valles Professor of Business Economics and Strategy, has taught at the New York University Stern School of Business since 2002. Prior to joining NYU, he held the MBA Class of 1958 Professorship at Harvard Business School. An expert in game theory and business strategy, Professor Brandenburger is the author of numerous papers on topics ranging from the foundations of game theory to applications of game theory to business. His articles about game theory and business strategy have appeared in such publications as

Econometrica, *Journal of Economic Theory*, and *Journal of Economics & Management Strategy*. He is also the coauthor, with Barry Nalebuff, of *Co-opetition* (Doubleday, 1996). Professor Brandenburger teaches the core MBA Strategy course at NYU Stern, and also an elective MBA course Game Theory and Business Strategy. Born in London, England, Professor Brandenburger received his B.A., M.Phil., and Ph.D. degrees from the University of Cambridge. He was a Harkness Fellow from 1983 to 1985.

Bhaskar Chakravorti is a Partner and Thought Leader of the global strategy advisory and merchant banking firm, Monitor Group, and is based in its headquarters in Cambridge, Massachusetts. Bhaskar leads Monitor's work in growth strategies, marketing innovation and managing uncertainty through practical applications of game theory and networks. In his practice, he manages senior-most executive client relationships and advises CEOs and other decision-makers in multiple industry sectors, primarily: technology, communications and media; life sciences, health and consumer products; public safety and policy. His clients have been among global top three in their respective industries. His advisory work has been varied; for example: tackling the challenges of bringing modern telecommunications to Africa; resolving public safety and Homeland security issues in wireless technologies in the US; growing the first entrepreneurial unit in a global high-technology corporation; devising mergers-and-acquisitions strategy for one of the largest consumer products companies; helping launch a billion-dollar blockbuster drug; investigating the future of quantum computing. Dr. Chakravorti is the author of the widely acclaimed book *"The Slow Pace of Fast Change: Bringing Innovations to Market in a Connected World"* (Harvard Business School Press, 2003), which was ranked in the top three books on Innovation on Amazon and picked as one of the Best Business Books of 2003 by multiple publications, e.g. *Strategy+Business*, *Library Journal*, and as one of the ten best business ideas for 2003, among other honors. He is also the author of numerous articles in leading academic journals in economics, management and technology (e.g. *Journal of Economic Theory*, *Journal of Mathematical Economics*, *Journal of Public Economics*, *Economic Theory*, *International Journal of Game Theory*, *Journal of Economics and Management Strategy*, *IEEE Transactions on Automatic Control*, etc.), and chapters in several edited books. He has written articles in the media (e.g. *New York Times*, *Wall Street Journal Europe*, *Financial Times*, *Economic Times*, *Businessworld*, etc.), executive journals (e.g. *Harvard Business Review*, *Ivey Business Journal*, *Technology in Society*, etc.), technology strategy journals (e.g. ACM's *Ubiquity*, *Darwin*, *Optimize*), and corporate publications. He has been interviewed on the topic of innovation, new technologies and strategy by leading publications/media (e.g. *BusinessWeek*, *Fortune*, *The Economist*, *NECN TV Evening News*, *CBS MarketWatch*, *Scientific American*, *Fast Company*, *Economic Times*, etc.) as well as for a documentary film on the impact of the open source movement. His work has been translated into multiple languages. Dr. Chakravorti is also the creator of an "ideas" website on bringing innovations to market and progress: www.slowpacefastchange.com.

Paris Cleanthous is an assistant professor of marketing at New York University's Stern School of Business. He currently teaches the marketing core course to Stern undergraduates. Professor Cleanthous joined NYU Stern in 2003. His primary research focuses on the valuation of innovations and their diffusion over time through their effect on customer willingness-to-pay. In particular, he evaluates pharmaceutical

innovation and addresses the moral hazard issue that arises due to the existence of prescription drug insurance coverage. His other research interests include advertising, competitive pricing, and empirical industrial organization. Besides the healthcare and pharmaceutical industries, Professor Cleanthous also has research projects on the telecommunications, music and other industries. Professor Cleanthous received his Bachelor of Science in economics and mathematics from the University of Michigan, Ann Arbor. He then continued his studies at Yale University where he received his Master of Arts, Master of Philosophy and Doctor of Philosophy in Economics.

Cristian Dezsó is a graduate student in economics at the Stern School of Business, New York University. His fields of study are industrial organization, applied game theory, and business strategy, and his research interest include various topics in reputation, organizational economics, and technology. He received his BA in IT applied to business, from the “Babes-Bolyai” University, Cluj, Romania, in 1996, and his MA in Economics from the Central European University, Budapest, Hungary.

Nicholas Economides is Professor of Economics at the Stern School of Business of New York University and Executive Director of the NET Institute at <http://www.NETinst.org>. His fields of specialization and research include the economics of networks, especially of telecommunications, computers, and information, the economics of technical compatibility and standardization, industrial organization, the structure and organization of financial markets, application of public policy to network industries, and strategic analysis of markets. He has published widely in the areas of networks, telecommunications, oligopoly, antitrust, product positioning, and on liquidity and the organization of financial markets and exchanges. He holds a Ph.D. and a M.A. in Economics from the University of California at Berkeley, as well as a B.Sc. (First Class Honors) in Mathematical Economics from the London School of Economics. He has previously taught at Columbia University (1981-1988) and at Stanford University (1988-1990). He is editor of the *Netnomics*, *The Quarterly Journal of Electronic Commerce*, *The Journal of Financial Transformation*, *The Journal of Network Industries*, on the Advisory Board of the *Social Science Research Network*, editor of *Economics of Networks Abstracts* by SSRN, and past editor of the *International Journal of Industrial Organization*. His web site on the Economics of Networks at <http://www.stern.nyu.edu/networks/> has been ranked as one of the top 5 economics sites worldwide by The Economist magazine. He is advisor to the U.S. Federal Trade Commission, the governments of Greece, Ireland, Portugal, and New Zealand, major telecommunications corporations, a number of the Federal Reserve Banks, the Bank of Greece, and major Financial Exchanges. He serves on the Advisory Board of the Economist Intelligence Unit. A complete CV is available at <http://www.stern.nyu.edu/networks/cvnoref.html>.

Jeremy Fox earned his PhD from Stanford University in 2003, and became an assistant professor at the University of Chicago's Department of Economics during that same year. He teaches graduate industrial organization. Fox's dissertation was on measuring switching costs in the labor market, and he has recently done work analyzing bidder payoffs during FCC spectrum auctions for mobile phone licenses. Spectrum auctions can be considered a special case of a two-sided matching market. Fox has recently worked on estimating total match payoffs in two-sided matching markets. Other examples of two-sided matching markets include suppliers and retailers, families and houses, and workers and employers.

Mark Ginsburg (PhD, New York University) is assistant professor in MIS at the Eller College of Business, University of Arizona. His research interests are in the areas of collaborative computing, visualization of large-scale digital libraries, socio-technical issues of virtual communities, and practical problems pertaining to document management, knowledge management, and e-business strategies. His research articles have appeared in *Communications of ACM*, *J. CSCW*, *IEEE Computer*, *J. Autonomous Agents and Multi-Agent Systems*, and the *Electronic Markets Journal*. From 1994-1996, he was the lead developer on the flagship EDGAR on the Internet project; the first large-scale dissemination of government data (corporate disclosure statements) to the general public. He also has extensive consulting experience at financial services firms. He is a member of IEEE, ACM, and SIGGROUP.

Gautam Gowrisankaran is an Assistant Professor of Economics at the John M. Olin School of Business at Washington University in St. Louis and a Faculty Research Fellow at the National Bureau of Economic Research in Cambridge, Massachusetts. He received his Ph.D. in Economics from Yale University in 1995, where his dissertation analyzed merger models. Since then, his research has focused on industrial organization, health economics and applied econometrics. Prof. Gowrisankaran's work has appeared in journals such as *Econometrica*, the *RAND Journal of Economics* and the *Journal of Health Economics*. His research has been funded by governmental and private sector agencies including the National Science Foundation, the Federal Trade Commission and the NET Institute. Prof. Gowrisankaran has served as a faculty member at the University of Minnesota Economics Department, and as a visiting faculty member at the Economics Departments of the University of Michigan, Harvard University and Yale University. Prof. Gowrisankaran has also served as a Visiting Scholar at the Federal Reserve Bank of San Francisco and as a consultant to several other Federal Reserve Banks.

Mikhail Klimenko is Associate Professor of Economics at the Georgia Institute of Technology, which he joined in 2004. As a graduate student, he attended Brown University, graduating with a Master's degree in 1991. He went on to receive an MA in Statistics and a Ph.D. in Business from Stanford University in 1997. Prior to joining the Georgia Institute of Technology, he taught at the University of California in San Diego from 1996 to 2004. Professor Klimenko's main research areas are international economics and open-economy industrial organization and he teaches courses on international economics and economics of telecommunication networks at the undergraduate, MA, and Ph.D. levels. His current research interests span several areas of economics and public policy regulatory policies for information and communication technology industries, open-economy industrial organization and theory and policy of international trade and foreign investment. His most recent work addresses trade and regulatory policy issues that arise in information and communication technology industries in the U.S. as well as internationally. Professor Klimenko has consulted for the World Bank and the European Bank for Reconstruction and Development. He has published in the *Journal of International Economics*, the *Journal of Development Economics*, and other journals.

Christopher Knittel is an assistant professor of economics at the University of California, Davis. He joined the faculty in 2002, having taught previously at Boston University from 1999 to 2002. Professor Knittel received his B.A. in economics and

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Elena Krasnokutskaya is an assistant professor in the Department of Economics at the University of Pennsylvania. In her research, she empirically evaluates performance and efficiency of auction mechanisms. The emphasis of her current work is on bidding and participation strategies of paving companies in highway procurement auctions. Her other research interests include empirical studies of product complementarities, bundling and contracting in telecom and construction industries. Elena Krasnokutskaya received her Doctor of Philosophy Degree from Yale University. She also holds a Diploma in mathematics from Moscow State University.

Tobias Kretschmer joined London School of Economics in 2001 with a PhD from London Business School and an MSc from the University of St. Gallen (Switzerland). Prior to joining LSE, he was a researcher in the Economics and Political Science Group at INSEAD, France. Dr Kretschmer works on the economics and management of network industries. His theoretical work includes studies on standards battles, adoption and coalition behavior in network industries, and incentives in complex organizations. His empirical work looks at PC operating systems and mobile telecommunications. He teaches Strategy and Managerial Economics at LSE and is a research fellow at ETLA (Helsinki), and the Centre for Economic Performance (London), and has taught at HEC (Paris), Warsaw University of Technology Business School, and AESE (Lisbon). His work was published, among others, in the *International Journal of Industrial Organization*, *Review of Industrial Organization*, and *Journal of Industry, Competition and Trade*.

Eugenio J. Miravete graduated in Economics at Universidad de Valencia (Spain) in 1987, and completed his Ph.D. at Northwestern University, 1996. His main area of interest is empirical industrial organization and his research deals with structural estimation of nonlinear pricing models which he applied mostly to telecommunications pricing, which he published, among others, in the *International Journal of Industrial Organization*, *Journal of Industrial Economics*, *American Economic Review*, *International Economic Review*, and *Review of Economic Studies*. He taught industrial organization and microeconomics both at undergraduate and graduate levels at Universidad de Valencia, New York University, and University of Pennsylvania, as well as introductory microeconomics for MBAs at the INSEAD (Fontainebleau, France). He is a research affiliate of the Center for Economic Policy Research (London, UK) and held visiting positions at Instituto de Análisis Económico (Barcelona, Spain) and Wissenschaftszentrum Berlin für Sozialforschung (Berlin, Germany). He is currently associate editor of the *Journal of the European Economic Association* and *Information Economics and Policy*.

Hiroshi Ohashi is Associate Professor of Economics at the University of Tokyo. Ohashi holds a bachelor's degree in economics from the University of Tokyo, and a doctorate from Northwestern University. He joined the University of Tokyo in 2003 after having taught as an assistant professor at the Sauder School of Business, University of British Columbia, Canada. Ohashi has served as a research fellow at the Economics and Social Research Institute, Cabinet Office, Government of Japan. Ohashi's main areas of interest are industrial organization and international trade policy. His work mainly focuses on empirical and policy analysis. His current research covers industries such as agriculture, aviation, entertainment, and, heavy metal. His papers have appeared at academic journals including the *Journal of Economics and Management Strategy*, *Journal of Industrial Economics*, and *Journal of International Economics*.

Yooki Park is a graduate student in economics at the University of California Berkeley. His fields of study are industrial organization and public finance, and his research interests include various topics in technology policy, including digital rights management and human resources management policies in technology firms. He received his BA in computer science from Cornell University in 1999, and previously worked as an enterprise software consultant in the financial services and transportation industries.

Pedro Pereira is a Senior Economist at the Portuguese Competition Authority and a Visiting Professor at the Technical Superior Institute of Lisbon. Pereira holds a bachelor's degree in economics from the new University of Lisbon, and a doctorate from the University of California, San Diego. He joined the Portuguese Competition Authority in 2003 after having taught as a Visiting Professor at the Universidad Carlos III de Madrid, and Universidad Complutense de Madrid. Pereira's main area of interest is industrial organization, and in particular consumer search. His work focuses on theoretical, experimental, and empirical analysis. His current research covers industries such as Telecommunications and E-Commerce. He published on academic journals including the *International Journal of Industrial Organization*, *Information Economics and Policy Strategy*, and *International Journal of the Economics of Business*.

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Christopher Snyder received his Ph.D. from M.I.T. in 1994. Since graduating, he has taught at George Washington University, where he currently holds the position of Professor in the Department of Economics and Director of the Program in Industry Economics and Policy. He has held visiting positions at the Australian National University, M.I.T., and the University of Chicago. He is an Associate Editor for the *International Journal of Industrial Organization* and *Review of Industrial Organization*. His research and teaching focus on the topic of contracts and organizations, taking both a theoretical and empirical perspective. His research has appeared in leading journals including the *Journal of Political Economy* and the *RAND Journal of Economics*. He is currently working on a project initially funded by a NET Institute grant on the economics of open-access academic journals. Professor **Yossi Spiegel** specializes in Industrial Organization, Economics of Regulation, and Corporate Finance. He is a Senior Lecturer at the Faculty of Management at Tel Aviv University since 2001. Previous employment includes, a visiting position at the Department of Economics, Northwestern University (1999-2001), Lecturer at the School of Economics at Tel Aviv University (1994-1999), and, Member of Technical Staff, at the Economic Research Group at Bellcore, New Jersey (1991-1994). He holds a Ph.D. in Economics from Northwestern University. Published over 20 papers in academic journals, including *The Rand Journal of Economics*, *The Journal of Regulatory Economics*, *Journal of Economics and Management Strategy*, and *International Journal of Industrial Organization*, *Journal of International Economics*, and *Game and Economic Behavior*. Serves as an associated editor of *International Journal of Industrial Organization* since January 2002.

Victor Stango is an associate professor of economics in the Tuck School of Business at Dartmouth. He joined the faculty in 2004, having worked previously at the Federal Reserve Banks of Chicago and New York, the University of Chicago, UC Berkeley, and the University of Tennessee. Professor Stango's research focuses on empirical industrial organization with a particular emphasis on network industries. He is an associate editor of the *International Journal of Industrial Organization*. Professor

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Professor **Arun Sundararajan**'s research program studies the economics of industries transformed by information technology. He teaches primarily in Stern's undergraduate program, and coordinates their core course on IT in business. Some of his recent papers have studied price discrimination for digital goods, using pricing policy in combination with digital rights management to manage piracy, price screening with network effects, how the structure of interconnections affects adoption in models of "local" network effects, and technology migration in wireless telecommunications. He serves on the editorial board of *Management Science* as an associate editor, and on the advisory board of SSRN's ebusiness/ecommerce journal. Many of Professor Sundararajan's former doctoral students hold faculty positions at business schools in leading universities. He occasionally advises early-stage technology companies on financing and product strategy. He has degrees in electrical engineering, operations research and business administration from the Indian Institute of Technology, Madras, and from the University of Rochester. Further information about Professor Sundararajan's research can be found on his web site at <http://oz.stern.nyu.edu/>

Chad Syverson is an Assistant Professor in the Economics Department at the University of Chicago, where he has been on the faculty since 2001. His research has spanned several topics, with a particular area of focus being the interactions between market structure and productivity. Published studies include investigations into the effects of competition on firms' productivity levels, both within and across industries, and the roles of non-portfolio differentiation and investor search in competition among mutual funds. Current work includes characterizing the reactions of incumbent airlines to the threat of entry (as opposed to actual entry) into their route networks; measuring vertical integration's productivity, price, and entry rate impacts, with particular regard to testing the predictions of foreclosure theory; determining how greater productivity dispersion impacts wages and asset prices; quantifying the importance of idiosyncratic technology and demand shocks to businesses' survival prospects; and comparing outcomes obtained by real estate agents selling their own homes to those they obtain for their clients. Syverson is a NBER Faculty Research Fellow in the Productivity, Industrial Organization, and Economic Fluctuations and Growth programs. He has regularly spent time as a Visiting Scholar at the Minneapolis Federal Reserve Bank since 2003, and serves on the board of the Chicago Census Data Research Center. He received his doctorate from the University of Maryland in 2001, and spent 2000-01 at the Brookings Institution as a Dissertation Fellow.

Rahul Telang is Assistant Professor of Information Systems at H John Heinz III School of Public Policy and Management, at Carnegie Mellon University. He received his PhD in Information Systems from GSIA, Carnegie Mellon University in 2002. His research interests include consumers' use of new technologies like search engines and Peer to Peer networks, and empirical and analytical models of software security and vulnerabilities. His current work on e-business examines loyalty on the Internet, competition and impact of used good markets on retailers and suppliers. His recent papers have studied the impact of patching on software quality, markets for

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V. Brian Viard is an Assistant Professor of Strategic Management, Stanford Graduate School of Business specializing in industrial organization economics and the economics of strategy. His research has focused on pricing and product strategies in information and technology industries, such as telecommunications and software. He has examined how firms set prices of successive versions of information products and how network externalities influence the pricing and quality of goods firms produce. He has also assessed the impact of number portability and entry on competition in telecommunications markets and has recently studied the impact of loyalty programs on competition and welfare.

ABSTRACTS OF PAPERS THAT RECEIVED A NET INSTITUTE GRANT IN
SUMMER 2005 BUT COULD NOT FIT IN A ONE-DAY CONFERENCE
PROGRAM

Risk Attitudes and Internet Search Engines: Theory and Experimental Evidence*

Aurora García-Gallego†

Nikolaos Georgantzís‡

Pedro Pereira§

José C. Pernías-Cerrillo¶

30th September 2004

Paper available at <http://www.netinst.org/Pereira.pdf>

Abstract

This paper analyzes the impact on consumer prices of the size and biases of price comparison search engines. We develop several theoretical predictions, in the context of a model related to Burdett and Judd (1983) and Varian (1980), and test them experimentally. The data supports the model's predictions regarding the impact of the number of firms, and the type of bias of the search engine. The data does not support the model's predictions regarding the impact of the size of the search engine. We identified several data patterns, and developed an econometric model for the price distributions. Variables accounting for risk attitudes improved significantly the explanatory power of the econometric model.

Keywords: Search engines, incomplete information, biased information, price levels, experiments.

JEL Codes: D43, D83, L13.

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MEDQUAL: Improving Medical Web Search over Time with Dynamic Credibility Heuristics

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Abstract

Performing a search on the World Wide Web (WWW) and traversing the resulting links is an adventure in which one encounters both credible and incredible web pages. Search engines, such as Google, rely on macroscopic Web topology patterns and even highly ranked ‘authoritative’ web sites may be a mixture of informed and uninformed opinions. Without credibility heuristics to guide the user in a maze of facts, assertions, and inferences, the Web remains an ineffective knowledge delivery platform. This report presents the design and implementation of a modular extension to the popular Google search engine, MEDQUAL, which provisions both URL and content-based heuristic credibility rules to reorder raw Google rankings in the medical domain. MEDQUAL, a software system written in Java, starts with a bootstrap configuration file which loads in basic heuristics in XML format. It then provides a subscription mechanism so users can join birds of feather specialty groups, for example Pediatrics, in order to load specialized heuristics as well. The platform features a coordination mechanism whereby information seekers can effectively become secondary authors, contributing by consensus vote additional credibility heuristics. MEDQUAL uses standard XML namespace conventions to divide opinion groups so that competing groups can be supported simultaneously. The net effect is a merger of basic and supplied heuristics so that the system continues to adapt and improve itself over time to changing web content, changing opinions, and new opinion groups. The key goal of leveraging the intelligence of a large-scale and diffuse WWW user community is met and we conclude by discussing our plans to develop MEDQUAL further and evaluate it.

Index Terms—Credibility, Web Credibility, Heuristics, Medical Informatics, Authoritative, Opinions, XML, Java

Highly Interconnected Subsystems of the Stock Market¹

John Idicula²

Netz Informatics³

Draft revised December 13, 2004

Paper available at <http://www.netinst.org/Idicula.pdf>

Abstract

The stock market is a complex system that affects economic and financial activities around the world. Analysis of stock price data can improve our understanding of the past price movements of stocks. In this work, we develop a method to determine the highly interconnected subsystems of the stock market. Our method relies on a k -core decomposition scheme to analyze large networks. Our approach illustrates that the stock market is a nearly decomposable system which comprises hierarchic subsystems. This work also presents results from the analysis of a network derived from a large data set of stock prices. This network analysis technique is a new promising approach to analyze and classify stocks based on price interactions and to decompose the complex system embodied in the stock market.

¹ Draft research paper submitted to The NET Institute, USA on September 30, 2004.

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Effects of Industry Concentration on Quality Choices for Network Connectivity

Draft Date: October 7, 2004

Mark A. Jamison

Paper available at <http://www.netinst.org/Jamison.pdf>

Abstract

I examine the effects of market concentration on connectivity in network industries. Using Cournot interactions for a duopoly, each network chooses quantity, quality for communications within the provider's own network (internal quality), and quality for communications between the provider's network and other networks (external quality). I find that large networks choose higher internal quality than do small networks and large networks choose higher internal quality than external quality. I also find that providers prefer flexible technologies that allow them to simultaneously choose outputs and qualities. Small networks prefer higher external quality than internal quality except when they make credible quality commitments before choosing output and have higher marginal operating costs than large networks. Networks choose identical external quality unless they have exogenously determined customer bases.

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Technical Compatibility and the Mode of Foreign Entry under Network Externalities

Mikhail Klimenko and Kamal Saggi*

September 2004

Paper available at http://www.netinst.org/Klimenko_Saggi.pdf

Abstract

This paper examines the preferences of a foreign firm and a welfare-maximizing host country government over two modes of foreign direct investment (FDI): de novo entry by the foreign firm and acquisition of the domestic incumbent. Two crucial features of the model are the presence of network externalities and (endogenously determined) partial incompatibility between the technology of the domestic incumbent and that introduced by the foreign firm. The relative impact of the modes of entry on local welfare is determined by the degree of competition (more intense under de novo entry) and the magnitude of the positive network externality (greater under acquisition). The clash between the foreign firm's equilibrium choice and the local government's ranking of the two modes of entry might be a potential motivation for policy restrictions that limit the degree of foreign ownership.

JEL classification numbers: F13, F23, O32

Keywords: Foreign Direct Investment, Oligopoly, Acquisition, Network Externalities, Technology Transfer, Technical Compatibility.

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Co-opetition in standard-setting: the case of the Compact Disc*

Tobias Kretschmer and Katrin Muehlfeld**

October 13, 2004

Paper available at http://www.netinst.org/Kretschmer_Muehlfeld.pdf

Abstract

The success of the CD has (partly) been attributed to the ability of Sony, Philips and Matsushita to cooperate in the run-up to the DAD conference in 1981, where the technological standard was set. We model the situation leading up to the conference in a simple game with technological progress and the possibility of prelaunching a technology. We identify players' tradeoffs between prelaunching (which ends technological progress) and continued development (which involves the risk of being pre-empted). Contrasting outcomes with complete and incomplete information, we find that there appeared to be considerable uncertainty about rivals' technological progress.

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A Model of Academic Journal Quality with Applications to Open-Access Journals

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Paper available at <http://www.netinst.org/McCabeSnyder.pdf>

Abstract

Previous research modeled academic journals as platforms connecting authors with readers in a two-sided market. This research used the same basic framework also used to study telephony, credit cards, video game consoles, etc. In this paper, we focus on a key difference between the market for academic journals and these other markets: journals vary in terms of quality, where a journal's quality determined by the quality of the papers it publishes. We provide a simple model of journal quality. As an illustration of the value of the model, we use it to address issues that have arisen in the recent debate concerning whether, in the Internet age, journals should become "open access" (freely available to readers, financed by author rather than subscriber fees). Among other issues, we examine (a) whether open-access journals would tend to publish more articles than traditional journals, moving further down the quality spectrum in order to boost revenue; (b) whether journal quality affects the profitability of adopting open access; and (c) whether submission fees or acceptance fees are better instruments to extract surplus from authors.

Keywords: Open access, academic journal, two-sided market, quality

Journal of Economic Literature Codes: L14, L82, D40, L31

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The Doubtful Profitability of Foggy Pricing*

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Abstract

This paper studies whether competition may induce firms abandoning deceptive pricing strategies aimed to profit from mistaken choices of consumers. The empirical analysis focuses on the pricing practices of early U.S. cellular firms, both under monopoly and duopoly. Foggy tariff options are those that are dominated by another option or a combination of other tariff options offered by the firm. I also define a measure of fogginess of non-dominated tariffs based on the range of airtime usage for which they are the least expensive option among those available. Results indicate that firms offer more dominated tariff options in a competitive market than under monopoly. While markets are profitable, perhaps because they grow or because firms collude, the use of foggy tactics is not frequent. However, if the market is more mature, or if firms do not cooperate, thus reducing the return to their investment, then they commonly turn to foggy pricing.

Keywords: Nonlinear Pricing; Foggy Strategies; Co-opetition.

JEL Codes: D43, L96, M21

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Information Precision and Asymptotic Efficiency of Industrial Markets

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Abstract

Online market places have an unprecedented power of bringing together a large number of buyers and sellers and aggregating information. Despite its benefits, this scale of aggregation of private information may bring about adverse effects that can cause inefficiencies, which can be ignored by conventional analysis. In this paper, I present a strategic model of a large industrial market with asymmetric information to examine (i) the validity of the conjecture of price-taking behavior in such markets as the number of agents becomes large; (ii) the effect of the rate that individual information precision decreases with increased number of agents on convergence to price-taking and efficiency. I show that in an industrial market with downstream competition, increasing the number of sellers may make all participants price-takers in the limit, but increasing the number of buyers may not. When the total precision of information in the market is high, price taking and full social efficiency is achieved in the limit with large numbers of buyers and sellers. However, if the total precision of information in the market is poor, large inefficiencies, including full inefficiency, can occur in the limiting outcome. The rate of decrease of individual information precision with increased number of agents determines the rate of convergence to efficiency, and the convergence is slower than that predicted by the single unit trading models in the literature.

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